

GRSM WIP Report

NPS Retaining Wall Inventory Program Great Smoky Mountains National Park



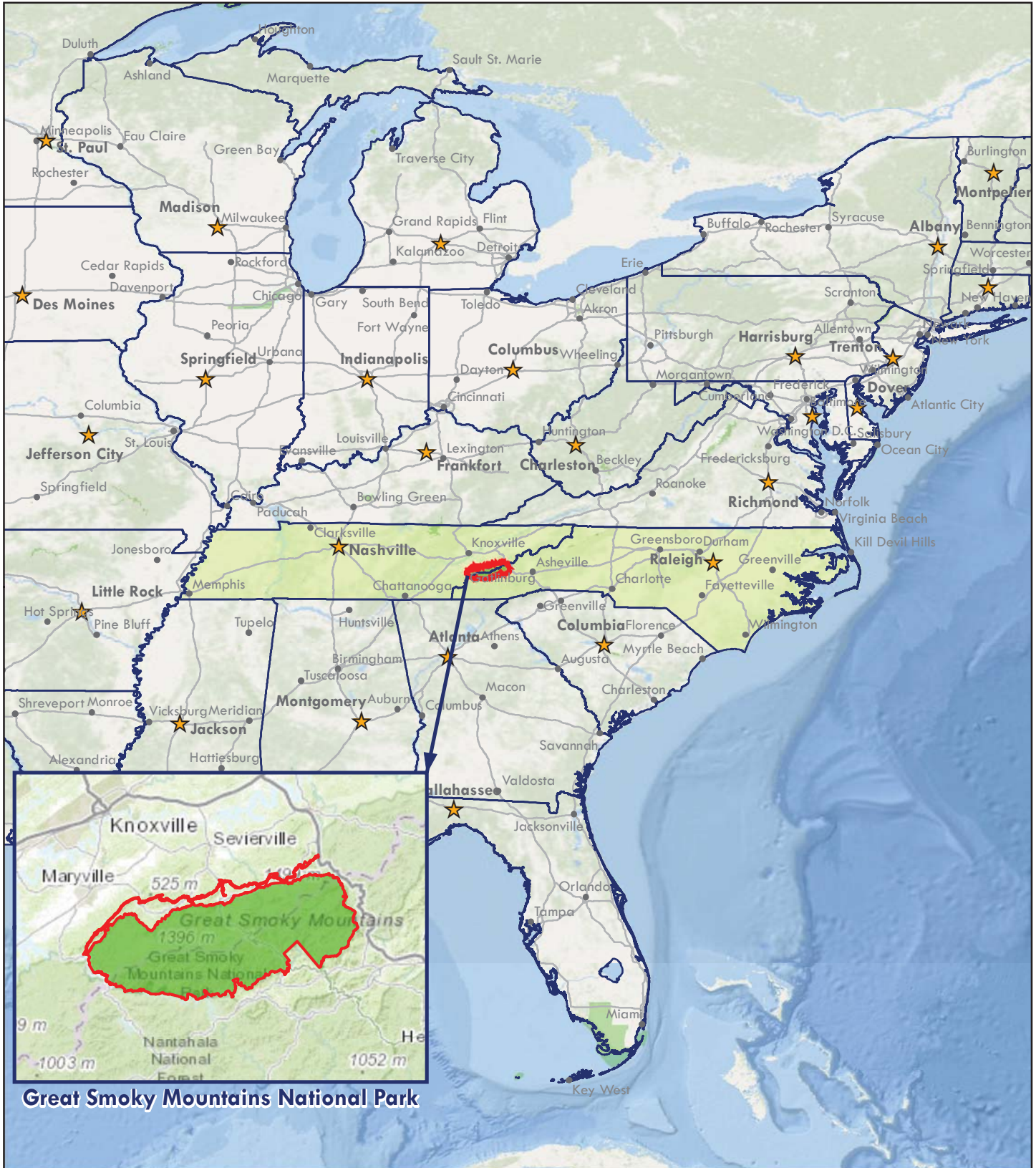
**Federal Lands Highway
Road Inventory Program**

Prepared By:

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

Data Collection Date: April 2011
Report Date: November 2015

Great Smoky Mountains National Park in North Carolina and Tennessee



Great Smoky Mountains National Park

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



Great Smoky Mountains National Park



**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



Great Smoky Mountains National Park

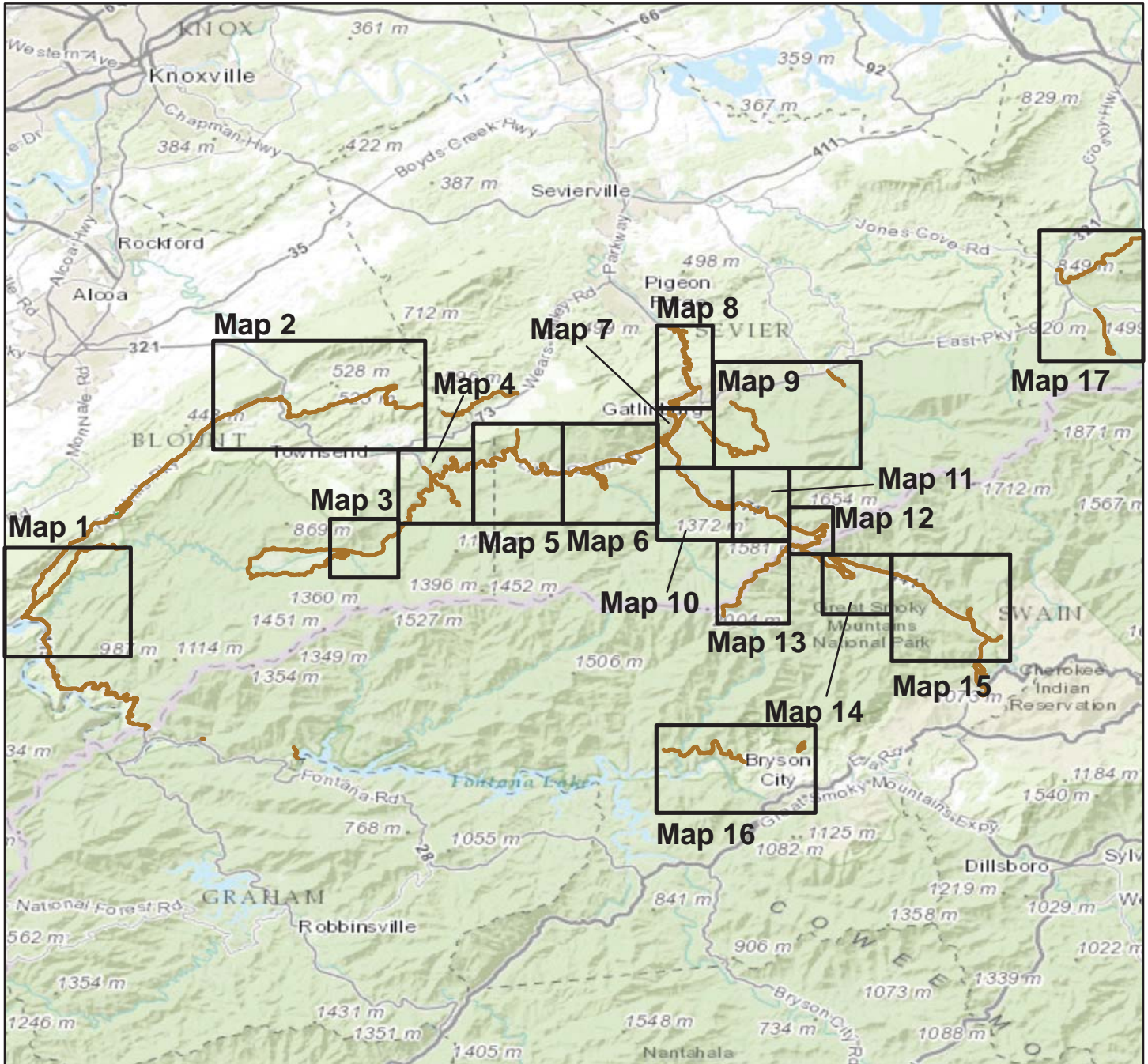


Federal Lands Highway
Road Inventory Program

Great Smoky Mountains National Park

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

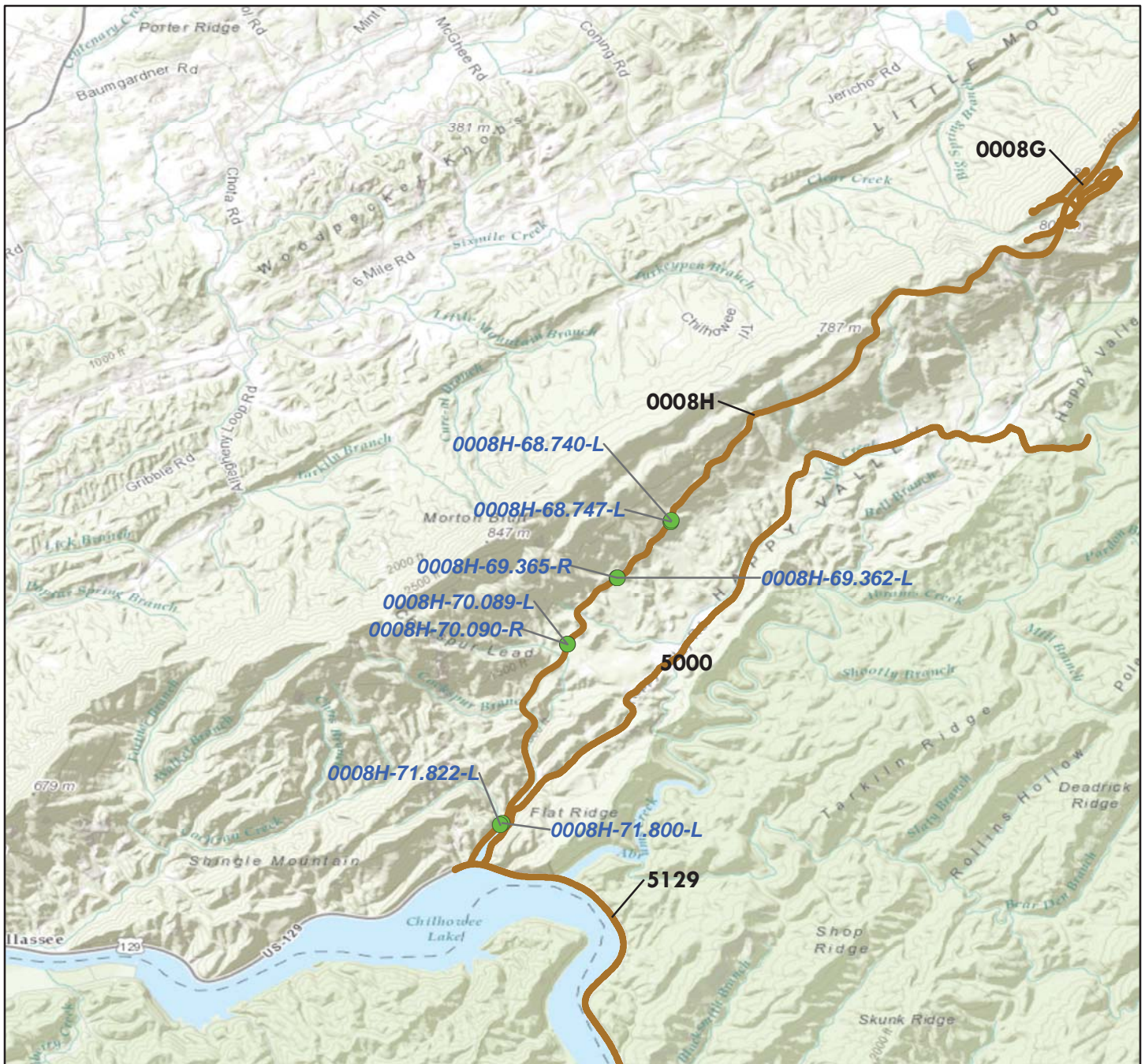
 RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

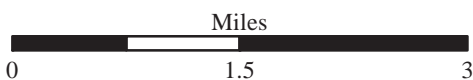
Map 1



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

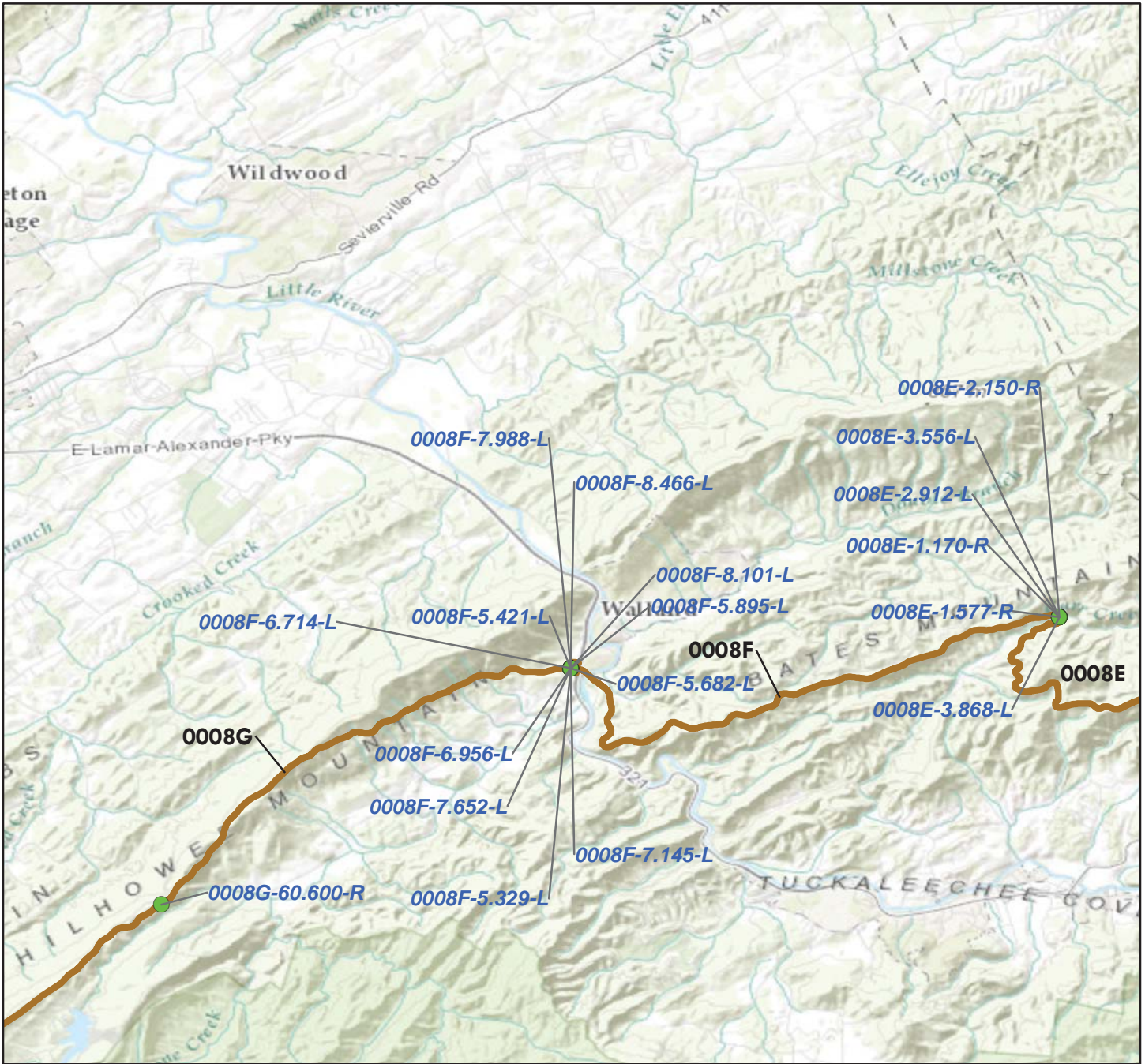
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 2



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

● Wall Locations

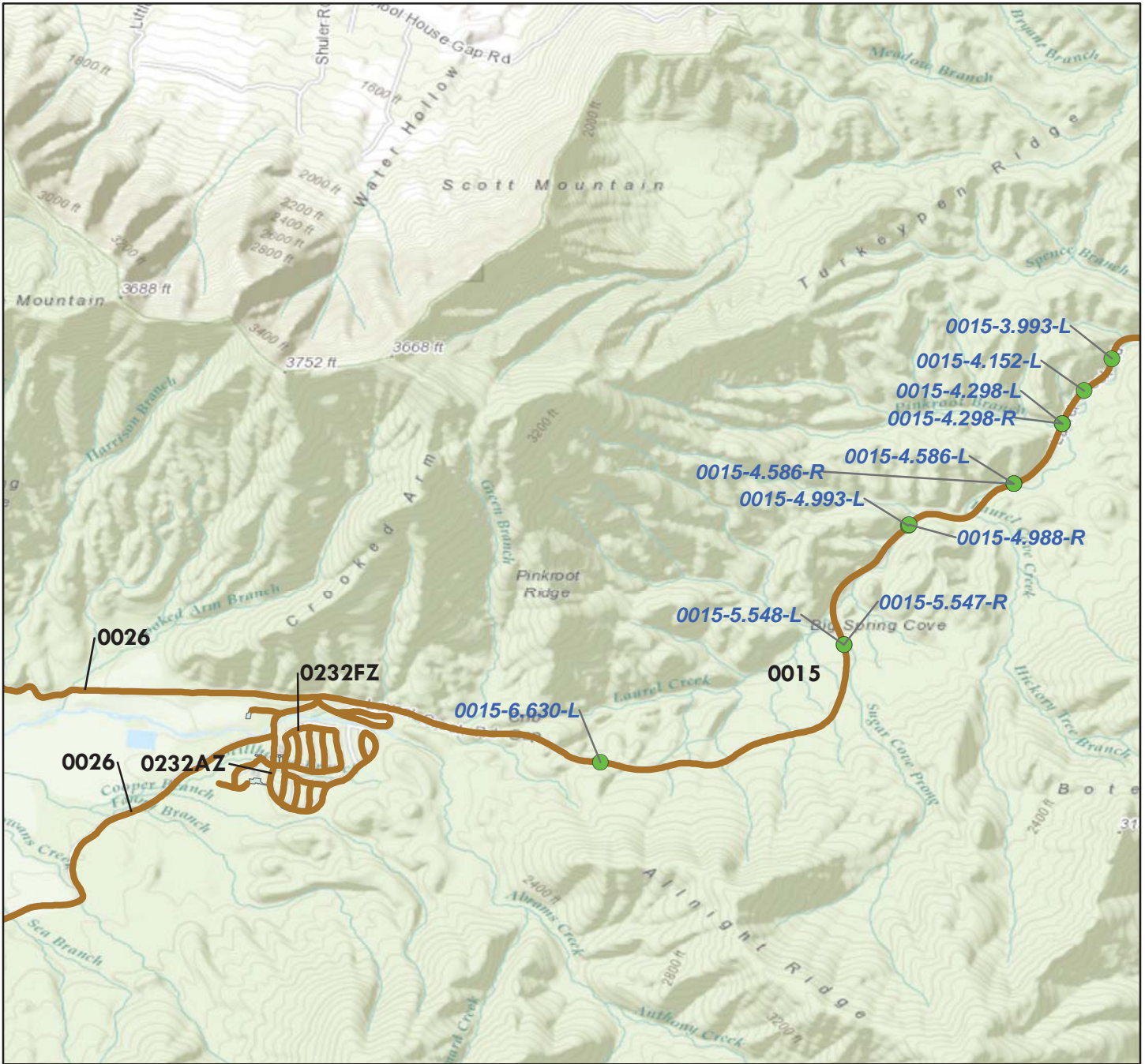
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 3



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

● Wall Locations

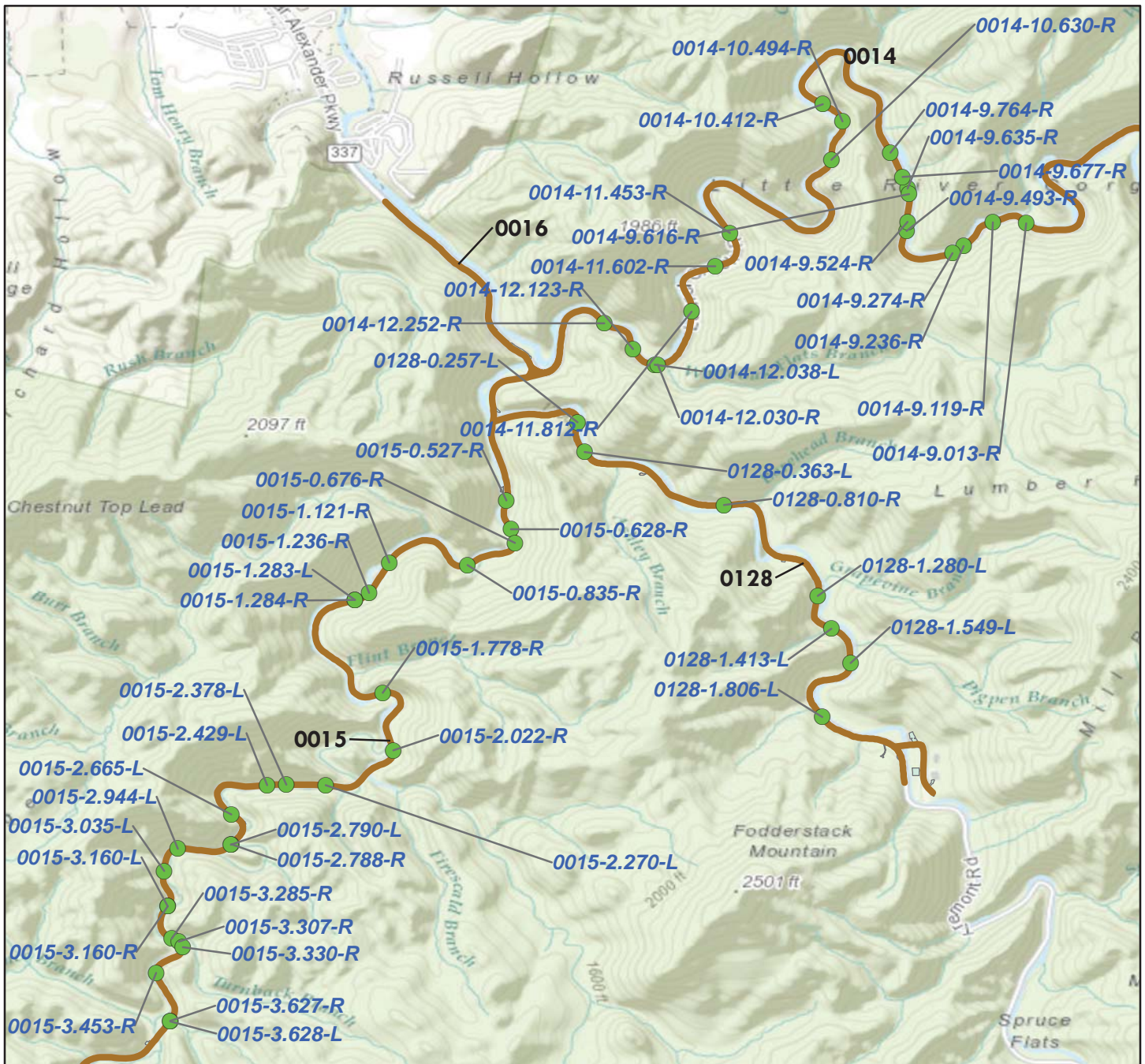
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 4



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

● Wall Locations

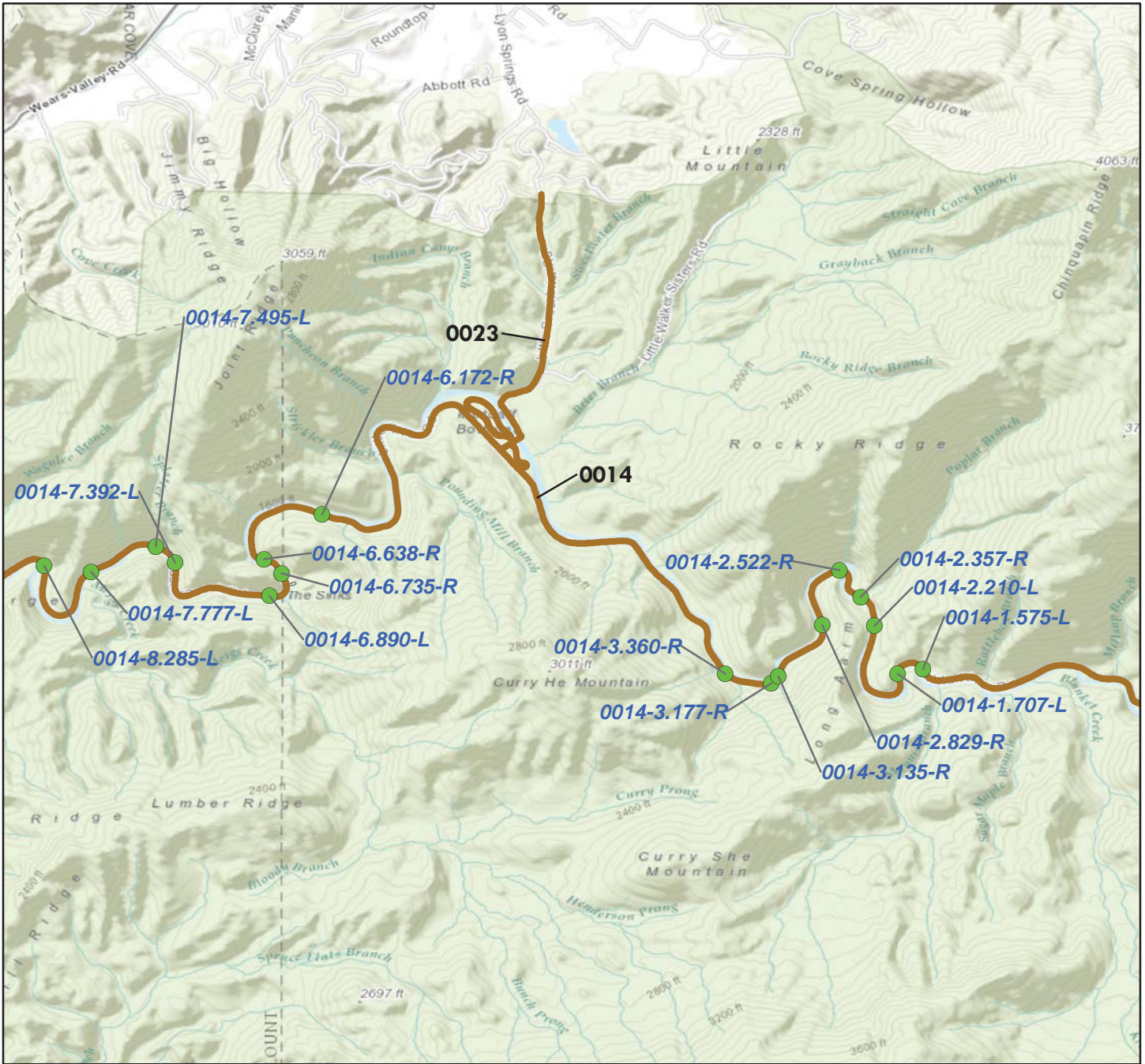
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

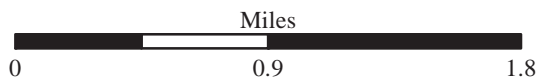
Map 5



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

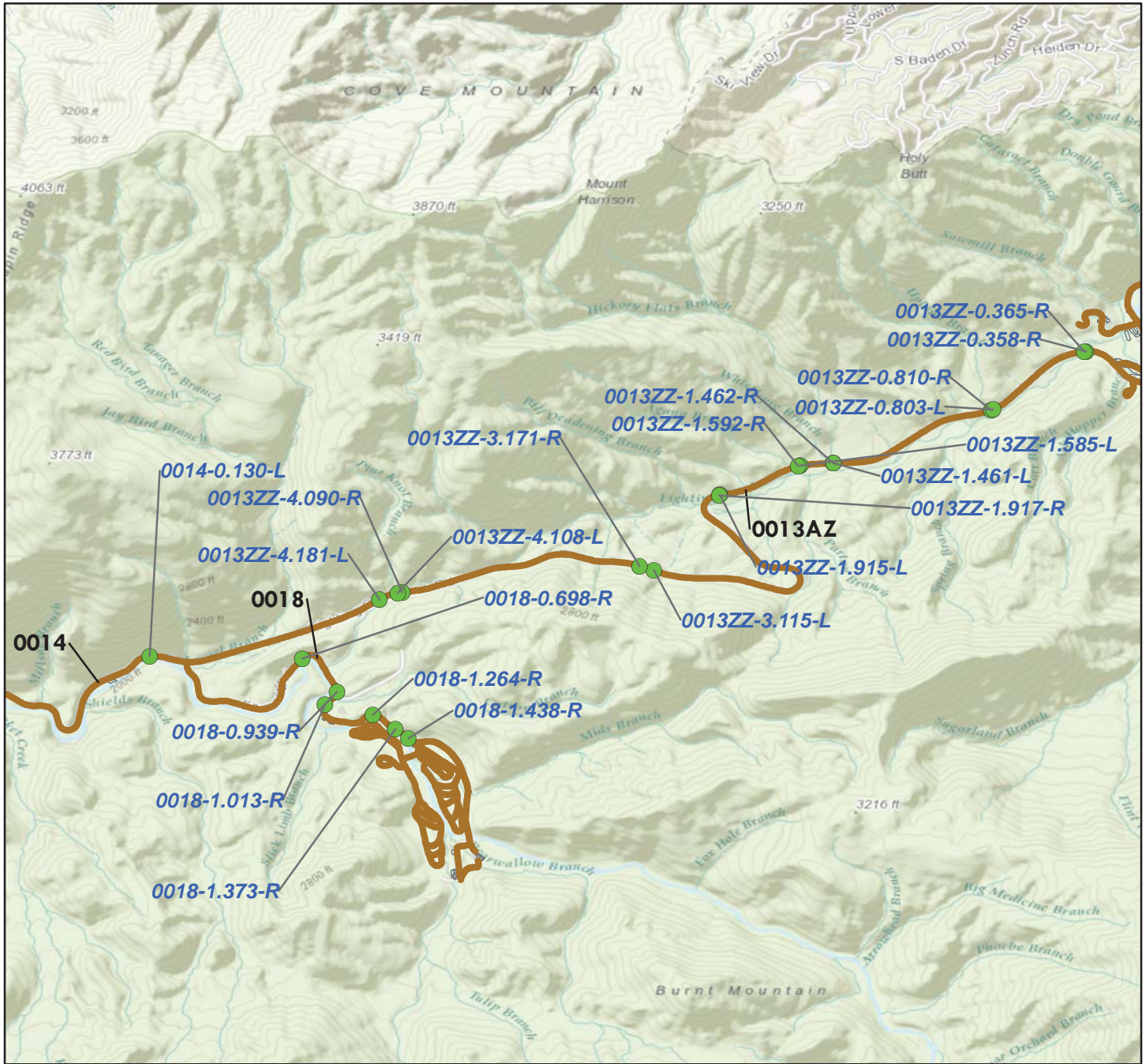
— RIP Collected Routes



Great Smoky Mountains National Park

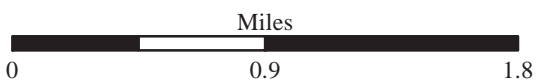
WALL LOCATION MAP

Map 6



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

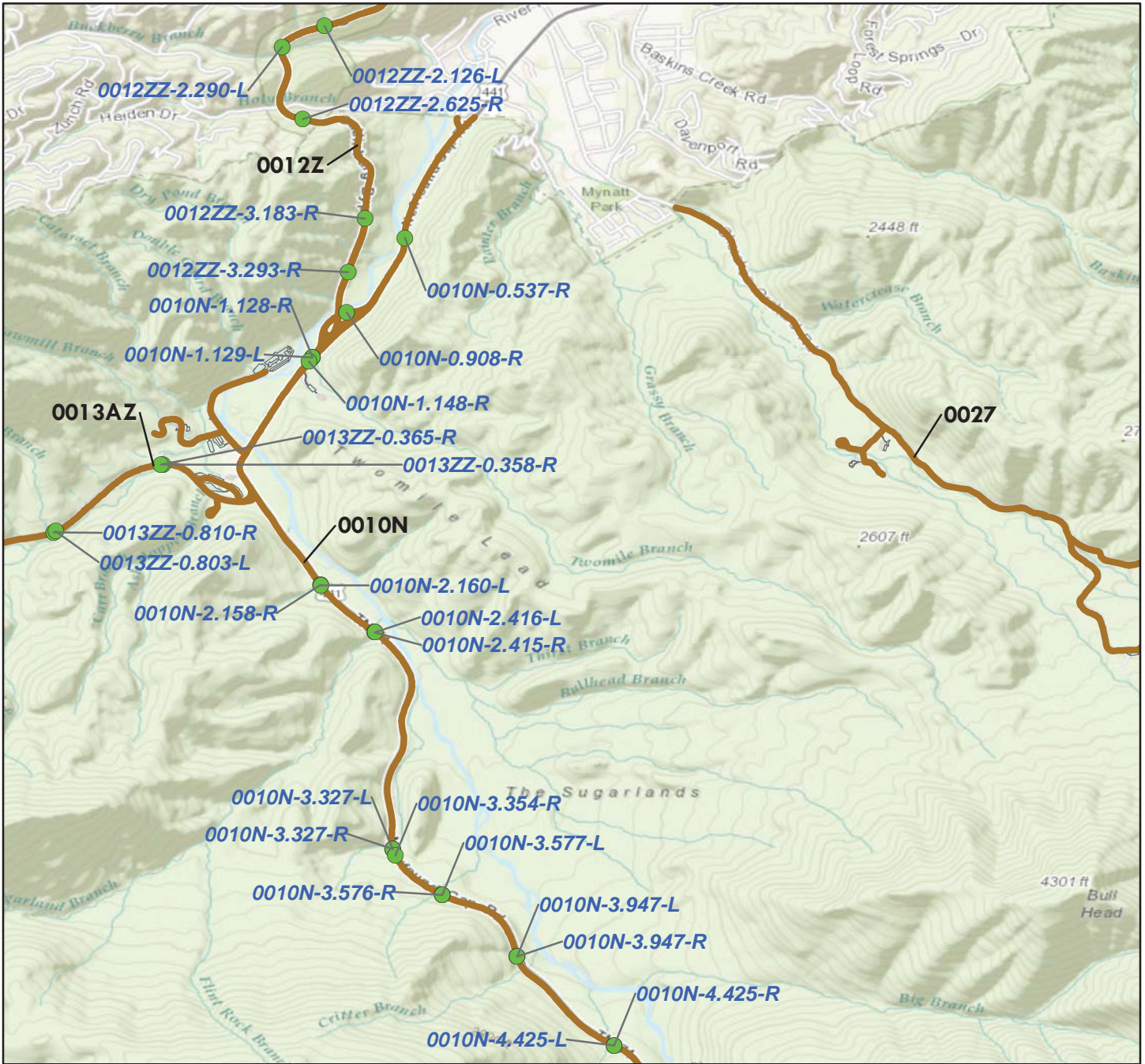
- Wall Locations
- RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 7



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

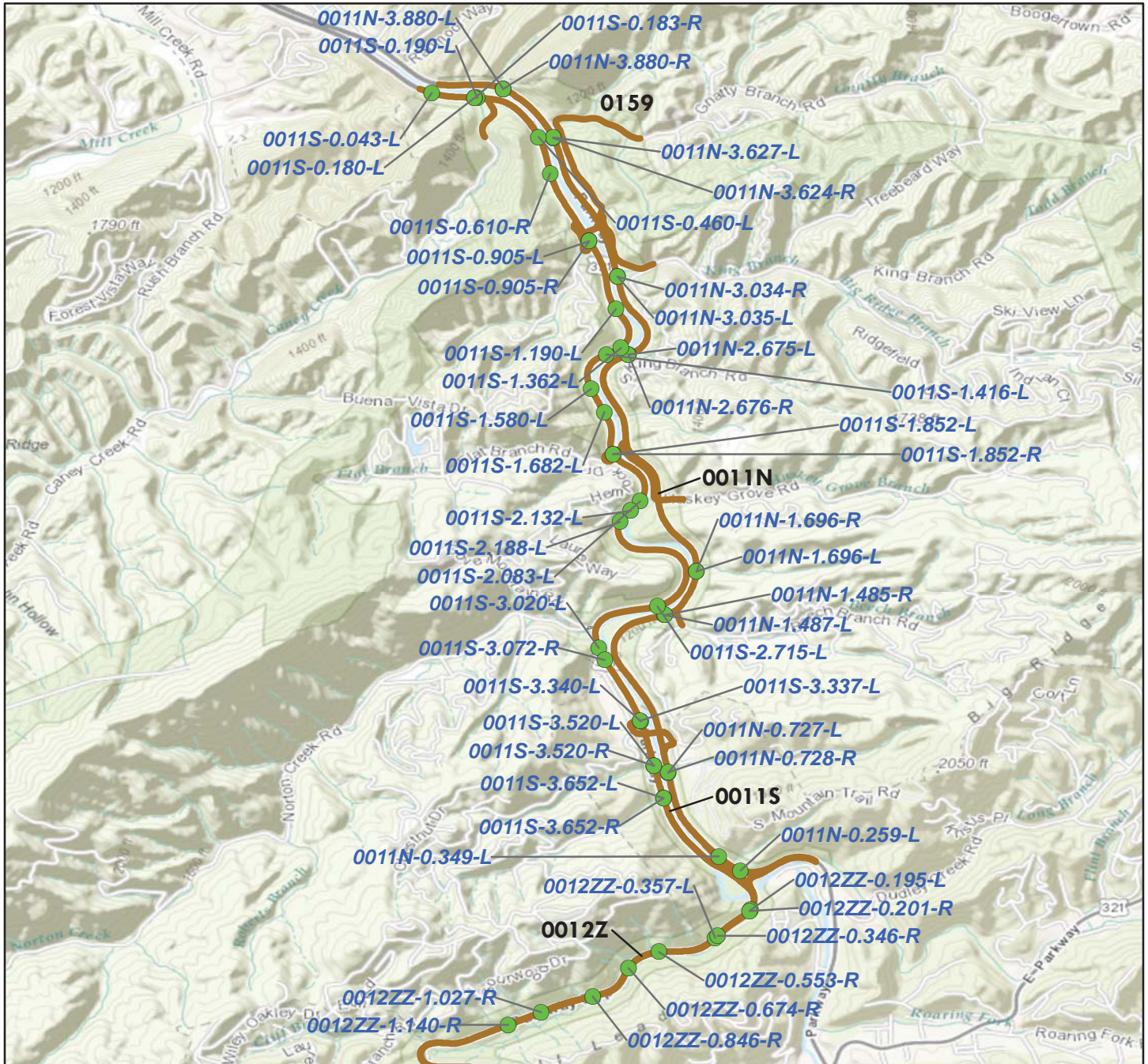
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

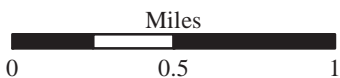
Map 8



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

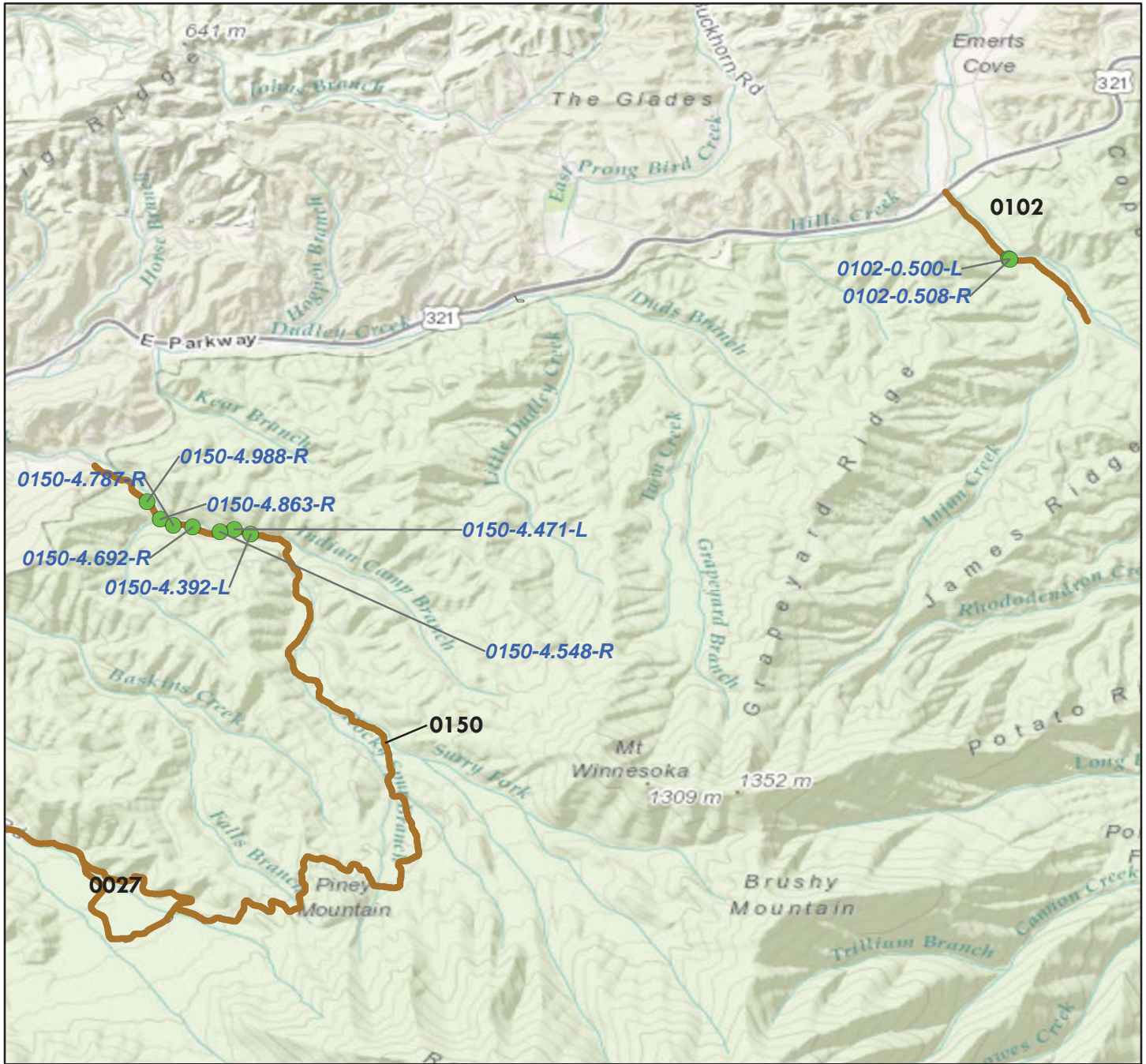
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 9



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

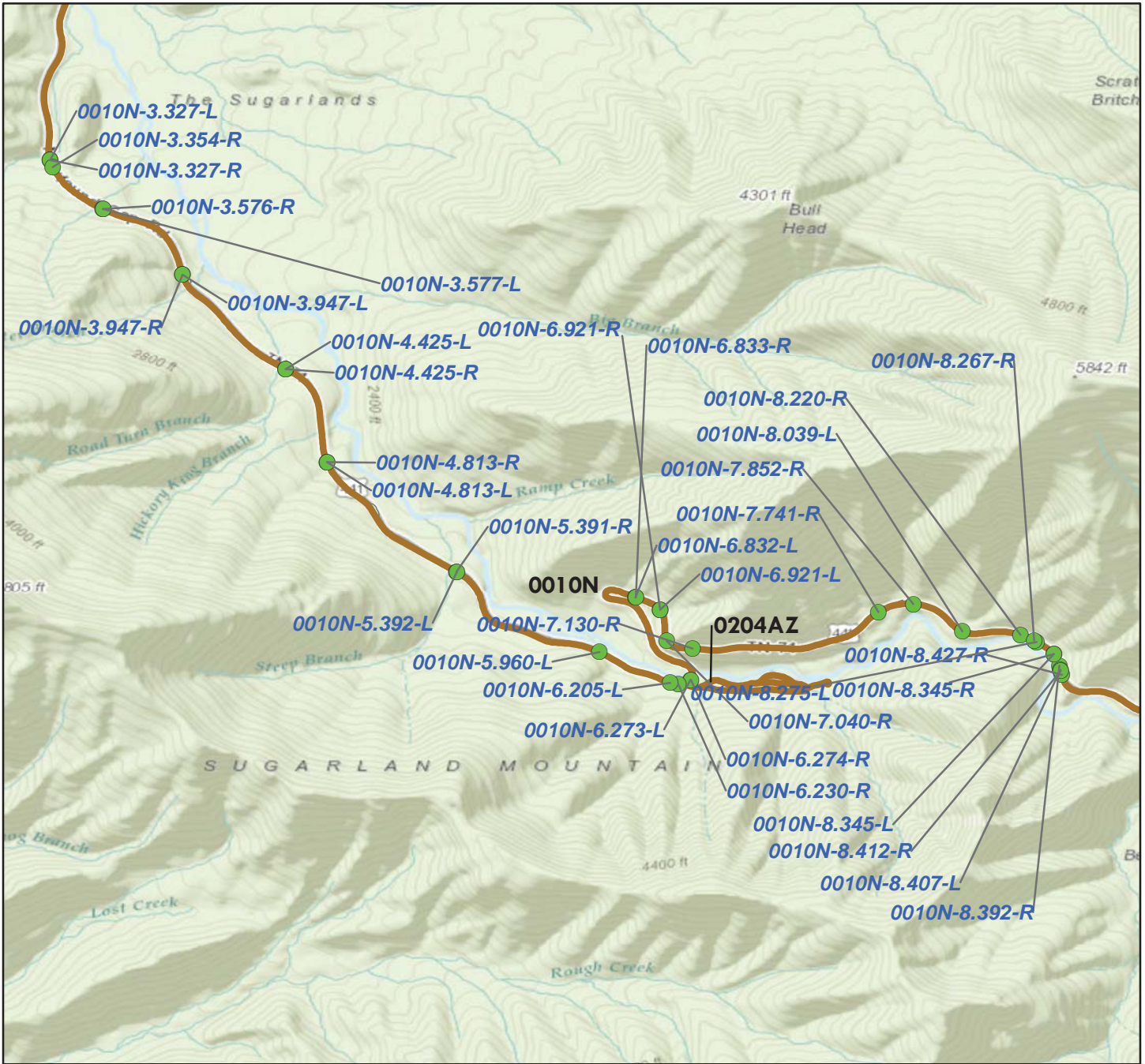
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 10



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

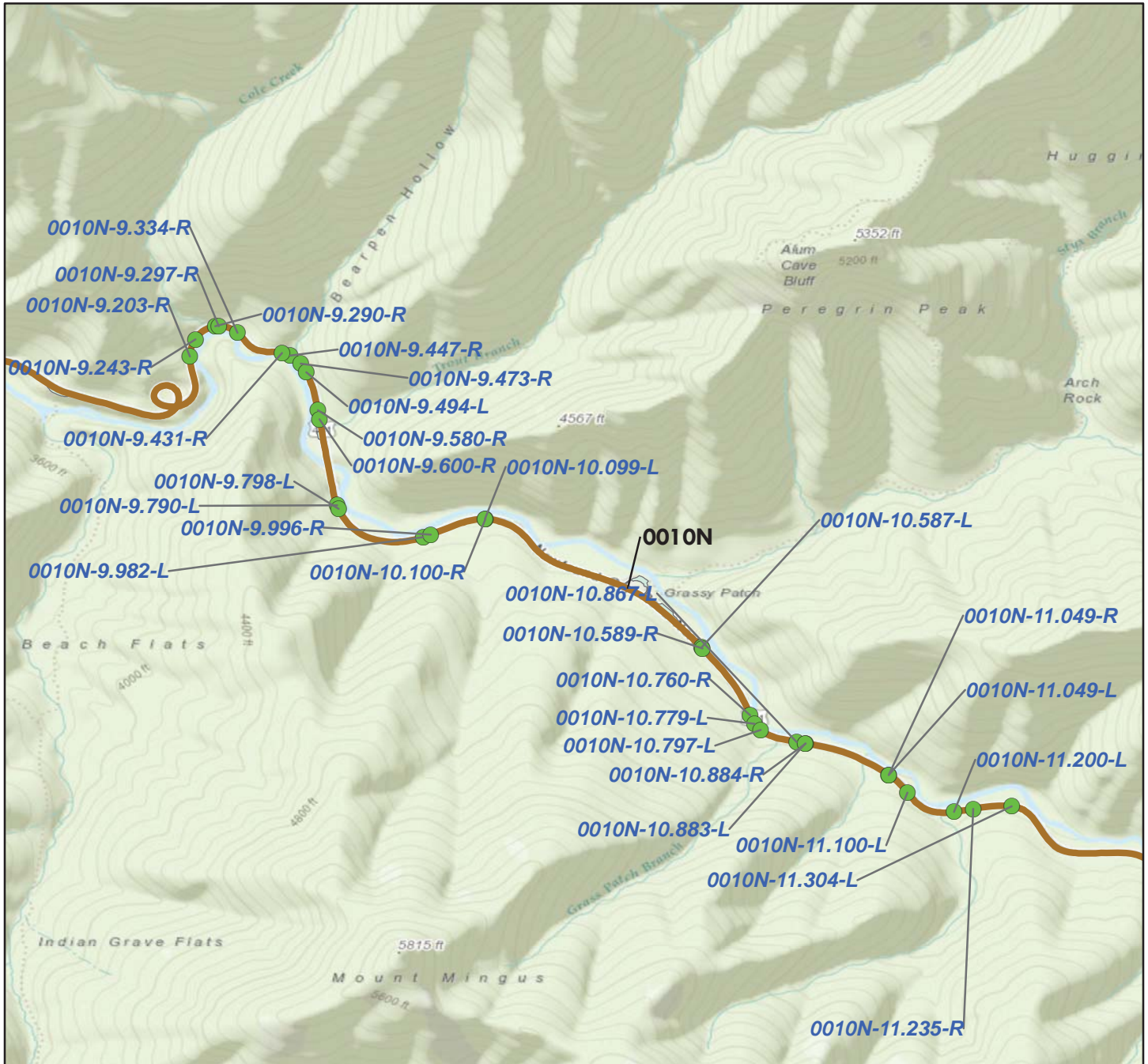
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 11



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

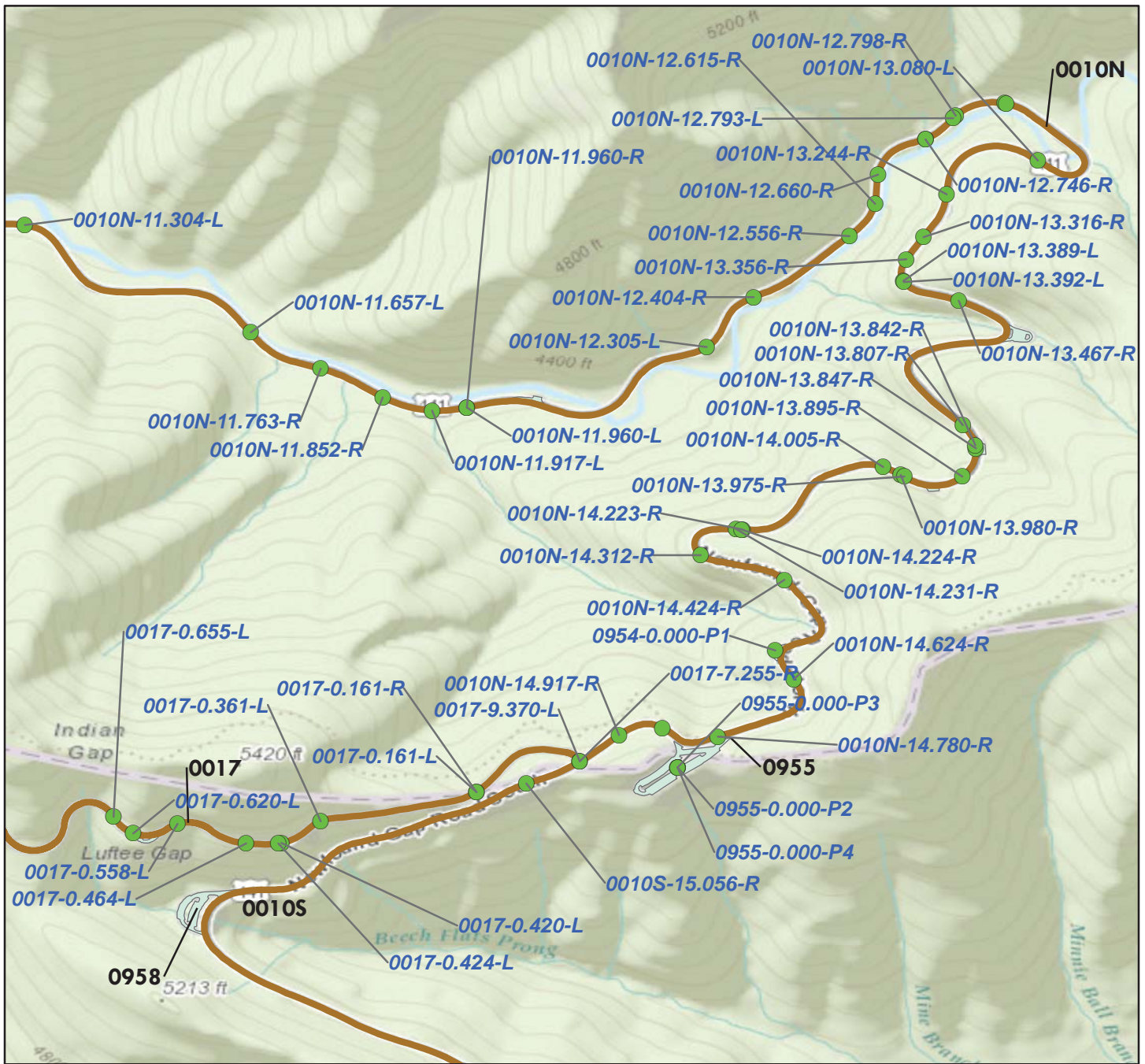
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 12



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

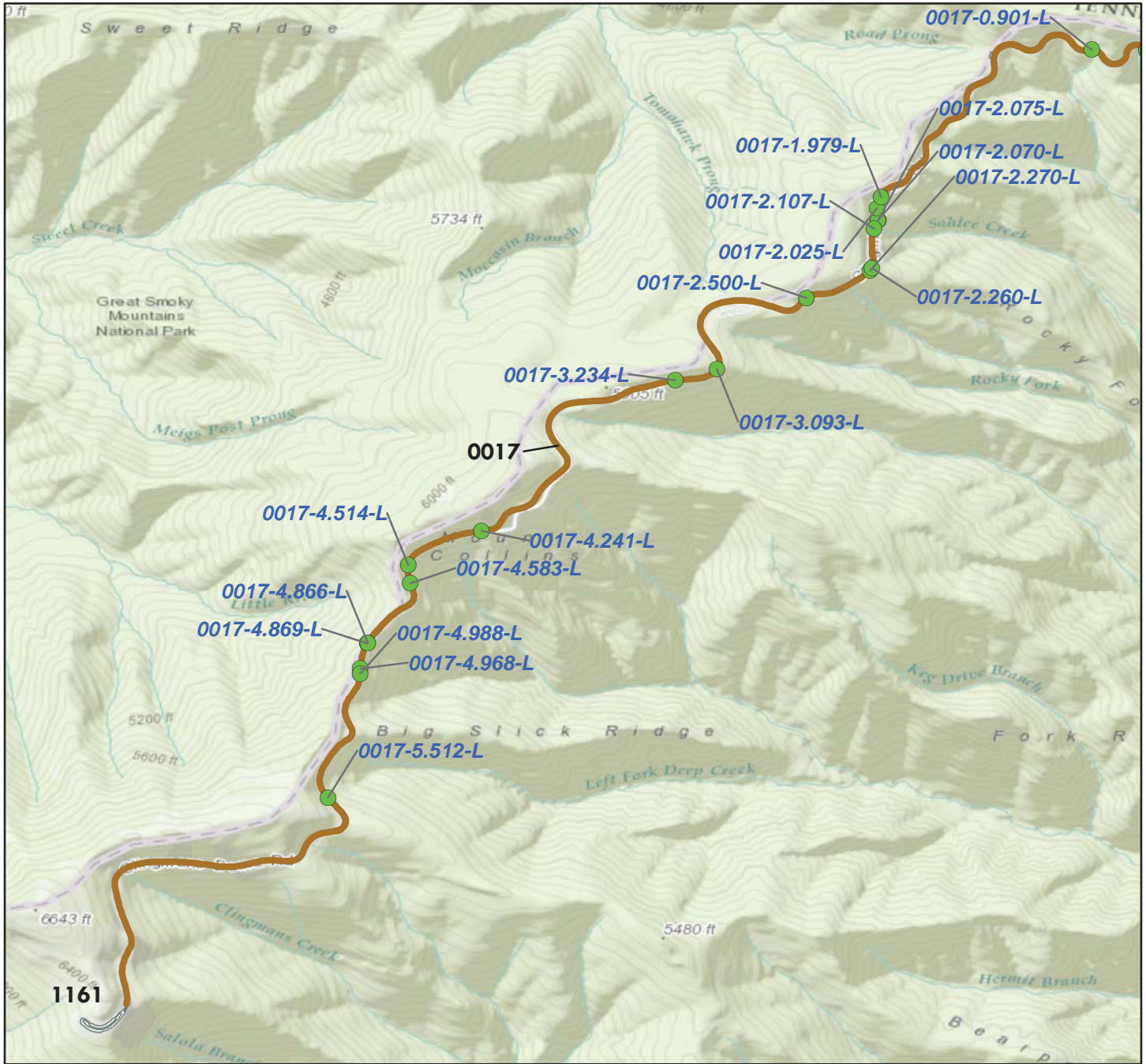
- Wall Locations (Not all labeled)
- RIP Collected Routes
- RIP Collected Parking



Great Smoky Mountains National Park

WALL LOCATION MAP

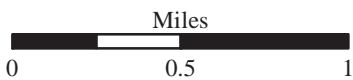
Map 13



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

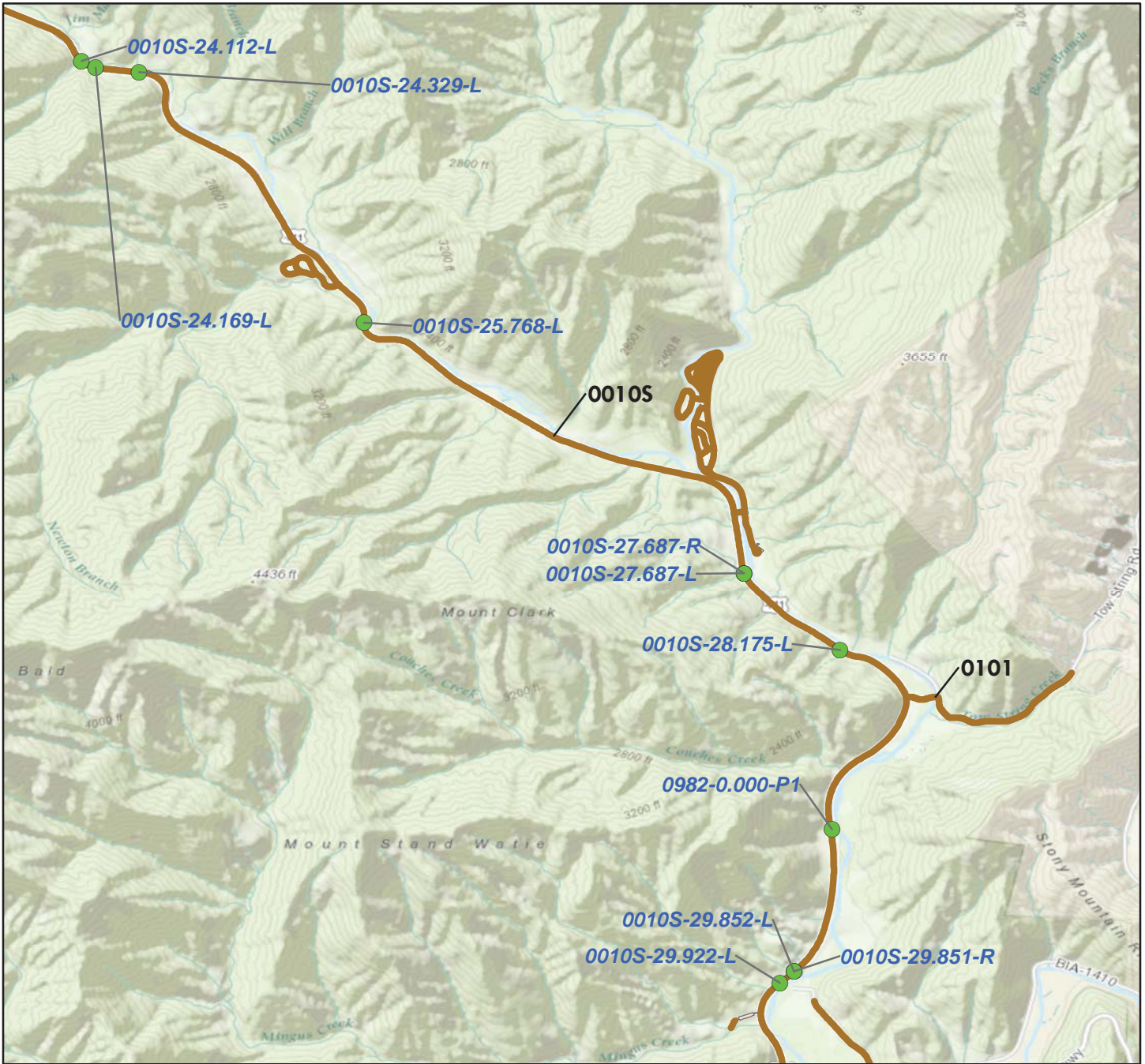
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

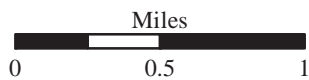
Map 15



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

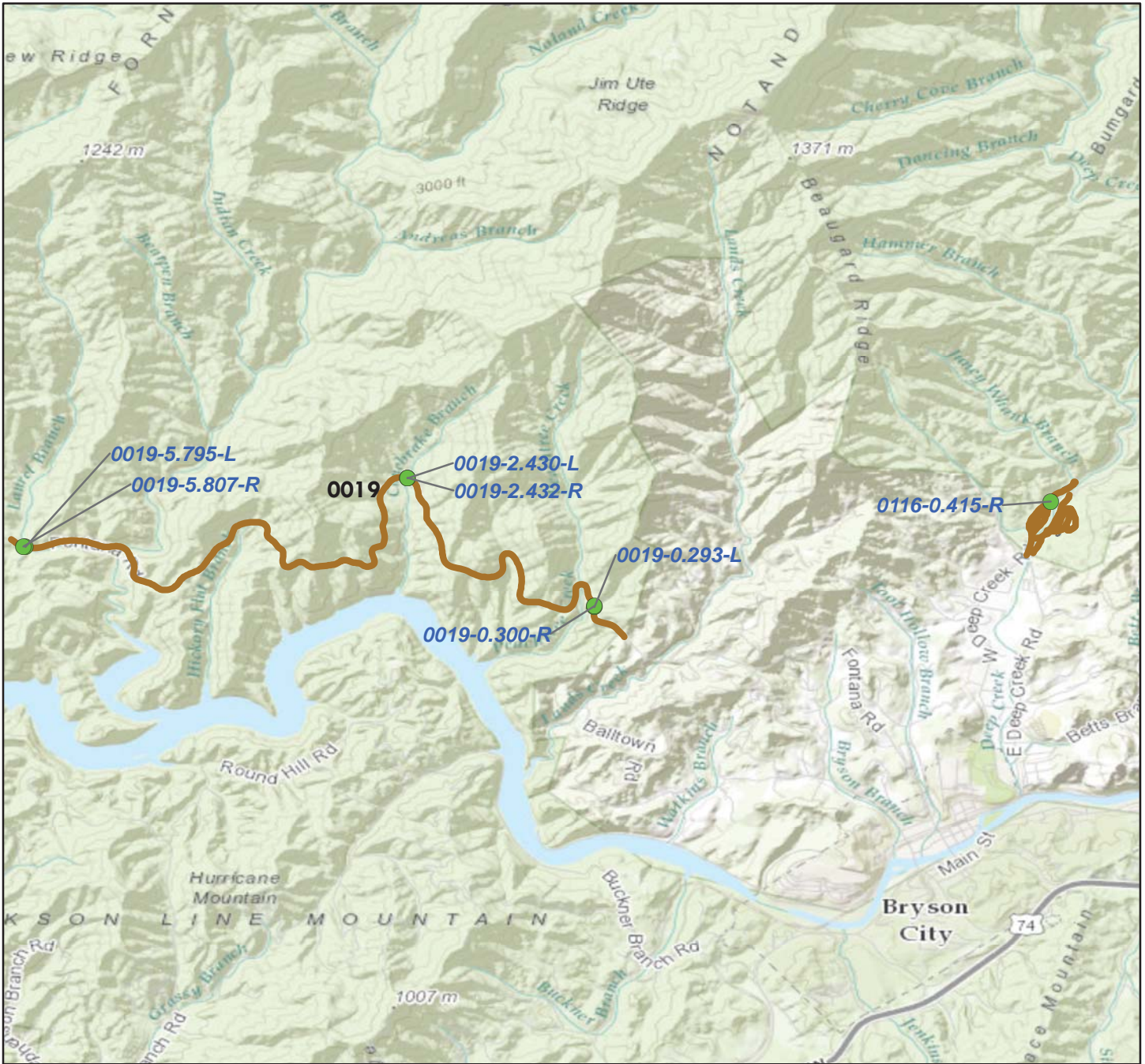
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 16



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

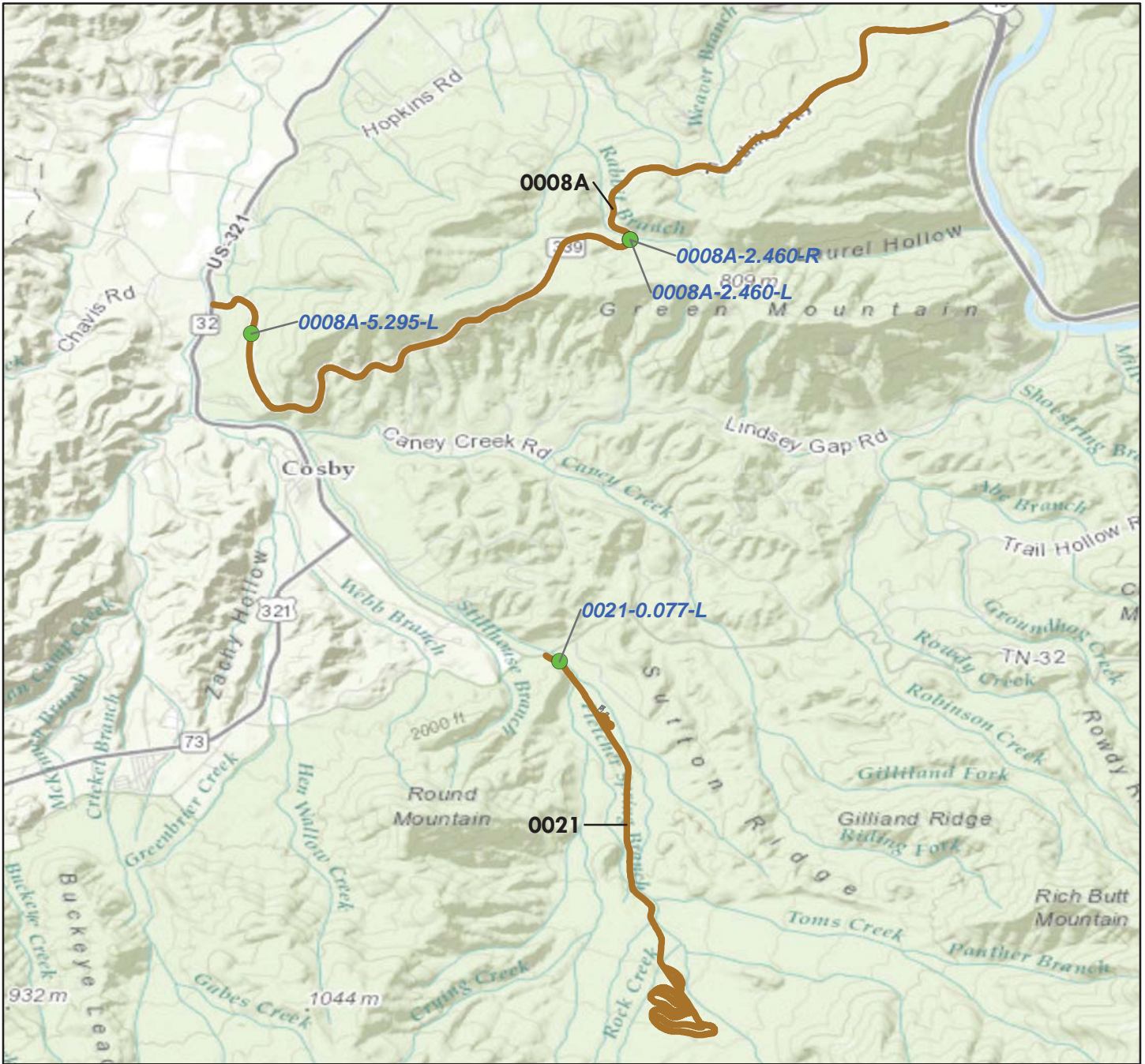
— RIP Collected Routes



Great Smoky Mountains National Park

WALL LOCATION MAP

Map 17



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



Great Smoky Mountains National Park



Federal Lands Highway
Road Inventory Program

Parkwide Summary: Great Smoky Mountains National Park

Initial retaining wall inspections were conducted at Great Smoky Mountains National Park in 2011, and encompassed all known retaining wall structures associated with Park roadways - including structure's retaining cuts and fills, as well as qualifying headwalls at culverts. For the purposes of the assessment, walls must be a minimum of 4 feet in maximum height of retained earth and greater than 6 feet in maximum height for culvert headwalls. This does not include the height of parapet or guardwall above a retaining wall. In general, guardwall or parapets are not included in this assessment, but were inspected for Great Smoky Mountains National Park in 2010 under a separate effort as part of the Guardwall/Rail Inventory Program (GIP). A report for GIP is available under separate cover.

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

The following tables provide an overview of the findings of this inspection and assessment effort. In all, 404 walls were inventoried on the routes listed below.

Table 1: Number of Walls by Route

Route Number	Route Name	No. of Walls
0008A	FOOTHILLS PARKWAY SECTION 8A	3
0008E	FOOTHILLS PARKWAY SECTION 8E	6
0008F	FOOTHILLS PARKWAY SECTION 8F	11
0008G	FOOTHILLS PARKWAY SECTION 8G	1
0008H	FOOTHILLS PARKWAY SECTION 8H	8
0010N	NEWFOUND GAP ROAD NORTH	116
0010S	NEWFOUND GAP ROAD SOUTH	34
0011N	GATLINBURG SPUR ROAD (NORTHBOUND)	16
0011S	GATLINBURG SPUR ROAD (SOUTHBOUND)	27
0012ZZ	GATLINBURG BYPASS ROAD AND RAMPS	14
0013ZZ	FIGHTING CREEK GAP ROAD AND SPUR	15
0014	LITTLE RIVER GORGE ROAD	38
0015	LAUREL CREEK ROAD	37
0017	CLINGMANS DOME ACCESS ROAD	30
0018	ELKMONT ROAD	6
0019	LAKEVIEW DRIVE EAST	6
0021	COSBY ENTRANCE ROAD	1
0022	CATALOCHEE ENTRANCE ROAD	3

Table 1: Number of Walls by Route

Route Number	Route Name	No. of Walls
0102	GREENBRIER ROAD	2
0116	WEST DEEP CREEK ROAD	1
0128	TREMONT ROAD	7
0150	ROARING FORK MOTOR NATURE TRAIL	7
0700	UNKNOWN ROUTE	9
0954	PARKING AT MP 14.4	1
0955	NEWFOUND GAP PARKING AREA	4
0982	COUCHES CREEK PARKING (OCONALUFTEE RIVER PULLOUT PARKING #12)	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
BW - Bridge Wall	1
CW - Cut Wall	5
FW - Fill Wall	195
HW - Head Wall	200
SP - Slope Protection	3

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	6
CL, Cantilever - Concrete	15
GC, Gravity - Mass Concrete	2
GD, Gravity - Dry Stone	33
GM, Gravity - Mortared Stone	327
MP, MSE - Precast Panel	20
TPW, Other -Tie back Panel Wall	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	294
Monitor	\$0	0
Maintenance	\$265,973	61
Repair Elements	\$1,154,183	40
Replace Elements	\$32,284	3
Replace Wall	\$730,239	6
Totals	\$2,182,679	404

*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	294
\$1 - \$25,000	91
\$25,001 - \$50,000	8
\$50,001 - \$100,000	7
\$100,001 - \$250,000	3
\$250,001 - \$500,000	1
\$500,001 - \$1,000,000	0
\$1,000,001 - \$2,000,000	0
\$2,000,001 - \$3,000,000	0
\$3,000,001 - \$4,000,000	0
Total Number of Walls	404

*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 Great Smoky Mountains National Park. 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 Great Smoky Mountains National Park 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⁾
GRSM-0010N-11.304-L	LOW	37	REPLACE WALL	\$52,500
GRSM-0010N-3.947-L	HIGH	49	REPLACE WALL	\$44,400
GRSM-0011S-1.852-L	HIGH	45	REPAIR ELEMENTS	\$50,500
GRSM-0017-4.988-L	MODERATE	45	REPLACE WALL	\$345,713
GRSM-0700-7.000-R	LOW	34	NO ACTION	\$0
GRSM-0982-0.000-P1	LOW	48	REPLACE WALL	\$43,526

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



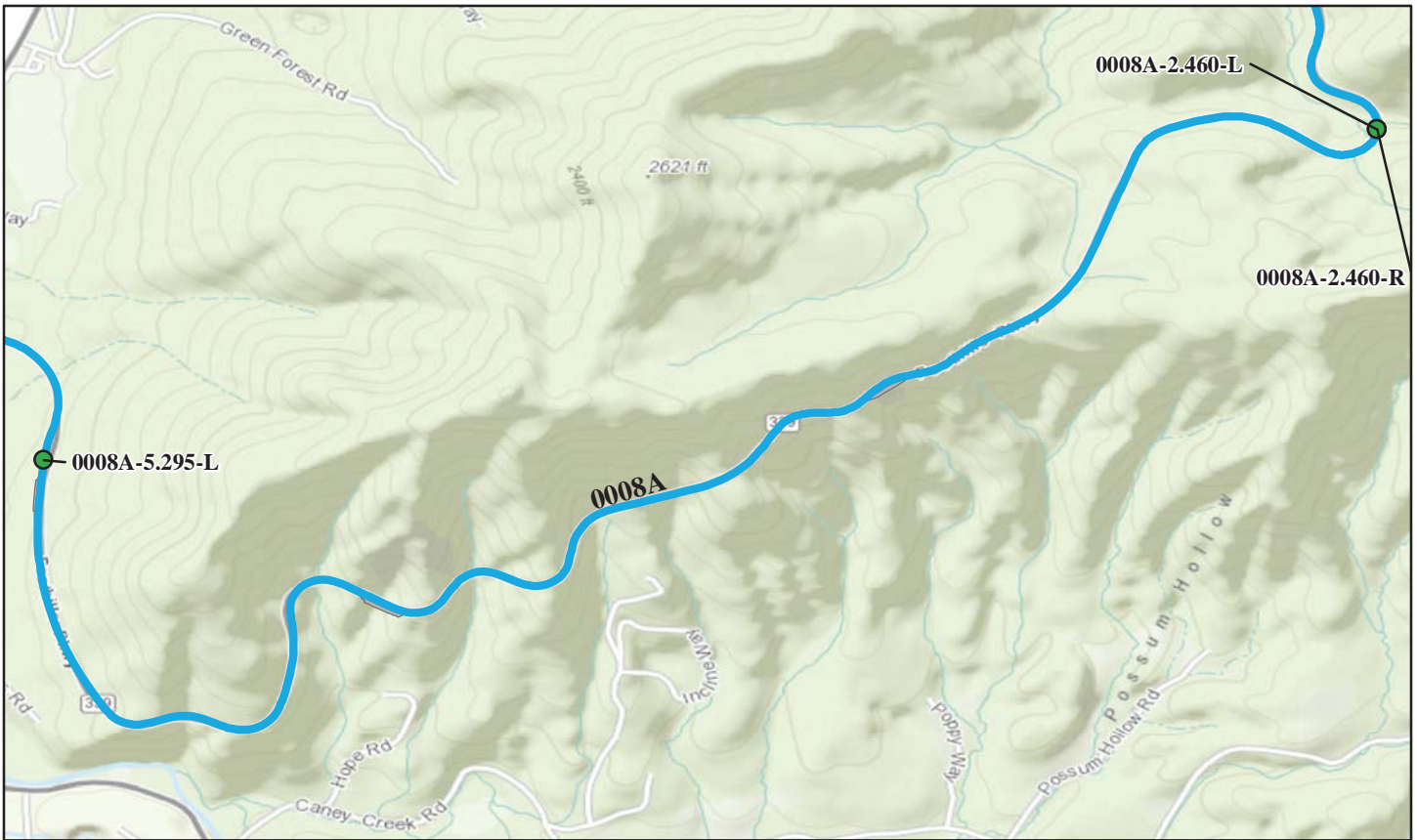
Great Smoky Mountains National Park



Federal Lands Highway
Road Inventory Program

Great Smoky Mountains National Park

ROUTE 0008A: FOOTHILLS PARKWAY SECTION 8A



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
GRSM-0008A-2.460-L 12/3/2007	435	58	Cantilever - Concrete	Head Wall	90	\$0.00
GRSM-0008A-2.460-R 12/3/2007	314	38	Cantilever - Concrete	Head Wall	90	\$0.00
GRSM-0008A-5.295-L 12/3/2007	1,330	197	Crib - Concrete	Cut Wall	93	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E



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)

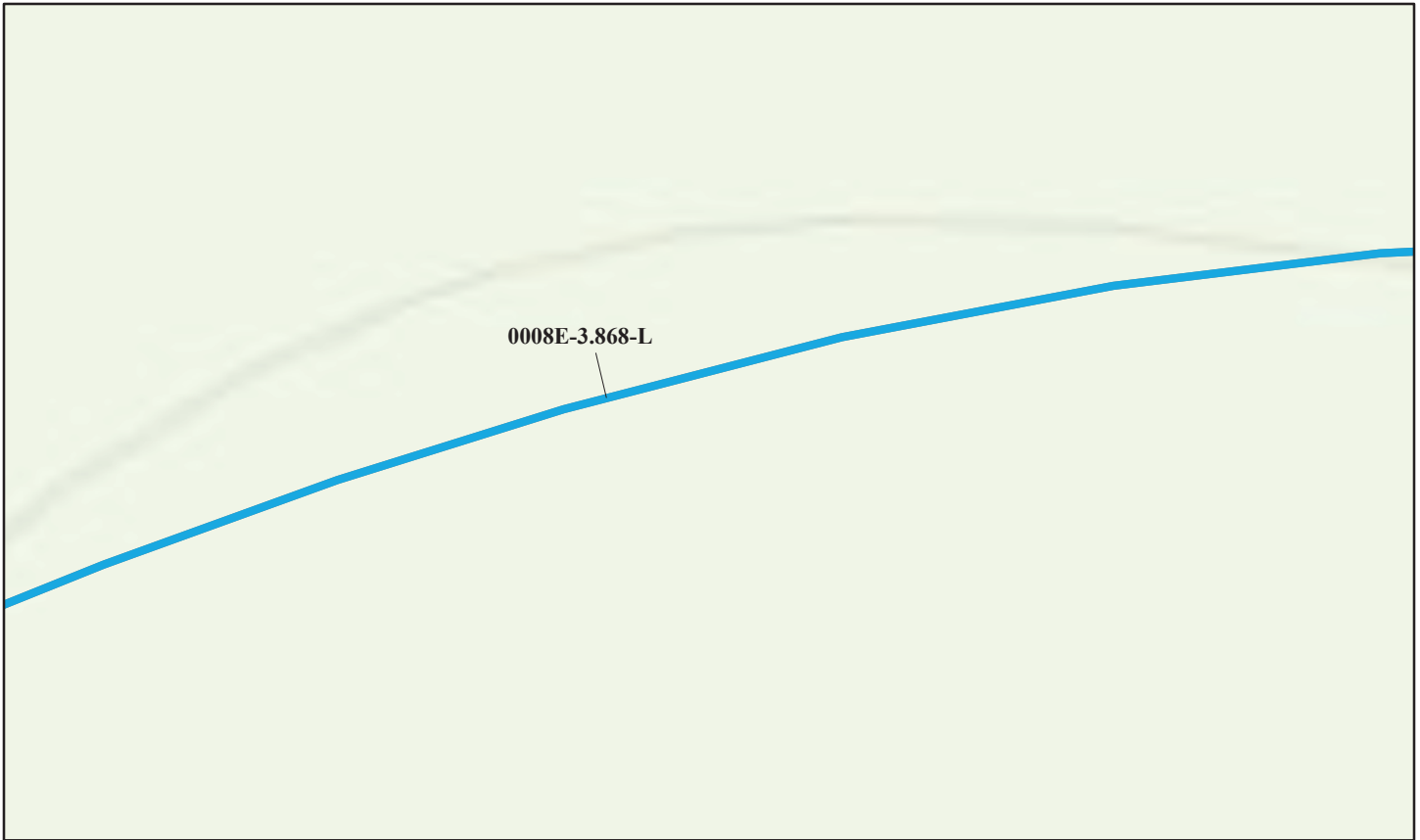
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0008E-1.170-R 4/19/2011	8,600	322	Other -Tie back Panel Wall	Cut Wall		
GRSM-0008E-1.577-R 4/19/2011	9550	422	MSE - Precast Panel	Fill Wall		
GRSM-0008E-2.150-R 4/19/2011	3040	276	MSE - Precast Panel	Fill Wall		
GRSM-0008E-2.912-L 4/19/2011	4500	195	MSE - Precast Panel	Fill Wall		
GRSM-0008E-3.556-L 4/19/2011	7250	330	MSE - Precast Panel	Fill Wall		

*Rating and cost data was not collected on this route.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E



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
GRSM-0008E-3.868-L 4/19/2011	640	80	Gravity - Dry Stone	Fill Wall		

*Rating and cost data was not collected on this route.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F



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)

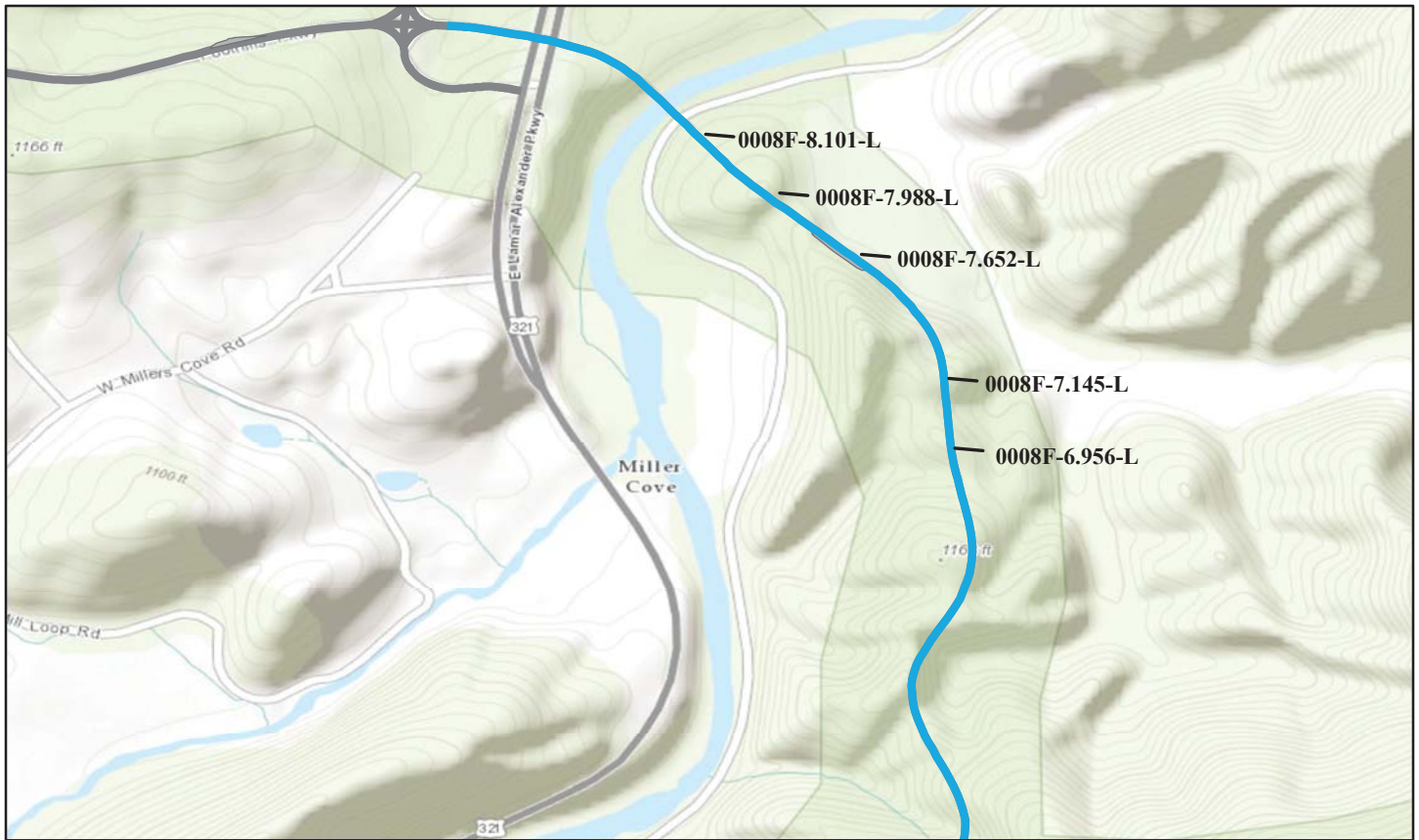
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0008F-5.329-L 4/19/2011	130	20	Cantilever - Concrete	Fill Wall		
GRSM-0008F-5.421-L 4/19/2011	4250	250	Cantilever - Concrete	Fill Wall		
GRSM-0008F-5.682-L 4/19/2011	936	117	Cantilever - Concrete	Fill Wall		
GRSM-0008F-5.895-L 4/19/2011	3934	319	MSE - Precast Panel	Fill Wall		
GRSM-0008F-6.714-L 4/19/2011	10	200	MSE - Precast Panel	Fill Wall		

*Rating and cost data was not collected on this route.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F



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
GRSM-0008F-6.956-L 4/19/2011	1,000	75	MSE - Precast Panel	Fill Wall		
GRSM-0008F-7.145-L 4/19/2011	1220	152	MSE - Precast Panel	Fill Wall		
GRSM-0008F-7.652-L 4/19/2011	1785	135	MSE - Precast Panel	Fill Wall		
GRSM-0008F-7.988-L 4/19/2011	10	120	MSE - Precast Panel	Fill Wall		
GRSM-0008F-8.101-L 4/19/2011	8100	281	MSE - Precast Panel	Fill Wall		

*Rating and cost data was not collected on this route.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F



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)

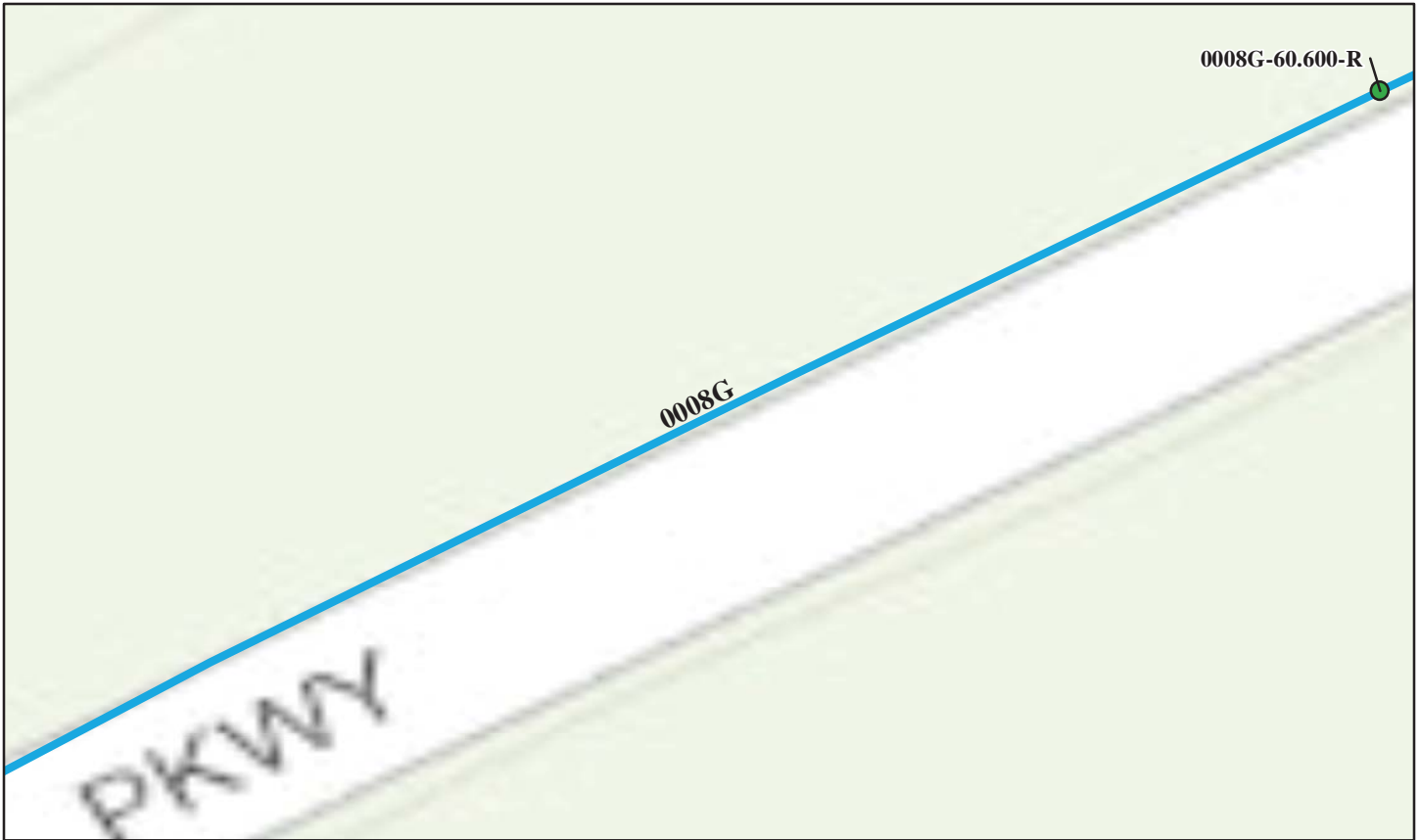
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0008F-8.466-L 4/19/2011	1,864	92	MSE - Precast Panel	Fill Wall		

*Rating and cost data was not collected on this route.

Great Smoky Mountains National Park

ROUTE 0008G: FOOTHILLS PARKWAY SECTION 8G



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
GRSM-0008G-60.600-R 12/1/2007	1,445	115	MSE - Precast Panel	Fill Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H



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
GRSM-0008H-68.740-L 12/1/2007	255	58	Cantilever - Concrete	Head Wall	84	\$0.00
GRSM-0008H-68.747-L 12/1/2007	145	36	Cantilever - Concrete	Head Wall	90	\$0.00
GRSM-0008H-69.362-L 12/1/2007	160	40	Cantilever - Concrete	Head Wall	87	\$0.00
GRSM-0008H-69.365-R 12/1/2007	190	46	Cantilever - Concrete	Head Wall	84	\$0.00
GRSM-0008H-70.089-L 12/1/2007	320	56	Cantilever - Concrete	Head Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H



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
GRSM-0008H-70.090-R 12/1/2007	320	56	Cantilever - Concrete	Head Wall	87	\$0.00
GRSM-0008H-71.800-L 12/1/2007	70	23	Gravity - Mortared Stone	Head Wall	52	\$4,385.00
GRSM-0008H-71.822-L 12/1/2007	90	18	Gravity - Mortared Stone	Head Wall	73	\$9,950.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-0.537-R 6/18/2007	2,670	306	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0010N-0.908-R 6/11/2007	2,648	284	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0010N-1.128-R 6/12/2007	235	38	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-1.129-L 6/12/2007	170	48	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-1.148-R 6/12/2007	6,886	540	Gravity - Mortared Stone	Fill Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-2.158-R 6/12/2007	53	20	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-2.160-L 6/12/2007	43	16	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-2.415-R 6/12/2007	248	52	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-2.416-L 6/12/2007	342	58	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-3.327-L 6/26/2007	250	37	Gravity - Mortared Stone	Head Wall	82	\$500.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-3.327-R 6/12/2007	165	41	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-3.354-R 6/12/2007	165	41	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-3.576-R 6/12/2007	23	17	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-3.577-L 6/12/2007	57	15	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-3.947-L 6/12/2007	138	26	Gravity - Mortared Stone	Head Wall	49	\$44,400.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

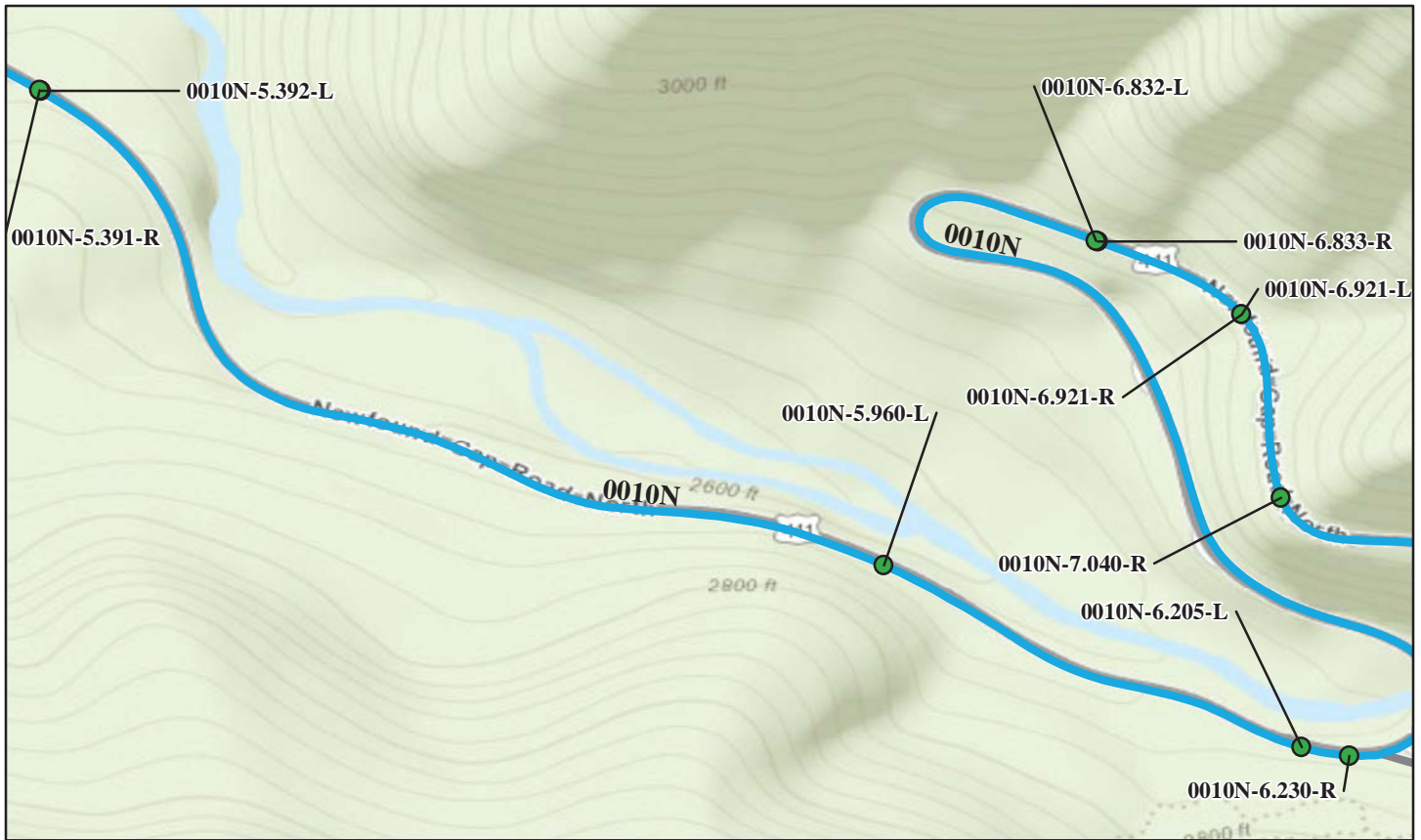
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-3.947-R 6/12/2007	46	18	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-4.425-L 6/12/2007	133	30	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-4.425-R 6/12/2007	150	30	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-4.813-L 6/12/2007	18	11	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-4.813-R 6/12/2007	41	13	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

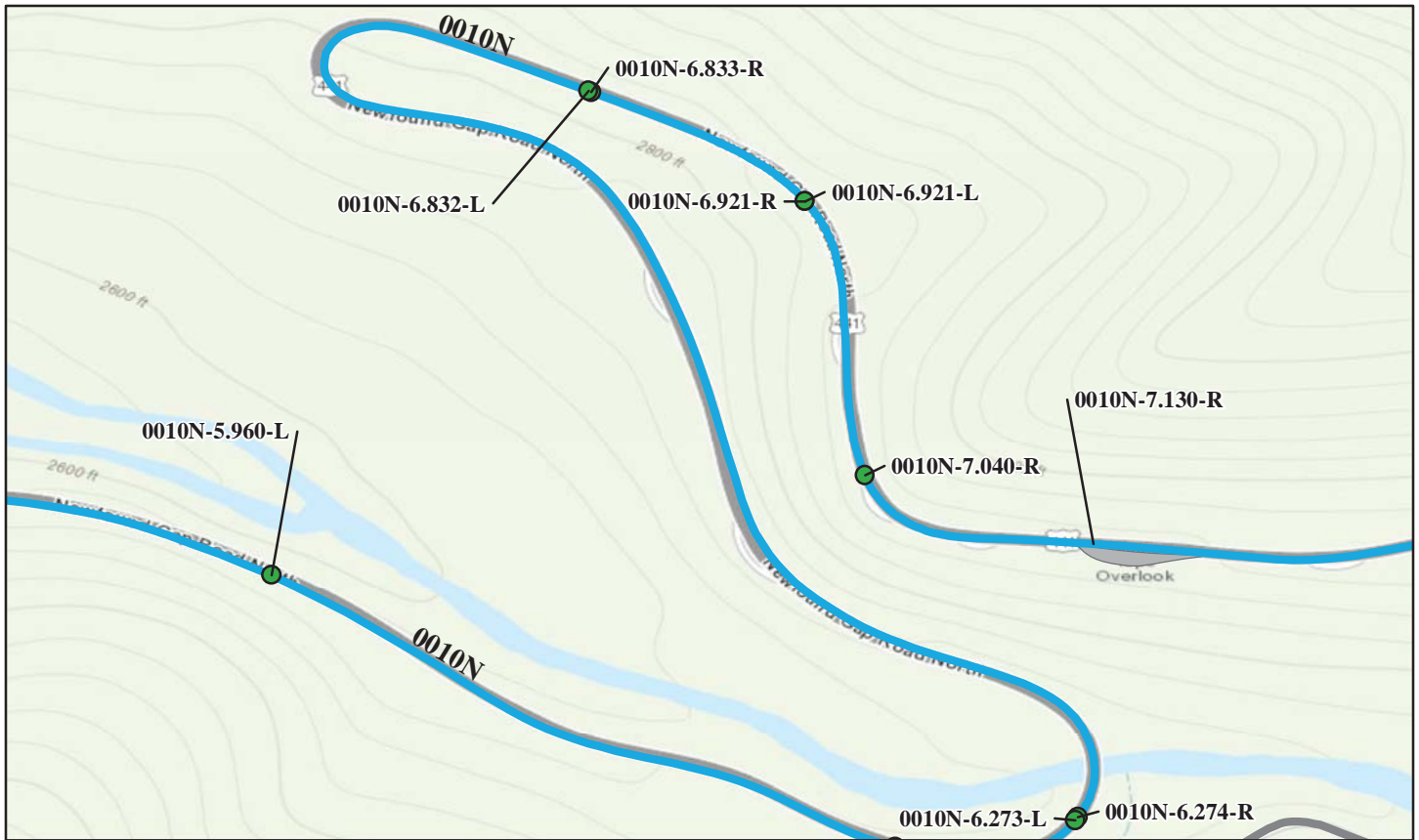
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-5.391-R 6/12/2007	114	32	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-5.392-L 6/12/2007	157	32	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-5.960-L 6/12/2007	657	167	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0010N-6.205-L 6/13/2007	2,420	220	Gravity - Mortared Stone	Fill Wall	88	\$0.00
GRSM-0010N-6.230-R 6/13/2007	77	18	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

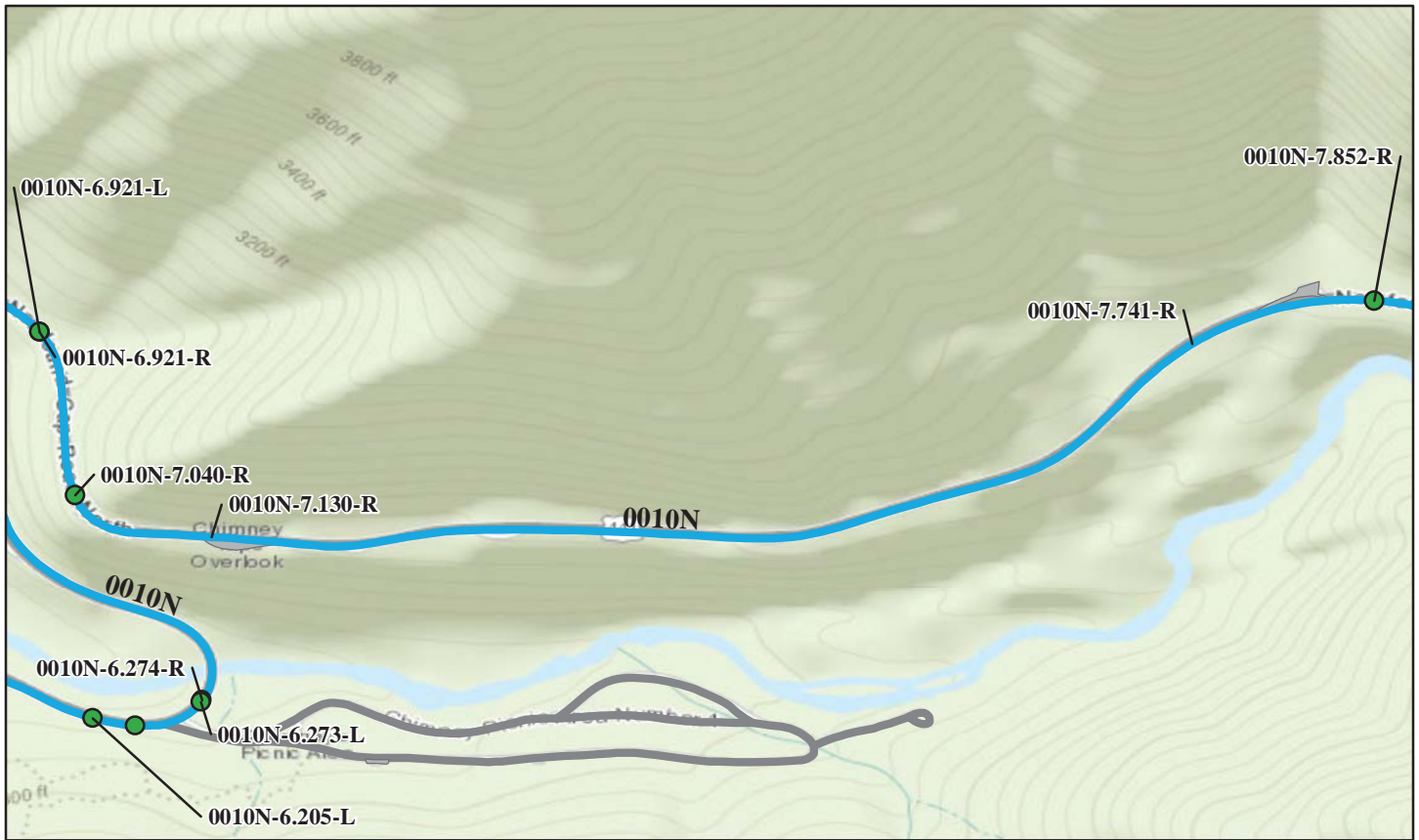
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-6.273-L 6/13/2007	20	11	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-6.274-R 6/13/2007	31	13	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-6.832-L 6/13/2007	28	12	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-6.833-R 6/13/2007	26	13	Gravity - Mortared Stone	Head Wall	72	\$880.00
GRSM-0010N-6.921-L 6/13/2007	26	10	Gravity - Mortared Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-6.921-R 6/13/2007	44	9	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-7.040-R 6/13/2007	1,051	105	Gravity - Dry Stone	Fill Wall	81	\$0.00
GRSM-0010N-7.130-R 6/13/2007	1,650	90	Gravity - Dry Stone	Fill Wall	52	\$232,500.00
GRSM-0010N-7.741-R 6/13/2007	58	19	Gravity - Mortared Stone	Head Wall	59	\$18,600.00
GRSM-0010N-7.852-R 6/13/2007	48	13	Gravity - Dry Stone	Head Wall	82	\$32,425.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-8.039-L 6/13/2007	29	9	Gravity - Mortared Stone	Head Wall	86	\$880.00
GRSM-0010N-8.220-R 6/13/2007	45	9	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-8.267-R 6/13/2007	420	73	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-8.275-L 6/13/2007	44	12	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0010N-8.345-L 6/13/2007	51	16	Gravity - Mortared Stone	Head Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-8.345-R 6/13/2007	83	17	Gravity - Mortared Stone	Head Wall	89	\$0.00
GRSM-0010N-8.392-R 6/13/2007	5,000	100	Gravity - Dry Stone	Fill Wall	77	\$0.00
GRSM-0010N-8.407-L 6/14/2007	44	18	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0010N-8.412-R 6/13/2007	385	35	Gravity - Dry Stone	Fill Wall	60	\$23,740.00
GRSM-0010N-8.427-R 6/13/2007	3,046	170	Gravity - Mortared Stone	Fill Wall	84	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-9.203-R 6/13/2007	1,472	152	Gravity - Mortared Stone	Fill Wall	72	\$43,420.00
GRSM-0010N-9.243-R 6/13/2007	2,200	110	Gravity - Dry Stone	Fill Wall	73	\$30,660.00
GRSM-0010N-9.290-R 6/13/2007	2,010	134	Gravity - Dry Stone	Fill Wall	63	\$62,010.00
GRSM-0010N-9.297-R 6/13/2007	36	15	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0010N-9.334-R 6/13/2007	5,600	400	Gravity - Mortared Stone	Fill Wall	80	\$5,775.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

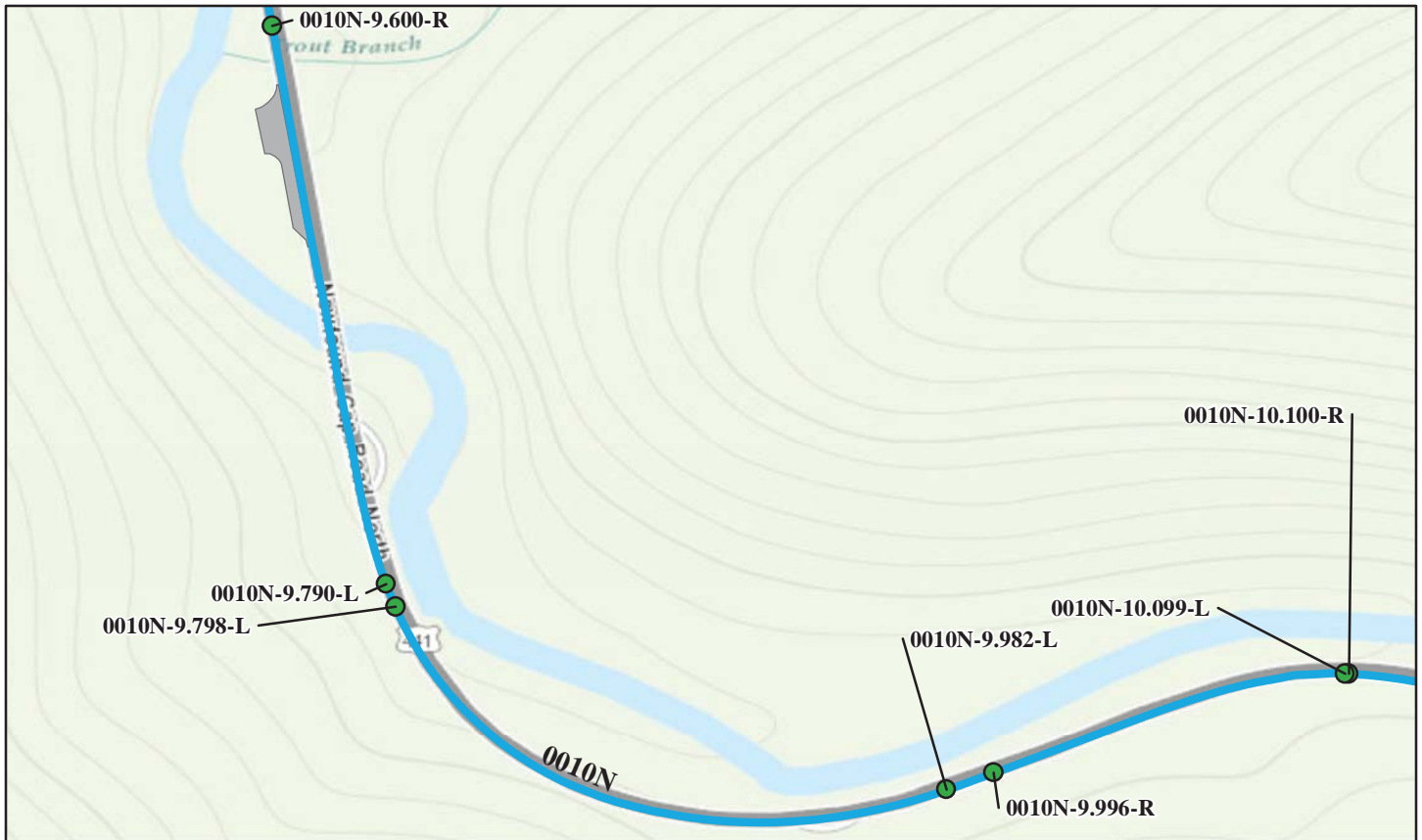
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-9.431-R 6/13/2007	460	75	Gravity - Mortared Stone	Fill Wall	73	\$0.00
GRSM-0010N-9.447-R 6/13/2007	2,380	170	Gravity - Mortared Stone	Fill Wall	76	\$0.00
GRSM-0010N-9.473-R 6/13/2007	334	81	Gravity - Dry Stone	Head Wall	82	\$0.00
GRSM-0010N-9.494-L 6/13/2007	140	23	Gravity - Mortared Stone	Head Wall	75	\$4,010.00
GRSM-0010N-9.580-R 6/14/2007	67	16	Gravity - Mortared Stone	Head Wall	75	\$2,380.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-9.600-R 6/14/2007	1,485	135	Gravity - Dry Stone	Fill Wall	77	\$0.00
GRSM-0010N-9.790-L 6/13/2007	488	75	Gravity - Dry Stone	Fill Wall	86	\$1,560.00
GRSM-0010N-9.798-L 6/13/2007	3,080	280	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0010N-9.982-L 6/14/2007	2,718	320	Gravity - Mortared Stone	Fill Wall	76	\$0.00
GRSM-0010N-9.996-R 6/14/2007	155	15	Gravity - Mortared Stone	Head Wall	72	\$4,700.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-10.099-L 6/14/2007	68	20	Gravity - Mortared Stone	Head Wall	78	\$0.00
GRSM-0010N-10.100-R 6/14/2007	78	16	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-10.587-L 6/13/2007	45	15	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0010N-10.589-R 6/14/2007	31	13	Gravity - Mortared Stone	Head Wall	80	\$500.00
GRSM-0010N-10.760-R 6/14/2007	31	13	Gravity - Mortared Stone	Head Wall	78	\$880.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

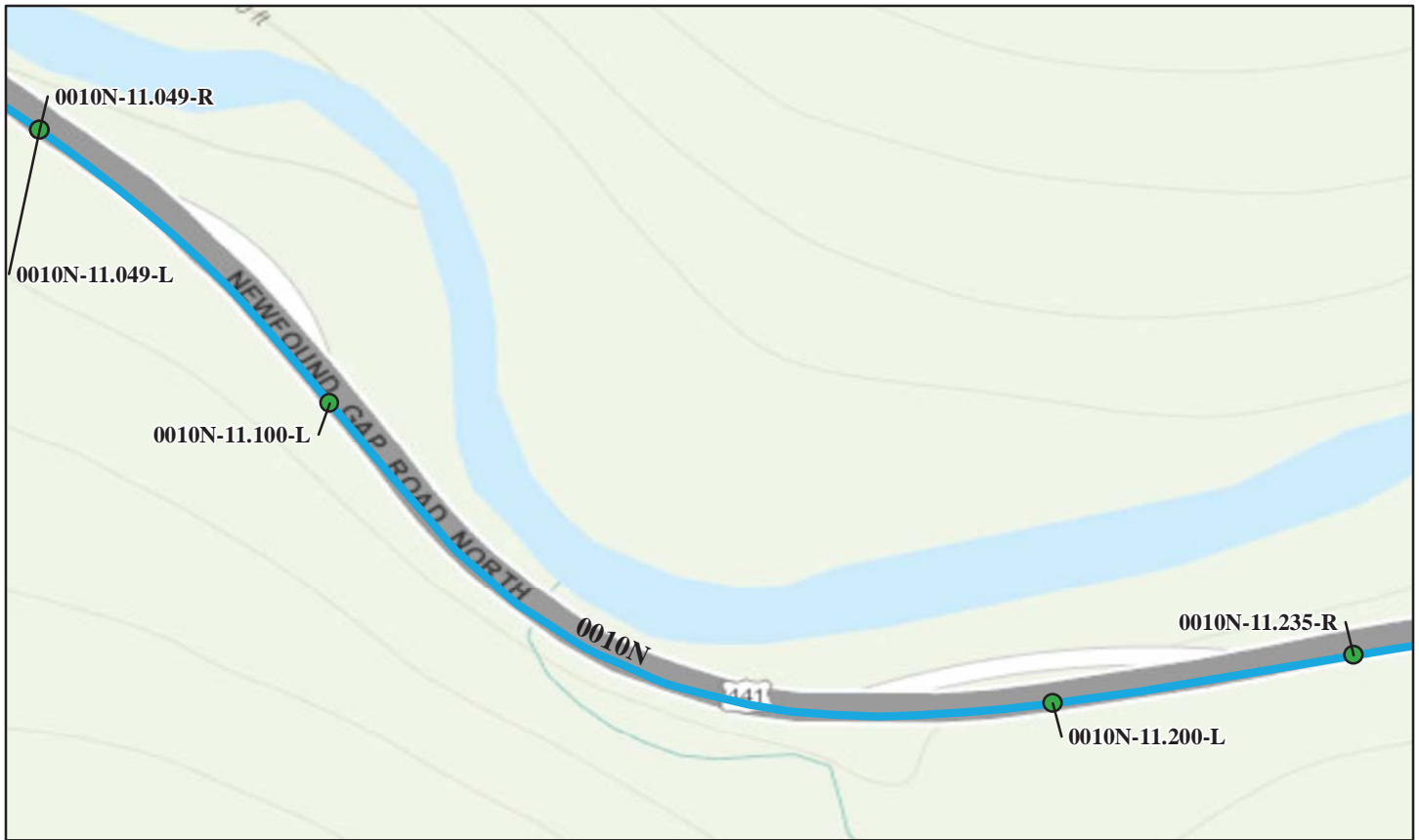
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-10.779-L 6/14/2007	825	96	Gravity - Dry Stone	Fill Wall	83	\$0.00
GRSM-0010N-10.797-L 6/14/2007	896	100	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0010N-10.867-L 6/14/2007	1,020	85	Gravity - Dry Stone	Fill Wall	83	\$0.00
GRSM-0010N-10.883-L 6/14/2007	102	22	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010N-10.884-R 6/14/2007	101	23	Gravity - Mortared Stone	Head Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-11.049-L 6/14/2007	38	14	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-11.049-R 6/14/2007	36	14	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-11.100-L 6/14/2007	1,500	150	Gravity - Dry Stone	Fill Wall	80	\$0.00
GRSM-0010N-11.200-L 6/14/2007	740	185	Gravity - Dry Stone	Fill Wall	80	\$0.00
GRSM-0010N-11.235-R 6/14/2007	59	18	Gravity - Dry Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

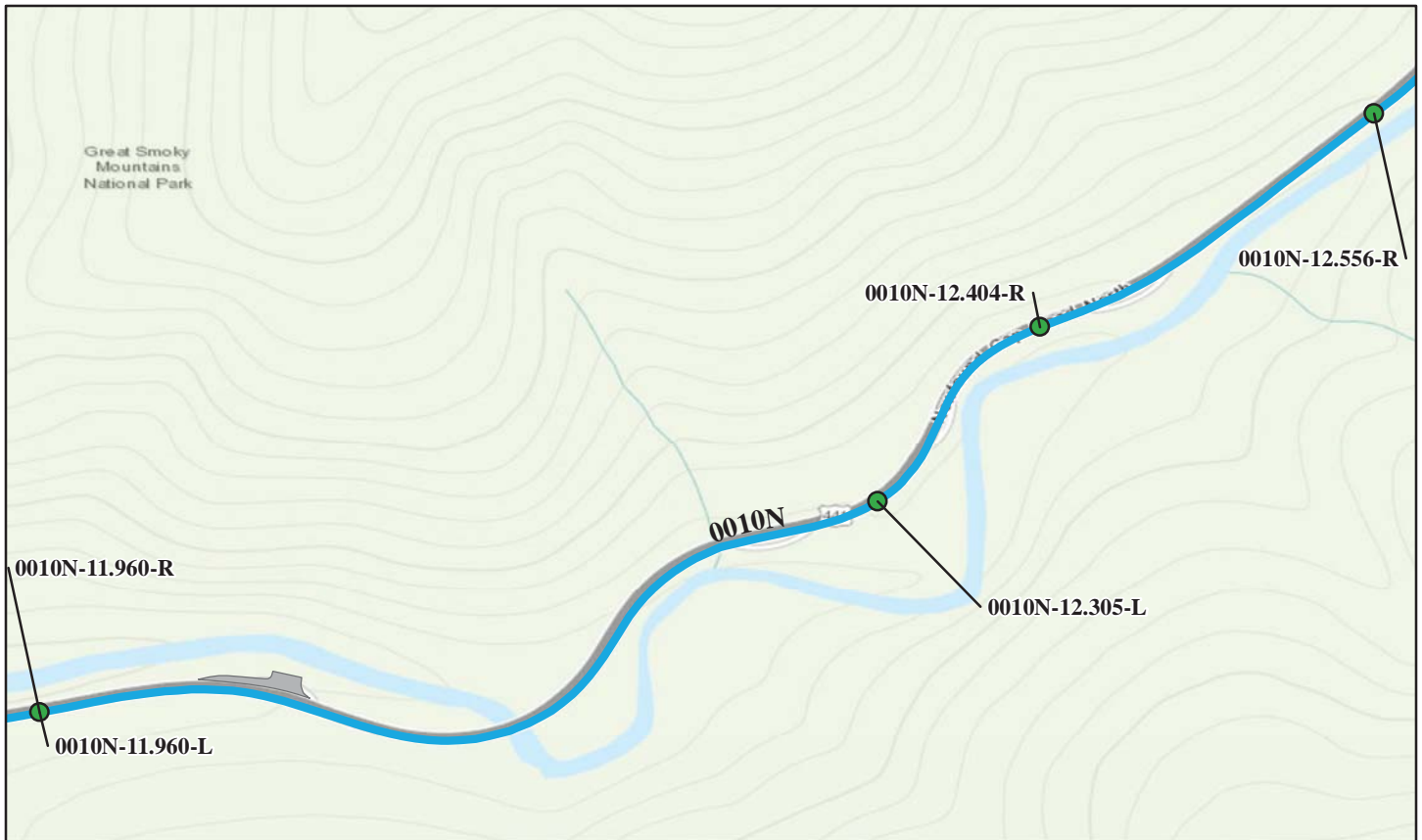
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-11.304-L 6/14/2007	134	21	Gravity - Mortared Stone	Head Wall	37	\$52,500.00
GRSM-0010N-11.657-L 6/14/2007	4,585	455	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0010N-11.763-R 6/14/2007	55	18	Gravity - Mortared Stone	Head Wall	82	\$0.00
GRSM-0010N-11.852-R 6/14/2007	60	21	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0010N-11.917-L 6/14/2007	1,480	135	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

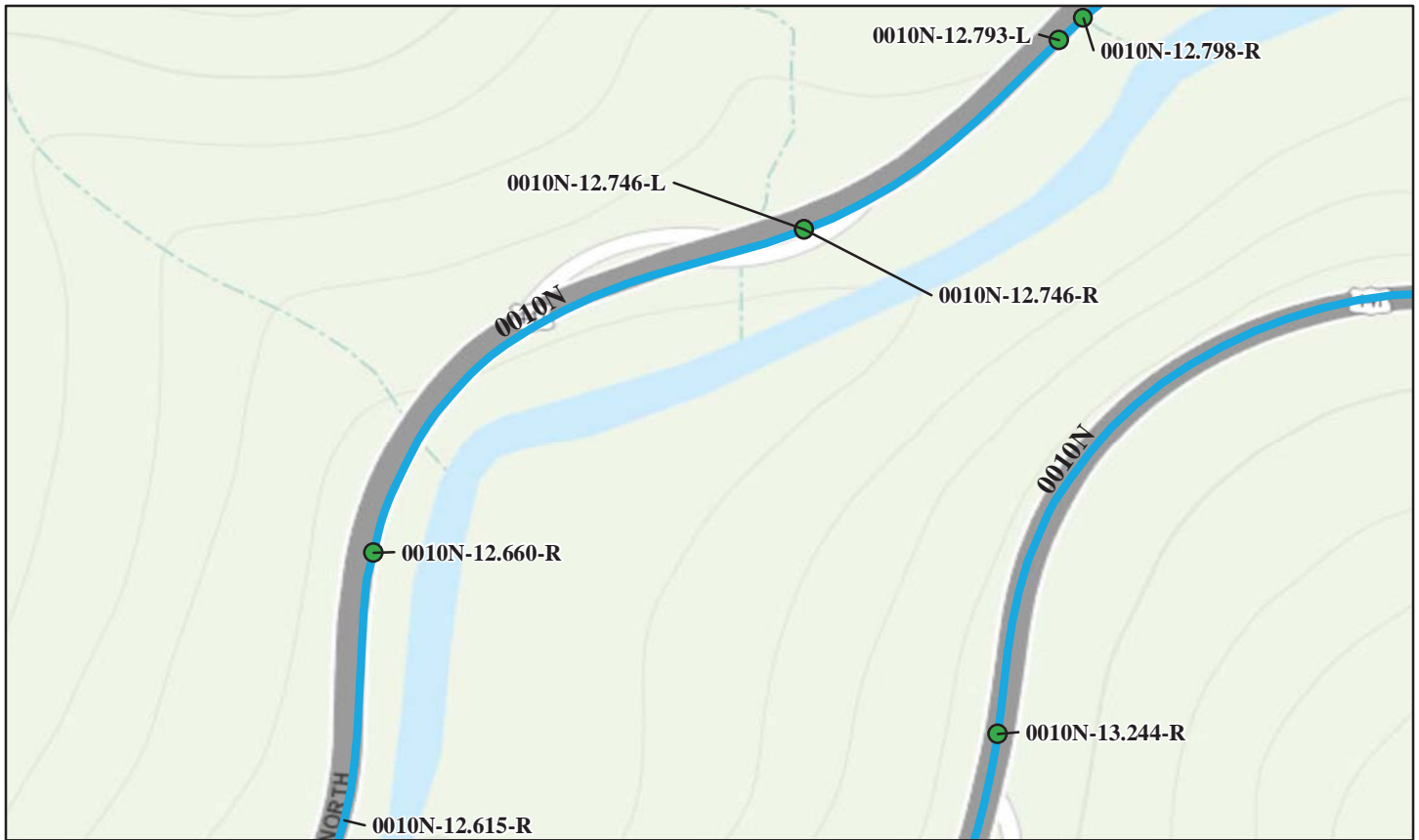
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-11.960-L 6/14/2007	137	23	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-11.960-R 6/14/2007	83	21	Gravity - Mortared Stone	Head Wall	61	\$10,400.00
GRSM-0010N-12.305-L 6/14/2007	41	12	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-12.404-R 6/14/2007	568	110	Gravity - Dry Stone	Fill Wall	70	\$13,460.00
GRSM-0010N-12.556-R 6/14/2007	110	16	Gravity - Mortared Stone	Fill Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

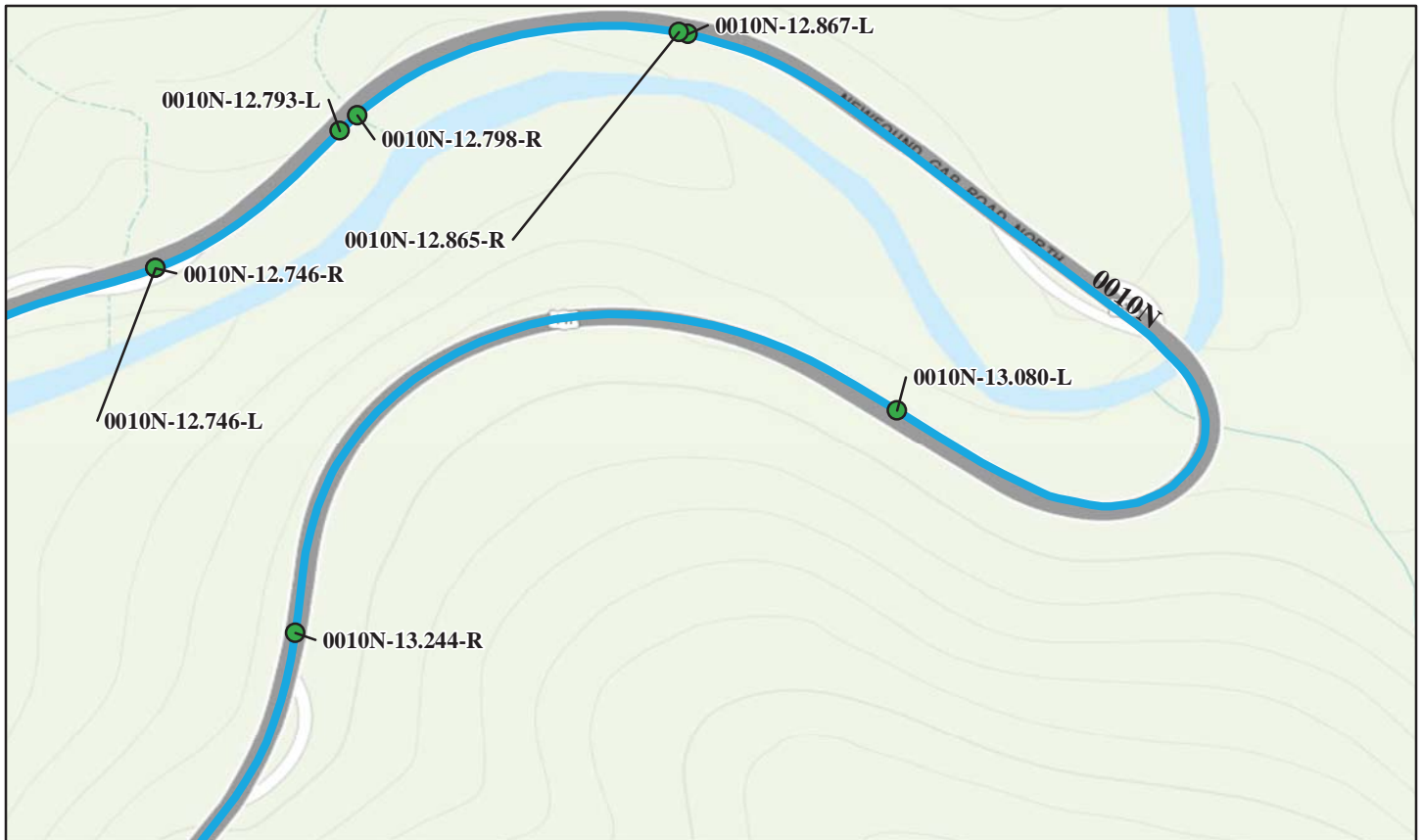
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-12.615-R 6/14/2007	53	10	Gravity - Mortared Stone	Head Wall	56	\$11,600.00
GRSM-0010N-12.660-R 6/14/2007	3,315	340	Gravity - Dry Stone	Fill Wall	77	\$5,560.00
GRSM-0010N-12.746-L 6/14/2007	50	15	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0010N-12.746-R 6/14/2007	64	16	Gravity - Mortared Stone	Head Wall	92	\$0.00
GRSM-0010N-12.793-L 6/14/2007	62	15	Gravity - Mortared Stone	Head Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

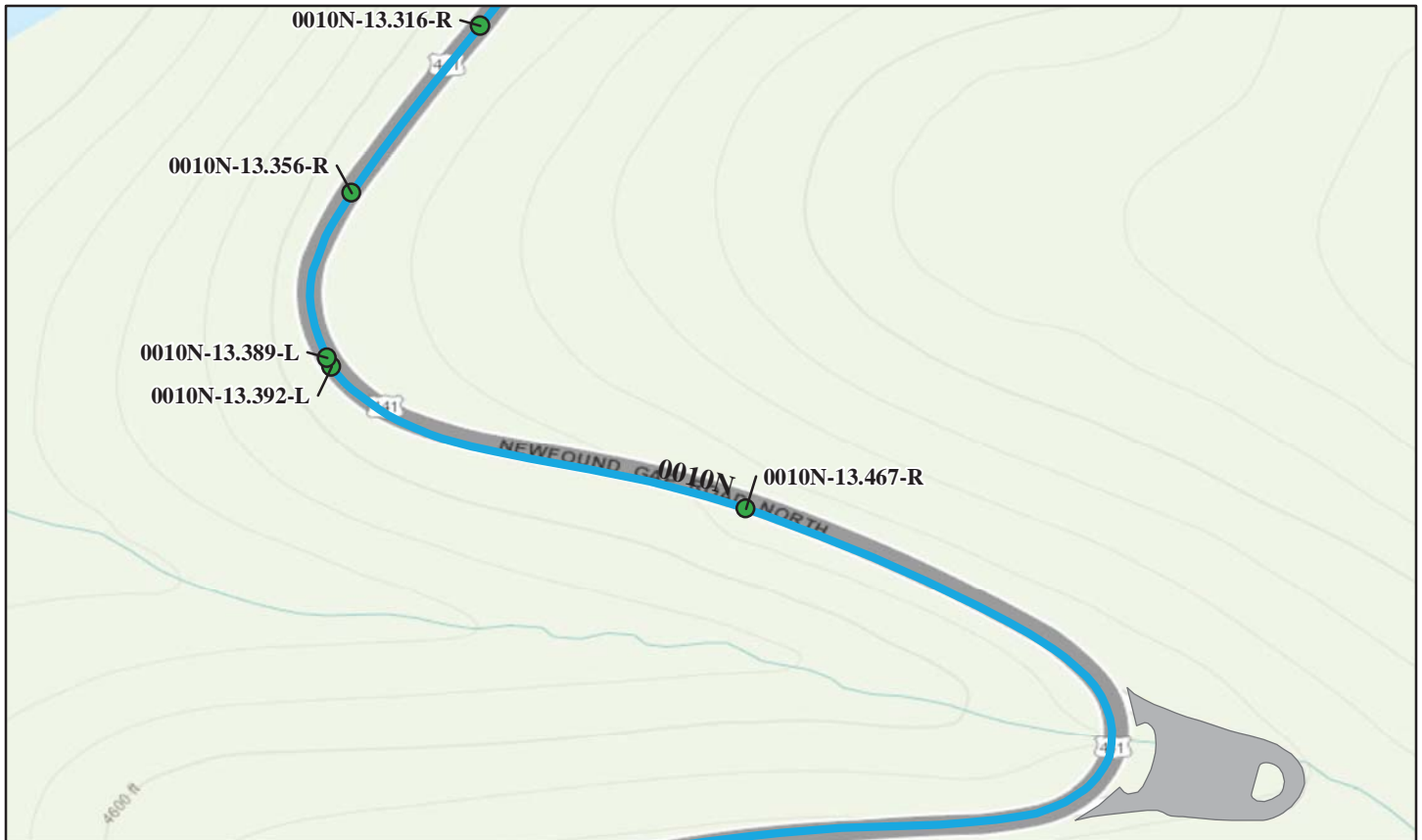
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-12.798-R 6/14/2007	45	15	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-12.865-R 6/14/2007	96	18	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010N-12.867-L 6/14/2007	65	18	Gravity - Mortared Stone	Head Wall	80	\$1,720.00
GRSM-0010N-13.080-L 6/14/2007	51	18	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010N-13.244-R 6/14/2007	2,453	230	Gravity - Mortared Stone	Fill Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

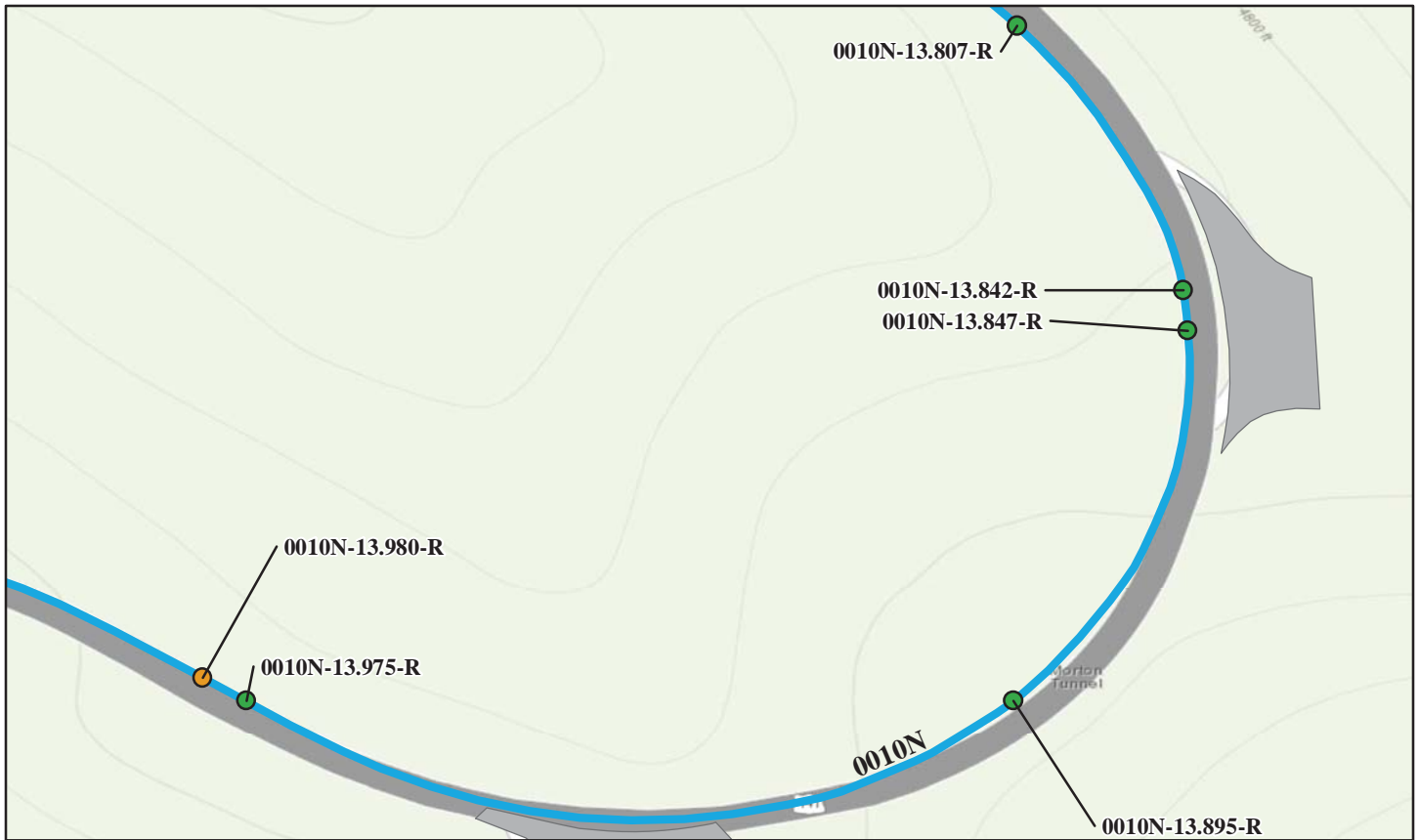
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-13.316-R 6/14/2007	2,288	185	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0010N-13.356-R 6/14/2007	785	107	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0010N-13.389-L 6/15/2007	5,610	340	Gravity - Mortared Stone	Fill Wall	72	\$7,389.00
GRSM-0010N-13.392-L 6/15/2007	30	10	Gravity - Mortared Stone	Head Wall	78	\$0.00
GRSM-0010N-13.467-R 6/15/2007	540	120	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

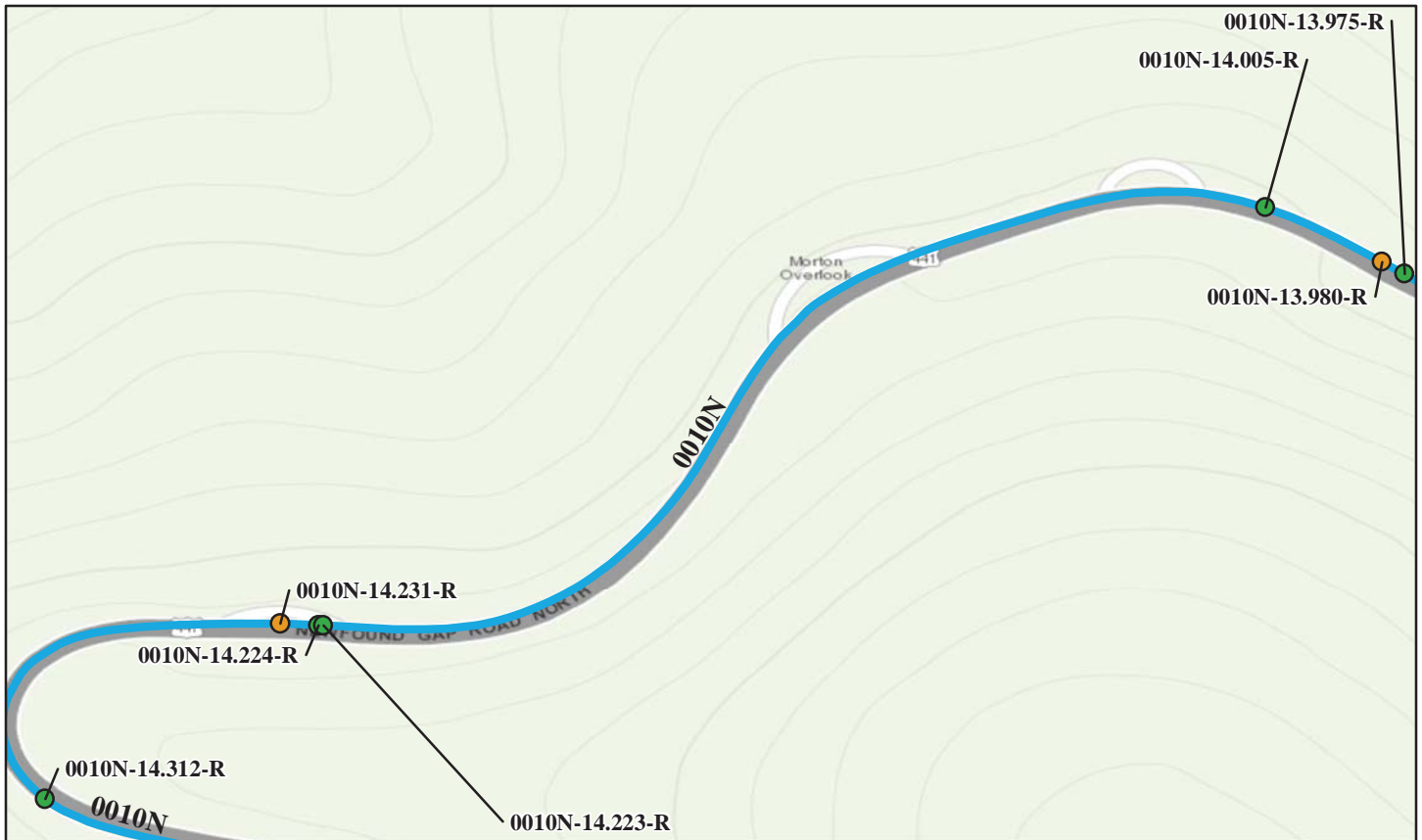
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-13.807-R 6/15/2007	63	14	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0010N-13.842-R 6/22/2007	60	12	Gravity - Mortared Stone	Head Wall	92	\$0.00
GRSM-0010N-13.847-R 6/15/2007	1,979	160	Gravity - Mortared Stone	Fill Wall	78	\$0.00
GRSM-0010N-13.895-R 6/15/2007	72	15	Gravity - Mortared Stone	Head Wall	80	\$225.00
GRSM-0010N-13.975-R 6/14/2007	58	14	Gravity - Mortared Stone	Head Wall	94	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-13.980-R 6/14/2007	1,449	100	Gravity - Mortared Stone	Fill Wall	69	\$2,193.00
GRSM-0010N-14.005-R 6/15/2007	138	38	Gravity - Mortared Stone	Fill Wall	98	\$0.00
GRSM-0010N-14.223-R 6/14/2007	320	71	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0010N-14.224-R 6/15/2007	375	75	Gravity - Mortared Stone	Fill Wall	80	\$1,080.00
GRSM-0010N-14.231-R 6/14/2007	2,148	241	Gravity - Mortared Stone	Fill Wall	66	\$82,400.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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
GRSM-0010N-14.312-R 6/15/2007	6,852	440	Gravity - Mortared Stone	Fill Wall	82	\$1,760.00
GRSM-0010N-14.424-R 6/15/2007	1,226	150	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0010N-14.624-R 6/15/2007	1,923	177	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0010N-14.780-R 6/15/2007	2,600	130	Gravity - Mortared Stone	Fill Wall	81	\$4,190.00
GRSM-0010N-14.857-L 6/15/2007	3,008	180	Gravity - Mortared Stone	Fill Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH



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)

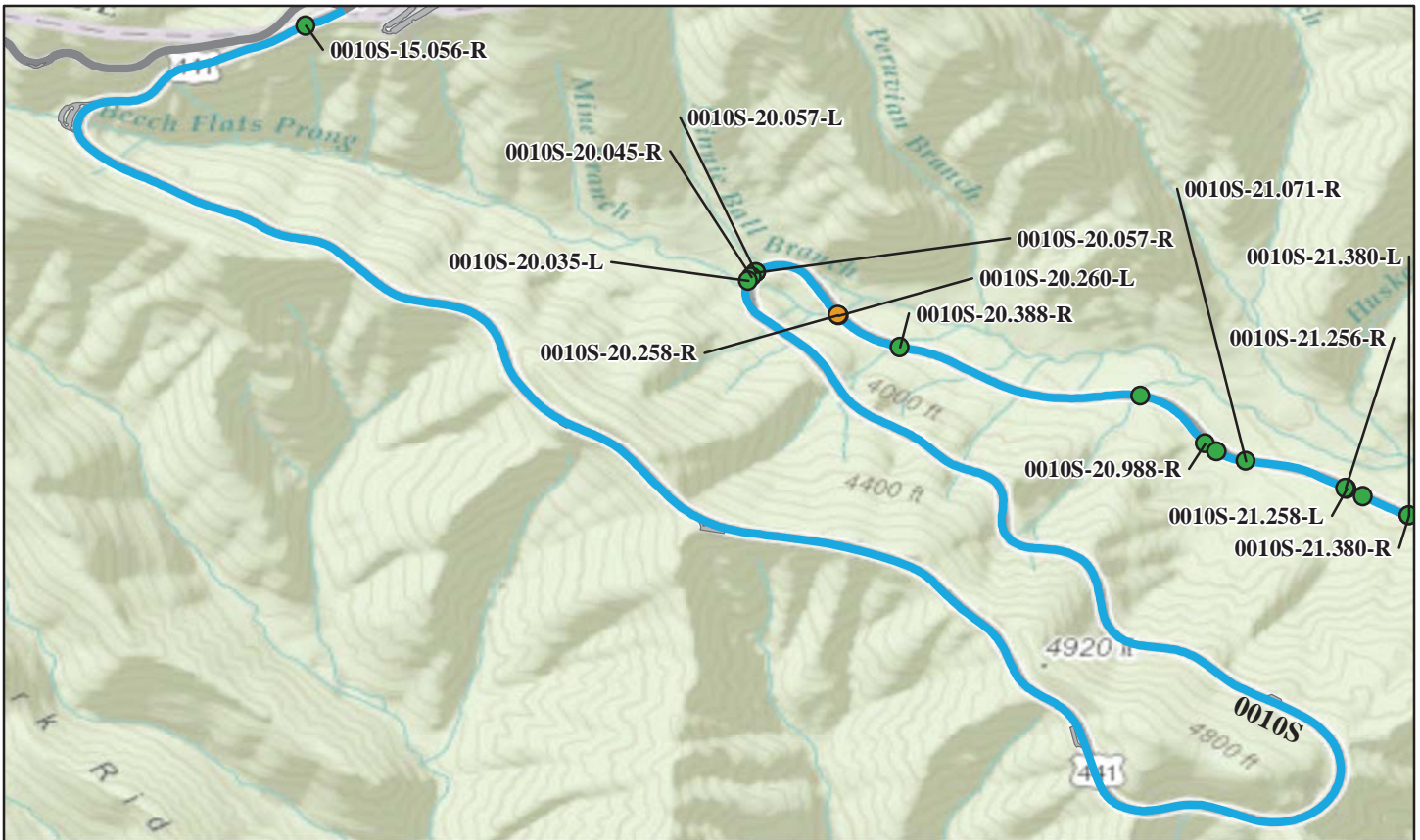
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010N-14.917-R 6/15/2007	1,768	170	Gravity - Mortared Stone	Fill Wall	69	\$188,000.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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
GRSM-0010S-15.056-R 6/15/2007	6,086	900	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0010S-20.035-L 6/15/2007	171	30	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010S-20.045-R 6/15/2007	141	30	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010S-20.057-L 6/15/2007	52	14	Gravity - Mortared Stone	Head Wall	81	\$786.00
GRSM-0010S-20.057-R 6/15/2007	71	18	Gravity - Mortared Stone	Head Wall	75	\$2,867.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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

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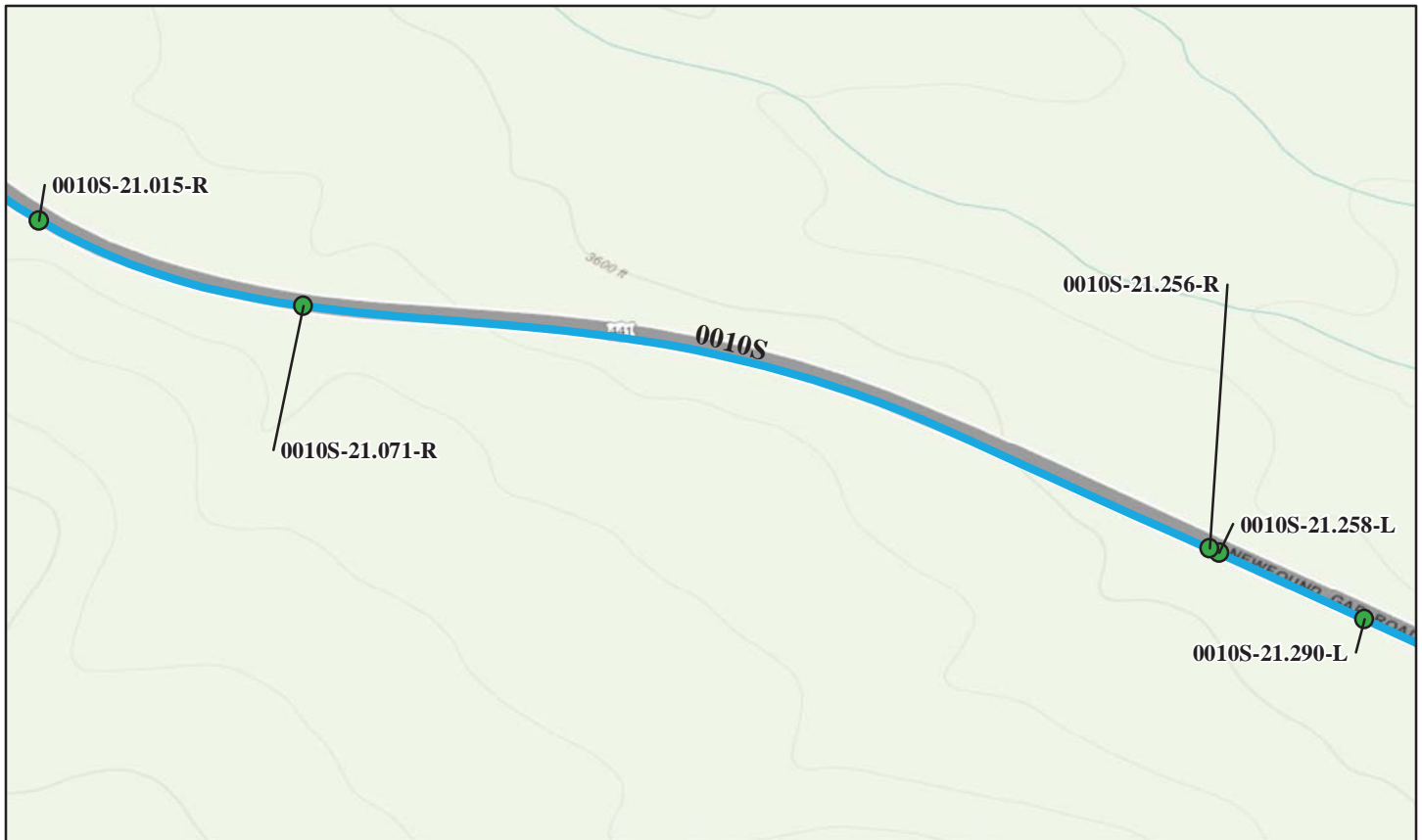
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010S-20.258-R 6/15/2007	185	36	Gravity - Mortared Stone	Head Wall	68	\$13,875.00
GRSM-0010S-20.260-L 6/15/2007	231	36	Gravity - Mortared Stone	Head Wall	95	\$0.00
GRSM-0010S-20.388-R 6/15/2007	56	15	Gravity - Mortared Stone	Head Wall	83	\$305.00
GRSM-0010S-20.832-R 6/15/2007	50	22	Gravity - Mortared Stone	Head Wall	91	\$0.00
GRSM-0010S-20.988-R 6/15/2007	34	12	Gravity - Mortared Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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
GRSM-0010S-21.015-R 6/15/2007	36	16	Gravity - Mortared Stone	Head Wall	88	\$220.00
GRSM-0010S-21.071-R 6/15/2007	74	25	Gravity - Mortared Stone	Head Wall	85	\$330.00
GRSM-0010S-21.256-R 6/16/2007	61	21	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010S-21.258-L 6/15/2007	27	13	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0010S-21.290-L 6/16/2007	95	18	Gravity - Mortared Stone	Head Wall	93	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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

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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
GRSM-0010S-21.380-L 6/16/2007	45	16	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010S-21.380-R 6/16/2007	74	18	Gravity - Mortared Stone	Head Wall	81	\$3,308.00
GRSM-0010S-21.852-L 6/16/2007	123	28	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010S-21.852-R 6/15/2007	136	25	Gravity - Mortared Stone	Head Wall	65	\$14,033.00
GRSM-0010S-22.291-R 6/16/2007	94	20	Gravity - Mortared Stone	Head Wall	98	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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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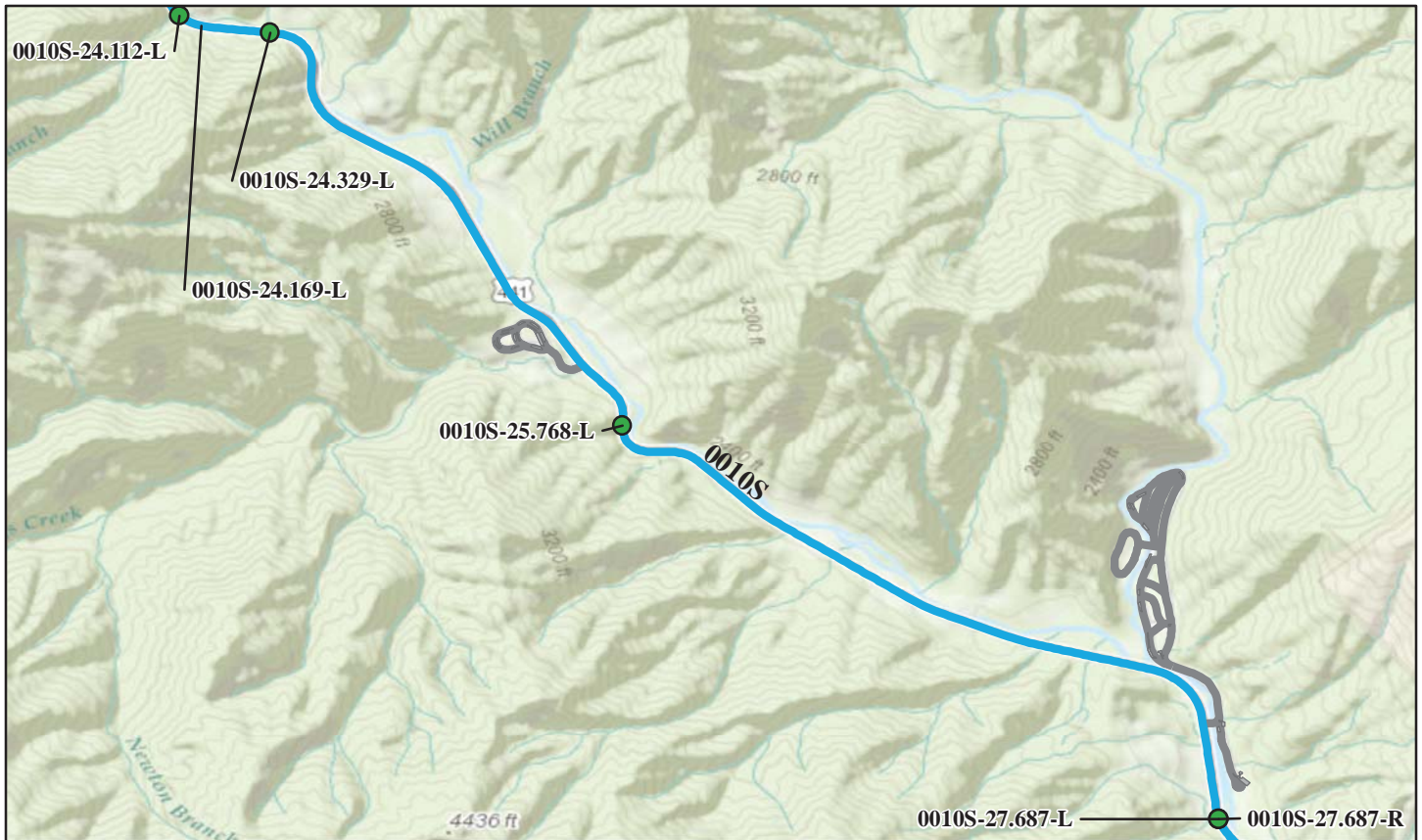
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010S-22.758-L 6/16/2007	57	17	Gravity - Mortared Stone	Head Wall	76	\$1,287.00
GRSM-0010S-22.758-R 6/16/2007	89	26	Gravity - Mortared Stone	Head Wall	80	\$813.00
GRSM-0010S-23.313-R 6/16/2007	150	30	Gravity - Mortared Stone	Head Wall	69	\$11,435.00
GRSM-0010S-23.315-L 6/15/2007	137	30	Gravity - Mortared Stone	Head Wall	80	\$1,631.00
GRSM-0010S-24.112-L 6/16/2007	32	13	Gravity - Mortared Stone	Head Wall	81	\$2,378.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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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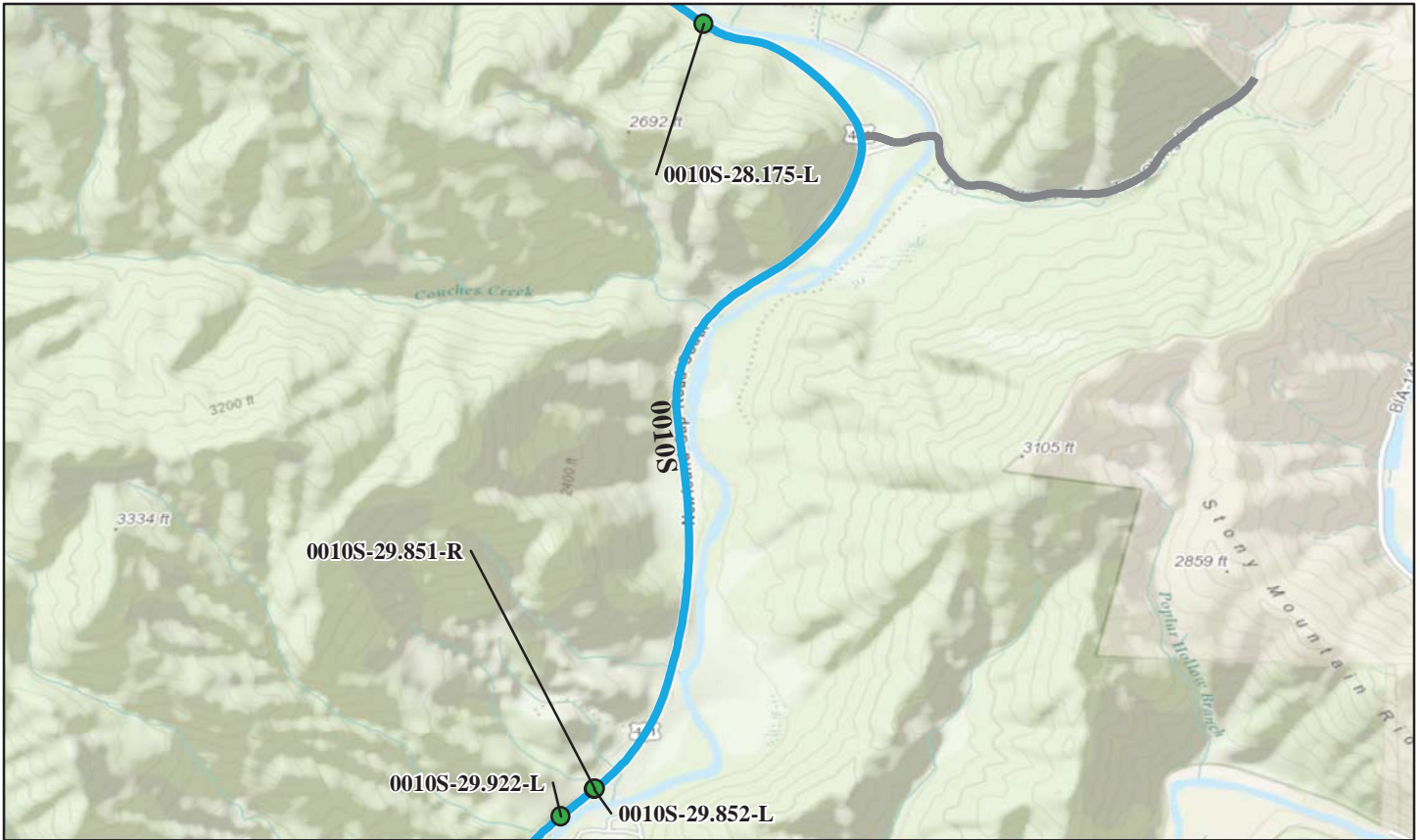
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010S-24.169-L 6/16/2007	240	40	Gravity - Dry Stone	Fill Wall	54	\$206,880.00
GRSM-0010S-24.329-L 6/16/2007	2,375	206	Gravity - Mortared Stone	Fill Wall	80	\$530.00
GRSM-0010S-25.768-L 6/16/2007	4,568	588	Gravity - Mortared Stone	Fill Wall	76	\$7,419.00
GRSM-0010S-27.687-L 6/16/2007	350	50	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010S-27.687-R 6/16/2007	352	52	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH



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)

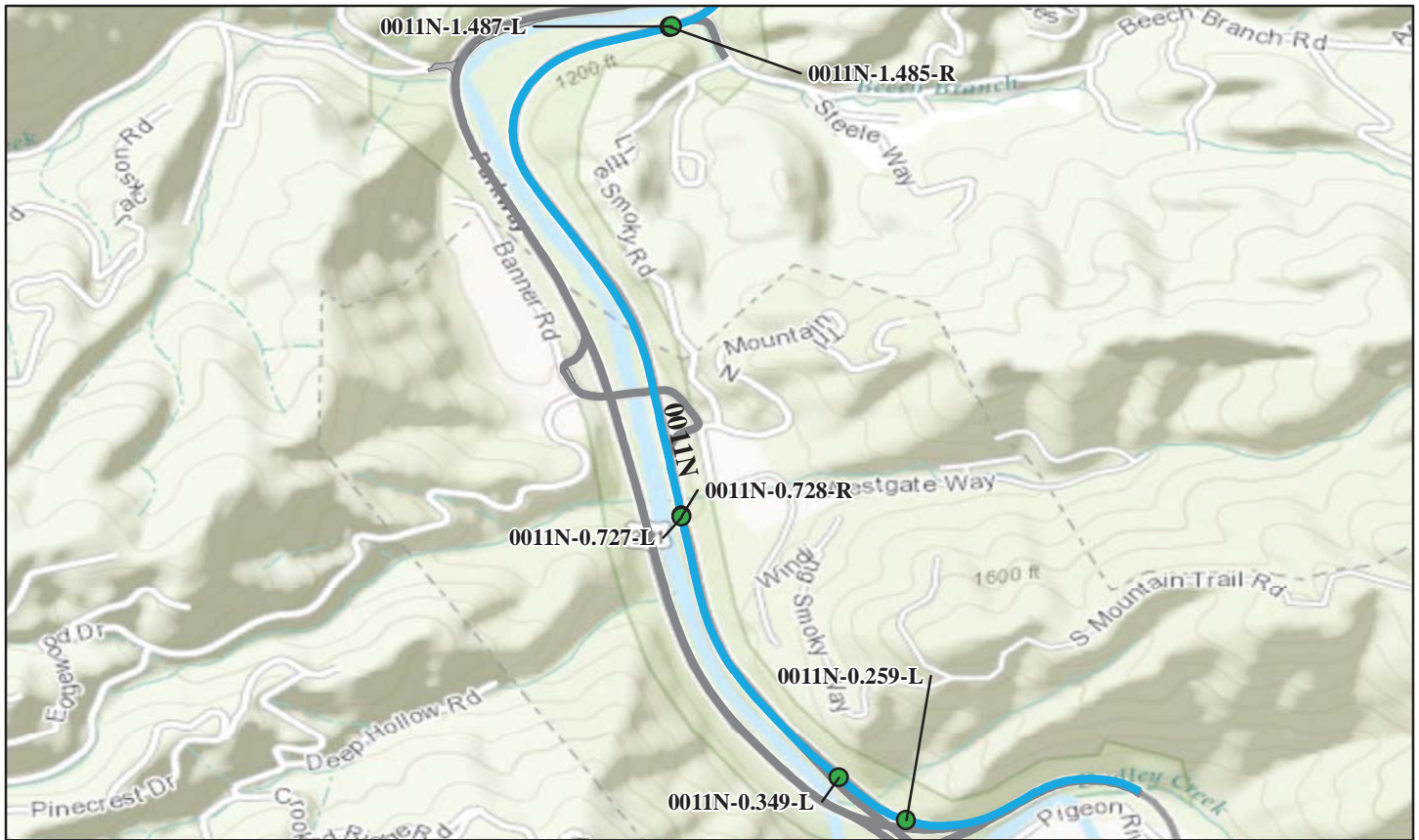
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0010S-28.175-L 6/15/2007	2,520	315	Gravity - Mortared Stone	Fill Wall	78	\$35,955.00
GRSM-0010S-29.851-R 6/16/2007	64	21	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0010S-29.852-L 6/16/2007	63	16	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0010S-29.922-L 6/16/2007	266	60	Gravity - Mortared Stone	Fill Wall	80	\$640.00

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

Great Smoky Mountains National Park

ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)



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
GRSM-0011N-0.259-L 6/20/2007	1,518	204	Gravity - Mortared Stone	Fill Wall	92	\$0.00
GRSM-0011N-0.349-L 6/20/2007	3,840	547	Gravity - Mortared Stone	Fill Wall	93	\$0.00
GRSM-0011N-0.727-L 6/19/2007	176	32	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0011N-0.728-R 6/19/2007	137	32	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0011N-1.485-R 6/19/2007	162	35	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)



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)

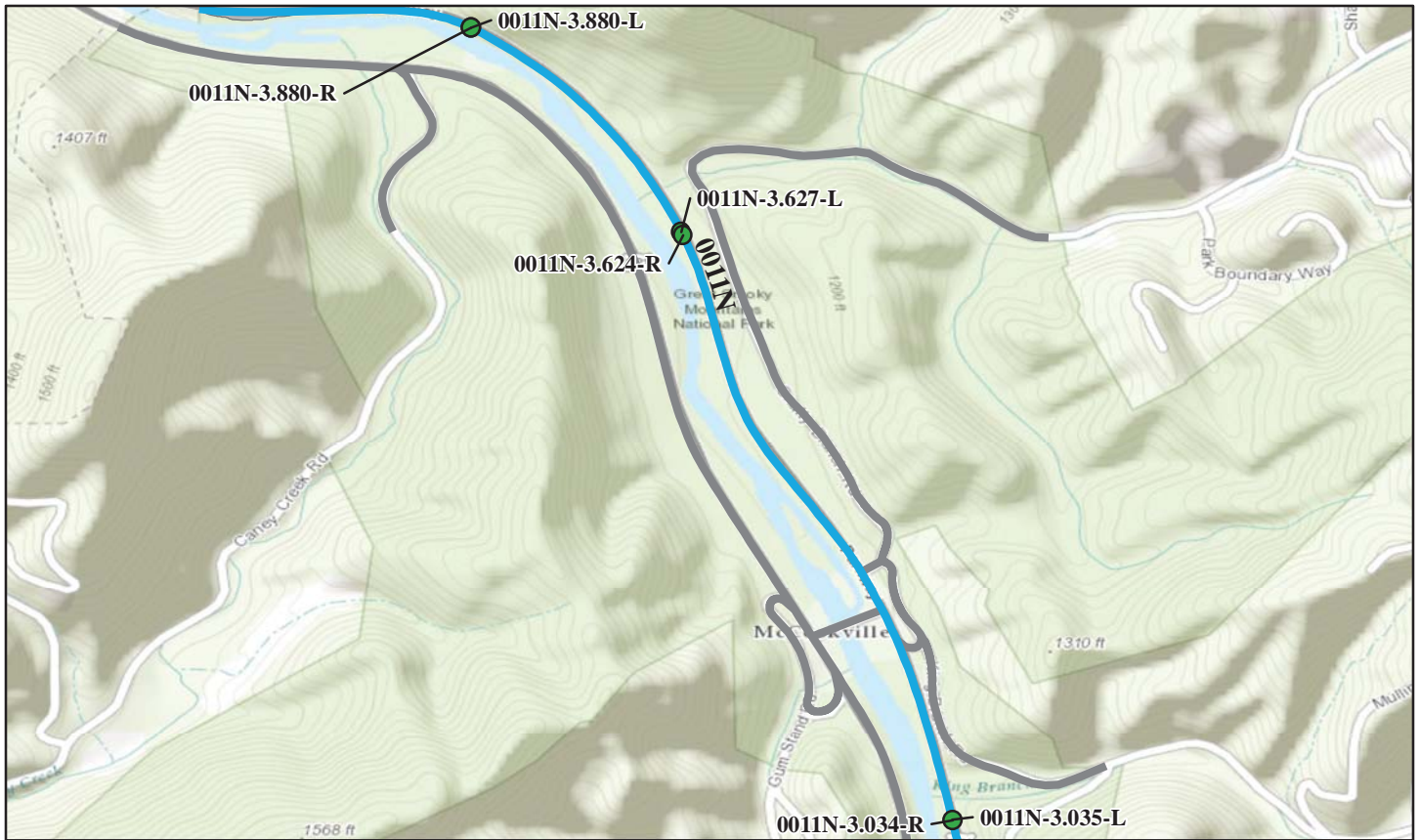
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011N-1.487-L 6/19/2007	132	28	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0011N-1.696-L 6/19/2007	88	22	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0011N-1.696-R 6/19/2007	44	19	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0011N-2.675-L 6/19/2007	129	26	Gravity - Mortared Stone	Head Wall	89	\$0.00
GRSM-0011N-2.676-R 6/19/2007	97	22	Gravity - Mortared Stone	Head Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)



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)

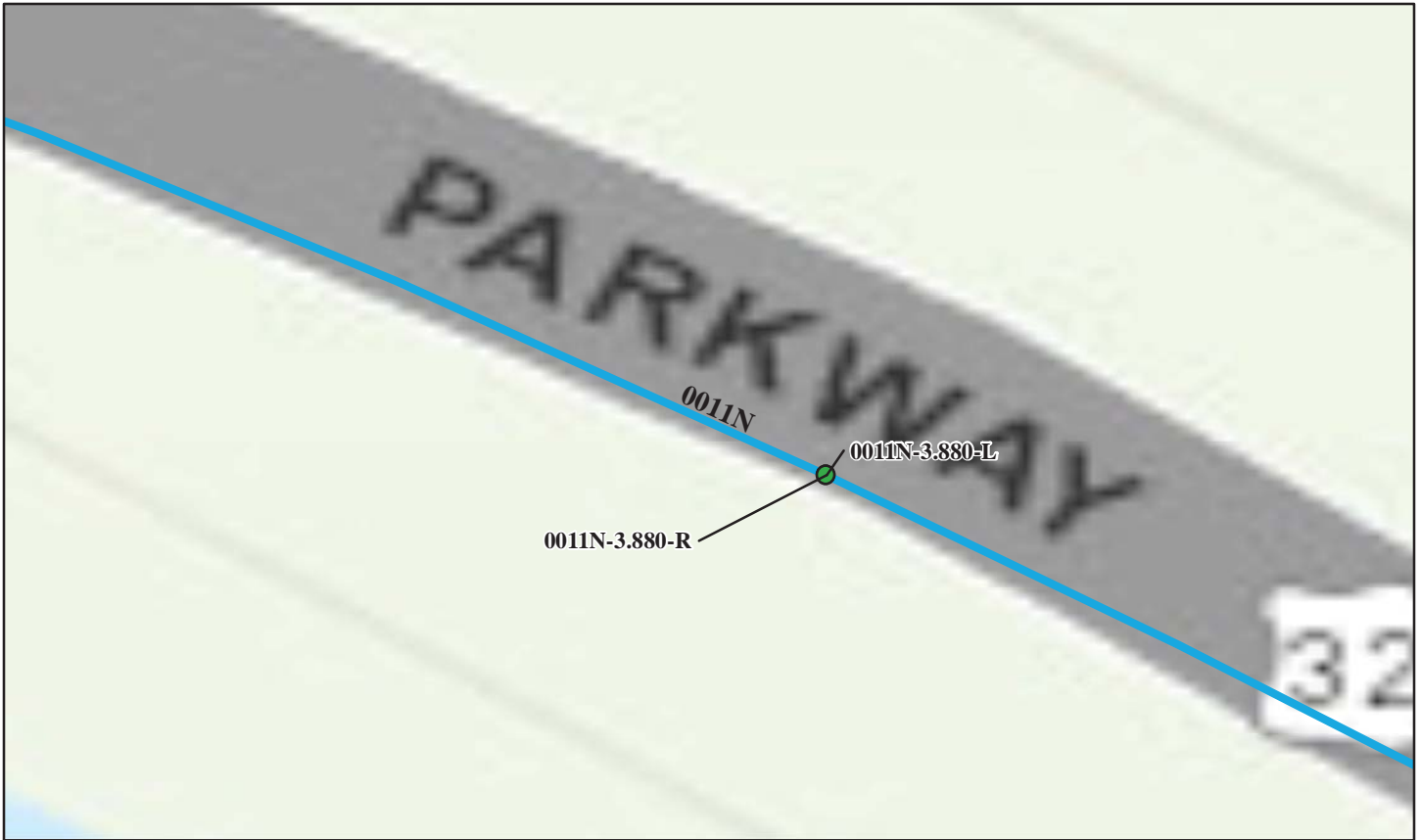
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011N-3.034-R 6/19/2007	357	59	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0011N-3.035-L 6/19/2007	446	56	Gravity - Mortared Stone	Head Wall	59	\$11,600.00
GRSM-0011N-3.624-R 6/19/2007	198	35	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0011N-3.627-L 6/19/2007	480	46	Gravity - Mortared Stone	Head Wall	82	\$0.00
GRSM-0011N-3.880-L 6/19/2007	58	18	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)



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)

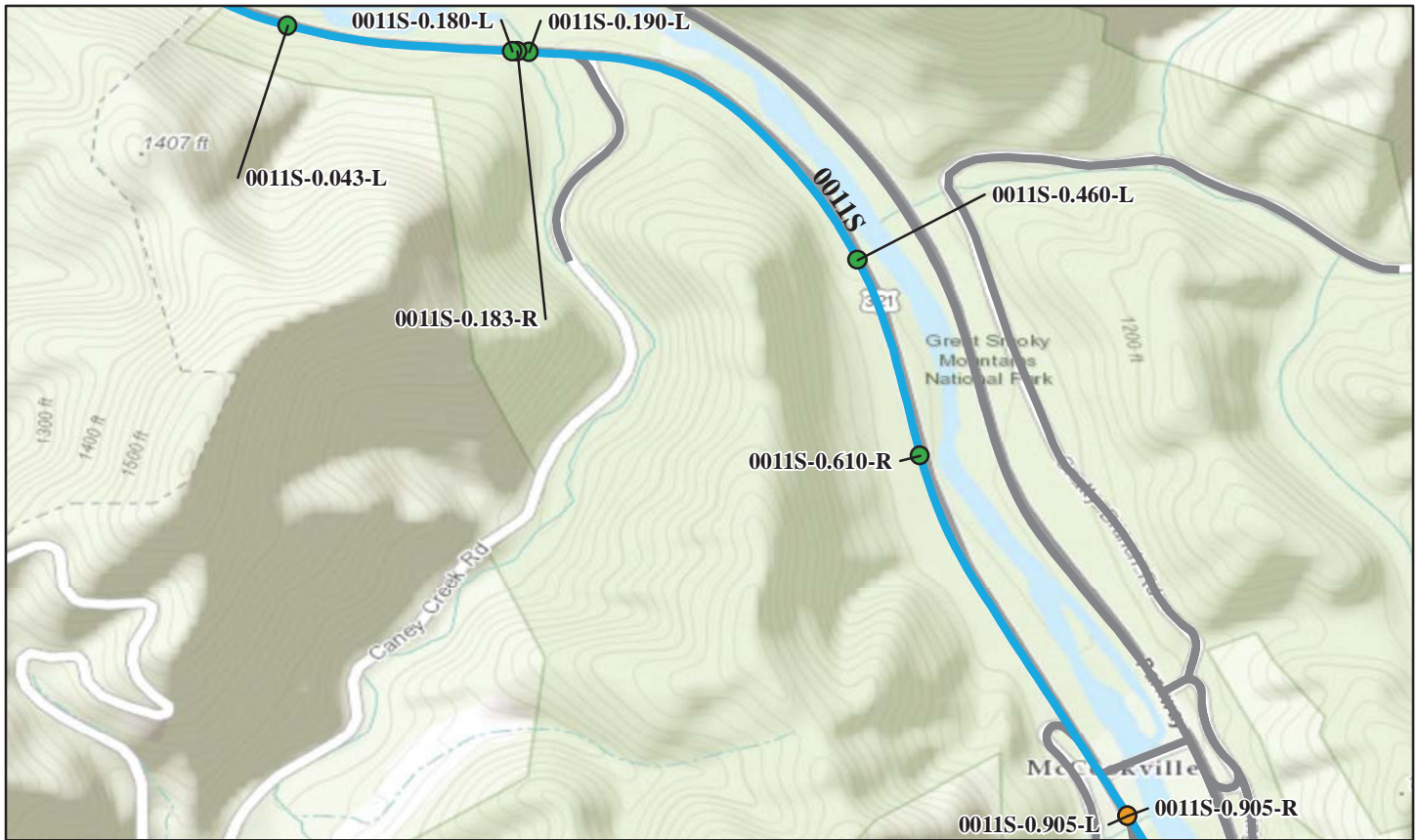
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011N-3.880-R 6/19/2007	74	18	Gravity - Mortared Stone	Head Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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)

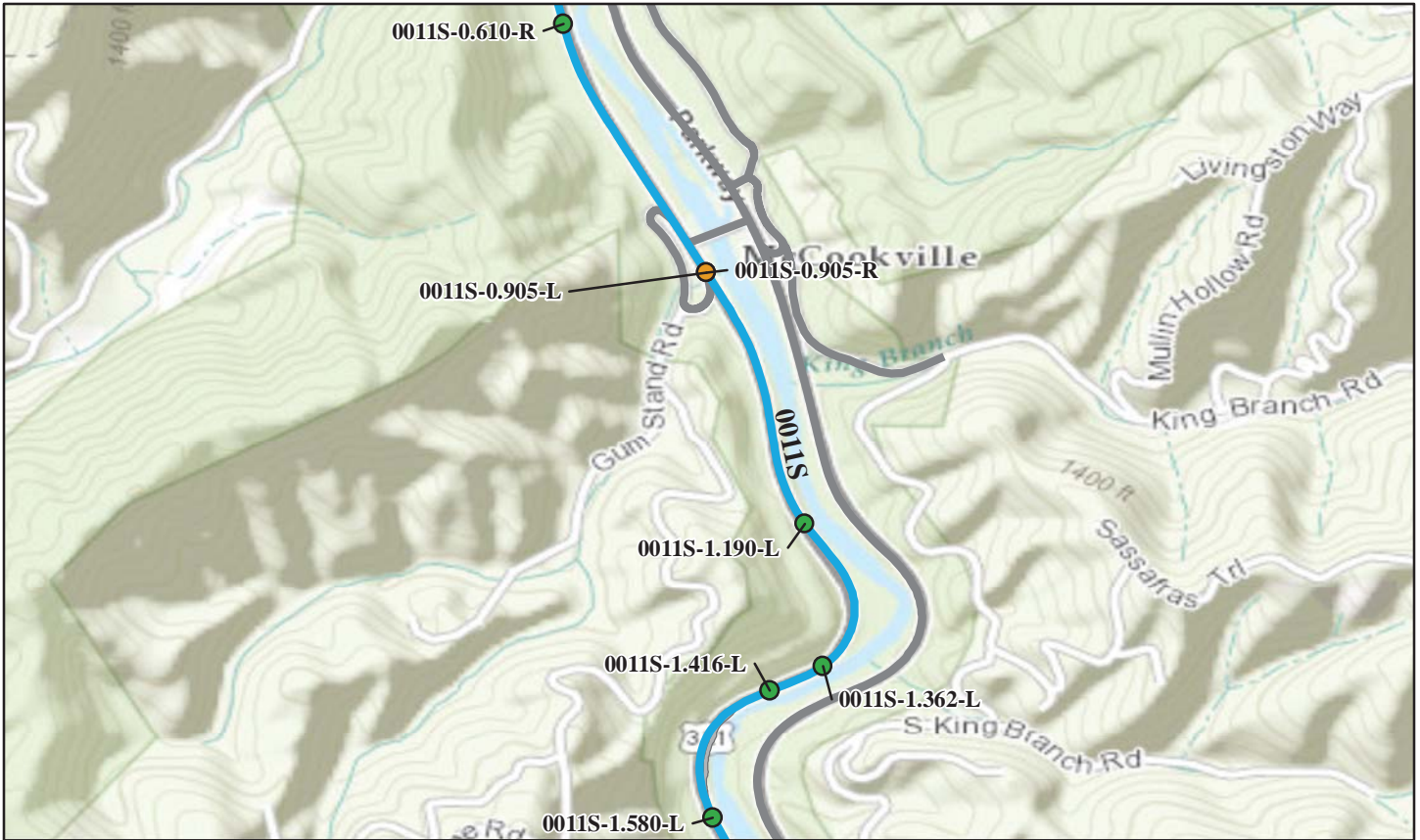
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011S-0.043-L 6/19/2007	29	10	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0011S-0.180-L 6/19/2007	385	50	Gravity - Mortared Stone	Head Wall	72	\$10,171.00
GRSM-0011S-0.183-R 6/19/2007	306	52	Gravity - Mortared Stone	Head Wall	79	\$472.00
GRSM-0011S-0.190-L 6/19/2007	24	12	Gravity - Mortared Stone	Head Wall	79	\$886.00
GRSM-0011S-0.460-L 6/19/2007	39	13	Gravity - Mortared Stone	Head Wall	87	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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
GRSM-0011S-0.610-R 6/19/2007	40	16	Gravity - Mortared Stone	Head Wall	75	\$1,830.00
GRSM-0011S-0.905-L 6/19/2007	135	24	Gravity - Mortared Stone	Head Wall	66	\$5,448.00
GRSM-0011S-0.905-R 6/19/2007	102	24	Gravity - Mortared Stone	Head Wall	69	\$4,816.00
GRSM-0011S-1.190-L 6/19/2007	915	140	Gravity - Mortared Stone	Fill Wall	83	\$11,249.00
GRSM-0011S-1.362-L 6/19/2007	46	12	Gravity - Mortared Stone	Head Wall	79	\$3,505.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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)

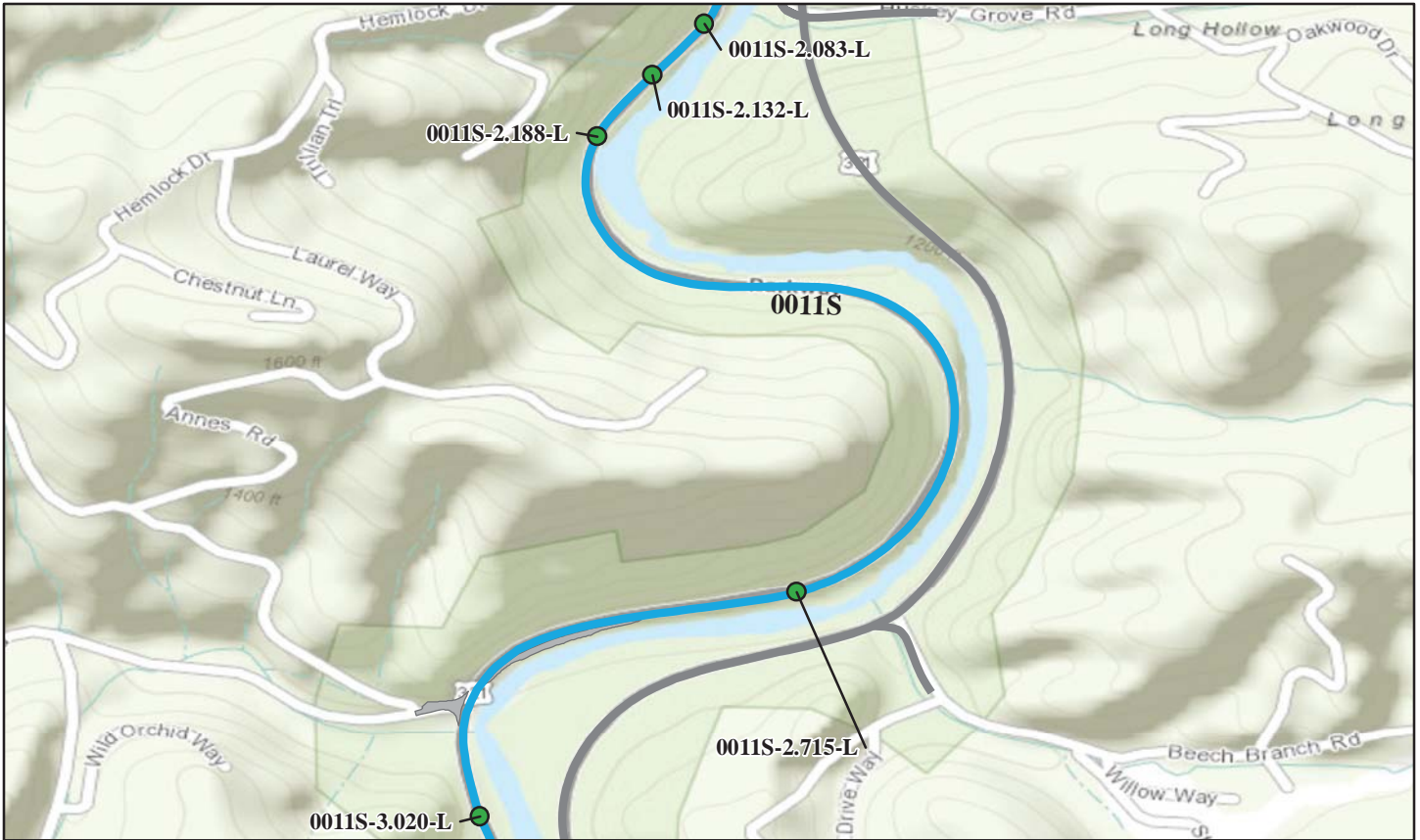
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011S-1.416-L 6/19/2007	3,092	265	Gravity - Mortared Stone	Fill Wall	73	\$39,750.00
GRSM-0011S-1.580-L 6/19/2007	55	14	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0011S-1.682-L 6/19/2007	49	14	Gravity - Mortared Stone	Head Wall	88	\$220.00
GRSM-0011S-1.852-L 6/19/2007	156	26	Gravity - Mortared Stone	Head Wall	45	\$50,500.00
GRSM-0011S-1.852-R 6/19/2007	94	29	Gravity - Mortared Stone	Head Wall	76	\$5,991.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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
GRSM-0011S-2.083-L 6/20/2007	51	12	Gravity - Mortared Stone	Head Wall	75	\$1,441.00
GRSM-0011S-2.132-L 6/20/2007	65	16	Gravity - Mortared Stone	Head Wall	87	\$440.00
GRSM-0011S-2.188-L 6/20/2007	1,708	170	Gravity - Mortared Stone	Fill Wall	87	\$684.00
GRSM-0011S-2.715-L 6/20/2007	36	12	Gravity - Mortared Stone	Head Wall	72	\$739.00
GRSM-0011S-3.020-L 6/20/2007	41	18	Gravity - Mortared Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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
GRSM-0011S-3.072-R 6/20/2007	46	15	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0011S-3.337-L 6/20/2007	56	20	Gravity - Mortared Stone	Head Wall	80	\$2,015.00
GRSM-0011S-3.340-L 6/20/2007	62	20	Gravity - Mortared Stone	Head Wall	69	\$750.00
GRSM-0011S-3.520-L 6/20/2007	115	24	Gravity - Mortared Stone	Head Wall	80	\$1,500.00
GRSM-0011S-3.520-R 6/20/2007	96	21	Gravity - Mortared Stone	Head Wall	84	\$3,432.00

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

Great Smoky Mountains National Park

ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)



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)

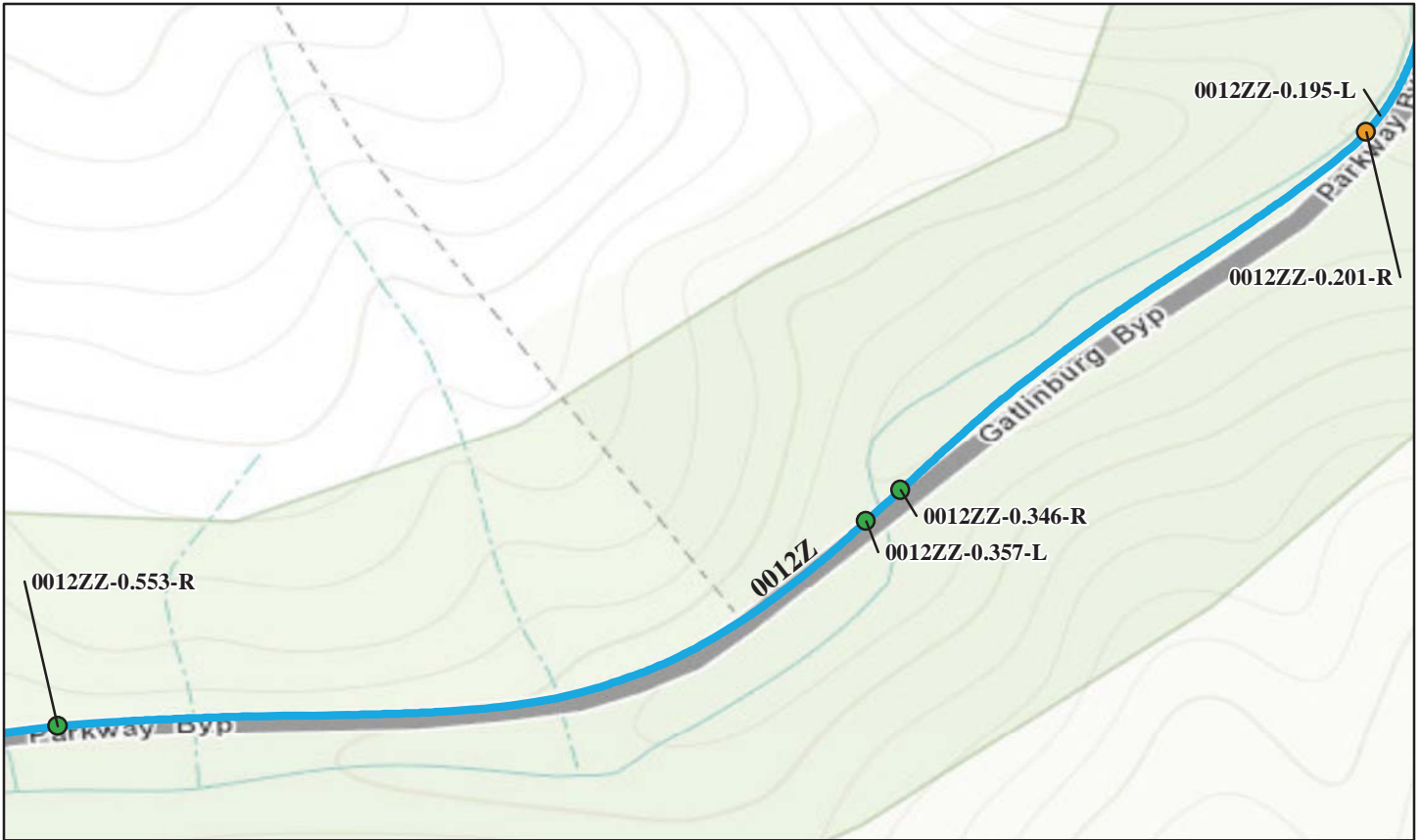
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0011S-3.652-L 6/20/2007	91	24	Gravity - Mortared Stone	Head Wall	78	\$6,484.00
GRSM-0011S-3.652-R 6/20/2007	91	24	Gravity - Mortared Stone	Head Wall	75	\$6,225.00

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

Great Smoky Mountains National Park

ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS



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)

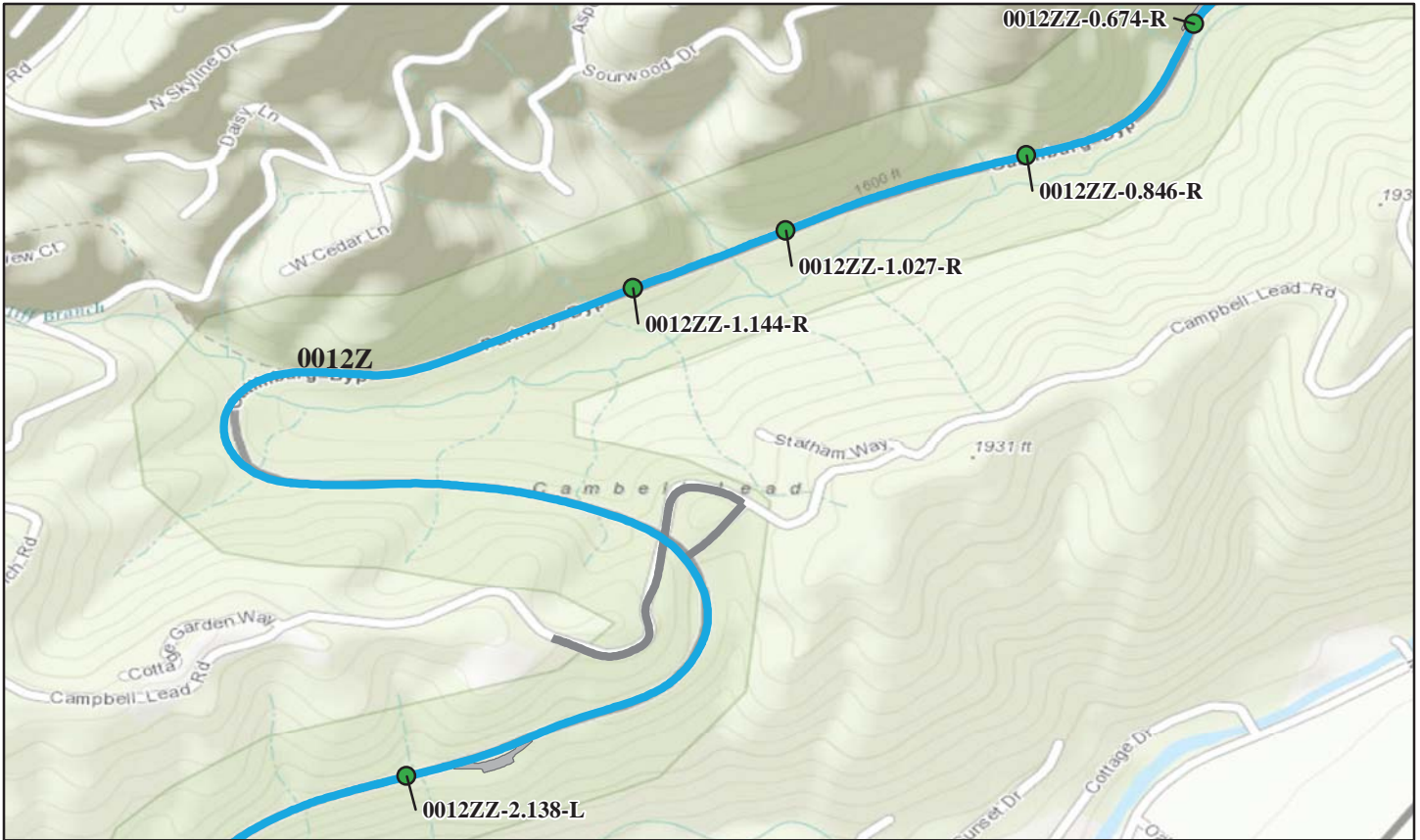
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0012ZZ-0.195-L 6/20/2007	222	35	Gravity - Mortared Stone	Head Wall	57	\$86,260.00
GRSM-0012ZZ-0.201-R 6/20/2007	114	28	Gravity - Mortared Stone	Head Wall	67	\$14,756.00
GRSM-0012ZZ-0.346-R 6/20/2007	188	33	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0012ZZ-0.357-L 6/20/2007	187	40	Gravity - Mortared Stone	Head Wall	83	\$330.00
GRSM-0012ZZ-0.553-R 6/20/2007	116	25	Gravity - Mortared Stone	Head Wall	83	\$375.00

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

Great Smoky Mountains National Park

ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS



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)

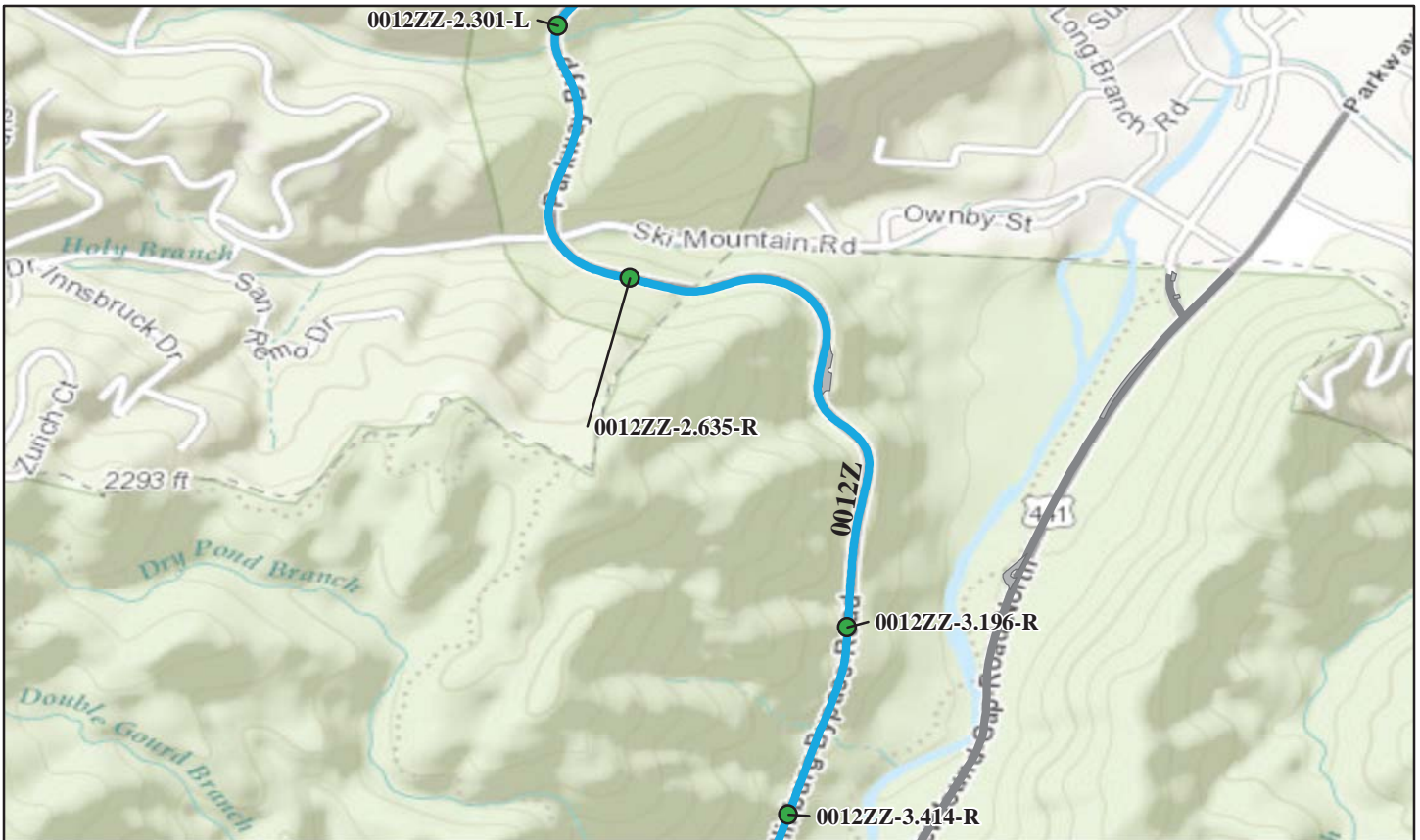
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0012ZZ-0.674-R 6/20/2007	269	28	Gravity - Mortared Stone	Head Wall	80	\$6,267.00
GRSM-0012ZZ-0.846-R 6/20/2007	35	17	Gravity - Mortared Stone	Head Wall	85	\$781.00
GRSM-0012ZZ-1.027-R 6/20/2007	140	24	Gravity - Mortared Stone	Head Wall	76	\$1,795.00
GRSM-0012ZZ-1.144-R 6/20/2007	77	20	Gravity - Mortared Stone	Head Wall	76	\$1,664.00
GRSM-0012ZZ-2.138-L 6/20/2007	5,108	547	Crib - Concrete	Fill Wall	83	\$1,555.00

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

Great Smoky Mountains National Park

ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS



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)

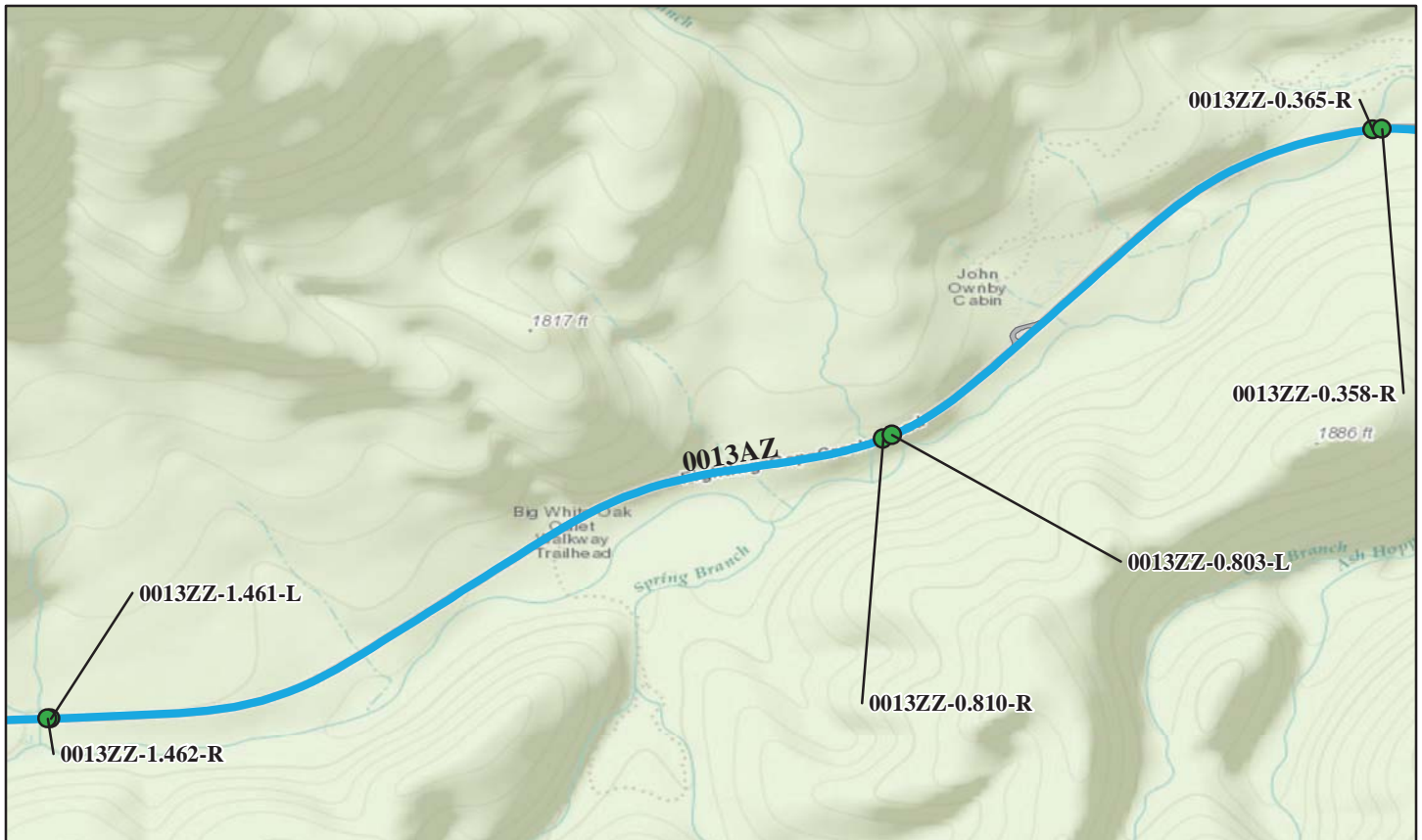
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0012ZZ-2.301-L 6/20/2007	2,809	310	Crib - Concrete	Fill Wall	97	\$1,850.00
GRSM-0012ZZ-2.635-R 6/20/2007	2,788	690	Crib - Concrete	Cut Wall	87	\$0.00
GRSM-0012ZZ-3.196-R 6/20/2007	38	16	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0012ZZ-3.414-R 6/20/2007	222	48	Gravity - Mortared Stone	Head Wall	80	\$1,320.00

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

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR



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
GRSM-0013ZZ-0.358-R 11/27/2007	1,000	125	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0013ZZ-0.365-R 11/27/2007	1,000	125	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0013ZZ-0.803-L 11/27/2007	70	20	Gravity - Dry Stone	Head Wall	77	\$0.00
GRSM-0013ZZ-0.810-R 11/27/2007	82	20	Gravity - Mortared Stone	Head Wall	86	\$0.00
GRSM-0013ZZ-1.461-L 11/27/2007	164	38	Gravity - Mortared Stone	Head Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR



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
GRSM-0013ZZ-1.462-R 11/27/2007	164	38	Gravity - Mortared Stone	Head Wall	87	\$0.00
GRSM-0013ZZ-1.585-L 11/27/2007	74	25	Gravity - Mortared Stone	Head Wall	80	\$5,720.00
GRSM-0013ZZ-1.592-R 11/27/2007	74	25	Gravity - Mortared Stone	Head Wall	82	\$0.00
GRSM-0013ZZ-1.915-L 11/27/2007	265	45	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0013ZZ-1.917-R 11/27/2007	313	45	Gravity - Mortared Stone	Head Wall	87	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR



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)

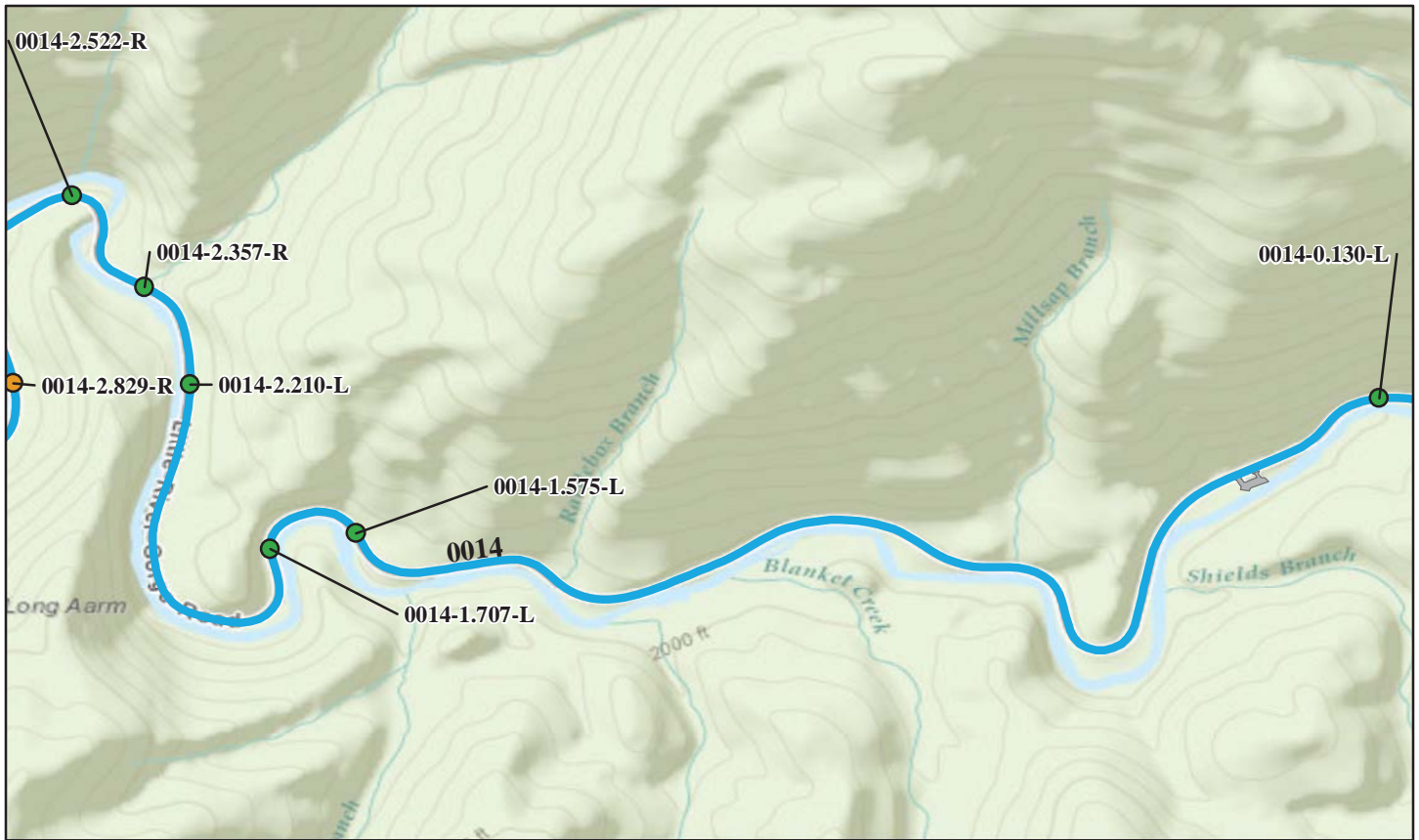
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0013ZZ-3.115-L 11/27/2007	1,220	220	Crib - Concrete	Slope Protection	74	\$3,690.00
GRSM-0013ZZ-3.171-R 11/27/2007	3,635	337	MSE - Precast Panel	Fill Wall	90	\$0.00
GRSM-0013ZZ-4.090-R 11/27/2007	132	30	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0013ZZ-4.108-L 11/27/2007	150	30	Gravity - Mortared Stone	Head Wall	82	\$0.00
GRSM-0013ZZ-4.181-L 11/27/2007	683	91	Gravity - Mortared Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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
GRSM-0014-0.130-L 11/27/2007	3,445	265	Gravity - Mortared Stone	Fill Wall	76	\$0.00
GRSM-0014-1.575-L 11/27/2007	2,282	306	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0014-1.707-L 11/28/2007	2,409	219	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0014-2.210-L 11/28/2007	10,193	703	Gravity - Mortared Stone	Fill Wall	70	\$0.00
GRSM-0014-2.357-R 11/28/2007	120	24	Gravity - Mortared Stone	Head Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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)

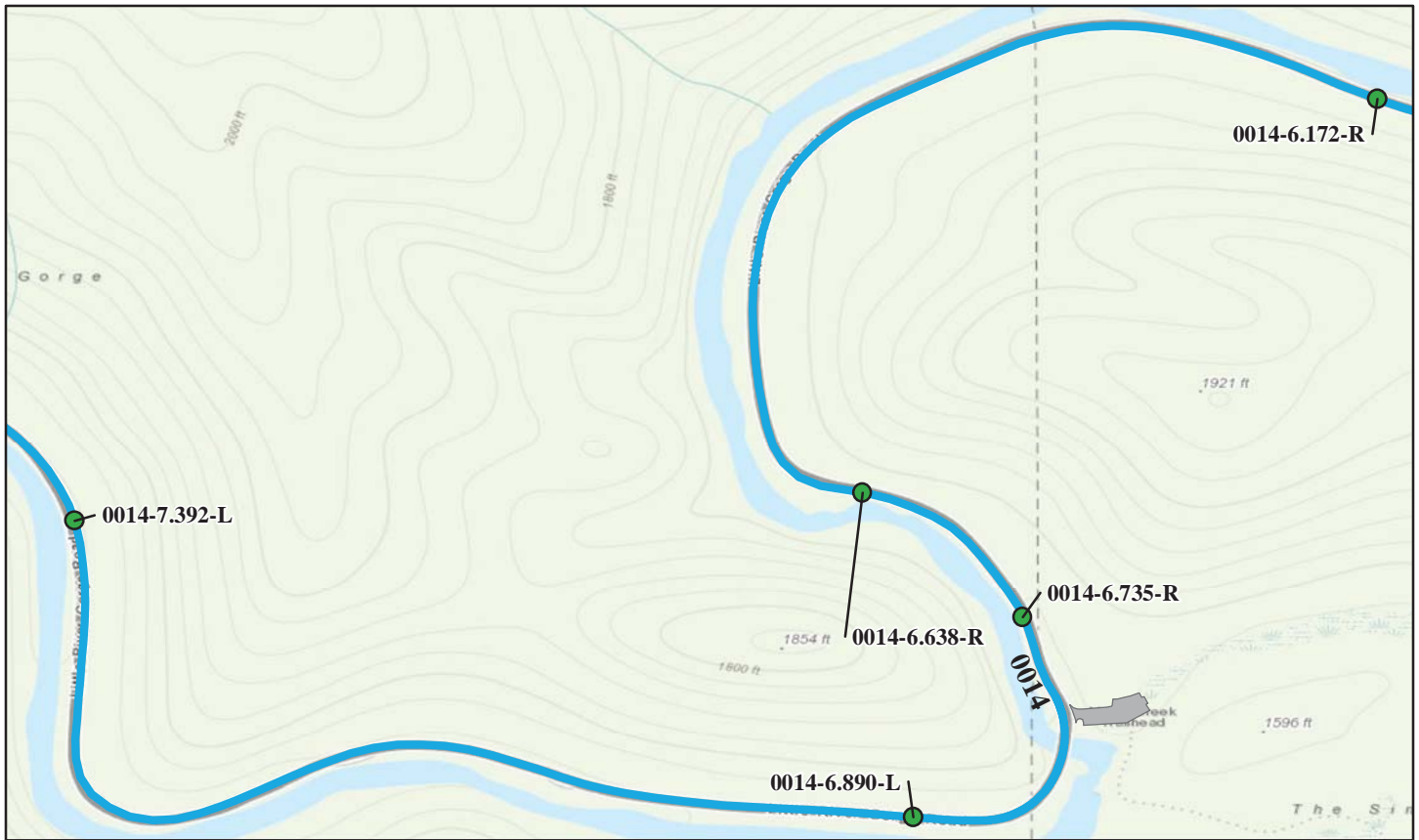
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0014-2.522-R 11/28/2007	2,559	209	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-2.829-R 11/28/2007	9,674	691	Gravity - Mortared Stone	Fill Wall	65	\$42,000.00
GRSM-0014-3.135-R 11/28/2007	818	102	Gravity - Dry Stone	Fill Wall	87	\$0.00
GRSM-0014-3.177-R 11/28/2007	3,633	303	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-3.360-R 11/28/2007	1,742	152	Gravity - Mortared Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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)

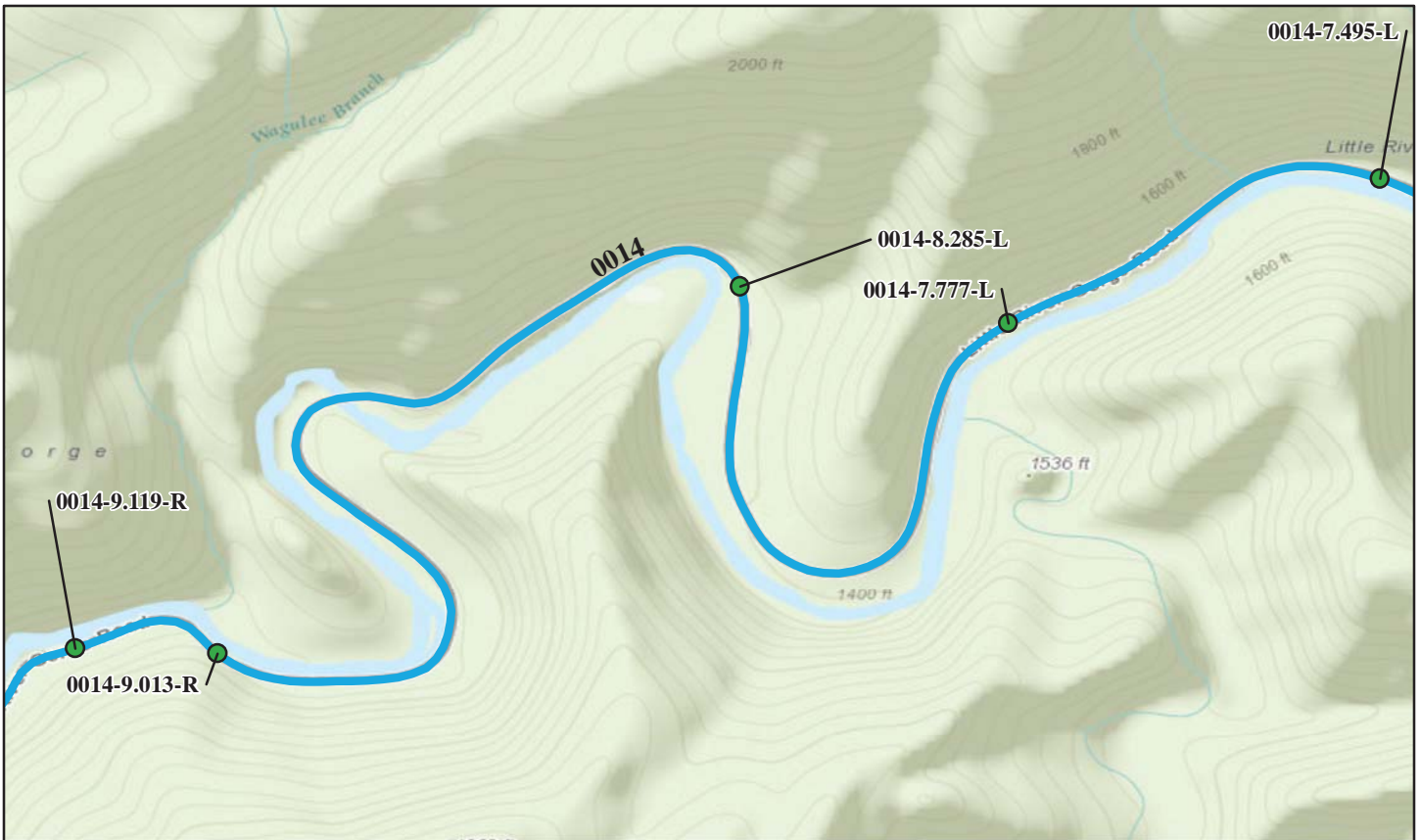
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0014-6.172-R 11/28/2007	1,233	137	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0014-6.638-R 11/28/2007	1,690	169	Gravity - Dry Stone	Fill Wall	83	\$0.00
GRSM-0014-6.735-R 11/28/2007	1,230	123	Gravity - Dry Stone	Fill Wall	79	\$0.00
GRSM-0014-6.890-L 11/28/2007	1,076	84	Gravity - Mortared Stone	Bridge Wall	88	\$0.00
GRSM-0014-7.392-L 11/28/2007	1,878	171	Gravity - Mortared Stone	Fill Wall	71	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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
GRSM-0014-7.495-L 11/28/2007	9,560	741	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-7.777-L 11/28/2007	6,858	606	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0014-8.285-L 11/28/2007	8,161	517	Gravity - Mortared Stone	Fill Wall	89	\$0.00
GRSM-0014-9.013-R 11/28/2007	6,192	531	Gravity - Mortared Stone	Fill Wall	77	\$0.00
GRSM-0014-9.119-R 11/28/2007	1,689	163	Gravity - Mortared Stone	Fill Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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
GRSM-0014-9.236-R 11/28/2007	1,080	72	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0014-9.274-R 11/28/2007	3,828	357	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0014-9.493-R 11/28/2007	2,875	281	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0014-9.524-R 11/28/2007	1,740	145	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0014-9.616-R 12/10/2007	1,035	84	Gravity - Mortared Stone	Fill Wall	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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
GRSM-0014-9.635-R 11/28/2007	1,109	140	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0014-9.677-R 11/28/2007	1,807	218	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0014-9.764-R 11/28/2007	1,805	140	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0014-10.412-R 11/28/2007	1,716	143	Gravity - Mortared Stone	Slope Protection	90	\$0.00
GRSM-0014-10.494-R 11/28/2007	4,985	525	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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
GRSM-0014-10.630-R 11/28/2007	2,500	342	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0014-11.453-R 11/28/2007	342	38	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-11.602-R 11/28/2007	1,485	184	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0014-11.812-R 11/28/2007	2,083	248	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-12.030-R 11/28/2007	883	102	Gravity - Mortared Stone	Fill Wall	86	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE 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)

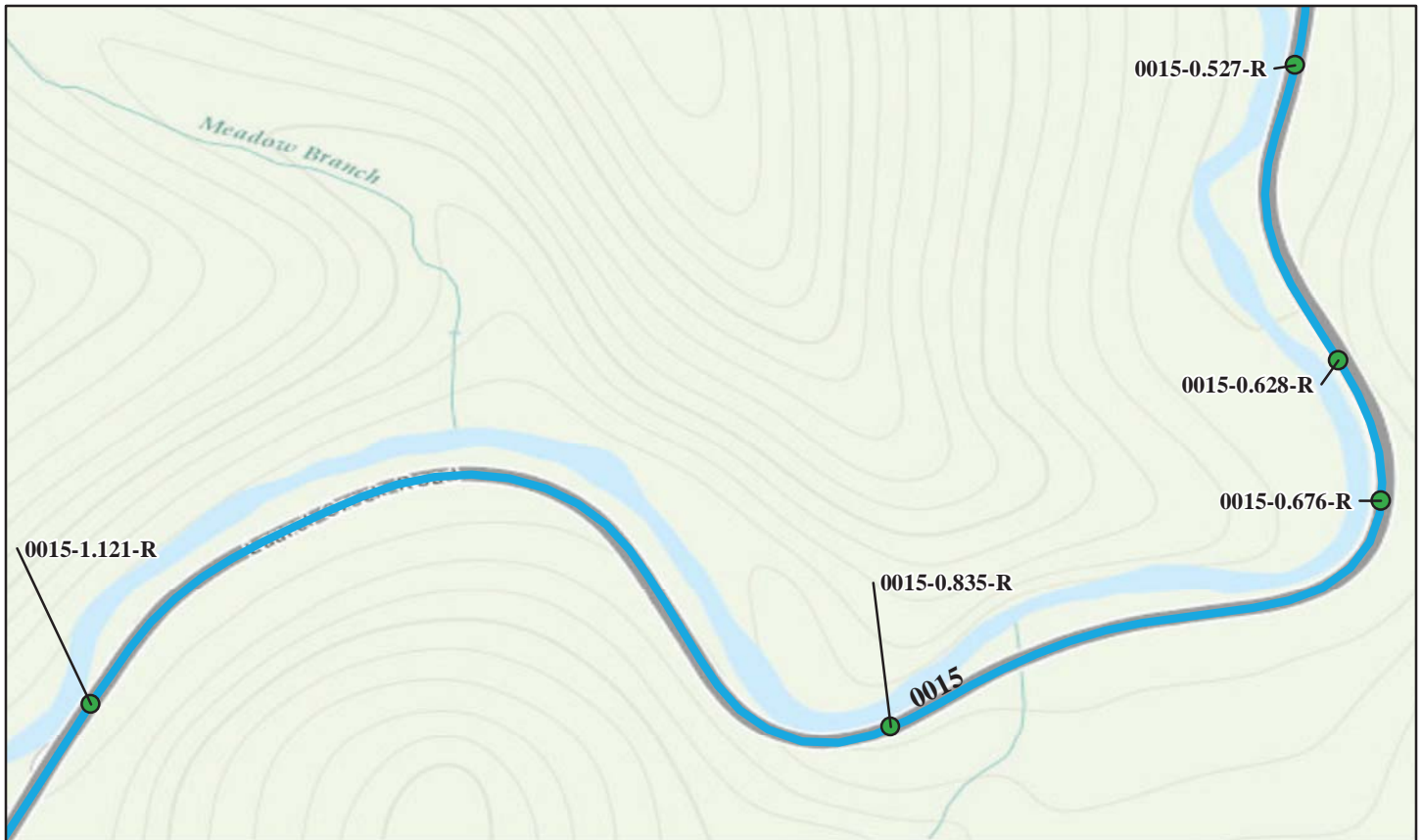
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0014-12.038-L 11/28/2007	253	44	Cantilever - Concrete	Head Wall	90	\$0.00
GRSM-0014-12.123-R 11/28/2007	653	90	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0014-12.252-R 11/28/2007	1,904	179	Gravity - Mortared Stone	Slope Protection	88	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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
GRSM-0015-0.527-R 11/29/2007	3,970	336	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0015-0.628-R 11/29/2007	1,300	116	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0015-0.676-R 11/29/2007	2,583	248	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0015-0.835-R 11/29/2007	4,016	309	Gravity - Mortared Stone	Fill Wall	78	\$20,280.00
GRSM-0015-1.121-R 11/29/2007	1,900	150	Gravity - Mortared Stone	Fill Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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)

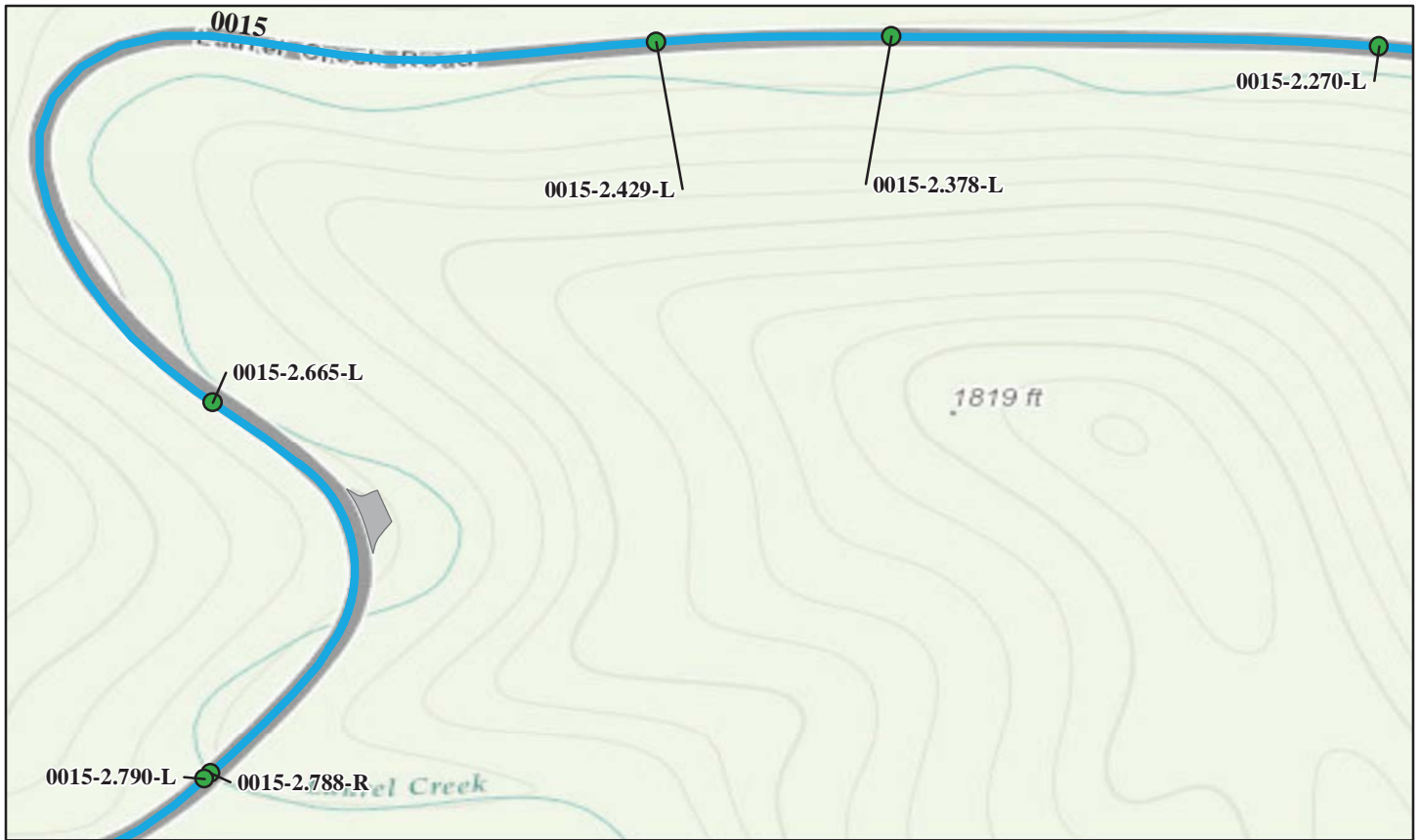
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0015-1.236-R 11/29/2007	1,283	137	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0015-1.283-L 11/29/2007	131	27	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0015-1.284-R 11/29/2007	205	35	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0015-1.778-R 11/29/2007	3,756	417	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0015-2.022-R 11/29/2007	1,687	269	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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
GRSM-0015-2.270-L 11/29/2007	3,340	245	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0015-2.378-L 11/29/2007	1,568	183	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0015-2.429-L 11/29/2007	2,350	198	Gravity - Mortared Stone	Fill Wall	87	\$0.00
GRSM-0015-2.665-L 11/30/2007	2,914	233	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0015-2.788-R 11/30/2007	333	70	Gravity - Mortared Stone	Head Wall	78	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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
GRSM-0015-2.790-L 11/30/2007	320	70	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0015-2.944-L 11/30/2007	2,157	196	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0015-3.035-L 11/30/2007	3,082	311	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0015-3.160-L 11/30/2007	345	68	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0015-3.160-R 11/30/2007	300	65	Gravity - Mortared Stone	Head Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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
GRSM-0015-3.285-R 11/30/2007	1,720	257	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0015-3.307-R 11/30/2007	189	30	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0015-3.330-R 11/30/2007	8,145	536	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0015-3.453-R 11/30/2007	3,010	197	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0015-3.627-R 11/30/2007	287	36	Gravity - Mortared Stone	Head Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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)

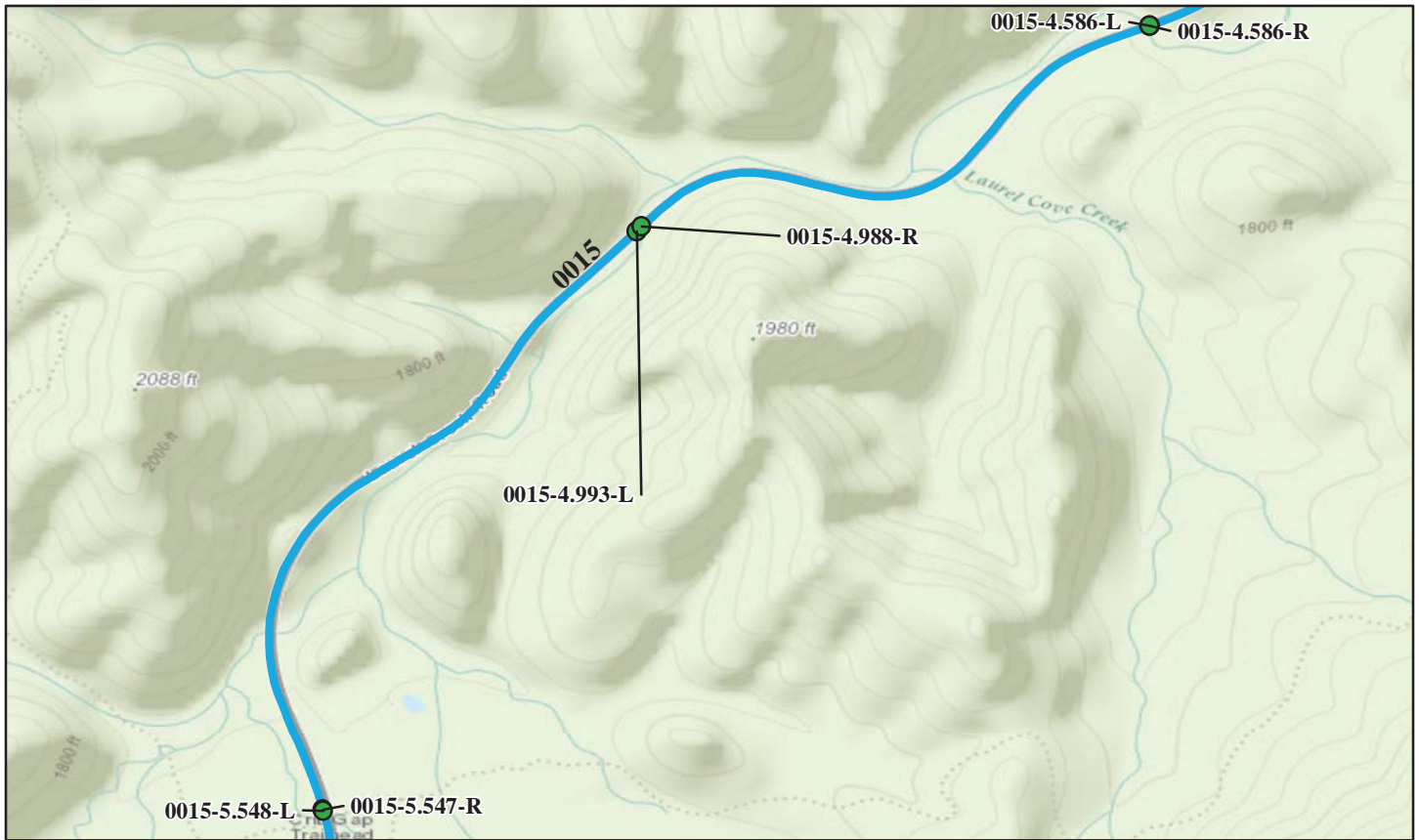
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0015-3.628-L 11/30/2007	170	33	Gravity - Mortared Stone	Head Wall	85	\$0.00
GRSM-0015-3.993-L 11/30/2007	1,471	145	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0015-4.152-L 11/30/2007	1,111	123	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0015-4.298-L 11/30/2007	180	38	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0015-4.298-R 11/30/2007	138	40	Gravity - Mortared Stone	Head Wall	85	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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
GRSM-0015-4.586-L 11/30/2007	362	65	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0015-4.586-R 11/30/2007	307	66	Gravity - Mortared Stone	Head Wall	83	\$0.00
GRSM-0015-4.988-R 11/30/2007	274	61	Gravity - Mortared Stone	Head Wall	80	\$0.00
GRSM-0015-4.993-L 11/30/2007	4,216	430	Gravity - Mortared Stone	Fill Wall	75	\$0.00
GRSM-0015-5.547-R 11/30/2007	390	45	Gravity - Mortared Stone	Head Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK 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)

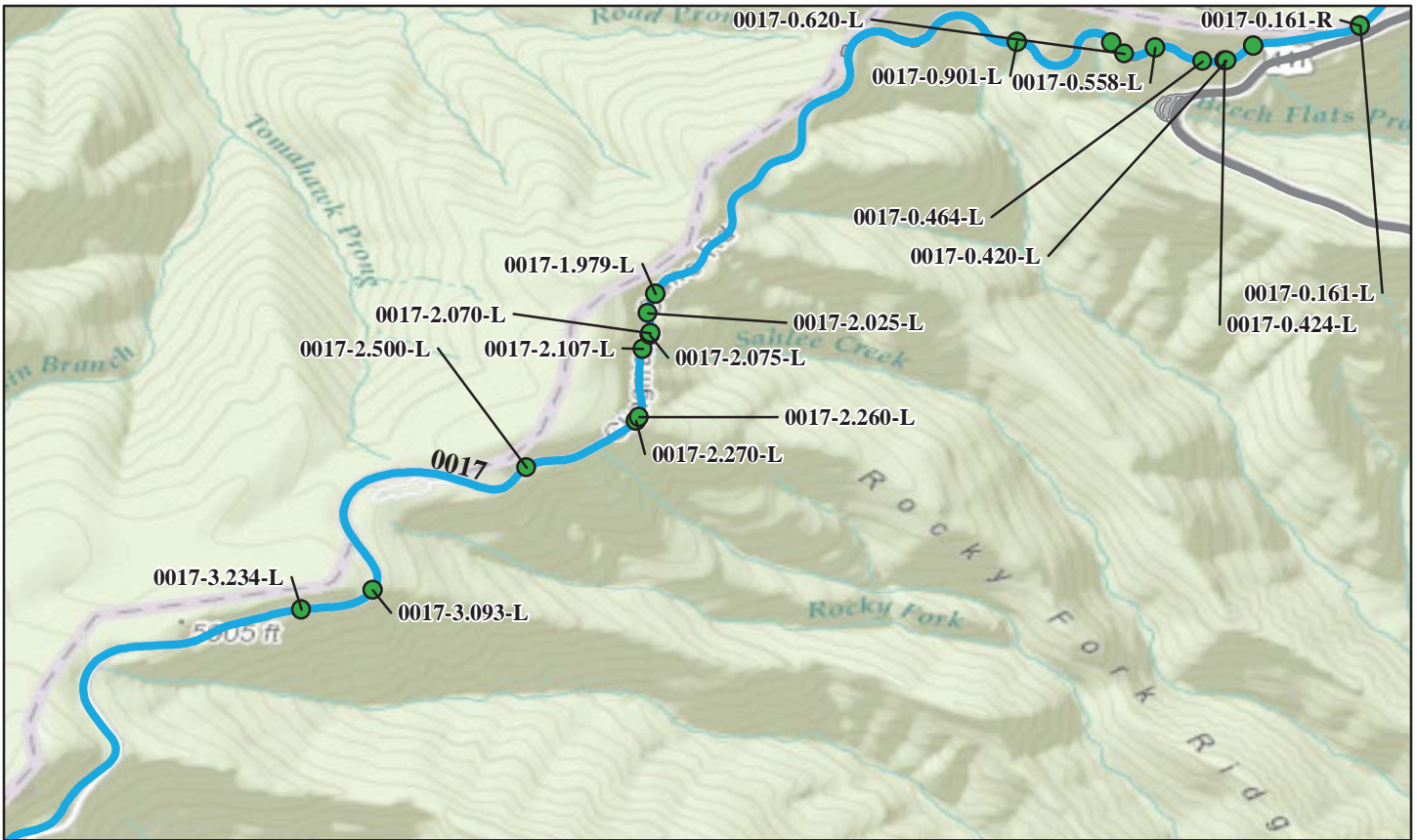
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0015-5.548-L 11/30/2007	390	45	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0015-6.630-L 11/30/2007	380	76	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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)

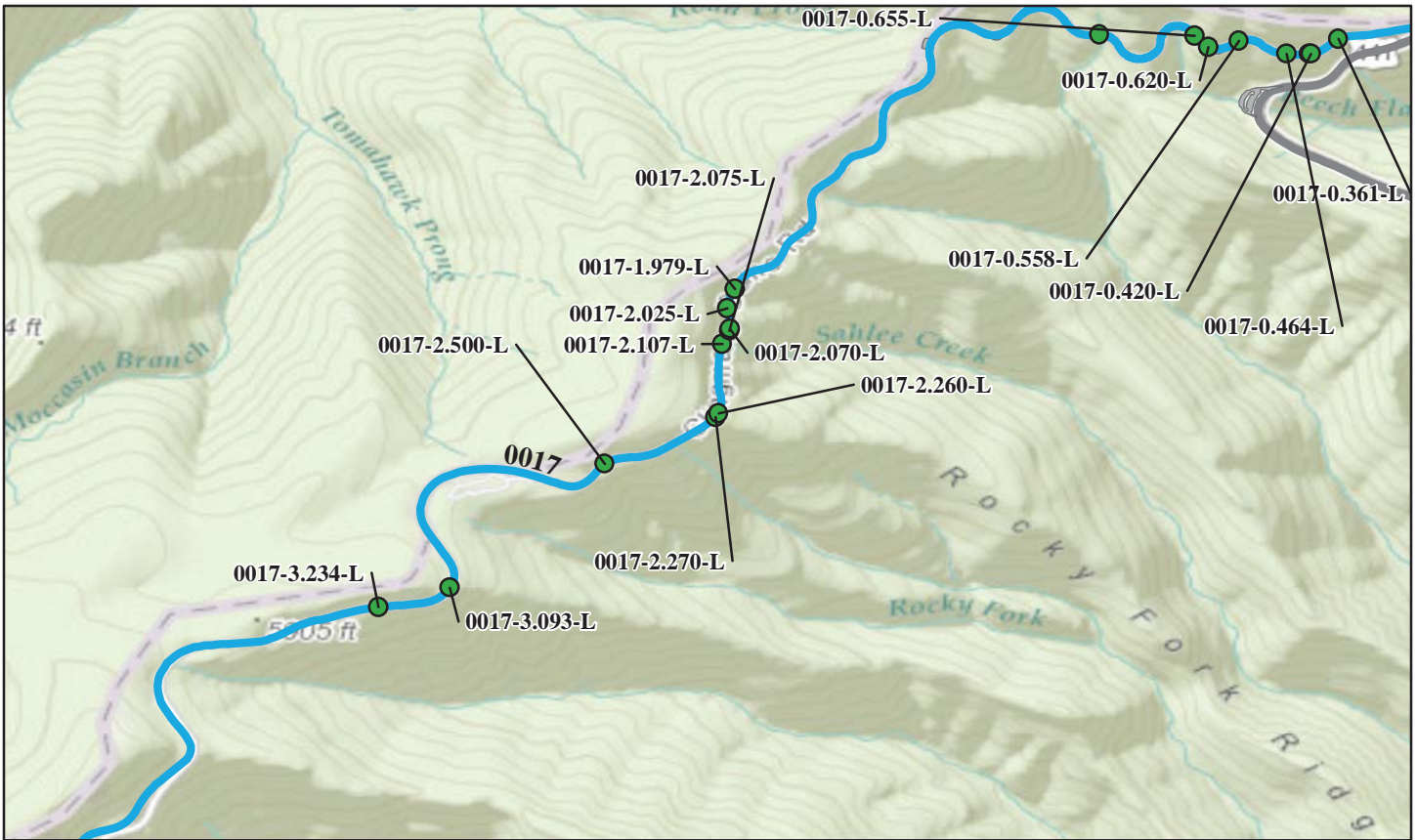
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0017-0.161-L 6/18/2007	312	50	Gravity - Mortared Stone	Head Wall	80	\$4,875.00
GRSM-0017-0.161-R 6/18/2007	5,468	705	Gravity - Mortared Stone	Fill Wall	86	\$0.00
GRSM-0017-0.361-L 6/18/2007	3,312	230	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0017-0.420-L 6/18/2007	181	31	Gravity - Mortared Stone	Fill Wall	71	\$4,010.00
GRSM-0017-0.424-L 6/18/2007	1,848	200	Gravity - Mortared Stone	Fill Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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)

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Good to Excellent (70 - 100)

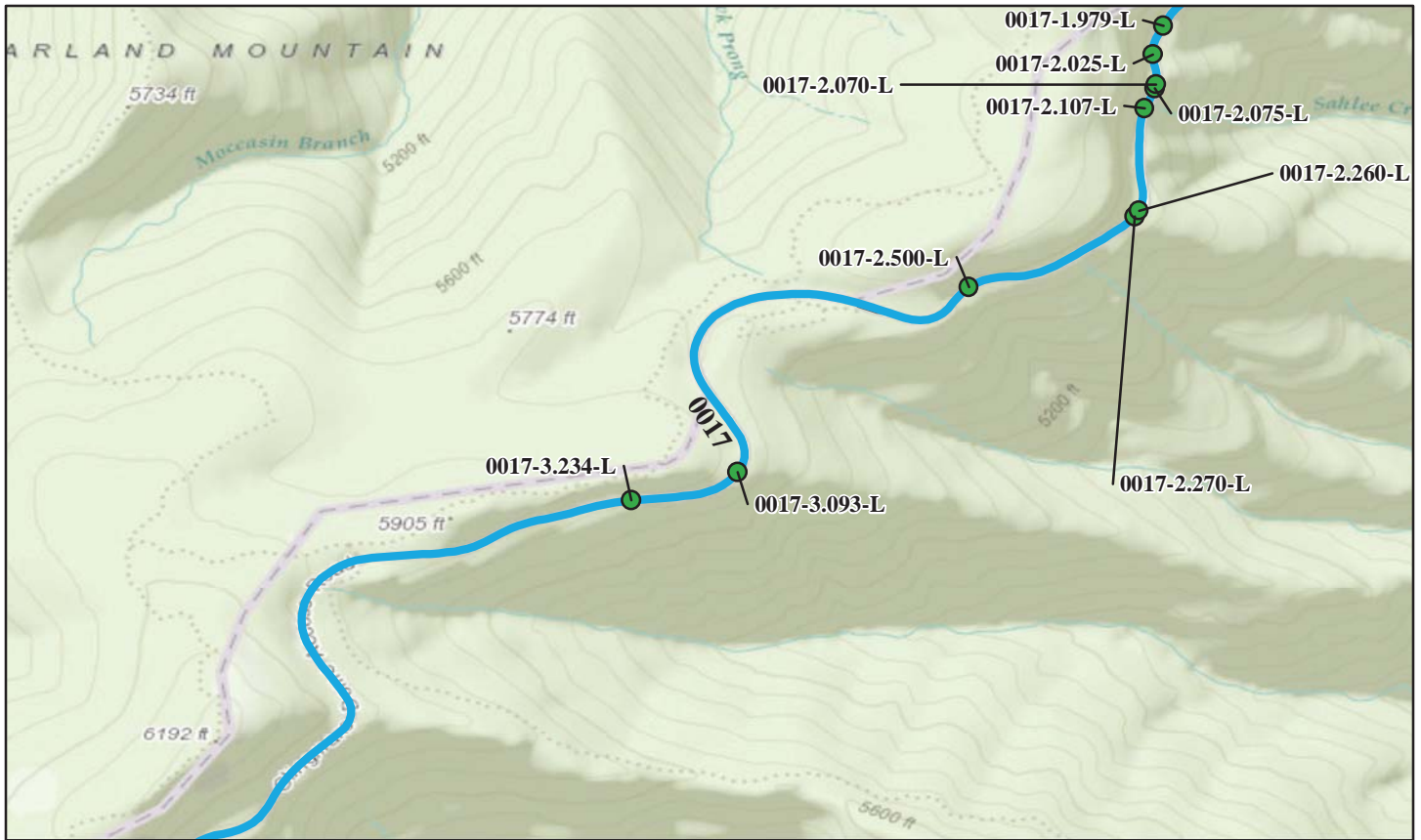
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0017-0.464-L 6/18/2007	771	200	Gravity - Mortared Stone	Fill Wall	81	\$0.00
GRSM-0017-0.558-L 6/18/2007	660	103	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0017-0.620-L 6/18/2007	150	27	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0017-0.655-L 6/18/2007	836	115	Gravity - Mortared Stone	Fill Wall	78	\$0.00
GRSM-0017-0.901-L 6/18/2007	165	35	Gravity - Mortared Stone	Head Wall	83	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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)

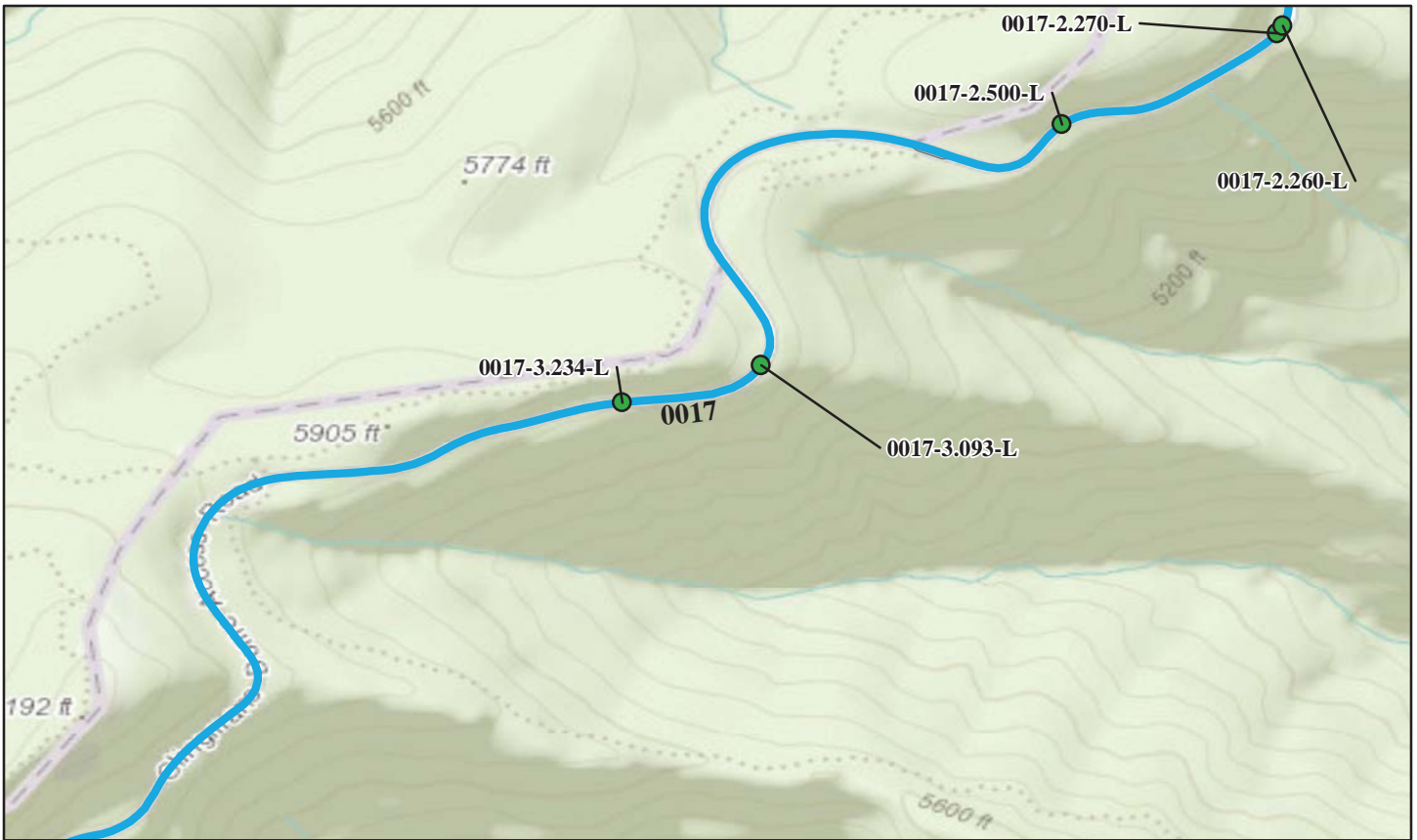
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0017-1.979-L 6/18/2007	161	30	Gravity - Mortared Stone	Fill Wall	83	\$0.00
GRSM-0017-2.025-L 6/18/2007	1,640	150	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0017-2.070-L 6/18/2007	26	11	Gravity - Mortared Stone	Head Wall	82	\$0.00
GRSM-0017-2.075-L 6/18/2007	1,140	158	Gravity - Mortared Stone	Fill Wall	84	\$0.00
GRSM-0017-2.107-L 6/18/2007	346	170	Gravity - Mortared Stone	Fill Wall	80	\$2,440.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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
GRSM-0017-2.260-L 6/18/2007	1,374	230	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0017-2.270-L 6/18/2007	858	114	Gravity - Mortared Stone	Fill Wall	85	\$500.00
GRSM-0017-2.500-L 6/18/2007	576	100	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0017-3.093-L 6/18/2007	1,419	175	Gravity - Mortared Stone	Fill Wall	85	\$880.00
GRSM-0017-3.234-L 6/18/2007	687	120	Gravity - Mortared Stone	Fill Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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
GRSM-0017-4.241-L 6/18/2007	982	120	Gravity - Mortared Stone	Fill Wall	81	\$0.00
GRSM-0017-4.514-L 6/18/2007	452	120	Gravity - Dry Stone	Fill Wall	83	\$500.00
GRSM-0017-4.583-L 6/19/2007	2,365	167	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0017-4.866-L 6/19/2007	1,616	205	Gravity - Mortared Stone	Fill Wall	80	\$880.00
GRSM-0017-4.869-L 6/19/2007	150	50	Gravity - Mortared Stone	Fill Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME 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
GRSM-0017-4.968-L 6/19/2007	681	80	Gravity - Mortared Stone	Fill Wall	80	\$0.00
GRSM-0017-4.988-L 6/19/2007	1,098	135	Gravity - Mortared Stone	Fill Wall	45	\$345,713.00
GRSM-0017-5.512-L 6/19/2007	887	150	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0017-7.255-R 6/19/2007	2,125	110	Gravity - Dry Stone	Fill Wall	65	\$67,080.00
GRSM-0017-9.370-L 6/18/2007	1,358	185	Gravity - Mortared Stone	Fill Wall	82	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT 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
GRSM-0018-0.698-R 11/27/2007	3,722	309	Gravity - Mortared Stone	Fill Wall	89	\$0.00
GRSM-0018-0.939-R 11/27/2007	1,200	120	Gravity - Dry Stone	Fill Wall	58	\$3,284.00
GRSM-0018-1.013-R 11/27/2007	145	14	Gravity - Mortared Stone	Head Wall	75	\$0.00
GRSM-0018-1.264-R 11/27/2007	3,432	286	Gravity - Dry Stone	Fill Wall	56	\$6,760.00
GRSM-0018-1.373-R 11/27/2007	1,520	152	Gravity - Dry Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT 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
GRSM-0018-1.438-R 11/27/2007	1,224	102	Gravity - Mortared Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST



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

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

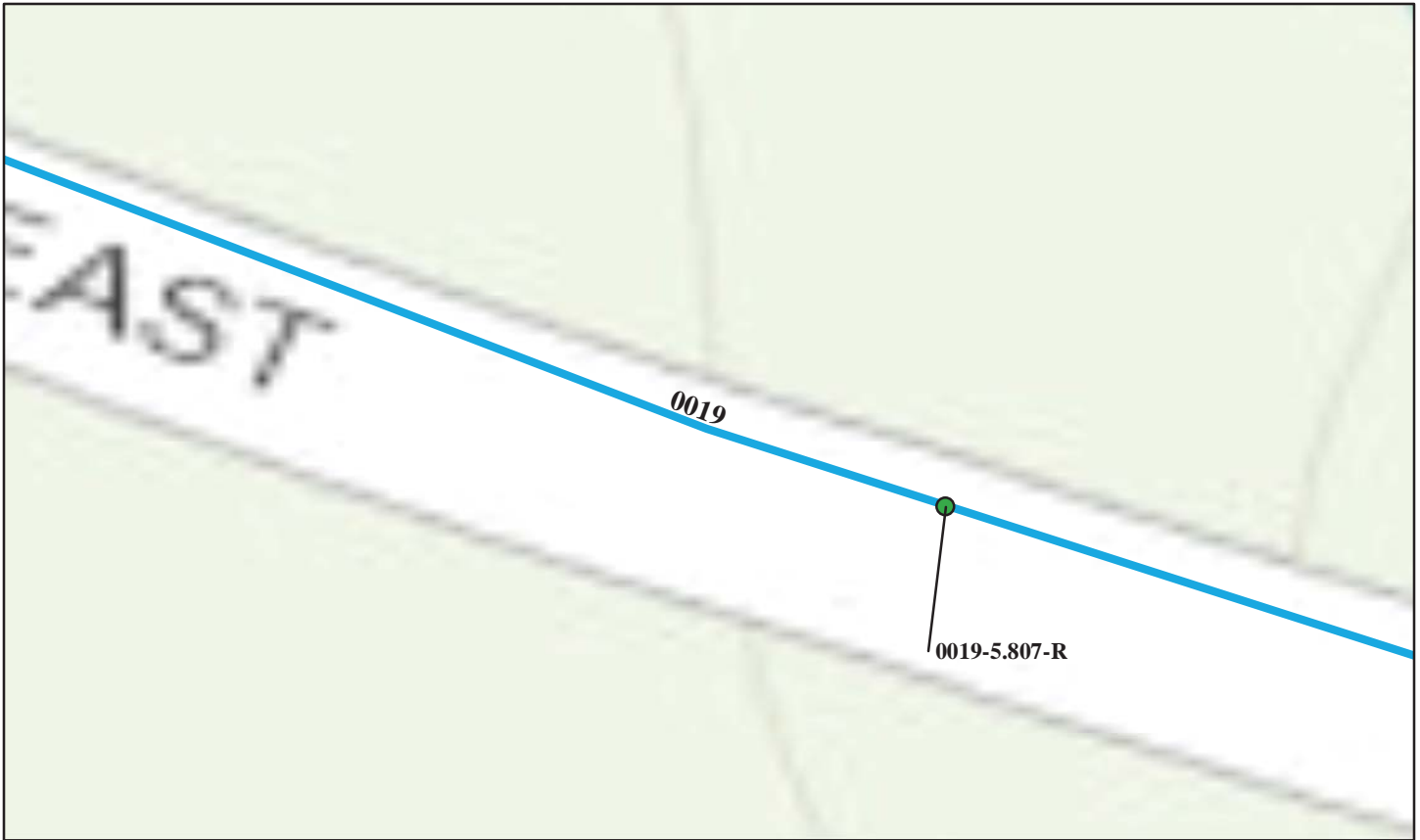
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0019-0.293-L 12/1/2007	124	27	Gravity - Mortared Stone	Head Wall	79	\$2,190.00
GRSM-0019-0.300-R 12/1/2007	158	36	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0019-2.430-L 12/1/2007	77	23	Gravity - Mortared Stone	Head Wall	90	\$0.00
GRSM-0019-2.432-R 12/1/2007	101	27	Gravity - Mortared Stone	Head Wall	88	\$0.00
GRSM-0019-5.795-L 12/1/2007	68	18	Gravity - Mass Concrete	Head Wall	94	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST



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

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0019-5.807-R 12/1/2007	96	25	Gravity - Mass Concrete	Head Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0021: COSBY ENTRANCE 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
GRSM-0021-0.077-L 11/30/2007	1,774	333	Gravity - Mortared Stone	Fill Wall	59	\$63,885.00

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

Great Smoky Mountains National Park

ROUTE 0022: CATALOOCHEE ENTRANCE 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)

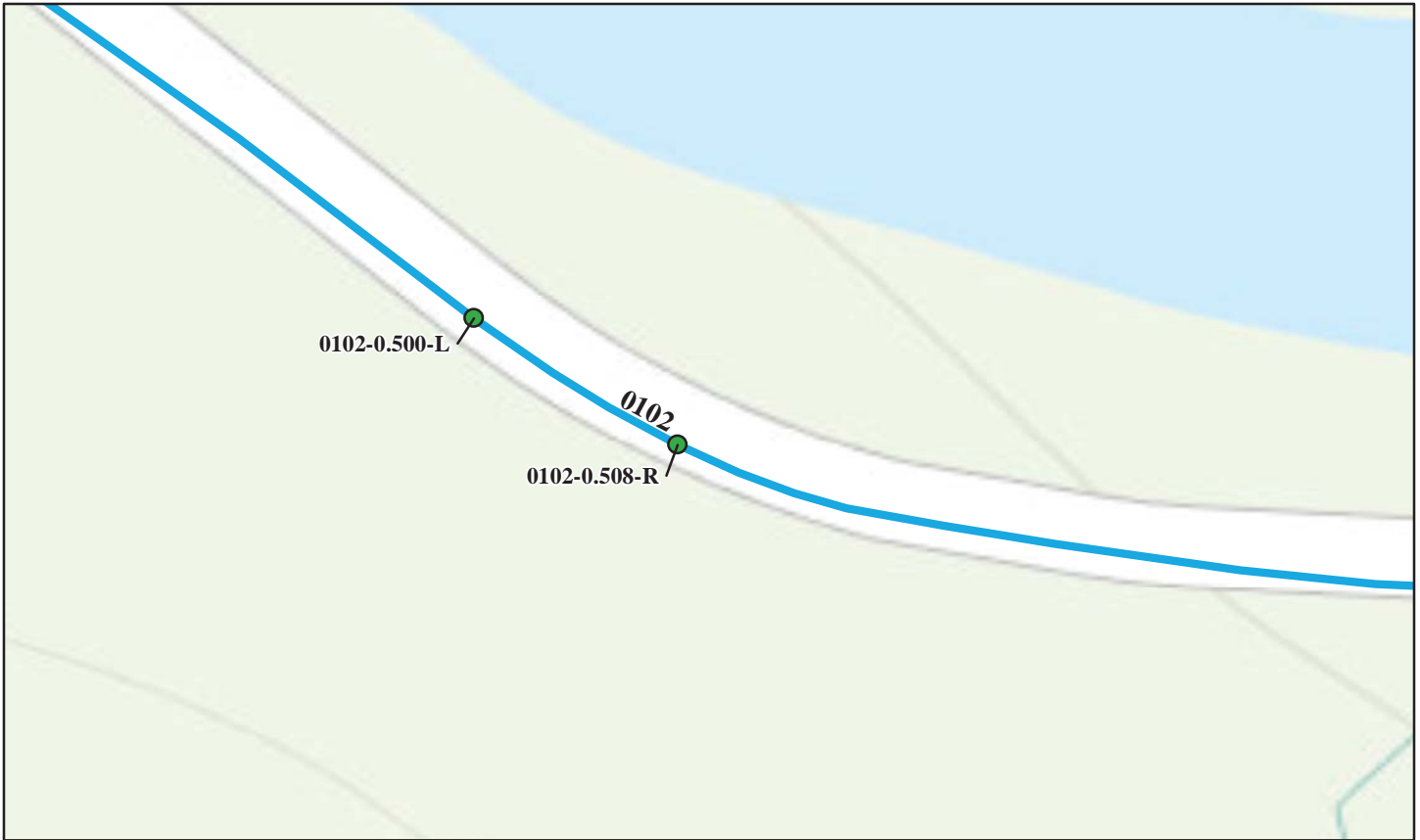
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0022-0.596-L 12/3/2007	175	25	Gravity - Mortared Stone	Head Wall	58	\$0.00
GRSM-0022-0.770-L 12/3/2007	957	87	Gravity - Mortared Stone	Cut Wall	75	\$0.00
GRSM-0022-0.834-L 12/3/2007	920	115	Gravity - Mortared Stone	Cut Wall	77	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0102: GREENBRIER 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
GRSM-0102-0.500-L 12/3/2007	558	93	Gravity - Dry Stone	Fill Wall	75	\$3,210.00
GRSM-0102-0.508-R 12/3/2007	205	37	Gravity - Dry Stone	Head Wall	80	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0116: WEST DEEP CREEK 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)

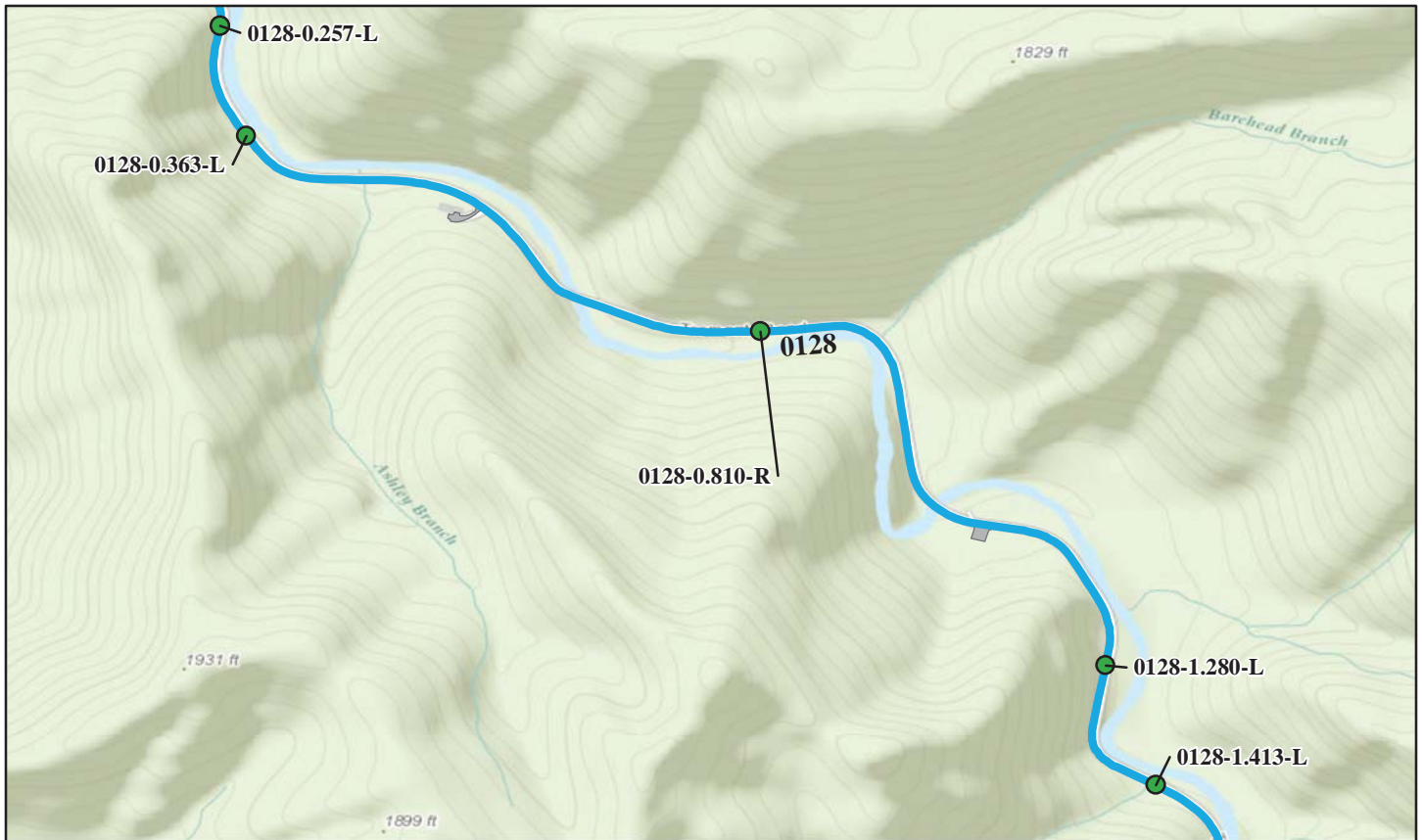
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0116-0.415-R 12/1/2007	3,321	300	Gravity - Dry Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0128: TREMONT 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
GRSM-0128-0.257-L 11/29/2007	590	95	Gravity - Mortared Stone	Fill Wall	78	\$0.00
GRSM-0128-0.363-L 11/29/2007	1,210	119	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0128-0.810-R 11/29/2007	2,477	245	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0128-1.280-L 11/29/2007	690	107	Gravity - Mortared Stone	Fill Wall	82	\$0.00
GRSM-0128-1.413-L 11/29/2007	2,634	311	Gravity - Mortared Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0128: TREMONT 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)

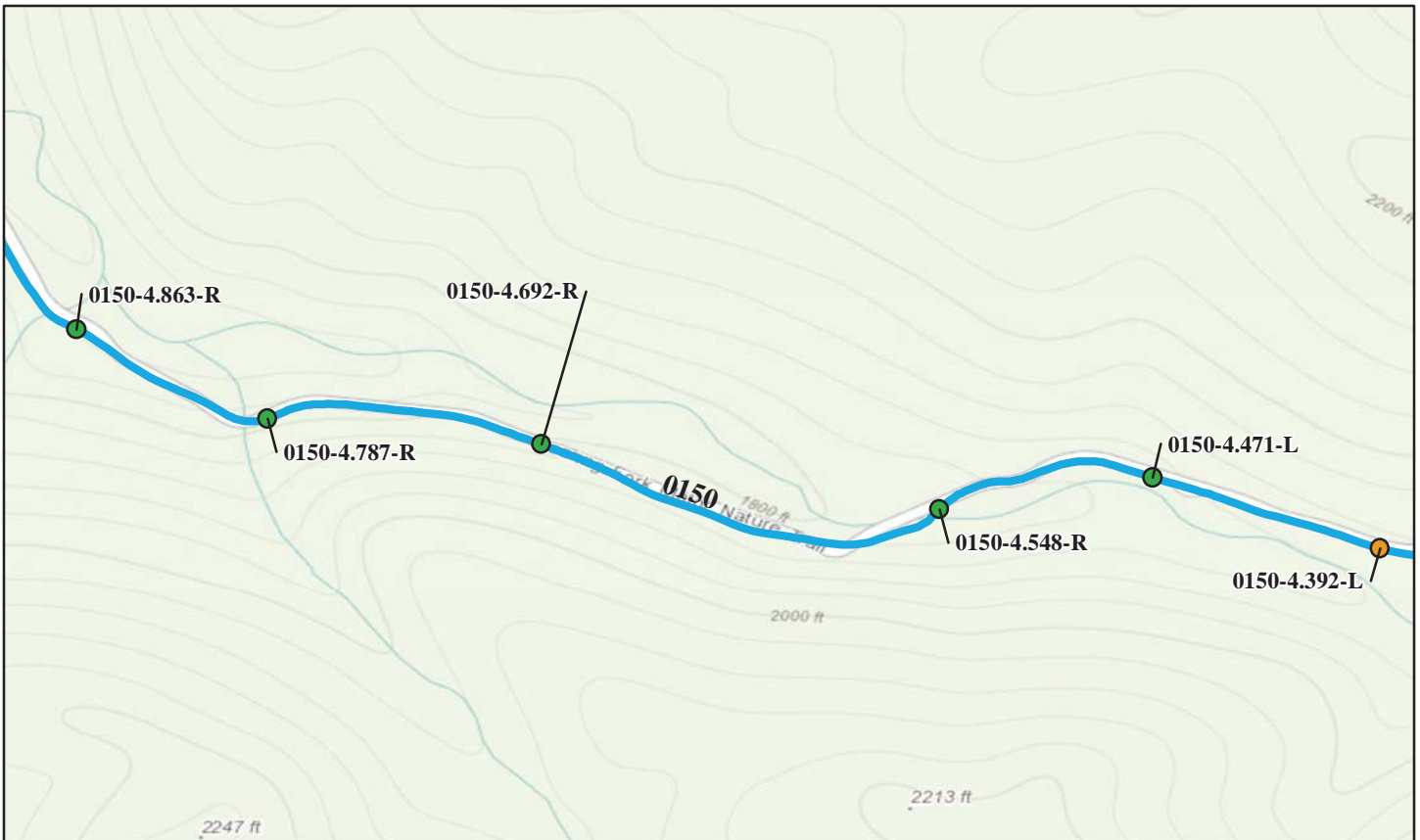
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0128-1.549-L 11/29/2007	1,340	200	Gravity - Mortared Stone	Fill Wall	90	\$0.00
GRSM-0128-1.806-L 11/29/2007	2,070	238	Gravity - Mortared Stone	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL



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)

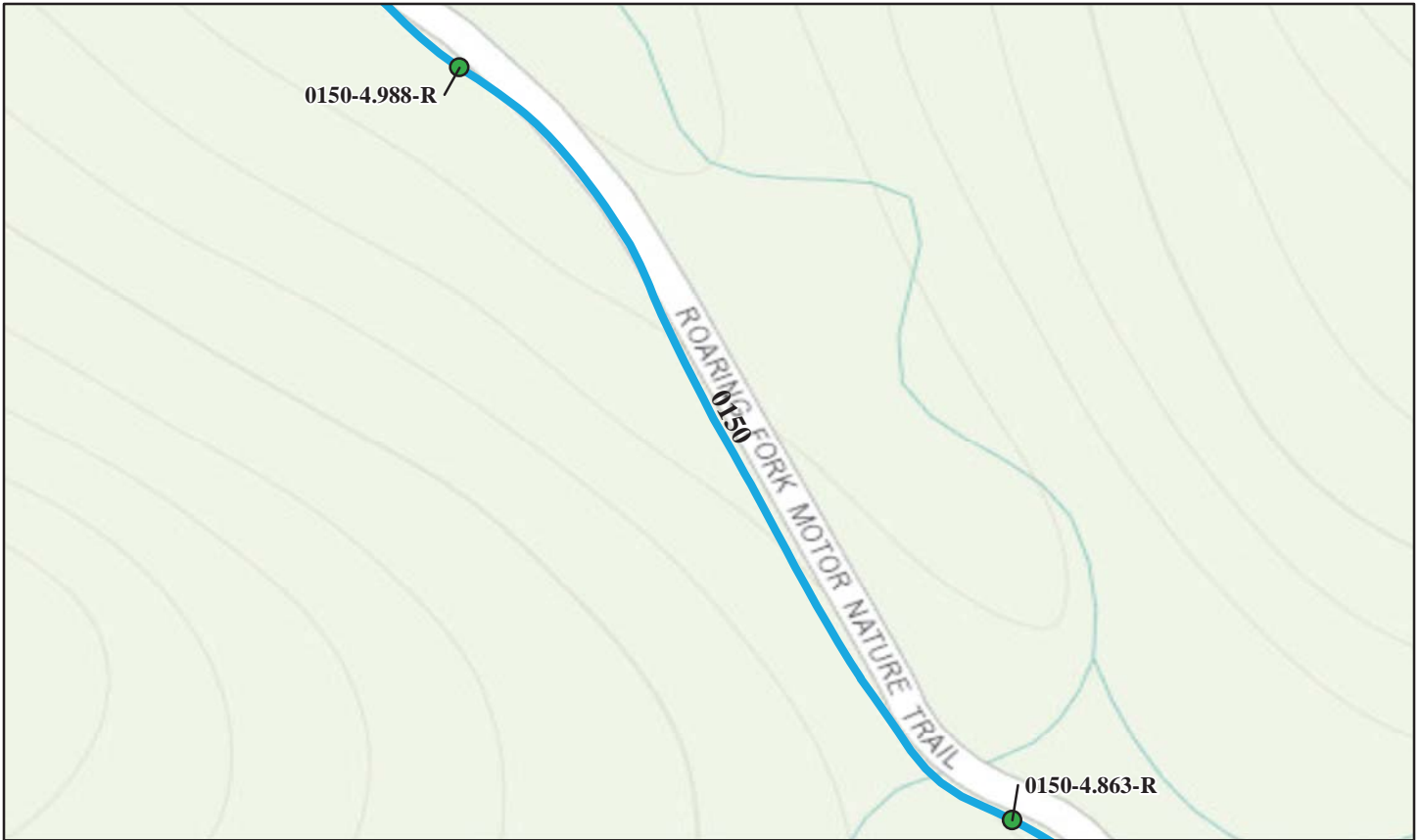
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0150-4.392-L 12/3/2007	188	52	Gravity - Mortared Stone	Fill Wall	69	\$10,520.00
GRSM-0150-4.471-L 12/3/2007	234	65	Gravity - Mortared Stone	Fill Wall	85	\$0.00
GRSM-0150-4.548-R 12/3/2007	888	96	Gravity - Mortared Stone	Fill Wall	72	\$23,670.00
GRSM-0150-4.692-R 12/3/2007	132	35	Gravity - Mortared Stone	Fill Wall	74	\$3,312.00
GRSM-0150-4.787-R 12/3/2007	324	68	Gravity - Dry Stone	Fill Wall	84	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL



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
GRSM-0150-4.863-R 12/3/2007	527	101	Gravity - Dry Stone	Fill Wall	83	\$0.00
GRSM-0150-4.988-R 12/3/2007	253	44	Gravity - Mortared Stone	Fill Wall	87	\$0.00

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

Great Smoky Mountains National Park

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
GRSM-0700-0.000-R 12/1/2007	1,864	92	MSE - Precast Panel	Fill Wall	83	\$0.00
GRSM-0700-6.850-R 12/1/2007	8,100	281	MSE - Precast Panel	Fill Wall	83	\$0.00
GRSM-0700-7.000-R 12/1/2007	-1	120	MSE - Precast Panel	Fill Wall	34	\$0.00
GRSM-0700-7.350-R 12/1/2007	1,785	135	MSE - Precast Panel	Fill Wall	62	\$0.00
GRSM-0700-8.050-R 12/1/2007	1,000	75	MSE - Precast Panel	Fill Wall	71	\$0.00

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

Great Smoky Mountains National Park

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)

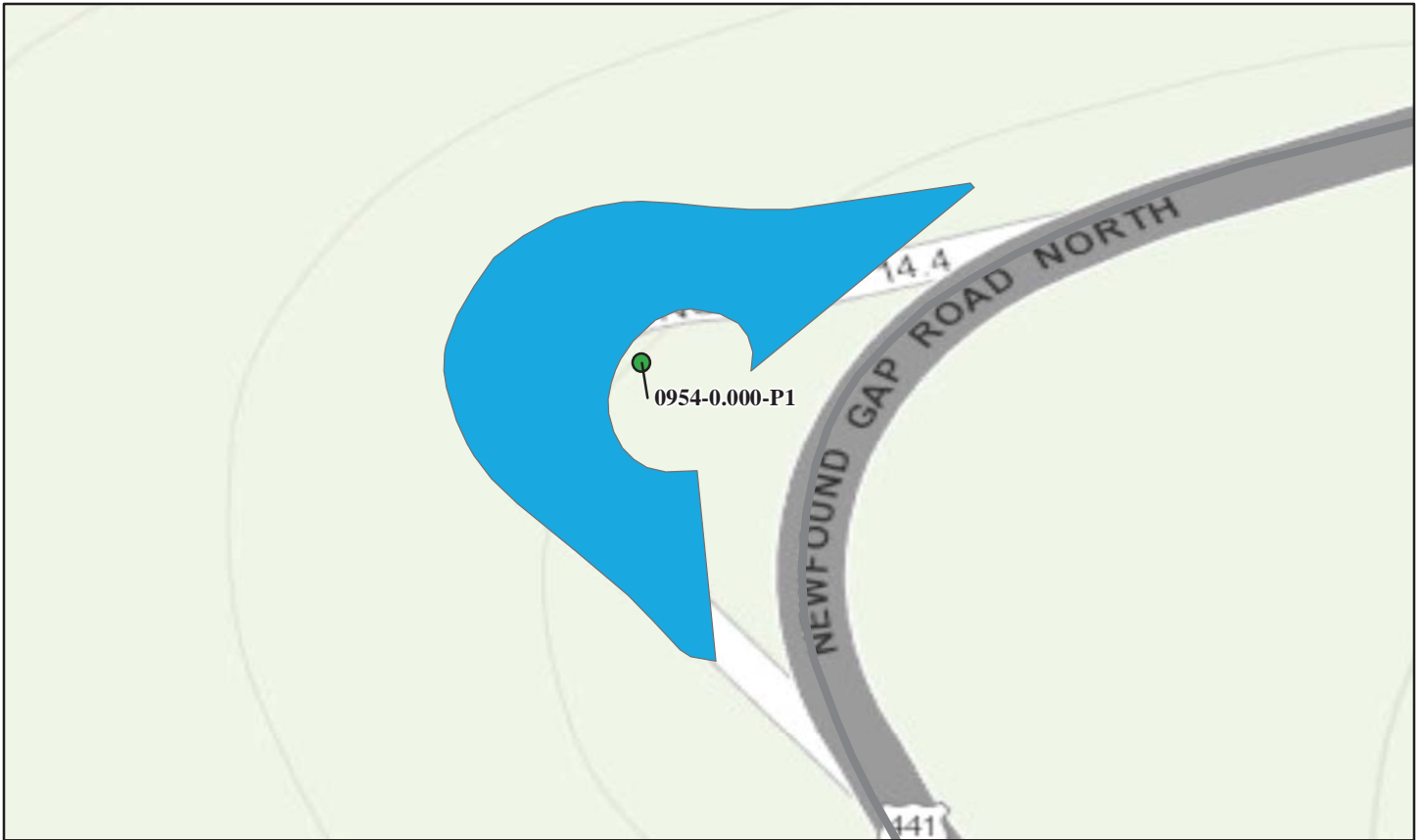
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0700-9.050-R 12/1/2007	3,934	319	MSE - Precast Panel	Fill Wall	83	\$0.00
GRSM-0700-9.350-R 12/1/2007	936	117	Cantilever - Concrete	Fill Wall	90	\$0.00
GRSM-0700-9.600-R 12/1/2007	4,250	250	Cantilever - Concrete	Fill Wall	90	\$0.00
GRSM-0700-9.700-R 12/1/2007	130	20	Cantilever - Concrete	Fill Wall	90	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0954: PARKING AT MP 14.4



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)

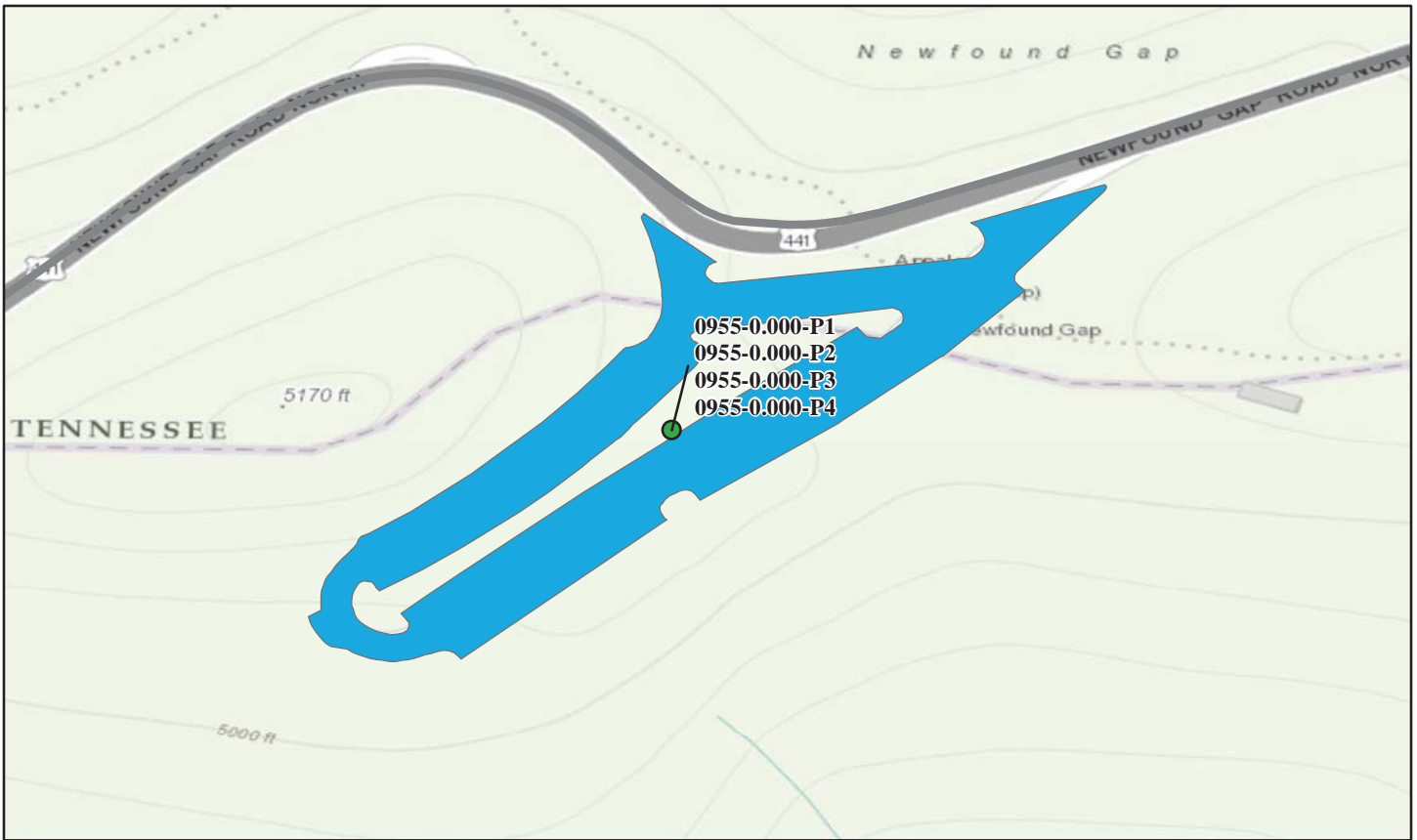
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GRSM-0954-0.000-P1 6/15/2007	2058	255	Gravity - Mortared Stone	Fill Wall	77	\$20,579.00

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

Great Smoky Mountains National Park

ROUTE 0955: NEWFOUND GAP 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
GRSM-0955-0.000-P1 6/15/2007	920	230	Gravity - Mortared Stone	Fill Wall	91	\$0.00
GRSM-0955-0.000-P2 6/15/2007	340	85	Gravity - Mortared Stone	Fill Wall	80	\$4,750.00
GRSM-0955-0.000-P3 6/15/2007	1695	345	Gravity - Mortared Stone	Fill Wall	81	\$0.00
GRSM-0955-0.000-P4 6/15/2007	8314	373	Gravity - Mortared Stone	Fill Wall	79	\$0.00

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

Great Smoky Mountains National Park

ROUTE 0982: COUCHES CREEK PARKING (OCONALUFTEE RIVER PULLOUT PARKING #12)



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
GRSM-0982-0.000-P1 6/16/2007	161	28	Crib - Concrete	Fill Wall	48	\$43,526.00

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

Tier 3 Retaining Wall Details



Great Smoky Mountains National Park



Federal Lands Highway
Road Inventory Program

Wall ID:	GRSM-0008A-2.460-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8A		
Inspection Date:	December 03, 2007	Approximate Year Built:	1965
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilever headwall serving as a tunnel under the parkway for abandoned road.		

Wall Measurements

Wall Length (ft.):	58	Face Area (sq.):	435
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Abandoned road bed, no distress	9
CONCRETE 8.00	No distress	9
LATERAL SLOPE 0.50	Stable embankment, no distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, no distress.	9
WALL DRAINS 0.50	Weeps at toe, no distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0008A: FOOTHILLS PARKWAY SECTION 8A

Retaining Wall Condition Photos



GRSM_0008A_2.460_L_1.jpg



GRSM_0008A_2.460_L_2.jpg

Wall ID:	GRSM-0008A-2.460-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8A		
Inspection Date:	December 03, 2007	Approximate Year Built:	1965
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Canitlever concrete headwall serving as a tunnel under the parkway for abandoned road.		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	314
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Abandoned road bed, no distress.	9
CONCRETE 8.00	No distress.	9
LATERAL SLOPE 0.50	Stable embankment, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, no distress	9
WALL DRAINS 0.50	Weeps at toe, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0008A: FOOTHILLS PARKWAY SECTION 8A

Retaining Wall Condition Photos



GRSM_0008A_2.460_R_1.jpg



GRSM_0008A_2.460_R_2.jpg

Wall ID:	GRSM-0008A-5.295-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8A		
Inspection Date:	December 03, 2007	Approximate Year Built:	1965
*Wall Rating:	93	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:	Long concrete crib cut wall near road start.		

Wall Measurements

Wall Length (ft.):	197	Face Area (sq.):	1330
Average Wall Height (ft.):	6	Face Angle (deg.):	80
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable, flat soil/paved ditch. No distress.	9
BIN OR CRIB 8.00	No distress	10
LATERAL SLOPE 0.50	Stable slope, no distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable slope, no distress.	9
WALL DRAINS 0.50	Free draining face, no distress.	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0008A: FOOTHILLS PARKWAY SECTION 8A

Retaining Wall Condition Photos



GRSM_0008A_5.295_L_1.jpg

Wall ID:	GRSM-0008E-1.170-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Cut Wall	Primary Wall Type:	Other -Tie back Panel Wall
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Multi-tiered, concrete panel (8 ft x 10 ft), tie-back wall. Wall starts at station 616+75 and corresponds to RW1 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	322	Face Area (sq.):	8600
Average Wall Height (ft.):	26	Face Angle (deg.):	75
Maximum Wall Height (ft.):	38	Vertical Offset (ft.):	0

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_1.170_R_1.jpg



GRSM_0008E_1.170_R_10.jpg

Wall ID:	GRSM-0008E-1.577-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall starts at station 638+25 and corresponds to RW2 per the 1984 8E6 as-built plans. Large rock fill 20 ft below the wall.		
Wall Measurements			
Wall Length (ft.):	422	Face Area (sq.):	9550
Average Wall Height (ft.):	22	Face Angle (deg.):	85
Maximum Wall Height (ft.):	40	Vertical Offset (ft.):	-22

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_1.577_R_1.jpg



GRSM_0008E_1.577_R_10.jpg

Wall ID:	GRSM-0008E-2.150-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Fractured Fin Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formed panel relief and colored concrete. Wall starts at station 668+50 and corresponds to RW8 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	276	Face Area (sq.):	3040
Average Wall Height (ft.):	11	Face Angle (deg.):	88
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-3

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_2.150_R_1.jpg



GRSM_0008E_2.150_R_2.jpg

Wall ID:	GRSM-0008E-2.912-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	Unknown
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall starts at station 708+75 and corresponds to RW12 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	195	Face Area (sq.):	4500
Average Wall Height (ft.):	23	Face Angle (deg.):	86
Maximum Wall Height (ft.):	42	Vertical Offset (ft.):	-3

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_2.912_L_1.jpg



GRSM_0008E_2.912_L_2.jpg

Wall ID:	GRSM-0008E-3.556-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall starts at station 742+75 and corresponds to RW15 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	330	Face Area (sq.):	7250
Average Wall Height (ft.):	21	Face Angle (deg.):	88
Maximum Wall Height (ft.):	27	Vertical Offset (ft.):	-50

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_3.556_L_1.jpg



GRSM_0008E_3.556_L_2.jpg

Wall ID:	GRSM-0008E-3.868-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8E		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Poorly placed, large boulder (2+ ft diameter), dry-laid stone wall. Similar to a rockery construction, but poorly crafted. Wall starts at station 759+25 and corresponds to RW16 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	80	Face Area (sq.):	640
Average Wall Height (ft.):	8	Face Angle (deg.):	48
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-3

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008E: FOOTHILLS PARKWAY SECTION 8E

Retaining Wall Condition Photos



GRSM_0008E_3.868_L_1.jpg



GRSM_0008E_3.868_L_2.jpg

Wall ID:	GRSM-0008F-5.329-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	2007
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever wall with granite stone veneer. Originally inspected 12/07. Updated 4/11. Wall is extension of bridge abutment approach wall at east end of Bridge No.8. Wall starts at station 836+38 per the 1983 8E6 as-builts.		
Wall Measurements			
Wall Length (ft.):	20	Face Area (sq.):	130
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_5.329_L_1.jpg

Wall ID:	GRSM-0008F-5.421-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	2005
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever wall with granite stone veneer. Wall sits between Bridge 8 and 9. Wall was originally inspected 12/07. Wall starts at station 838+72 per the 1983 8E6 as-builts.		
Wall Measurements			
Wall Length (ft.):	250	Face Area (sq.):	4250
Average Wall Height (ft.):	0	Face Angle (deg.):	85
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	0

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_5.421_L_1.jpg

Wall ID:	GRSM-0008F-5.682-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	2000
*Wall Rating:	No data available	Maintenance Action:	No data available

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever wall with granite stone veneer and parapet. Originally inspected 12/07. Wall starts at the west end of Bridge 10 at approximate station 855+00 per the 1984 8E6 as-builts.		

Wall Measurements

Wall Length (ft.):	117	Face Area (sq.):	936
Average Wall Height (ft.):	0	Face Angle (deg.):	85
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_5.682_L_1.jpg

Wall ID:	GRSM-0008F-5.895-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall is located well below roadway. Originally inspected 12/07. Wall starts at station 866+25 and corresponds to RW5 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	319	Face Area (sq.):	3934
Average Wall Height (ft.):	12	Face Angle (deg.):	85
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-26

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_5.895_L_1.jpg



GRSM_0008F_5.895_L_2.jpg

Wall ID:	GRSM-0008F-6.714-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:	Color Additive	Architectural Facing:	Formlined Concrete
General Description:	Blown out Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall starts at station 909+50 and correlates to RW7 per the 1984 8E6 as-built plans.		

Wall Measurements

Wall Length (ft.):	200	Face Area (sq.):	10
Average Wall Height (ft.):	0	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-60

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_6.714_L_1.jpg



GRSM_0008F_6.714_L_2.jpg

Wall ID:	GRSM-0008F-6.956-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Originally inspected 12/07. Wall starts at station 922+25 and corresponds to RW8 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	75	Face Area (sq.):	1000
Average Wall Height (ft.):	13	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-75

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_6.956_L_1.jpg



GRSM_0008F_6.956_L_2.jpg

Wall ID:	GRSM-0008F-7.145-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:	Color Additive	Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Wall starts at station 932+25 and corresponds to RW9 per the 1984 8E6 as-built plans.		

Wall Measurements

Wall Length (ft.):	152	Face Area (sq.):	1220
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-50

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_7.145_L_1.jpg



GRSM_0008F_7.145_L_2.jpg

Wall ID:	GRSM-0008F-7.652-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Originally inspected 12/07. Wall starts at station 959+00 and corresponds to RW11 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	135	Face Area (sq.):	1785
Average Wall Height (ft.):	13	Face Angle (deg.):	85
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-53

*Element details and repair recommendations are not available for this wall.

Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_7.652_L_1.jpg



GRSM_0008F_7.652_L_2.jpg

Wall ID:	GRSM-0008F-7.988-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Assumed Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Blown out wall originally inspected 12/07. Wall starts at station 976+75 and corresponds to RW13 per the 1984 8E6 as-built plans.		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	10
Average Wall Height (ft.):	0	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-126

*Element details and repair recommendations are not available for this wall.

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ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_7.988_L_1.jpg



GRSM_0008F_7.988_L_2.jpg

Wall ID:	GRSM-0008F-8.101-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Originally inspected 12/07. Wall starts at station 982+75 and corresponds to RW14 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	281	Face Area (sq.):	8100
Average Wall Height (ft.):	28	Face Angle (deg.):	85
Maximum Wall Height (ft.):	41	Vertical Offset (ft.):	-30

*Element details and repair recommendations are not available for this wall.

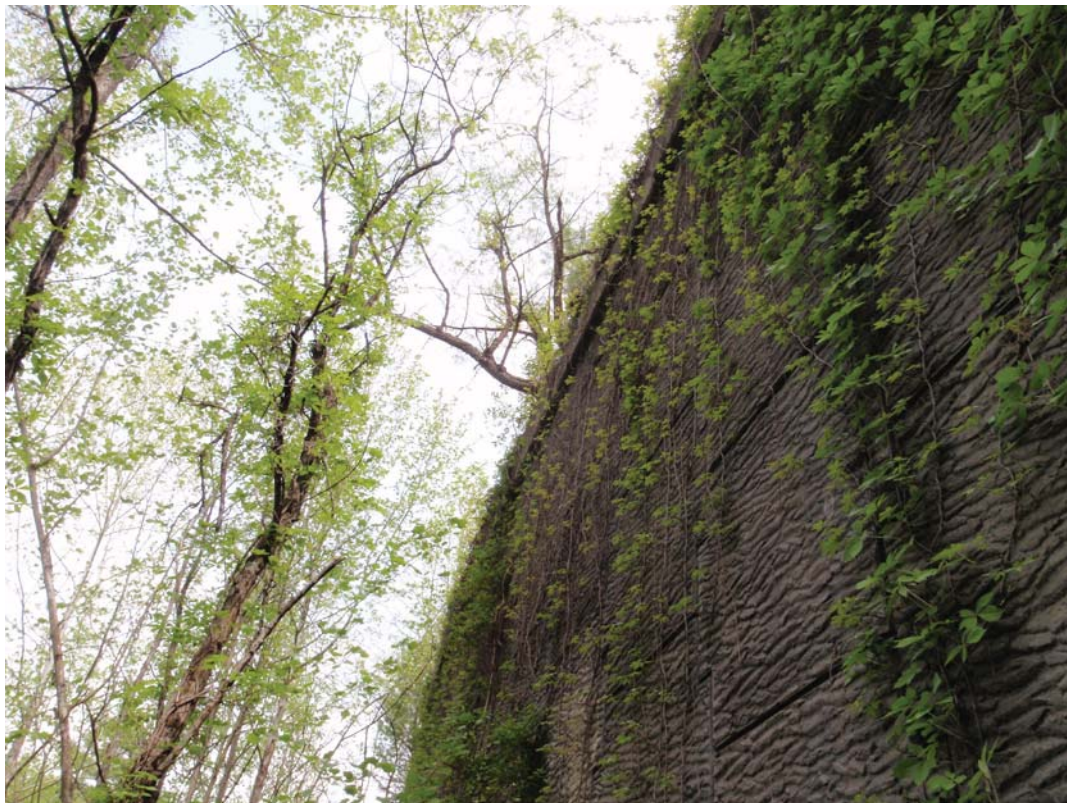
Great Smoky Mountains National Park

ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_8.101_L_1.jpg



GRSM_0008F_8.101_L_2.jpg

Wall ID:	GRSM-0008F-8.466-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8F		
Inspection Date:	April 19, 2011	Approximate Year Built:	1968
*Wall Rating:	No data available	Maintenance Action:	No data available
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:	Color Additive	Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Formlined Concrete
General Description:	Reinforced Earth Co. pre-cast panel MSE wall with a formlined panel relief and colored concrete. Originally inspected 12/07. Wall starts at station 1002+00 and corresponds to RW16 per the 1984 8E6 as-built plans.		
Wall Measurements			
Wall Length (ft.):	92	Face Area (sq.):	1864
Average Wall Height (ft.):	20	Face Angle (deg.):	85
Maximum Wall Height (ft.):	29	Vertical Offset (ft.):	-50

*Element details and repair recommendations are not available for this wall.

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ROUTE 0008F: FOOTHILLS PARKWAY SECTION 8F

Retaining Wall Condition Photos



GRSM_0008F_8.466_L_1.jpg



GRSM_0008F_8.466_L_2.jpg

Wall ID:	GRSM-0008G-60.600-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8G		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Segmental concrete block MSE wall with strap reinforcement.		

Wall Measurements

Wall Length (ft.):	115	Face Area (sq.):	1445
Average Wall Height (ft.):	12	Face Angle (deg.):	90
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of foundation distress.	9
CONCRETE 8.00	Facing element, minor cracking at the face, minor push-out of top row of elements, not impacting wall performance.	8
ARCHITECTURAL FACING 0.50	Concrete facing elements, minor push-out at top row of elements, not impacting wall performance.	8
LATERAL SLOPE 0.50	Steep slopes at 1.5H:1V slopes, moderate surface erosion, not impacting wall.	8
DOWNSLOPE 0.50	5-6 foot wide flat bench, then 2H:1V gentle slope, no signs of distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is flat grassy bench, no signs of distress.	9
TRAFFIC BARRIER/FENCE 0.50	Guardrail at top of wall, no signs of distress.	9
WALL DRAINS 0.50	None observed, assumed buried, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0008G: FOOTHILLS PARKWAY SECTION 8G

Retaining Wall Condition Photos



GRSM_0008G_60.600_R_1.jpg

Wall ID:	GRSM-0008H-68.740-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilever headwall with guardrail at top, on outlet side.		

Wall Measurements

Wall Length (ft.):	58	Face Area (sq.):	255
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of foundation distress.	9
CONCRETE 8.00	Minor cracking, moss covered, minor pitting at the face, performing as intended.	8
CULVERT 0.50	10' x 10' CBC, performing as intended.	8
LATERAL SLOPE 0.50	Steep slopes at 1.5H:1V, well vegetated with grass and trees, minor surface erosion.	8
DOWNSLOPE 0.50	Active stream channel, relatively flat, not impacting wall.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder has steep slope at 1.5H:1V, well vegetated.	9
TRAFFIC BARRIER/FENCE 0.50	Guardrail at roadway, no signs of distress.	9
WALL DRAINS 0.50	3-inch PVC at 10 foot centers, performing as intended.	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.

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ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos

Condition photos are not available for GRSM--0008H-68.740-L.

Wall ID:	GRSM-0008H-68.747-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in-place concrete headwall at inlet of 10x 10 box culvert.		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	145
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Firm soil and rock.	9
CONCRETE 8.00	No distress.	9
LATERAL SLOPE 0.50	Embankment fill grass, no distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
UPSLOPE 0.50	Wooded shallow slope.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_68.747_L_1.jpg

Wall ID:	GRSM-0008H-69.362-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in-place cantilever concrete headwall at inlet of 10 x 10 box culvert.		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	160
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Granular soil and rock.	9
CONCRETE 8.00	Weathered, lichen present, no distress.	8
LATERAL SLOPE 0.50	Treed embankment fill.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
UPSLOPE 0.50	Gentle wooded area.	9
WALL DRAINS 0.50	3-inch diameter weep holes, no distress.	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.

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_69.362_L_1.jpg

Wall ID:	GRSM-0008H-69.365-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilever headwall, with guardrail, on outlet side.		

Wall Measurements

Wall Length (ft.):	46	Face Area (sq.):	190
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material in alluvial channel, no signs of foundation distress.	9
CONCRETE 8.00	Minor cracking, pitting at the face, moss cover, performing as intended.	8
LATERAL SLOPE 0.50	Steep 1.5H:1V slopes with vegetation and trees.	8
CULVERT 0.50	10' x 10' CBC, performing as intended.	9
DOWNSLOPE 0.50	Active stream channel, flat outlet apron, not impacting wall, no signs of distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is grassy 2-3 foot wide bench, no signs of distress.	9
TRAFFIC BARRIER/FENCE 0.50	Guardrail at top, no signs of distress.	9
WALL DRAINS 0.50	3 -inch PVC at 10 foot intervals, performing as intended.	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.

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_69.365_R_1.jpg

Wall ID:	GRSM-0008H-70.089-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilever headwall on outlet side. 14 ft H x 12 ft W concrete box culvert.		

Wall Measurements

Wall Length (ft.):	56	Face Area (sq.):	320
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at stream channel, no signs of foundation distress.	9
CONCRETE 8.00	Minor cracking, minor moss cover, minor efflorescence, moderate pitting, performing as intended.	8
CULVERT 0.50	12' x 14' CBC, performing as intended.	8
DOWNSLOPE 0.50	Active stream channel, no signs of distress.	8
LATERAL SLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, minor slope surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is sloped at 1.5H:1V.	8
TRAFFIC BARRIER/FENCE 0.50	Guardwall at top, no signs of distress.	9
WALL DRAINS 0.50	3-inch PVC drains at 10' spacing, good performance.	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.

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0008H-70.089-L.

Wall ID:	GRSM-0008H-70.090-R		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in-place cantilever concrete headwall at inlet of culvert 12 x 14 box culvert.		

Wall Measurements

Wall Length (ft.):	56	Face Area (sq.):	320
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Firm granular soil.	9
CONCRETE 8.00	Slightly weathered no cracking observed, mossy.	8
LATERAL SLOPE 0.50	Embankment fill, grassy with trees.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
UPSLOPE 0.50	Flat streambed river rock.	9
WALL DRAINS 0.50	3-inch weep holes at 10-foot on center spacing.	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.

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_70.090_R_1.jpg

Wall ID:	GRSM-0008H-71.800-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	52	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block cut masonry headwall on outlet side.		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	70
Average Wall Height (ft.):	3	Face Angle (deg.):	80
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-18

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor condition, severe undermining at base (voids), but not impacting roadway.	5
WALL FOUNDATION MATERIAL 8.00	Rock fill and granular material, voids and undermining at outlet.	5
MORTAR 8.00	Concrete mortar, extensive debonding throughout, severe cracking and voids at concrete pipe outlet, pipe still functioning.	4
STONE MASONRY 8.00	1-2 foot diameter limestone and sandstone blocks, moderate surface weathering, moss cover, missing adjacent to the base (undermining).	6
CULVERT 0.50	5-foot diameter concrete pipe, moderate displacement at joints, performing as intended.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is steep slope at 1.5H:1V with heavy vegetation.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Outlet to pond, moderate undercut and erosion.	6
LATERAL SLOPE 1.00	Steep slope at 1.5H:1V , heavy vegetation, moderate surface erosion.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Fill voids at outlet: Volume left = 5ft high x 7ft wide x 3 feet deep = 105 ft3 = 4 cyd, volume right = 4ft high x 7ft wide x 3 feet deep = 84ft3 = 3cyd, Total = 7 cyd. Mob/demob = \$1000. Pumper truck with concrete = 4 hrs x \$210/hr = \$840. Lean concrete
Repair Cost:	\$4,385

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

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_71.800_L_1.jpg

Wall ID:	GRSM-0008H-71.822-L		
Route Name:	FOOTHILLS PARKWAY SECTION 8H		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	73	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry headwall over 5-foot diameter precast concrete culvert inlet.		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	90
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	7
WALL FOUNDATION MATERIAL 8.00	Firm granular soil.	9
MORTAR 8.00	Extensive debonding, some cracking, and some missing.	5
STONE MASONRY 8.00	Moss, little to some weathering, some missing stones at base.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road - no distress. Shoulder - steep vegetated some raveling.	8
UPSLOPE 0.50	Flat stream bed.	9
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Minor erosion of embankment fill at both ends.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint entire wall 90 sq.ft. x \$75/sq.ft. = \$6,750. Replace/reset 1 cubic yard of stone, use local material = \$3,200. The access to the wall is steep, but there is plenty of staging area along the road.
Repair Cost:	\$9,950

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

Great Smoky Mountains National Park

ROUTE 0008H: FOOTHILLS PARKWAY SECTION 8H

Retaining Wall Condition Photos



GRSM_0008H_71.822_L_1.jpg

Wall ID:	GRSM-0010N-0.537-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 18, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall along river		

Wall Measurements

Wall Length (ft.):	306	Face Area (sq.):	2670
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	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	founded on bedrock, no distress	9
MORTAR 8.00	Minor cracking and debonding	8
STONE MASONRY 8.00	No distress noted in stone	9
ROAD/SIDEWALK/SHOULDER 0.50	minor cracking	8
TRAFFIC BARRIER/FENCE 0.50	guardwall with/minor impact damage, degraded mortar at wall interface (about 40%)	8
CULVERT 0.50	18" concrete pipe through wall, no distress	9
DOWNSLOPE 0.50	bedrock to river, no distress	9
LATERAL SLOPE 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_0.537_R_1.jpg

Wall ID:	GRSM-0010N-0.908-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 11, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	No comment		

Wall Measurements

Wall Length (ft.):	284	Face Area (sq.):	2648
Average Wall Height (ft.):	9	Face Angle (deg.):	83
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No distress	8
WALL FOUNDATION MATERIAL 8.00	Foundation on rock. No distress	9
MORTAR 8.00	Minor cracking at joints, typically at weep hole locations, minor spalling.	8
STONE MASONRY 8.00	No distress.	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	Evenly spaced drains - no observed distress	9
DOWNSLOPE 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010N-0.908-R.

Wall ID:	GRSM-0010N-1.128-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Double box - outlet		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	235
Average Wall Height (ft.):	9	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Same as above	8
WALL FOUNDATION MATERIAL 8.00	Embankment fill and firm soil	8
MORTAR 8.00	Minor cracking and debonding in joints	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Shallow vegetated slope to creek - no distress	8
LATERAL SLOPE 0.50	Well vegetated - no distress	8
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_1.128_R_1.jpg



GRSM_0010N_1.128_R_2.jpg

Wall ID:	GRSM-0010N-1.129-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Double box headwall - inlet		

Wall Measurements

Wall Length (ft.):	48	Face Area (sq.):	170
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	As above	9
WALL FOUNDATION MATERIAL 8.00	Slightly undermined at wall start, concrete on bedrock.	8
MORTAR 8.00	Minor debonding in joints	9
STONE MASONRY 8.00	No distress, plumb	9
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	Stable creek bed. No distress	9
LATERAL SLOPE 0.50	No distress - stable road fill	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	Non visible - no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_1.129_L_1.jpg

Wall ID:	GRSM-0010N-1.148-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Older rounded dry stack mortared after stacking. Last 100 ft is angular dry stack.		

Wall Measurements

Wall Length (ft.):	540	Face Area (sq.):	6886
Average Wall Height (ft.):	12	Face Angle (deg.):	80
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As above	8
WALL FOUNDATION MATERIAL 8.00	Stable stream bed. No distress	8
MORTAR 8.00	Minimal cracking/debonding	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Steep vegetated slope	8
WALL DRAINS 0.50	No distress	9
UPSLOPE 1.00	Steep, vegetated. Some raveling.	7

Repair Recommendations

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

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

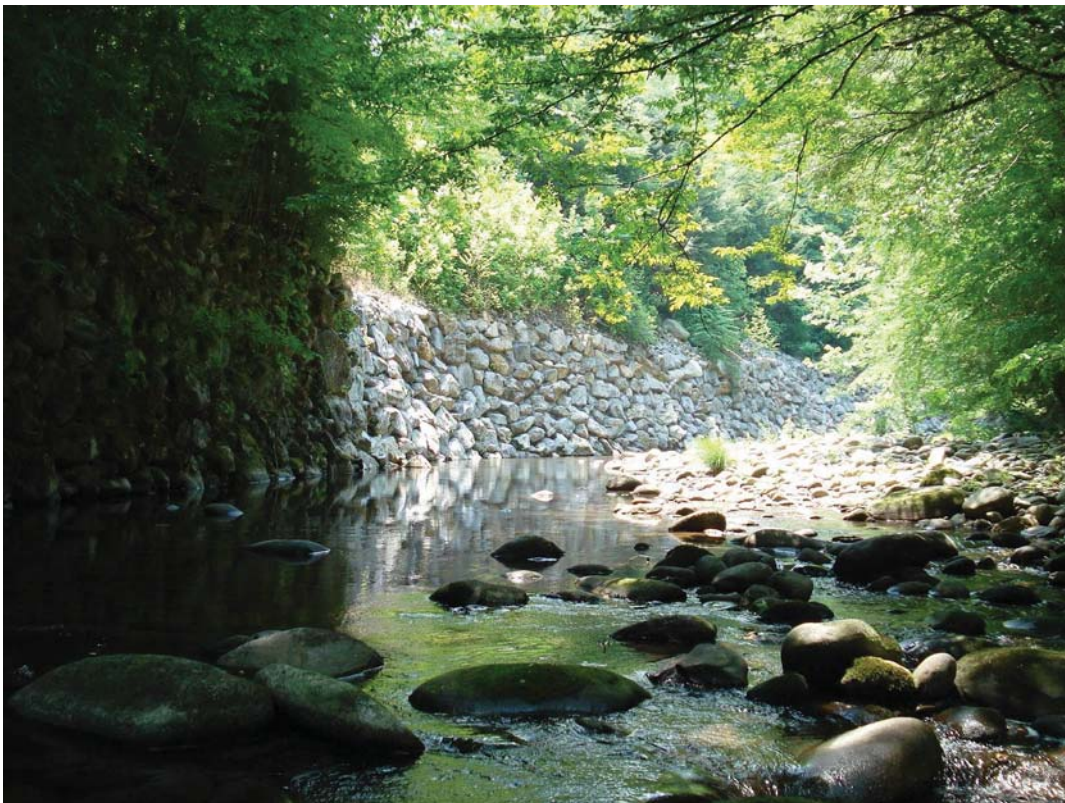
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_1.148_R_1.jpg



GRSM_0010N_1.148_R_2.jpg

Wall ID:	GRSM-0010N-2.158-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet hw - 2.5 x 6 box		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	53
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable embankment, no distress	8
MORTAR 8.00	Slight debonding.	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	No distress	9
LATERAL SLOPE 0.50	Stable embankment - no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_2.158_R_1.jpg

Wall ID:	GRSM-0010N-2.160-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet hw		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	43
Average Wall Height (ft.):	6	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	As intended	8
WALL FOUNDATION MATERIAL 8.00	Soil - no distress	9
MORTAR 8.00	Minor cracking	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	Non observed - no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_2.160_L_1.jpg

Wall ID:	GRSM-0010N-2.415-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet of twin 10 x 6 box culvert		

Wall Measurements

Wall Length (ft.):	52	Face Area (sq.):	248
Average Wall Height (ft.):	4	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	As intended	9
WALL FOUNDATION MATERIAL 8.00	Firm soil, no distress	9
MORTAR 8.00	Some debonding	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Stable road embankment	8
CULVERT 0.50	No distress	9
UPSLOPE 0.50	Gentle slope, vegetated, stable	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_2.415_R_1.jpg

Wall ID:	GRSM-0010N-2.416-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet double box culvert 10 x 6		

Wall Measurements

Wall Length (ft.):	58	Face Area (sq.):	342
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	No distress, rock, concrete	9
MORTAR 8.00	Minor debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Streambed, no distress	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No drains, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_2.416_L_1.jpg

Wall ID:	GRSM-0010N-3.327-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 26, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall, double 6 ft box culvert, Outlet		

Wall Measurements

Wall Length (ft.):	37	Face Area (sq.):	250
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-55

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall performing as designed except where tree roots have split wall.	8
WALL FOUNDATION MATERIAL 8.00	Soil, no settlement noted	8
MORTAR 8.00	Mild cracks (debonding)	8
STONE MASONRY 8.00	Good condition, no distress except where cracked by tree roots	9
LATERAL SLOPE 0.50	Riprap + soil, small failure on downwall side, not critical	8
UPSLOPE 0.50	Steep slope (37degrees), mild raveling, no distress	8
WALL DRAINS 0.50	None, no distress	8
DOWNSLOPE 0.50	Creek bed, sediment downstream, concrete slab armoring below culvert	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Cut down tree at wall top immediately above cracking in wall. Treat with herbicide to kill roots. 2 crew 3 hrs@\$55/hr = \$330. Use \$500 minimum WO.
Repair Cost:	\$500

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

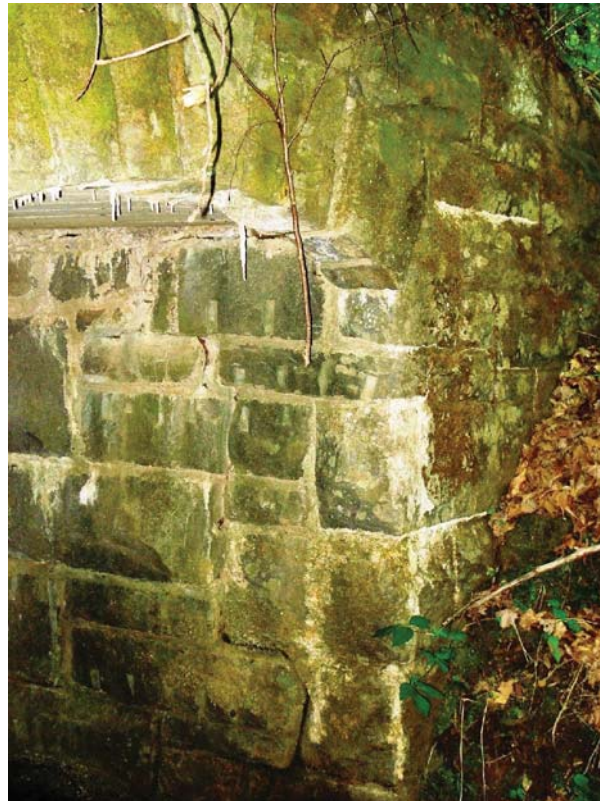
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.327_L_1.jpg



GRSM_0010N_3.327_L_2.jpg

Wall ID:	GRSM-0010N-3.327-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	37 degree fill, Inlet		

Wall Measurements

Wall Length (ft.):	41	Face Area (sq.):	165
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-43

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Weathered slightly	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	37 degree fill - no distress between top of wall and road	9
WALL DRAINS 0.50	None visible, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.327_R_1.jpg

Wall ID:	GRSM-0010N-3.354-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Twin 5 x7 stone outlet at toe of large road fill		

Wall Measurements

Wall Length (ft.):	41	Face Area (sq.):	165
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-43

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable streambed no distress	9
MORTAR 8.00	Slightly weathered throughout	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Steep, well vegetated, no distress	8
UPSLOPE 0.50	Steep (37 degree) road fill. Well vegetated, no distress	8
WALL DRAINS 0.50	None visible, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010N-3.354-R.

Wall ID:	GRSM-0010N-3.576-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 4 x 3 box		

Wall Measurements

Wall Length (ft.):	17	Face Area (sq.):	23
Average Wall Height (ft.):	1	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As new	9
WALL FOUNDATION MATERIAL 8.00	Firm soil, no distress	9
MORTAR 8.00	Little debonding	8
STONE MASONRY 8.00	Moss-covered, intact, competent	8
CULVERT 0.50	No distress	9
LATERAL SLOPE 0.50	Stable embankment	9
UPSLOPE 0.50	Gentle vegetated slope	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.576_R_1.jpg

Wall ID:	GRSM-0010N-3.577-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet single 4 x 3 box		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	57
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	Rock and concrete, slight undermining	7
MORTAR 8.00	Good condition, no distress	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Streambed,	8
WALL DRAINS 0.50	None, no distress	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.577_L_1.jpg

Wall ID:	GRSM-0010N-3.947-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	49	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet single 3 x 3 box w/ 5 x 5 perpendicular wingwall		

Wall Measurements

Wall Length (ft.):	26	Face Area (sq.):	138
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Short term performance is poor	4
WALL FOUNDATION MATERIAL 8.00	Settled and rotated - "failed"	2
MORTAR 8.00	Slight debonding	6
STONE MASONRY 8.00	No distress	9
ROAD/SIDEWALK/SHOULDER 1.00	Settling and cracking at beginning of wall	4
WALL DRAINS 0.50	None, no visible distress	9
LATERAL SLOPE 1.00	Lateral spreading, settling, slumping at wall beginning. Wing wall displaced	5
DOWNSLOPE 1.00	Steep, vegetated, possibly unstable riprap	6
TRAFFIC BARRIER/FENCE 5.00	Damage	2

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace stone wall - 140sf x \$160/sf = 22,400. Replace Guardwall - 20lf x \$1100/lf = \$22,000 - Unit cost from recent GRSM FHWA projects.
Repair Cost:	\$44,400

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

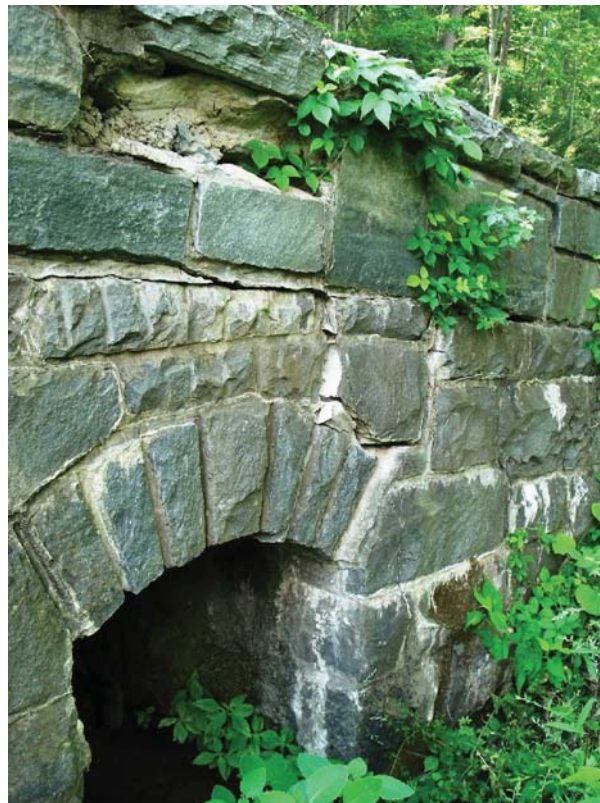
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.947_L_1.jpg



GRSM_0010N_3.947_L_2.jpg

Wall ID:	GRSM-0010N-3.947-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet for 3 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	46
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	Firm soil	9
MORTAR 8.00	Limited debonding, otherwise good	8
STONE MASONRY 8.00	As new except one cracked stone	9
ROAD/SIDEWALK/SHOULDER 0.50	Steep, forested, stable	8
LATERAL SLOPE 0.50	Flat, grass-covered, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_3.947_R_1.jpg

Wall ID:	GRSM-0010N-4.425-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 9.5 x 6.5 box culvert		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	133
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	General low severity weathering	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	Two large trees along top of wall. Not causing distress	8
WALL DRAINS 0.50	None evident, no distress	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	1:1 road embankment, vegetated, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_4.425_L_1.jpg

Wall ID:	GRSM-0010N-4.425-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 10.5 x 6.5 box culvert		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	150
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Competent soil, no distress	9
MORTAR 8.00	Light cracking (debonding)	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Slight surface raveling.	8
UPSLOPE 0.50	Steep (40degrees) road fill. Slight surface raveling	8
DOWNSLOPE 0.50	Creek bed, sediment, armored with concrete, rock, mortar. No distress	9
WALL DRAINS 0.50	None, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_4.425_R_1.jpg

Wall ID:	GRSM-0010N-4.813-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 3 x 3 box		

Wall Measurements

Wall Length (ft.):	11	Face Area (sq.):	18
Average Wall Height (ft.):	1	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	General low severity. Weathering	8
STONE MASONRY 8.00	No distress	9
UPSLOPE 0.50	Vegetated 1:1 shoulder, no distress	8
DOWNSLOPE 0.50	Dry creek bed, riprap, no distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	None evident, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_4.813_L_1.jpg

Wall ID:	GRSM-0010N-4.813-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet for 3 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	41
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-18

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Firm embankment	9
MORTAR 8.00	Slight debonding	8
STONE MASONRY 8.00	No distress	9
UPSLOPE 0.50	40 degree fill slope, slight surface raveling	8
DOWNSLOPE 0.50	Creek bed, armored with/small concrete slab, no distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	None evident, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_4.813_R_1.jpg

Wall ID:	GRSM-0010N-5.391-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 9 x 5.5 box culvert		

Wall Measurements

Wall Length (ft.):	32	Face Area (sq.):	114
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable creek bed, no distress	9
MORTAR 8.00	Slight debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Creek bed armored with rock and concrete, no distress	9
LATERAL SLOPE 0.50	Riprap, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	None evident, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_5.391_R_1.jpg

Wall ID:	GRSM-0010N-5.392-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 9 x 6 box culvert		

Wall Measurements

Wall Length (ft.):	32	Face Area (sq.):	157
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Soil, no distress	9
MORTAR 8.00	Minor spalling at crown of opening and at bottom of opening	8
STONE MASONRY 8.00	No distress	9
UPSLOPE 0.50	Steep (1:1) fill. No distress	8
DOWNSLOPE 0.50	Riprap armored stream channel, no distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	None evident, no distress	9
VEGETATION 1.00	Tree growing at wall top - should be removed	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_5.392_L_1.jpg

Wall ID:	GRSM-0010N-5.960-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 12, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall at road edge		

Wall Measurements

Wall Length (ft.):	167	Face Area (sq.):	657
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	North lateral slope may eventually impair long term performance	8
WALL FOUNDATION MATERIAL 8.00	Soil, no distress	9
MORTAR 8.00	Minor debonding at isolated locations	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Gentle slope for 20-30 ft, transitions to .75:1. No distress	8
WALL DRAINS 0.50	None evident, no distress	9
LATERAL SLOPE 1.00	Riprap at north end rotated out slightly, held up by trees	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_5.960_L_1.jpg



GRSM_0010N_5.960_L_2.jpg

Wall ID:	GRSM-0010N-6.205-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall on CIP concrete footing at toe of fill slope along river		

Wall Measurements

Wall Length (ft.):	220	Face Area (sq.):	2420
Average Wall Height (ft.):	11	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	35

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Cip concrete foundation on streambed material. No distress	9
MORTAR 8.00	Light weathering, minor spalling	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Streambed with/large boulders. No distress	9
LATERAL SLOPE 0.50	Riprap slope protection at ends, no distress	9
UPSLOPE 0.50	Heavily vegetated with/large boulders, no distress	9
WALL DRAINS 0.50	None observed, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.205_L_1.jpg



GRSM_0010N_6.205_L_2.jpg

Wall ID:	GRSM-0010N-6.230-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet for 4 ft dia concrete pipe		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	77
Average Wall Height (ft.):	4	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	As intended	9
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Low severity weathering	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable creek bed, cobbles to boulders, no distress	9
LATERAL SLOPE 0.50	Riprap and soil, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	None, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.230_R_1.jpg

Wall ID:	GRSM-0010N-6.273-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet for 3 x 3 box		

Wall Measurements

Wall Length (ft.):	11	Face Area (sq.):	20
Average Wall Height (ft.):	1	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall performing as intended - culvert needs cleaning	9
WALL FOUNDATION MATERIAL 8.00	Not visible, likely fill soil, no distress - rated 8 due to poor visibility	8
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	Sediment buildup in culvert 1 ft deep by 25 ft into culvert. Not effecting wall performance but should clean.	9
DOWNSLOPE 0.50	Creek bed, aggrading slightly (about 1 ft) at outlet	9
LATERAL SLOPE 0.50	Riprap and soil, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Riprap and soil fill at road shoulder, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.273_L_1.jpg

Wall ID:	GRSM-0010N-6.274-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 3 x 3 box		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	31
Average Wall Height (ft.):	2	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	As intended, rated 8 instead of 9 because moss obscured view on primary elements	8
WALL FOUNDATION MATERIAL 8.00	Firm soil	8
MORTAR 8.00	Moss covered, no distress observed	9
STONE MASONRY 8.00	Moss covered, no distress observed	9
LATERAL SLOPE 0.50	Soil embankment, grass covered	8
UPSLOPE 0.50	Heavily vegetated	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.274_R_1.jpg

Wall ID:	GRSM-0010N-6.832-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet for 3 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	28
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended - rated 8 instead of 9 due to poor visibility on primary elements	8
WALL FOUNDATION MATERIAL 8.00	Firm soil	9
MORTAR 8.00	Moss covered, no observable distress	8
STONE MASONRY 8.00	Moss covered, no observable distress	8
LATERAL SLOPE 0.50	Flat stable embankment, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Forested, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.832_L_1.jpg

Wall ID:	GRSM-0010N-6.833-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 3 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	26
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-13

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Adequate currently but mortar and channel distress pose slight risk to long term performance.	7
WALL FOUNDATION MATERIAL 8.00	Not visible, some settlement may be occurring	7
MORTAR 8.00	2 large cracks (3ft x 0.5-1inch wide) apparently due to wall settlement, may have been repointed in the past	6
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	Seepage evident through mortar cracks	8
UPSLOPE 0.50	Road fill, no distress	9
LATERAL SLOPE 1.00	Riprap and soil have raveled slightly into channel and outlet.	6
DOWNSLOPE 1.00	Creek bed. Some riprap has fallen from side slopes causing blockage and sedimentation at outlet.	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint cracks - 2 crew, 4 hours @ \$55/hr. Material incidental = \$440. Clean outlet - 2 crew, 4 hours @ \$55/hr = \$440
Repair Cost:	\$880

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.833_R_1.jpg

Wall ID:	GRSM-0010N-6.921-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	26
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Firm soil, no distress	8
MORTAR 8.00	Localized debonding	8
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	None evident, no distress	8
DOWNSLOPE 0.50	Creek bed, no distress	9
LATERAL SLOPE 0.50	Soil, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.921_L_1.jpg

Wall ID:	GRSM-0010N-6.921-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet		

Wall Measurements

Wall Length (ft.):	9	Face Area (sq.):	44
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	On bedrock. No distress	9
STONE MASONRY 8.00	One stone missing at upper north corner. No other distress	8
MORTAR 8.00	No distress	9
DOWNSLOPE 0.50	Slight erosion below outlet.	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Grassy shoulder, no distress	9
WALL DRAINS 0.50	None observed. No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_6.921_R_1.jpg

Wall ID:	GRSM-0010N-7.040-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	81	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Downslope below guardwall, thick vegetation, steep		

Wall Measurements

Wall Length (ft.):	105	Face Area (sq.):	1051
Average Wall Height (ft.):	10	Face Angle (deg.):	50
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Performing as intended, monitor side slopes + downslope, obscured by vegetation	8
WALL FOUNDATION MATERIAL 8.00	Soil, embankment fill, some areas possibly on rock outcrops, no undermining observed, steep downslope	7
PLACED STONE 8.00	Intact, subrounded to sub angular, 2' minus size, some voids	8
UPSLOPE 0.50	Road shoulder + guard rail	8
WALL DRAINS 0.50	No drains, no seepage, no distress	9
DOWNSLOPE 1.00	Very steep, forested, some raveling	7
LATERAL SLOPE 1.00	Very steep, forested, some raveling	7

Repair Recommendations

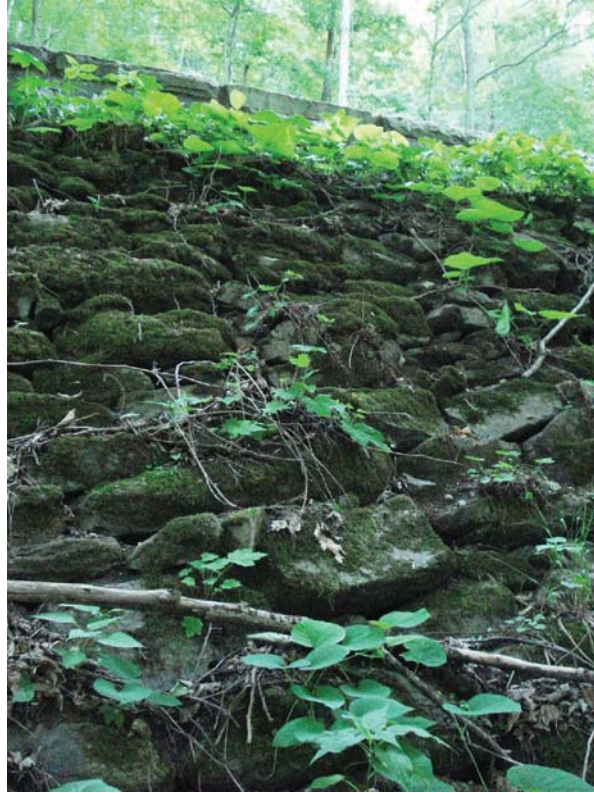
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_7.040_R_1.jpg

Wall ID:	GRSM-0010N-7.130-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	52	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Located between two overlooks		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	1650
Average Wall Height (ft.):	18	Face Angle (deg.):	55
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor to critical, GD stones at base of wall have bulged out and have destabilized entire wall	4
WALL FOUNDATION MATERIAL 8.00	Founded on soil; no evidence that settlement of end causing wall movement	8
PLACED STONE 8.00	3' stacked rocks, rocks at base are bulging out causing separation of all rocks and settlement of roadway and wall	3
DOWNSLOPE 0.50	Moderate, angular rock fill, wooded, no observed distress	8
LATERAL SLOPE 0.50	Steep	8
ROAD/SIDEWALK/SHOULDER 1.00	Cracked and sagging within limits of wall	4
WALL DRAINS 0.50	Self draining, no obvious drainage-related issues	8
UPSLOPE 1.00	Grassy shoulder; shows some signs of deformation	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Rebuild Wall - Remove and Reset existing wall stones: remove and salvage 1650sf existing stone: No unit cost in guide - use \$50/sf. Rebuild dry stack wall w/salvaged material - \$50/sf, 1650sf x (50+50) = \$165000. Poor access - increase 30% - \$165,000x1.3.
Repair Cost:	\$232,500

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_7.130_R_1.jpg



GRSM_0010N_7.130_R_2.jpg

Wall ID:	GRSM-0010N-7.741-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	59	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 ft box culvert outlet		

Wall Measurements

Wall Length (ft.):	19	Face Area (sq.):	58
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor performance; segment damaged and requires repair	6
WALL FOUNDATION MATERIAL 8.00	Possible undermining at northern half; possible saturated foundation soil has settled	5
MORTAR 8.00	Generally in good condition, minor debonding; badly damaged down northern half	6
STONE MASONRY 8.00	Generally good condition; loose stones at damaged section	6
DOWNSLOPE 0.50	Riprap at culvert outlet, wooded, moderate slope, no distress	8
LATERAL SLOPE 0.50	No distress, no erosion	8
UPSLOPE 0.50	Grassy shoulder, no distress	8
WALL DRAINS 0.50	No observed internal drainage-related issues	8

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Remove and rest north end of headwall 30sf x \$620/sf = \$18,600
Repair Cost:	\$18,600

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_7.741_R_1.jpg



GRSM_0010N_7.741_R_2.jpg

Wall ID:	GRSM-0010N-7.852-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along inside Curve		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	48
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to Excellent	8
WALL FOUNDATION MATERIAL 8.00	Founded on soil, no evidence of distress	8
MORTAR 8.00	General Weathering, some minor debonding; should be repointed	8
STONE MASONRY 8.00	Blocks are in good condition; no sign of distress	9
DOWNSLOPE 0.50	Riprap outlet, no evidence of distress/erosion	8
LATERAL SLOPE 0.50	Minor erosion along northern end	8
UPSLOPE 0.50	Vegetated slope; no evidence of distress	8
WALL DRAINS 0.50	No observed drainage -related issues	8

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint 50% of wall: $836.5\text{sf} \times 0.5 = 418.25$ Use 425sf, $425 \times \$75/\text{sf} = \31875 . Remove small trees along top of wall: 2 crew, 5 hrs: $2 \times 5 \times \$55/\text{hr} = \550 .
Repair Cost:	\$32,425

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010N-7.852-R.

Wall ID:	GRSM-0010N-8.039-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	86	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	1.5 ft concrete pipe culvert, inlet		

Wall Measurements

Wall Length (ft.):	9	Face Area (sq.):	29
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Pretty good shape, needs ditch/side slope maintenance	9
WALL FOUNDATION MATERIAL 8.00	Soil + rock boulders, no distress	9
MORTAR 8.00	Minor debonding, no distress	8
STONE MASONRY 8.00	One block dislodged from top; otherwise no distress	9
UPSLOPE 0.50	Shoulder, minor cave, no distress	8
WALL DRAINS 0.50	None, no distress	8
LATERAL SLOPE 1.00	Some erosion due to side ditch	6
CURB/BERM/DITCH 1.00	Not armored, some erosion at side slope (down wall)	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean ditch at end of wall. Reset cap rock and mortar. 2 crew 8hrs@\$55/hr = \$880
Repair Cost:	\$880

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.039_L_1.jpg

Wall ID:	GRSM-0010N-8.220-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	1.5 ft concrete box culvert outlet		

Wall Measurements

Wall Length (ft.):	9	Face Area (sq.):	45
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	8
WALL FOUNDATION MATERIAL 8.00	On soil, no distress	9
MORTAR 8.00	Minor debonding	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	45 degree slope w riprap at outlet, no distress	8
LATERAL SLOPE 0.50	Minor to moderate erosion adjacent to hw, no evidence of movement	8
UPSLOPE 0.50	Grassy shoulder; no distress	8
VEGETATION 0.50	One large tree at base of wall; does not appear to affect function	8
WALL DRAINS 0.50	No observed drainage issues	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.220_R_1.jpg

Wall ID:	GRSM-0010N-8.267-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Mass Concrete
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Last 28 ft gravity mortared stone, foundation for gravity mortared head wall		

Wall Measurements

Wall Length (ft.):	73	Face Area (sq.):	420
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good for both walls	8
WALL FOUNDATION MATERIAL 8.00	Covered by secondary wall, likely ok	8
CONCRETE 8.00	Secondary wall - poured concrete, minor cracking at center of channel, no distress, seepage at cold joint	8
MORTAR 8.00	Primary wall - mild debonding	8
OTHER PRIMARY ELEMENT 8.00	Poured concrete seepage at cold joint; minor loss of concrete due to seepage, no distress	8
PLACED STONE 8.00	Secondary element, stacked boulders (3'-7') with concrete mortar	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Drainage channel down steep slope, armored with 1-2' diameter rock, no distress	8
LATERAL SLOPE 0.50	Minor sloughing, wooded, boulders at downwall end	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.267_R_1.jpg

Wall ID:	GRSM-0010N-8.275-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 3 ft x 4 ft box culvert		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	44
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	8
WALL FOUNDATION MATERIAL 8.00	Firm soil	8
MORTAR 8.00	Slight debonding	8
STONE MASONRY 8.00	New, one cracked stone	8
LATERAL SLOPE 0.50	Flat grassy embankment + fill	8
UPSLOPE 0.50	Forested steep slope with large boulders	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.275_L_1.jpg

Wall ID:	GRSM-0010N-8.345-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 3 ft single box culvert		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	51
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Steep channel armored with 1-2' rocks	8
LATERAL SLOPE 0.50	Steep, rock and soil fill embankment	8
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	No distress, shoulder	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.345_L_1.jpg

Wall ID:	GRSM-0010N-8.345-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 3 ft box culvert		

Wall Measurements

Wall Length (ft.):	17	Face Area (sq.):	83
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	Founded on bedrock, no distress	10
MORTAR 8.00	General weathering, good condition	9
PLACED STONE 8.00	No distress	9
CULVERT 0.50	3' concrete	8
UPSLOPE 0.50	Grassy shoulder, small area of shifted material at southern end, should be backfilled	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No distress	9
DOWNSLOPE 0.50	Bedrock	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.345_R_1.jpg

Wall ID:	GRSM-0010N-8.392-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	5000
Average Wall Height (ft.):	50	Face Angle (deg.):	45
Maximum Wall Height (ft.):	50	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor bulging	7
WALL FOUNDATION MATERIAL 8.00	Founded on bedrock and in some places on native soil	8
PLACED STONE 8.00	.5-2' in diameter stacked rock, slight bulging at base and top in sections, rock appears competent	8
DOWNSLOPE 0.50	Small wooded rocky bench, then steep bedrock	8
UPSLOPE 0.50	Road shoulder, no distress	8
WALL DRAINS 0.50	No distress	8
LATERAL SLOPE 1.00	Upwall end has drainage, steep rocky	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.392_R_1.jpg



GRSM_0010N_8.392_R_2.jpg

Wall ID:	GRSM-0010N-8.407-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	3 ft box culvert inlet		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	44
Average Wall Height (ft.):	2	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 to excellent	9
WALL FOUNDATION MATERIAL 8.00	Founded blast rock fill	9
MORTAR 8.00	General weathering	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Large angular rock fill downslope, no distress	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	Grassy shoulder, no distress	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.407_L_1.jpg

Wall ID:	GRSM-0010N-8.412-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	60	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet headwall with dry stack wall		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	385
Average Wall Height (ft.):	11	Face Angle (deg.):	45
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Undermining threatens headwall and dry stack	4
WALL FOUNDATION MATERIAL 8.00	Undermined, soil gone, bedrock present	2
MORTAR 8.00	Moss covered, no cracks noted	8
PLACED STONE 8.00	Moss covered, some small voids	8
STONE MASONRY 8.00	Moss covered, largely intact	8
WALL DRAINS 0.50	No distress	9
LATERAL SLOPE 1.00	Steep vegetation/dry stack at start, end - erosion gully	5
CULVERT 1.00	Large void between culvert and headwall	6
DOWNSLOPE 1.00	Very steep outcrops	7

Repair Recommendations

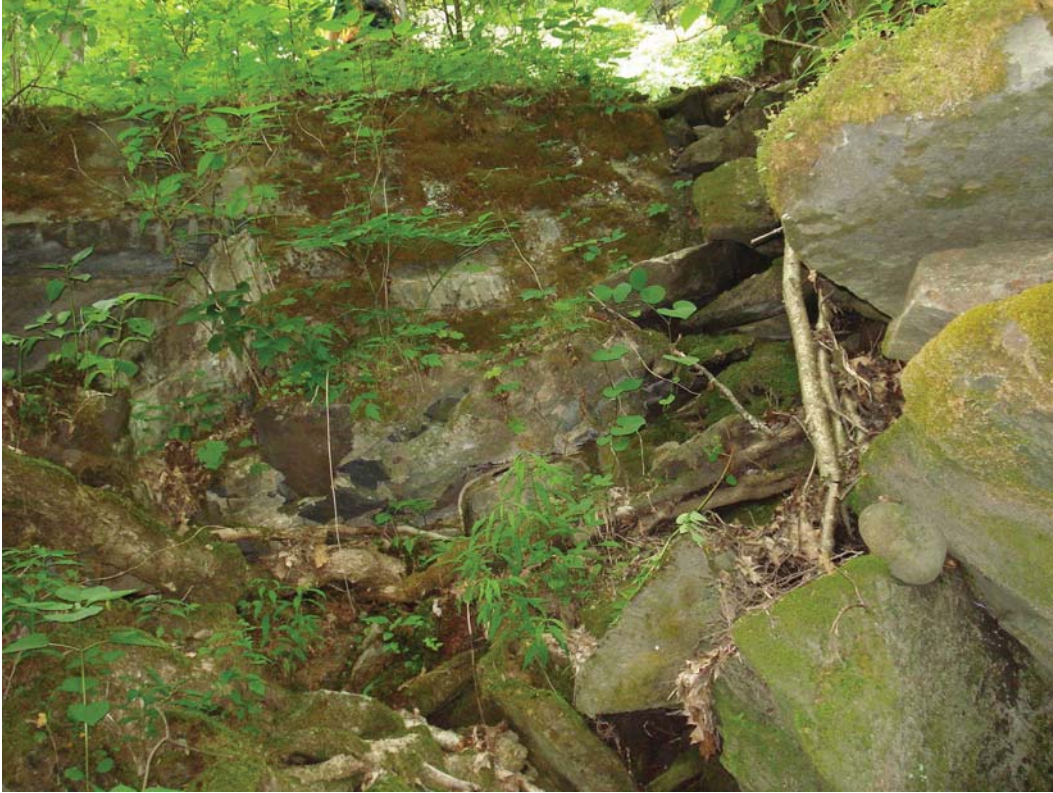
Failure Consequence:	MODERATE
Recommendation Narrative:	Repair undermining of wall. Place 10cy concrete at wall base to repair undermining. Place 2cy concrete to fill void between culvert and HW. Face with stones. Use on-site material - Void repair: 12cy concrete@ \$1470/cy = \$17640. Facing: 90sf dry stack@.
Repair Cost:	\$23,740

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.412_R_1.jpg



GRSM_0010N_8.412_R_2.jpg

Wall ID:	GRSM-0010N-8.427-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Long gravity mortared fill wall with 3 ft headwall section		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	3046
Average Wall Height (ft.):	17	Face Angle (deg.):	90
Maximum Wall Height (ft.):	26	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	9
WALL FOUNDATION MATERIAL 8.00	Soil	8
MORTAR 8.00	General weathering, spalling	8
WIRE/GEOSYNTHETIC FACING 8.00	Possible geosynthetic with backfill	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	No distress, wooded, steep with rocky sections	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	Grassy shoulder, no distress	9
VEGETATION 0.50	Several large trees; none interfere with wall function	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.

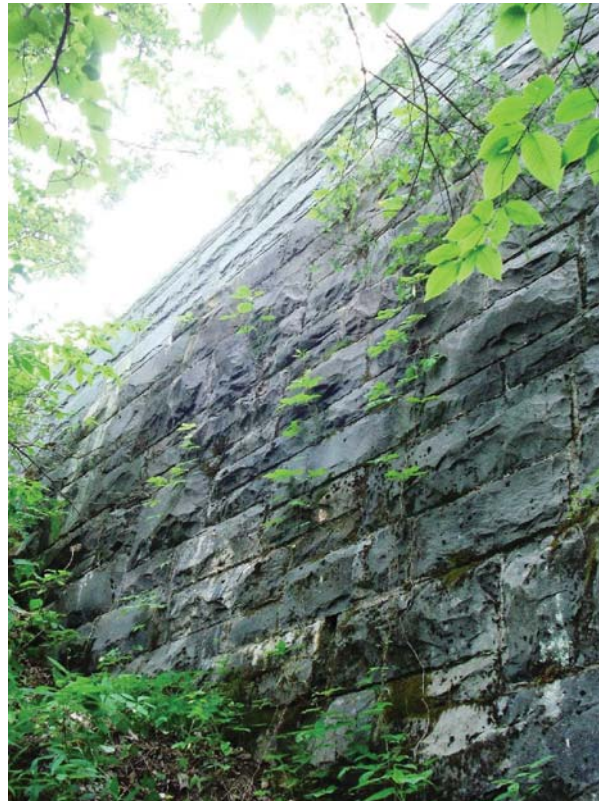
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_8.427_R_1.jpg



GRSM_0010N_8.427_R_2.jpg

Wall ID:	GRSM-0010N-9.203-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall along river, mortared some time after construction, just past headwall @ 9.130		

Wall Measurements

Wall Length (ft.):	152	Face Area (sq.):	1472
Average Wall Height (ft.):	9	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good	7
WALL FOUNDATION MATERIAL 8.00	Founded on river rock and soil, localized undermining of wall	7
MORTAR 8.00	Some spalling at base of wall	7
STONE MASONRY 8.00	No distress	8
UPSLOPE 0.50	No distress	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No issues	9
DOWNSLOPE 1.00	River channel; river is undermining wall at localized areas	6
VEGETATION 1.00	Large diameter tree at northern end causing damage	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repair undermining along river in spot locations using mortared stone: 8'x15' + 3'x20' + 3'x30' = 270sf 270sf x \$160/sf = \$43200. Remove tree at north wall end - Treat w/herbicide to prevent further root damage 2 crew x 2hrs x \$55/hr = \$220.
Repair Cost:	\$43,420

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.203_R_1.jpg



GRSM_0010N_9.203_R_2.jpg

Wall ID:	GRSM-0010N-9.243-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	73	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Extends from river to road edge		

Wall Measurements

Wall Length (ft.):	110	Face Area (sq.):	2200
Average Wall Height (ft.):	20	Face Angle (deg.):	50
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good	7
WALL FOUNDATION MATERIAL 8.00	Founded on native soil, base of wall slightly undermined, erosion by river at approx. 25' from beginning of wall	6
PLACED STONE 8.00	Rocks 2'-5' in diameter, no distress	9
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	Road shoulder, no distress	9
DOWNSLOPE 1.00	Riverbed, some erosion at base of wall	6
LATERAL SLOPE 1.00	GM wall located up-wall, steep slope downwall	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remortar stones at beginning of wall at undermined area: 26'x10' = 260sf - use repointing cost@\$75/sf 260sf x \$75/sf = \$19500. Place erosion control boulders along same section: Use Class 6 riprap - 26'x4'x4'/27 = 15.4cy - Use 20cy, 20cy x \$120/cy = \$2400
Repair Cost:	\$30,660

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.243_R_1.jpg

Wall ID:	GRSM-0010N-9.290-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	63	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	3 ft- subangular to subrounded stone masonry, 65% length undermined by river		

Wall Measurements

Wall Length (ft.):	134	Face Area (sq.):	2010
Average Wall Height (ft.):	15	Face Angle (deg.):	80
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs repair to undermining of wall to prevent failure in future. Currently, the wall is functional	5
WALL FOUNDATION MATERIAL 8.00	River bed undermining over ~65% of wall length. Undermined ~3'x3'.	4
MORTAR 8.00	Some minor debonding	8
STONE MASONRY 8.00	No distress	8
LATERAL SLOPE 0.50	Steep, forested upwall, bridge abutment downwall	8
WALL DRAINS 0.50	No distress	9
UPSLOPE 1.00	Forested, steep	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Pore/place concrete footing in undermined wall section: 90'long x 3'deep x 3'high = 810cf --> 30cy 30cy x \$1470/cy = \$44100 Used FHWA minor concrete unit cost (WIP cost guide). Riprap erosion control at wall toe: Assume same dimensions as above - 30cy
Repair Cost:	\$62,010

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.290_R_1.jpg



GRSM_0010N_9.290_R_2.jpg

Wall ID:	GRSM-0010N-9.297-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet of 3 ft x 3 ft box culvert		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	36
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Firm soil and bedrock	8
MORTAR 8.00	No distress	8
STONE MASONRY 8.00	No distress	8
DOWNSLOPE 0.50	Steep forest, stable	8
LATERAL SLOPE 0.50	No distress	8
WALL DRAINS 0.50	None, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010N-9.297-R.

Wall ID:	GRSM-0010N-9.334-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Begins at opening of bridge, part gm, part gravity dry-stack fill wall		

Wall Measurements

Wall Length (ft.):	400	Face Area (sq.):	5600
Average Wall Height (ft.):	14	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-26

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, minor undermining	8
WALL FOUNDATION MATERIAL 8.00	Wall founded on up pushed roots and partially on river bed material, no evidence of settling, minor undermining	7
MORTAR 8.00	Some spalling, minor debonding	7
PLACED STONE 8.00	No distress	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	No distress, bridge to north, relatively level south	8
UPSLOPE 0.50	Vegetated 1:1 slope, no distressed	8
VEGETATION 0.50	4-6 medium sized trees along top of wall, don not compromise wall function	8
WALL DRAINS 0.50	No issues	8

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Place mortared Riprap to arrest undermining - GM wall section, approx midwall: (30' long x 3' high x 3' deep)/27 = 10cy, 10cy x \$330/cy = \$3300. Increase by 75% for small quantity, difficult access - \$3300 x 1.75 = \$5775. Used FHWA WIP cost guide unit cost
Repair Cost:	\$5,775

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.334_R_1.jpg



GRSM_0010N_9.334_R_2.jpg

Wall ID:	GRSM-0010N-9.431-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	73	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Already inventoried by park		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	460
Average Wall Height (ft.):	6	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	7
WALL FOUNDATION MATERIAL 8.00	Firm soil and rock	7
MORTAR 8.00	Crudely filled mortar, performance unaffected	7
STONE MASONRY 8.00	Large sub-angular to sub-round 2'-5'	8
LATERAL SLOPE 0.50	Steep boulders vegetated	8
UPSLOPE 0.50	Gentle grass covered	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.431_R_1.jpg

Wall ID:	GRSM-0010N-9.447-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	76	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	3 ft- stone masonry		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	2380
Average Wall Height (ft.):	14	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	7
WALL FOUNDATION MATERIAL 8.00	Riverbed, possible stones missing	7
MORTAR 8.00	Some cracking, debonding	7
STONE MASONRY 8.00	Intact as new	9
LATERAL SLOPE 0.50	Steep, vegetated, large boulders	8
UPSLOPE 0.50	Flat grass covered	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.447_R_1.jpg

Wall ID:	GRSM-0010N-9.473-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	82	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:	Guardwall on top		

Wall Measurements

Wall Length (ft.):	81	Face Area (sq.):	334
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	Founded on soil, no settlement/rotation	8
STONE MASONRY 8.00	No distress	8
MORTAR 8.00	General weathering, no distress	9
DOWNSLOPE 0.50	Riprap erosion protection at culvert opening; no distress	8
LATERAL SLOPE 0.50	Vegetated	8
ROAD/SIDEWALK/SHOULDER 0.50	Asphalt pavement in good condition	8
VEGETATION 0.50	One large tree close to wall, does not affect wall	8
WALL DRAINS 0.50	No issues	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.473_R_1.jpg



GRSM_0010N_9.473_R_2.jpg

Wall ID:	GRSM-0010N-9.494-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	75	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet, some stones missing from top of wall		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	140
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Repair missing stone	7
WALL FOUNDATION MATERIAL 8.00	Firm soil	8
MORTAR 8.00	Some debonding	7
STONE MASONRY 8.00	Slight weathering	8
LATERAL SLOPE 0.50	Flat grassy slope	8
UPSLOPE 0.50	Forested, moderately steep, boulders	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint 20% of face area: 2. x 140 = 28sf 28 x \$75/sf = \$2100. Replace stones: Salvage/re-use onsite material: 2 crew, 4hrs, 2 x \$55/hr x 4 = \$440. Repair undermine: Place 1 cy concrete: 1cy x \$1470/cy = \$1470.
Repair Cost:	\$4,010

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.494_L_1.jpg

Wall ID:	GRSM-0010N-9.580-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	75	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Single box culvert outlet - abuts dry stack wall inventoried separately		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	67
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-9

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Performing as intended, requires mild repair	7
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	Moderate condition signs of weeping and leaching, mild degradation mortar, some debonding, 1/8" cracks	6
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	No distress, dry stack stone wall	8
UPSLOPE 0.50	Moderately steep shoulder, soil and rock embankment, no distress	8
WALL DRAINS 1.00	Water appears to be seeping through wall face	6
DOWNSLOPE 1.00	Channeled, moderate erosion at culvert floor	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint 30% of wall face: .3 x 67sf = 20sf, 20sf x \$75/sf = \$1500. Replace stones and mortar at wall base/outlet(4' x 4' area): Use/salvage on-site stones, mortar incidental: 2 crew, 8 hrs: 2 x \$55 x 8 = \$880
Repair Cost:	\$2,380

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.580_R_1.jpg

Wall ID:	GRSM-0010N-9.600-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along east bank of river, gravity mortared headwall built into wall 65 ft from start		

Wall Measurements

Wall Length (ft.):	135	Face Area (sq.):	1485
Average Wall Height (ft.):	11	Face Angle (deg.):	70
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-23

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, minor undermining and unraveling at HW location	8
WALL FOUNDATION MATERIAL 8.00	Founded on river bed material, no deformation	8
PLACED STONE 8.00	Large angular boulders, some loose near HW but don't affect stability	7
LATERAL SLOPE 0.50	No distress, keyed into lateral slope	8
WALL DRAINS 0.50	Wall is self draining, no distress	9
DOWNSLOPE 1.00	River + river bed, heavy river flow may be undermining wall at location of culvert, stones should be mortared	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.

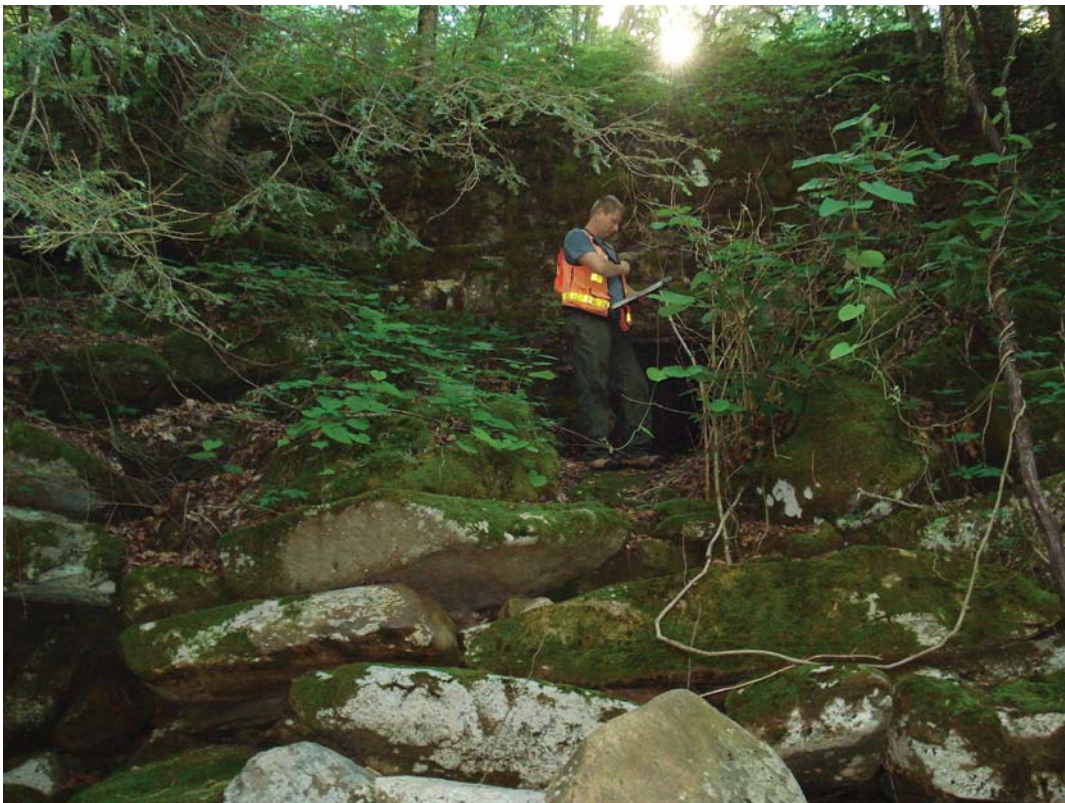
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.600_R_1.jpg



GRSM_0010N_9.600_R_2.jpg

Wall ID:	GRSM-0010N-9.790-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	86	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:	Supports portion of pull off at mp 9.703, stacked angular and subrounded boulders		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	488
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Wall founded on blast rock and riverbed material, no erosion or distress	9
PLACED STONE 8.00	Stacked angular to sub-rounded boulders; rough-stacked; no distress	9
WALL DRAINS 0.50	Wall is self draining	9
LATERAL SLOPE 0.50	Terminates vertically at north end; keyed into GM wall south end	10
UPSLOPE 1.00	Void in slope at approx center of wall results from soil loss between large boulders	6

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Place boulders and soil backfill: Use on-site material, 2 crew + backhoe for 6 hrs: 6hrs x (2(\$55) +\$150) = \$1560
Repair Cost:	\$1,560

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.790_L_1.jpg



GRSM_0010N_9.790_L_2.jpg

Wall ID:	GRSM-0010N-9.798-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	1.5 ft culvert pipe 2/3 way down wall		

Wall Measurements

Wall Length (ft.):	280	Face Area (sq.):	3080
Average Wall Height (ft.):	11	Face Angle (deg.):	70
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	PLACED STONE w/ concrete mortar, boulders 1'-6', mild undermining	8
MORTAR 8.00	Mild debonding	8
PLACED STONE 8.00	No distress	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	1.5' culvert concrete pipe outlet, no distress	8
DOWNSLOPE 0.50	Riverbed, no distress (channel composed of cobbles and boulders)	8
LATERAL SLOPE 0.50	No distress, slope protection UW, native slope DW	8
WALL DRAINS 0.50	No distress	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.798_L_1.jpg

Wall ID:	GRSM-0010N-9.982-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	76	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gd hw 4 ft x 4 ft 95 ft from start of wall internal		

Wall Measurements

Wall Length (ft.):	320	Face Area (sq.):	2718
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, some small debonding and spalling mortar	8
WALL FOUNDATION MATERIAL 8.00	Founded on large boulders and riverbed material, no distress	8
MORTAR 8.00	General weathering, some debonding, some spalling	7
STONE MASONRY 8.00	Some blocks need to be remortared	7
UPSLOPE 0.50	Vegetated, 1:1, no distress	8
VEGETATION 0.50	Small trees on top of wall, no distress	8
WALL DRAINS 0.50	Occasional weep holes, no distress	8
CULVERT 0.50	No distress	9
LATERAL SLOPE 0.50	Keyed into slope at N end, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.982_L_1.jpg



GRSM_0010N_9.982_L_2.jpg

Wall ID:	GRSM-0010N-9.996-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	72	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Single box culvert, difficult access (deep inlet), very wet environment		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	155
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Mortar distress threatens performance in the long term	6
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	Very poor condition, completely degraded in some locations due to moisture, moss-covered	4
OTHER PRIMARY ELEMENT 8.00	Irregular riprap OK, mild erosion, no distress	8
PLACED STONE 8.00	No distress	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Channel poured slab, no distress	8
LATERAL SLOPE 0.50	Mild shifting of boulder at inlet, no hindering of function	8
OTHER SECONDARY ELEMENT 0.50	Riprap on top of wall, mild erosion	8

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint GM portion of wall face: 50sf x \$75/sf = \$3750. Difficult access (deep inlet), increase 25% - 3750 x 1.25 = 4687.5 Use \$4700
Repair Cost:	\$4,700

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_9.996_R_1.jpg

Wall ID:	GRSM-0010N-10.099-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 4 ft x 4 ft culvert		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	68
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Soil + rock	8
MORTAR 8.00	Fir condition	7
STONE MASONRY 8.00	No distress	8
DOWNSLOPE 0.50	Shallow creek bed	8
LATERAL SLOPE 0.50	Steep, forested, stable	8
ROAD/SIDEWALK/SHOULDER 0.50	Grass covered + riprap	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.099_L_1.jpg

Wall ID:	GRSM-0010N-10.100-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Single box culvert inlet, base of stream channel, may be undersized, riprap stacked on top of wall		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	78
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Should be cleared of boulders, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Not visible, no distress	8
MORTAR 8.00	Mild debonding	8
OTHER PRIMARY ELEMENT 8.00	Riprap, no distress	8
PLACED STONE 8.00	No distress	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Riprap, do distress	8
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	Shoulder flat, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.100_R_1.jpg

Wall ID:	GRSM-0010N-10.587-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 13, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 3.5 ft x 3.5 ft culvert		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	45
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Firm soil + rock	8
MORTAR 8.00	No distress	8
STONE MASONRY 8.00	No distress	8
CULVERT 0.50	No distress	8
DOWNSLOPE 0.50	Forested creek bed	8
LATERAL SLOPE 0.50	Grass to forested, flat to steep	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.587_L_1.jpg

Wall ID:	GRSM-0010N-10.589-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Single box culvert inlet, armored ditch/channel oblique to culvert		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	31
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Missing cap rock, otherwise good	7
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress, one missing block (on site)	9
DOWNSLOPE 0.50	No distress	8
LATERAL SLOPE 0.50	Rounded cobbles + small boulders w/ mortar	8
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	Flat shoulder	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Replace and mortar missing stones: Salvage on-site material: 2 crew, 4 hrs - mortar incidental, 2 x 4 x \$55/hr = \$440 Use \$500 minimum
Repair Cost:	\$500

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.589_R_1.jpg

Wall ID:	GRSM-0010N-10.760-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 3 ft x 3 ft		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	31
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Slight undermining, otherwise good	7
WALL FOUNDATION MATERIAL 8.00	Rock + concrete, slightly undermined but still functional	7
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Riprap, no distress	8
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	Flat shoulder	9
DOWNSLOPE 1.00	Slight erosion of concrete on channel, some rock clutter in bottom	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove and reset mortared stones at culvert inlet: 3' x 3' area: 2 crew, 8hrs, mortar incidental: 2 x \$55 x 8 = \$880
Repair Cost:	\$880

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.760_R_1.jpg

Wall ID:	GRSM-0010N-10.779-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall supports pull off area,		

Wall Measurements

Wall Length (ft.):	96	Face Area (sq.):	825
Average Wall Height (ft.):	8	Face Angle (deg.):	80
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs some fill/chinking stones, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Founded on bedrock	9
PLACED STONE 8.00	Minor unravelling near large tree, requires some chinking stones	8
UPSLOPE 0.50	Grass, 1:1, no distress	8
LATERAL SLOPE 0.50	Abuts GM wall at S end, abuts large boulder at N end	9
WALL DRAINS 0.50	Wall is self draining	10
VEGETATION 1.00	Two large diameter trees atop wall	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.779_L_1.jpg



GRSM_0010N_10.779_L_2.jpg

Wall ID:	GRSM-0010N-10.797-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Guardwall on top		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	896
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Firm soil and rock	8
MORTAR 8.00	Some debonding between guardwall and fill wall, no distress	8
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	No distress	9
DOWNSLOPE 1.00	Shallow bouldery creek bank, vegetated	7
LATERAL SLOPE 1.00	Steep bank out of creekbed	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.797_L_1.jpg



GRSM_0010N_10.797_L_2.jpg

Wall ID:	GRSM-0010N-10.867-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Loosely stacked, irregular shape, voids		

Wall Measurements

Wall Length (ft.):	85	Face Area (sq.):	1020
Average Wall Height (ft.):	12	Face Angle (deg.):	45
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Some movement of boulders over time, but otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Likely coarse alluvium (boulders)	8
PLACED STONE 8.00	Some large voids, competent rock, not interlocking	9
DOWNSLOPE 0.50	River channel, no distress	8
LATERAL SLOPE 0.50	Boulder fill UW, headwall DW	8
WALL DRAINS 0.50	No distress	8
UPSLOPE 0.50	Shoulder, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.867_L_1.jpg

Wall ID:	GRSM-0010N-10.883-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet culvert		

Wall Measurements

Wall Length (ft.):	22	Face Area (sq.):	102
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Firm soil +rock	9
MORTAR 8.00	Minor debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Creek bed full of boulders, stable	8
LATERAL SLOPE 0.50	Minor erosion, steep forested	8
UPSLOPE 0.50	Steep grass covered	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

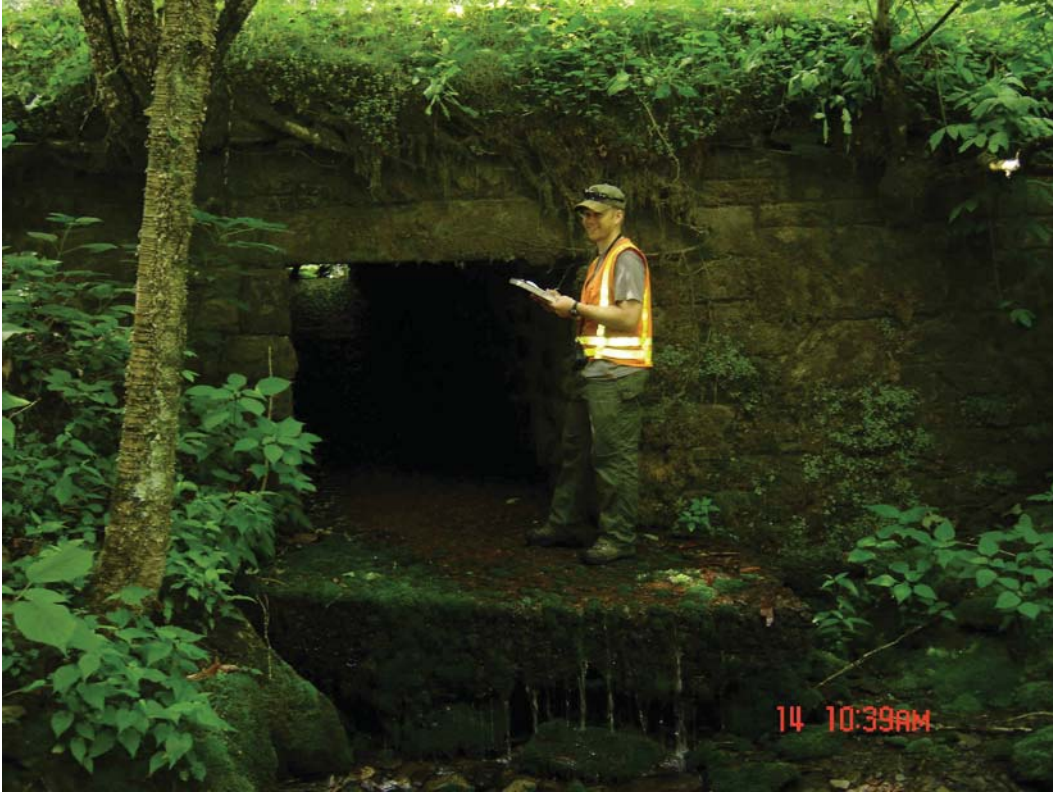
Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.883_L_1.jpg

Wall ID:	GRSM-0010N-10.884-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along outside of curve, inlet		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	101
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor spalling at bottom 2' of wall, otherwise good to excellent	8
WALL FOUNDATION MATERIAL 8.00	Founded on soil, bedrock; no signs of distress	9
MORTAR 8.00	Spalling within bottom 2' of wall	8
STONE MASONRY 8.00	No distress	8
DOWNSLOPE 0.50	Riprap erosion protection, no distress	8
WALL DRAINS 0.50	No distress	8
LATERAL SLOPE 1.00	Minor erosion at NW end of HW	7
ROAD/SIDEWALK/SHOULDER 1.00	Asphalt roadway, minor to moderate rutting, no distress	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_10.884_R_1.jpg



GRSM_0010N_10.884_R_2.jpg

Wall ID:	GRSM-0010N-11.049-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Failure could result in loss of roadway, inlet		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	38
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Minor cracking	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Riprap protection on heavily vegetated slope, debris at culvert opening	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor rutting on roadway, small vegetated shoulder	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.049_L_1.jpg

Wall ID:	GRSM-0010N-11.049-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet culvert		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	36
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Minor cracking	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Riprap erosion protection	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.049_R_1.jpg

Wall ID:	GRSM-0010N-11.100-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large voids, dry stack		

Wall Measurements

Wall Length (ft.):	150	Face Area (sq.):	1500
Average Wall Height (ft.):	10	Face Angle (deg.):	55
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Likely on river boulders or bedrock	8
PLACED STONE 8.00	Large boulders, elongated shaped, sub angular, non-interlocking, no distress	8
CULVERT 0.50	1.5' culvert outlets on wall face	8
DOWNSLOPE 0.50	Riverbed, no undermining	8
LATERAL SLOPE 0.50	Boulder fill, no distress	8
UPSLOPE 0.50	Soil shoulder, no distress	8
WALL DRAINS 0.50	No distress	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.100_L_1.jpg

Wall ID:	GRSM-0010N-11.200-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large voids, large subrounded boulders		

Wall Measurements

Wall Length (ft.):	185	Face Area (sq.):	740
Average Wall Height (ft.):	4	Face Angle (deg.):	60
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Riverbed soil + rock	8
PLACED STONE 8.00	Large boulders, sub-rounded, non interlocking	8
UPSLOPE 0.50	Gentle slope, no distress	8
WALL DRAINS 0.50	No distress	8
DOWNSLOPE 0.50	Creek channel, no distress	9
LATERAL SLOPE 1.00	Minor erosion downstream of wall, upstream is boulder fill	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.200_L_1.jpg

Wall ID:	GRSM-0010N-11.235-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	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:	3.5 ft x 4.5 ft box culvert inlet		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	59
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor erosion at corners	8
ROAD/SIDEWALK/SHOULDER 0.50	Narrow shoulder, no distress	8
DOWNSLOPE 0.50	Loose rock within dry creek bed, no erosion	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.235_R_1.jpg

Wall ID:	GRSM-0010N-11.304-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	37	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 ft x 4 ft cip concrete culvert		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	134
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Critical condition, needs replacement	2
WALL FOUNDATION MATERIAL 8.00	Undermining leaving lateral 3' void; wall has settled and rotated forward	2
MORTAR 8.00	Debonding, missing and spalling mortar	5
STONE MASONRY 8.00	Laree scale debonding, block in good condition	5
VEGETATION 1.00	Tree at south end leaning towards wall, roots exposed, near future failing would further destabilize wall	4
CULVERT 1.00	Sections of culvert have separated and need to be repaired, poor to critical condition	5
LATERAL SLOPE 1.00	Loose blocks N, large tree S, both contribute to destabilization of wall	5
UPSLOPE 1.00	Grades towards wall w/ 4 washout holes immediately behind HW	5
WALL DRAINS 1.00	Culvert in poor to critical shape; two .5' corrugated metal pipes below headwall	6

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Demo and rebuild headwall: 135sf x \$160/sf = \$21600. Remove/salvage existing stone: 1 x \$1050ea = \$1050. Place concrete foundation: (30' x 3' x 5')/27 = 16.7cy, 16.7cy x \$1470/cy = \$24500. Repair Culvert: Replace 10' end section of 48" CMP: 10' x \$210/lf
Repair Cost:	\$52,500

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.304_L_1.jpg



GRSM_0010N_11.304_L_2.jpg

Wall ID:	GRSM-0010N-11.657-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	At rivers edge, interlocking		

Wall Measurements

Wall Length (ft.):	455	Face Area (sq.):	4585
Average Wall Height (ft.):	10	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	Monitor undermining, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Mostly bedrock	9
MORTAR 8.00	Mild debonding	8
PLACED STONE 8.00	Slightly undermined in several locations, bottom 1-2' mortared w/ concrete	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	1.5' culvert, no distress	8
DOWNSLOPE 0.50	Bedrock river channel, slight undermining at base of wall	8
UPSLOPE 0.50	Semi continuous minor 1/8" in asphalt parallel to road, 4-5' back from face	8
WALL DRAINS 0.50	No distress	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.657_L_1.jpg

Wall ID:	GRSM-0010N-11.763-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along southern travel lane		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	55
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No settlement/rotation	9
MORTAR 8.00	General weathering, minor palling	8
STONE MASONRY 8.00	No distress	8
LATERAL SLOPE 0.50	No erosion/movement	9
WALL DRAINS 0.50	No distress	9
DOWNSLOPE 1.00	Accumulated settlement; impedes flow of water, should be removed	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.763_R_1.jpg

Wall ID:	GRSM-0010N-11.852-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along southern travel lane		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	60
Average Wall Height (ft.):	2	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 to excellent	8
WALL FOUNDATION MATERIAL 8.00	No settling/rotation	8
MORTAR 8.00	Minor debonding	8
STONE MASONRY 8.00	No distress	8
DOWNSLOPE 0.50	Riprap lined stream channel, no erosion	8
LATERAL SLOPE 0.50	Minor erosion at both ends	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor to moderate cracking of edge of pavement, no distress	8
WALL DRAINS 0.50	No distress	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.852_R_1.jpg

Wall ID:	GRSM-0010N-11.917-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Extends to bedrock river channel, interlocking stone masonry		

Wall Measurements

Wall Length (ft.):	135	Face Area (sq.):	1480
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Some material missing from base of wall, no distress	8
MORTAR 8.00	Minor debonding, missing grout from river erosion	8
STONE MASONRY 8.00	No distress	9
UPSLOPE 0.50	Road, no distress	8
WALL DRAINS 0.50	No distress	8
DOWNSLOPE 0.50	Riverbed, no distress	9
LATERAL SLOPE 1.00	Mild sloughing in bolder filled slope	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.917_L_1.jpg

Wall ID:	GRSM-0010N-11.960-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet to 6 ft x 4 ft box culvert		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	137
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Firm rock + soil	8
MORTAR 8.00	Occasional debonding	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Vegetated rock fill slopes	8
UPSLOPE 0.50	Shallow forested slope and creek bed	8
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.960_L_1.jpg



GRSM_0010N_11.960_L_2.jpg

Wall ID:	GRSM-0010N-11.960-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	61	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Close proximity to travel lane		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	83
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Failure at northern and needs repair, otherwise fair	5
WALL FOUNDATION MATERIAL 8.00	No distress	8
STONE MASONRY 8.00	Damage along northern half with ~3' disp.	5
MORTAR 8.00	Needs to be repointed	6
DOWNSLOPE 0.50	Riprap lined stream channel, no distress	8
LATERAL SLOPE 1.00	Erosion along northern half	7
WALL DRAINS 1.00	Damage to northern wall may be drainage related, but no obvious evidence exists	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove and replace wall end: 7.5' long x 4.5' high = 33.75sf Use 35sf, 35sf x \$160/sf = \$5600. Remove/Salvage existing stones: 1 x \$1050ea = \$1050. Repoint remaining wall face: 83 sf - 35sf = 48 sf Use 50sf, 50sf x \$75/sf = \$3750.
Repair Cost:	\$10,400

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_11.960_R_1.jpg

Wall ID:	GRSM-0010N-12.305-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet single 4 ft x 4 ft box culvert		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	41
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Bedrock, no distress	9
MORTAR 8.00	Minor debonding	8
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	No distress	8
DOWNSLOPE 0.50	Channel bedrock, no distress	9
LATERAL SLOPE 0.50	Bedrock, no distress	9
UPSLOPE 0.50	Shoulder, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.305_L_1.jpg

Wall ID:	GRSM-0010N-12.404-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	70	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Below parking area		

Wall Measurements

Wall Length (ft.):	110	Face Area (sq.):	568
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	North end performance threatened by distress	6
WALL FOUNDATION MATERIAL 8.00	No distress due to foundation issues	9
PLACED STONE 8.00	Loose stone and undermining at north end	6
WALL DRAINS 0.50	Self draining, no distress	9
VEGETATION 1.00	Trees at north end causing wall distress	6
LATERAL SLOPE 1.00	Distress on northern end	7
ROAD/SIDEWALK/SHOULDER 1.00	Minor pavement cracking, some settlement in shoulder	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Remove and reset north 30 ft of wall - Add chinking stones throughout: Removal: Backhoe hrs@\$150/hr = \$1200, 2 crew 8hrs@\$55/hr = \$880. Reset: 30ftx7ft = 210sf, 210 x \$50/sf = \$10,500. Chinking - Place chinking stones in small voids, 2 crew 8hrs@\$55/hr
Repair Cost:	\$13,460

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.404_R_1.jpg

Wall ID:	GRSM-0010N-12.556-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Also headwall for 18 in concrete pipe outlet		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	110
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	Not visible, likely cobbles and boulders, no visible foundation-related distress in wall	8
MORTAR 8.00	Mild debonding, moss-covered	8
STONE MASONRY 8.00	Quarried capstone, moss-covered, no distress	9
DOWNSLOPE 0.50	Channel edge, fortified with/riprap, no distress	9
LATERAL SLOPE 0.50	Boulder fill, mild raveling, vegetated, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Grass shoulder, no distress	9
WALL DRAINS 0.50	None, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.556_R_1.jpg

Wall ID:	GRSM-0010N-12.615-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	56	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet for 18 in concrete pipe - on riprap		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	53
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Drainage, mortar and foundation distress threaten short term performance	5
WALL FOUNDATION MATERIAL 8.00	Not visible but undermined by water flowing behind wall face	5
MORTAR 8.00	extensive debonding and weathering, mortar missing in some places	6
STONE MASONRY 8.00	Stones intact but wall displaced outward 1-2".	6
DOWNSLOPE 0.50	Riprap fill, no distress	9
CULVERT 1.00	Culvert disconnected from headwall, water flowing behind wall face	5
CURB/BERM/DITCH 1.00	Surface shoulder water infiltrating into fill	5
ROAD/SIDEWALK/SHOULDER 1.00	Grass-covered shoulder with/voids	5
WALL DRAINS 1.00	None, water flow behind wall face likely causing mortar and foundation distress	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove and replace headwall: Remove wall: 2 crew 12hrs@\$55/hr = \$1320, Backhoe 12hrs@\$150 = \$1800. Dump Truck (stone salvage and haul - later use) 4hrs@\$120/hr = \$480. Construct 50sf mortared stone headwall - FHWA contract cost includes new material.
Repair Cost:	\$11,600

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.615_R_1.jpg

Wall ID:	GRSM-0010N-12.660-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	77	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:	Wall along river. HW about midwall		

Wall Measurements

Wall Length (ft.):	340	Face Area (sq.):	3315
Average Wall Height (ft.):	9	Face Angle (deg.):	65
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	-12

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Missing toe stones and vegetation threatening long term performance. No immediate threat to performance	7
WALL FOUNDATION MATERIAL 8.00	Large diameter boulders and bedrock, river bed. No distress	9
PLACED STONE 8.00	Isolated areas of missing stones near toe, approx 250sf	7
LATERAL SLOPE 0.50	Stable natural slope, no distress	9
UPSLOPE 0.50	Well vegetated slope with/tress, no distress	9
WALL DRAINS 0.50	self draining, no distress	9
VEGETATION 1.00	Numerous trees growing on top of wall. Roots may be displacing some face stones	7

Repair Recommendations

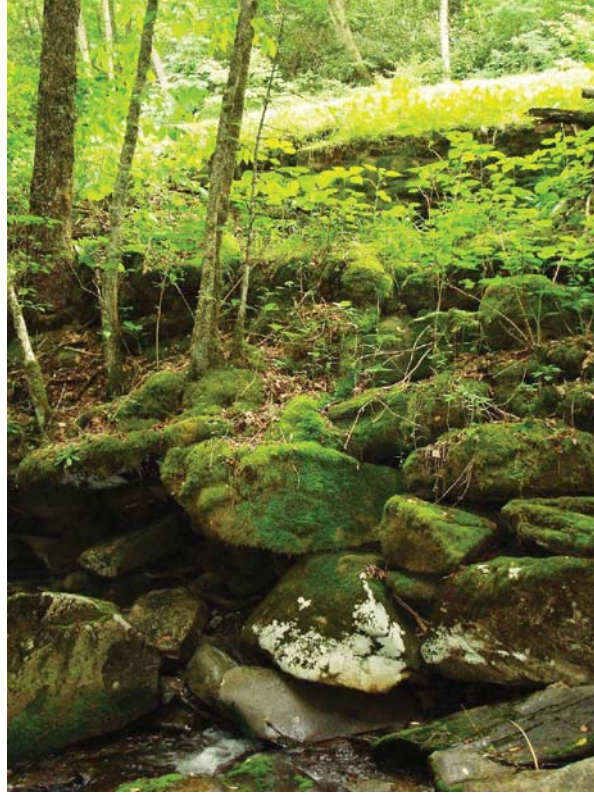
Failure Consequence:	HIGH
Recommendation Narrative:	Replace missing toe stones - approx 250sf: 3 crew 12 hrs@\$55/hr = \$1980, Track hoe 12 hrs@\$225/hr = \$2700. Remove Selective Vegetation - Roots damaging wall: 2 crew 8hrs@\$55/hr = \$880
Repair Cost:	\$5,560

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

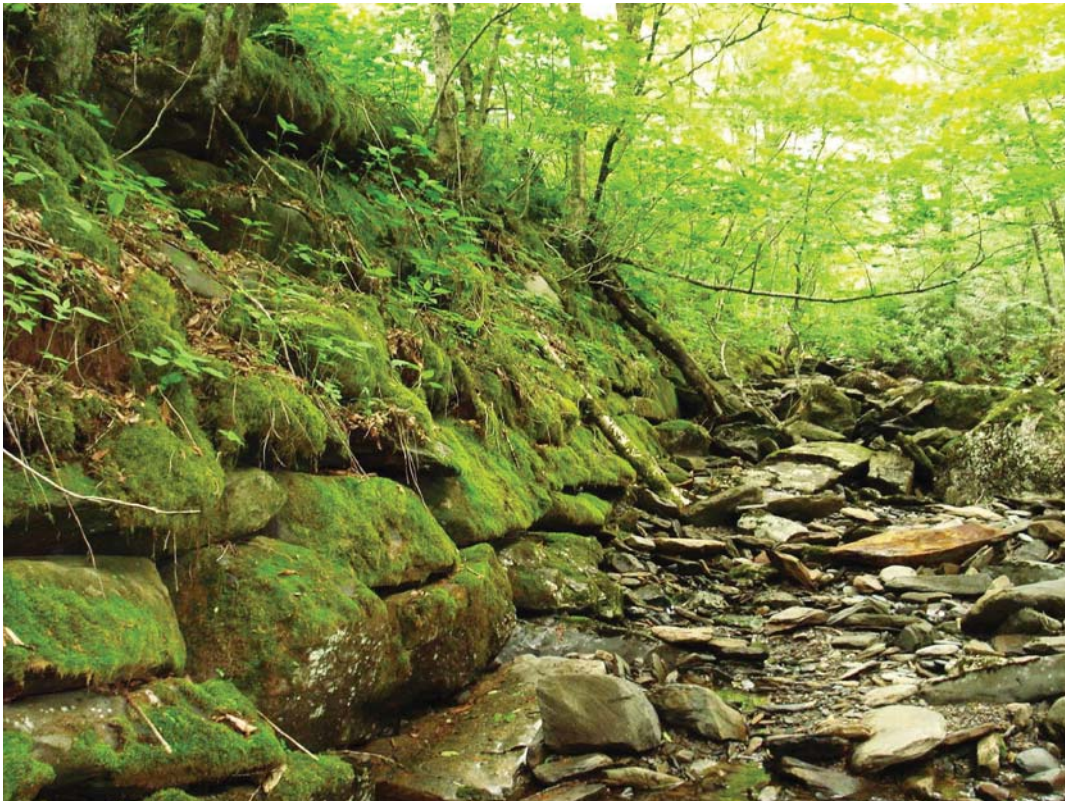
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.660_R_1.jpg



GRSM_0010N_12.660_R_2.jpg

Wall ID:	GRSM-0010N-12.746-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 x 3 box headwall		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	50
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	no distress	9
MORTAR 8.00	no distress	9
STONE MASONRY 8.00	no distress	9
DOWNSLOPE 0.50	riprap lined creek channel, no distress	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	no distress	9
WALL DRAINS 0.50	none, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.746_L_1.jpg

Wall ID:	GRSM-0010N-12.746-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	92	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	inlet 4 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	64
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	As intended, good to excellent	9
WALL FOUNDATION MATERIAL 8.00	On bedrock, no distress	10
MORTAR 8.00	No distress	9
STONE MASONRY 8.00	no distress	9
LATERAL SLOPE 0.50	minor erosion on south end	8
DOWNSLOPE 0.50	bedrock in creek channel, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Grassy shoulder, no distress	9
WALL DRAINS 0.50	none visible, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.746_R_1.jpg

Wall ID:	GRSM-0010N-12.793-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	62
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, as intended	8
WALL FOUNDATION MATERIAL 8.00	Firm soil, no distress	9
MORTAR 8.00	some debonding, weathering, moss-covered	7
STONE MASONRY 8.00	moss-covered, as new	9
LATERAL SLOPE 0.50	shallow grass-covered embankment, no distress noted	9
ROAD/SIDEWALK/SHOULDER 0.50	shallow slope, grass covered, no distress noted	9
UPSLOPE 0.50	forested, no distress noted	9
WALL DRAINS 0.50	no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.793_L_1.jpg

Wall ID:	GRSM-0010N-12.798-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	45
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	Rock and concrete. No distress noted	9
MORTAR 8.00	Moderate debonding and weathering, light cracking, moss covered	7
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Rock and soil fill, mild raveling	8
DOWNSLOPE 0.50	Loose rock channel bottom, low gradient, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Grassy shoulder, no distress	9
WALL DRAINS 0.50	None, no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.798_R_1.jpg

Wall ID:	GRSM-0010N-12.865-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 4 x 4 box		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	96
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	8
WALL FOUNDATION MATERIAL 8.00	2' thick concrete slab (likely reinforced). No distress	9
MORTAR 8.00	Moderately weathered, some de-bonding, moss covered.	7
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Slight undermining, not currently effecting wall.	8
LATERAL SLOPE 0.50	Vegetated embankment, some scour at toe.	8
UPSLOPE 0.50	Rock slope, no distress	9
WALL DRAINS 0.50	None, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.865_R_1.jpg

Wall ID:	GRSM-0010N-12.867-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 4 x 3 box culvert		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	65
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Aggrading stream, mortar loss slightly impairing long term performance	7
WALL FOUNDATION MATERIAL 8.00	Likely founded on or near bedrock, no distress	9
MORTAR 8.00	Loss of mortar (3-4") on lower 10% of wall, moss covered	7
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	riprap over bedrock, no distress	9
UPSLOPE 0.50	Grassy rock fill shoulder, no distress	9
WALL DRAINS 0.50	none, no distress	9
DOWNSLOPE 1.00	Creek bed aggrading into culvert	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint headwall: lower 10% of 65sf = 6.5sf, use 20sf, 20sf x \$75/sf = \$1500. lean inlet debris: 2 crew 2hrs@\$55/hr = \$220
Repair Cost:	\$1,720

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_12.867_L_1.jpg

Wall ID:	GRSM-0010N-13.080-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 x 4 box culvert		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	51
Average Wall Height (ft.):	2	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 to excellent	9
WALL FOUNDATION MATERIAL 8.00	no distress	9
MORTAR 8.00	Light weathering, minor debonding	8
STONE MASONRY 8.00	no distress	9
DOWNSLOPE 0.50	riprap lined dry creek bed, no distress	9
LATERAL SLOPE 0.50	no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.080_L_1.jpg

Wall ID:	GRSM-0010N-13.244-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Guardwall topped along outside curve		

Wall Measurements

Wall Length (ft.):	230	Face Area (sq.):	2453
Average Wall Height (ft.):	10	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 to excellent	9
WALL FOUNDATION MATERIAL 8.00	no distress	9
MORTAR 8.00	minor isolated cracking	8
STONE MASONRY 8.00	No stone distress noted, mortar distress captured above	9
UPSLOPE 0.50	vegetated and wooded, moderate to steep slope, no distress	8
LATERAL SLOPE 0.50	no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	no distress	9
WALL DRAINS 0.50	no distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.244_R_1.jpg

Wall ID:	GRSM-0010N-13.316-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall adjacent to roadway w/guardwall		

Wall Measurements

Wall Length (ft.):	185	Face Area (sq.):	2288
Average Wall Height (ft.):	12	Face Angle (deg.):	80
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good, as intended	8
WALL FOUNDATION MATERIAL 8.00	firm soil, no distress	9
MORTAR 8.00	Light debonding, moss covered.	8
STONE MASONRY 8.00	no distress, moss covered	9
DOWNSLOPE 0.50	Appears stable, thick vegetation.	8
ROAD/SIDEWALK/SHOULDER 0.50	no wall distress. Some wheel path cracking.	9
WALL DRAINS 0.50	none, no distress	9
LATERAL SLOPE 1.00	Mild slope creep before beginning of wall. Guardwall leaning slightly. Appears to be old event.	7

Repair Recommendations

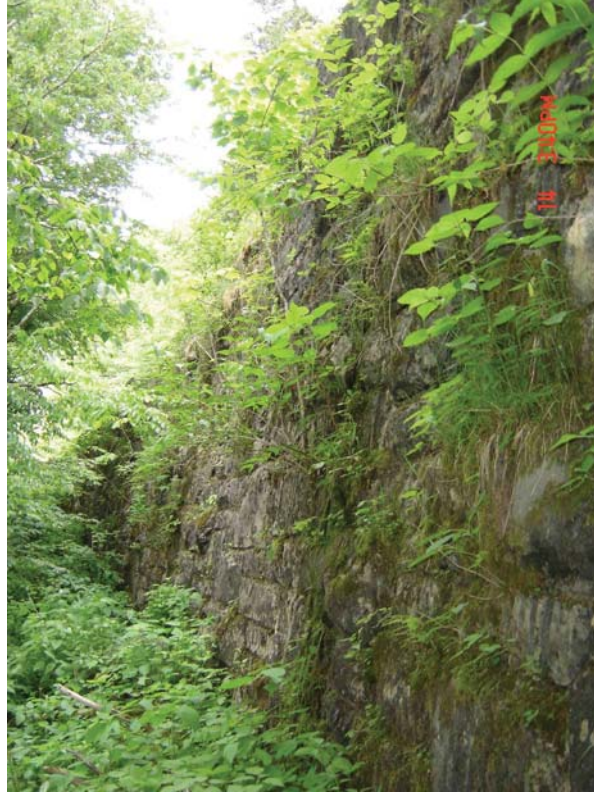
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.316_R_1.jpg

Wall ID:	GRSM-0010N-13.356-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	1.5 ft high guardwall along south travel lane		

Wall Measurements

Wall Length (ft.):	107	Face Area (sq.):	785
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	no distress	9
MORTAR 8.00	Minor cracking	8
STONE MASONRY 8.00	no distress in stones	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking along outside pavement edge	8
DOWNSLOPE 0.50	heavily vegetated and wooded, moderate to steep, no distress	9
LATERAL SLOPE 0.50	no distress	9
WALL DRAINS 0.50	no distress	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.

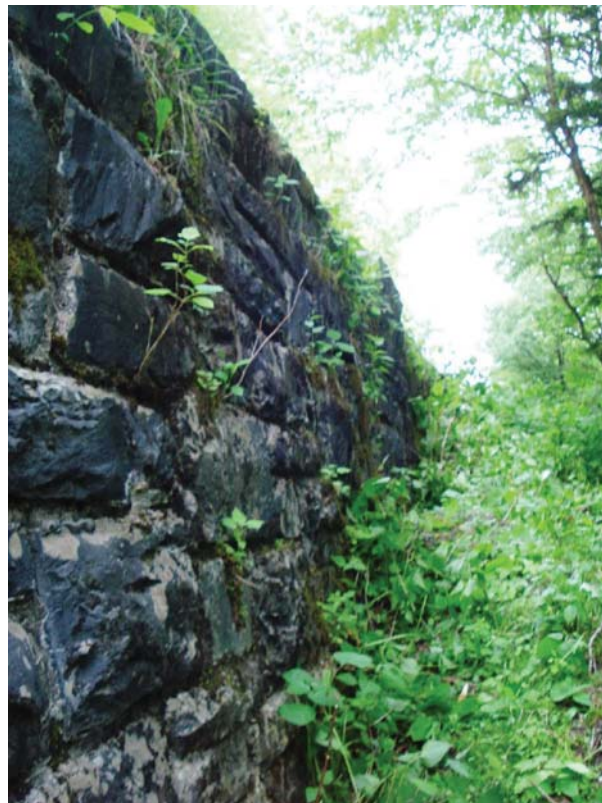
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.356_R_1.jpg



GRSM_0010N_13.356_R_2.jpg

Wall ID:	GRSM-0010N-13.389-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall along the southbound travel lane of high ADT roadway founded on moderate to steep slope high consequence of failure due to proximity to roadway		

Wall Measurements

Wall Length (ft.):	340	Face Area (sq.):	5610
Average Wall Height (ft.):	17	Face Angle (deg.):	85
Maximum Wall Height (ft.):	25	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good performance of wall; some localized areas require routing maintenance and repair	7
WALL FOUNDATION MATERIAL 8.00	Evidence of slope creek indicated by void below wall along the north end; no evidence of settlement or rotation	6
MORTAR 8.00	Generally good condition; shows sign of normal seasonal weathering; minor cracking and debonding	8
STONE MASONRY 8.00	Good overall condition; blocks shown no distress; minor debonding	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor pavement cracking along outside wheel line; distress not affecting wall performance	8
TRAFFIC BARRIER/FENCE 0.50	GM guard wall generally in good condition; minor to moderate impact damage; guard wall distress does not affect wall performance	8
LATERAL SLOPE 0.50	Transitions to guard wall at both ends; no evidence of erosion or distress	9
DOWNSLOPE 1.00	Large mounds of fine crushed gravel along base of wall in several locations possibly causing slope creep and voids below wall	6
WALL DRAINS 1.00	Suspect that weep holes along base of wall are covered by crushed gravel (de-icing) material along base	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove mounds of fine crushed gravel from base of wall -30 labor hrs (\$55/hr) = \$1,650. Place lean concrete backfill to fill voids -0.65 cuyd (\$175/cuyd) = \$113.75. Stone masonry repointing - 75 sqft (\$75/sqft) = \$5,625
Repair Cost:	\$7,389

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

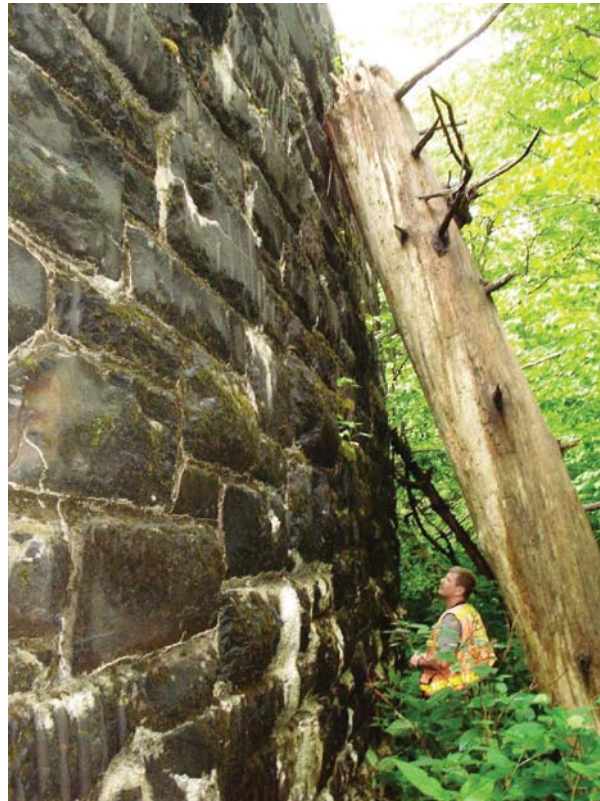
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.389_L_1.jpg



GRSM_0010N_13.389_L_2.jpg

Wall ID:	GRSM-0010N-13.392-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 24 in diameter culvert constructed along west northbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	30
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; wall is functioning as design with minor distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of wall settlement or rotation	8
MORTAR 8.00	Good condition overall; some debonding; debonding is not currently affecting wall performance	7
STONE MASONRY 8.00	Good condition overall; wall is covered with moss; minor debonding caused by degradation of the mortar	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress; relatively flat grassy shoulder	8
LATERAL SLOPE 0.50	No evidence of distress	9
UPSLOPE 0.50	Steep rocky forested slope with no evidence of distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.392_L_1.jpg

Wall ID:	GRSM-0010N-13.467-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall supporting high ADT roadway constructed along the southbound travel lane and atop a steep slope high consequence of failure due to size and proximity to roadway		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	540
Average Wall Height (ft.):	4	Face Angle (deg.):	80
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; wall is working as intended	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering; evidence of weeping (calcite precipitate)	8
STONE MASONRY 8.00	Good condition overall; minor debonding	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Steep vegetated and wooded slope; evidence of minor slope creep; mild unraveling of the slope	7
LATERAL SLOPE 1.00	Steep fill embankment	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.467_R_1.jpg

Wall ID:	GRSM-0010N-13.807-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Relatively new GM headwall for a 18 in diameter culvert located along southbound travel lane of high ADT roadway high consequence of failure due to proximity to roadway		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	63
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 overall; minor debonding	8
WALL FOUNDATION MATERIAL 8.00	Founded on bedrock with no evidence of settlement or rotation	10
MORTAR 8.00	General age-related weathering; good condition overall	8
STONE MASONRY 8.00	Good condition overall; minor debonding on southern half; stone blocks show no distress	8
LATERAL SLOPE 0.50	Minor erosion along the northern end	8
DOWNSLOPE 0.50	Steep slope comprised of bedrock and soil; no evidence of distress	9
WALL DRAINS 0.50	No evidence of drainage-related issues	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.807_R_1.jpg

Wall ID:	GRSM-0010N-13.842-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 22, 2007	Approximate Year Built:	1938
*Wall Rating:	92	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Relatively new GM inlet headwall for 24 in diameter concrete pipe culvert constructed within steep slope and along southbound travel lane of high ADT roadway		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	60
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance of wall	9
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation	8
MORTAR 8.00	No distress	10
STONE MASONRY 8.00	No distress	10
ROAD/SIDEWALK/SHOULDER 0.50	Grassy shoulder with no evidence of distress	8
DOWNSLOPE 0.50	Relatively flat to steep forested slope with no evidence of distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.842_R_1.jpg

Wall ID:	GRSM-0010N-13.847-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall with new GM guard wall supporting high ADT roadway culvert opening within wall along the top high consequence of failure due to height and proximity to roadway		

Wall Measurements

Wall Length (ft.):	160	Face Area (sq.):	1979
Average Wall Height (ft.):	12	Face Angle (deg.):	90
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; wall is functioning as intended	8
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	General age-related weathering; minor efflorescence in localized areas	7
STONE MASONRY 8.00	Good overall condition; minor debonding	8
CULVERT 0.50	No distress; 18" diameter culvert; outlets along top of wall	8
DOWNSLOPE 0.50	No distress; relatively flat bench along base transitioning to steep forested slope	8
ROAD/SIDEWALK/SHOULDER 0.50	Asphalt pavement with minor cracking along outside wheel line	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 1.00	Weep holes at random locations appear to be functioning properly; efflorescence indicates water weeping through mortar	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.847_R_1.jpg

Wall ID:	GRSM-0010N-13.895-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Relatively new GM outlet headwall for 30 in diameter concrete culvert constructed along southbound travel lane of high ADT roadway located approximately 80 ft from tunnel portal low consequence of failure		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	72
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; requires repointing along the base of the wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; wall is founded on bedrock	9
MORTAR 8.00	General age-related distress; moderate spalling along base of wall	7
STONE MASONRY 8.00	Moderate debonding along base of wall	8
LATERAL SLOPE 0.50	Minor erosion along the north end	8
DOWNSLOPE 0.50	No distress; riprap lined channel extends from outlet of culvert; bedrock slope	9
UPSLOPE 0.50	Grassy moderately slope; no evidence of distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repointing - 3.0 sqft (\$75/sqft) = \$225.00
Repair Cost:	\$225

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.895_R_1.jpg

Wall ID:	GRSM-0010N-13.975-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	94	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Relatively new GM outlet headwall for 30 in diameter concrete culvert constructed within moderate to steep slope supporting high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	58
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent; wall is functioning as designed	9
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	No distress; general age-related weathering	10
STONE MASONRY 8.00	No distress	10
DOWNSLOPE 0.50	No distress; riprap lined channel grading away from HW at culvert outlet	9
UPSLOPE 0.50	No distress	9
WALL DRAINS 0.50	No distress	9
LATERAL SLOPE 1.00	Moderate erosion along the northern end of the wall	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.975_R_1.jpg

Wall ID:	GRSM-0010N-13.980-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	69	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM toe wall supporting a steep vegetated slope constructed along the southbound travel lane of a high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	1449
Average Wall Height (ft.):	14	Face Angle (deg.):	85
Maximum Wall Height (ft.):	22	Vertical Offset (ft.):	-35

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; large void at an isolated location along wall needs to be repaired to prevent damage to wall elements	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation; large void between wall base and the supporting ground; void is located immediately beyond culvert outlet; minor ongoing erosion at culvert opening	5
PLACED STONE 8.00	3 ft x 6 ft GD at the beginning of the wall has collapsed; GD wall supports the lateral slope and its collapse does not affect overall performance of the toe wall nor is it affecting the upslope	6
MORTAR 8.00	General age-related weathering; minor cracking; efflorescence at isolated areas along the wall	8
STONE MASONRY 8.00	Minor debonding; blocks show no distress	8
CULVERT 0.50	No distress; 36-in. diameter concrete pipe	9
DOWNSLOPE 0.50	No distress; moderate, well vegetated slope	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; steep, well vegetated road fill slope	9

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Lean Concrete Backfill - 12 cuyd (\$175/cuyd) = \$2,100. Unclassified Borrow - 2.7 cuyd (\$35/cuyd) = \$93.33
Repair Cost:	\$2,193

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_13.980_R_1.jpg

Wall ID:	GRSM-0010N-14.005-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	98	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Relatively new GM fill wall along southbound travel lane of high ADT roadway constructed atop steep slope high consequence of failure		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	138
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent overall performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation about the base	10
MORTAR 8.00	No distress	10
STONE MASONRY 8.00	No distress	10
WALL DRAINS 0.50	No drains visible; however, no evidence of drainage-related distress	9
DOWNSLOPE 0.50	No distress; steep well vegetated slope	10
LATERAL SLOPE 0.50	No distress; wall transitions to approximate 2.0 ft high GM guard wall	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.005_R_1.jpg

Wall ID:	GRSM-0010N-14.223-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall located along southbound travel lane of high ADT roadway along inside curve of roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	71	Face Area (sq.):	320
Average Wall Height (ft.):	4	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 overall; face of wall is largely covered by small vegetation	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation	9
PLACED STONE 8.00	3 ft x 6 ft GD at the beginning of the wall has collapsed; GD wall supports the lateral slope and its collapse does not affect overall performance of the toe wall nor is it affecting the upslope	6
MORTAR 8.00	General age-related weathering;	9
STONE MASONRY 8.00	Minor debonding along approximately 10% of the mortar joints	9
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	No distress; relatively level, 4-ft wide bench at base of wall transitions to well vegetated moderate slope	9
LATERAL SLOPE 0.50	No distress; wall transitions to GM guard wall at both ends	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.223_R_1.jpg



GRSM_0010N_14.223_R_2.jpg

Wall ID:	GRSM-0010N-14.224-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	80	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:	GM fill wall along southbound travel lane of high ADT roadway constructed atop moderate to steep well vegetated slope high consequence of failure		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	375
Average Wall Height (ft.):	5	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 overall; gravel mounds are to be removed from along base of wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation of wall about the base	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Some minor debonding along top of wall where the retaining wall transitions to guard wall	8
CULVERT 0.50	No distress; 24-in. diameter concrete pipe	8
WALL DRAINS 0.50	No observed drainage-related distress; however, gravel mounds may be obstructing weep holes along base of wall	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
DOWNSLOPE 1.00	Large mounds of gravel debris is piled along base of wall; gravel mounds are possibly obstructing weep holes and allowing for the accumulation of water long the base of wall during rain events	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove gravel mounds along base- 8 labor hrs (\$55/hr) = \$440. Remove vegetation from face of wall, 8 labor hrs (\$55/hr) = \$440, Material costs = \$200
Repair Cost:	\$1,080

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.224_R_1.jpg

Wall ID:	GRSM-0010N-14.231-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 14, 2007	Approximate Year Built:	Unknown
*Wall Rating:	66	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall with attached GM guard wall wall constructed atop steep well vegetated slope and directly supports the Morton Overlook Pullout Area constructed along southbound travel lane of high ADT roadway		

Wall Measurements

Wall Length (ft.):	241	Face Area (sq.):	2148
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition overall; moderate to severe mortar degradation leading to severe cracking and extensive debonding; three full height cracks; small brush growing from face of wall	6
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Moderate to severe degradation of mortar with minor spalling throughout the wall, approximately 50 ft from start of wall; approximate 1/4-in. to 1/2-in cracks at three isolated located along wall	5
STONE MASONRY 8.00	Moderate to severe debonding in some areas along the top of wall; no distress to blocks	6
CULVERT 0.50	No distress; 24-in. diameter concrete pipe	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress; weep holes along base of wall all appear to be functional	9
TRAFFIC BARRIER/FENCE 1.00	Approximate 1.5-2.0 ft tall GM guard wall attached to wall; moderate degradation of mortar leading to moderate to severe cracking and extensive debonding	5
VEGETATION 1.00	Small diameter bushes growing in wall joints and causing loss of mortar	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - 712 sqft (\$75/sqft) = \$53,437.50, Guard wall = 1.5'(241')(\$75/sqft) = \$27,112.50. Remove Gravel Mounds & Vegetation - 30 labor hrs (\$55/hr) = \$1,650, Material Cost (herbicide) = \$200
Repair Cost:	\$82,400

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

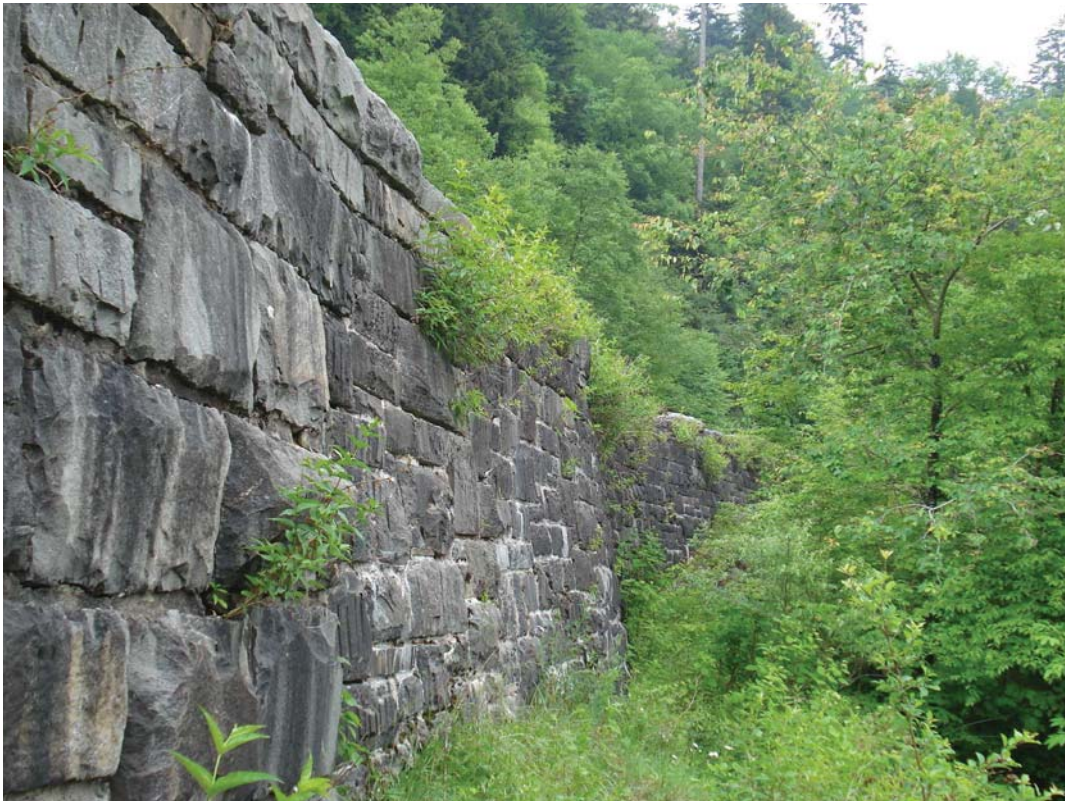
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ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.231_R_1.jpg



GRSM_0010N_14.231_R_2.jpg

Wall ID:	GRSM-0010N-14.312-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	82	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:	GM fill wall along southbound travel lane of high ADT roadway founded atop moderate to steep forested slope high consequence of failure		

Wall Measurements

Wall Length (ft.):	440	Face Area (sq.):	6852
Average Wall Height (ft.):	15	Face Angle (deg.):	85
Maximum Wall Height (ft.):	34	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; gravel mounds along base of wall may be obstructing weep holes and are promoting growth of small vegetation adjacent to wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation about the base	9
MORTAR 8.00	General age-related weathering; minor cracking; minor efflorescence buildup at various isolated locations	8
STONE MASONRY 8.00	Minor debonding; blocks shown no sign of distress	8
VEGETATION 0.50	Small vines growing from face of wall; gravel mounds promoting growth of small bushes adjacent to base of wall	8
WALL DRAINS 0.50	No observed drainage related distress; no observed weep holes; its possible that mounds of gravel debris are covering and obstructing weep holes along base	8
CULVERT 0.50	No distress; 24-in. diameter square concrete pipe	9
LATERAL SLOPE 0.50	No distress; wall transitions to GM guard wall at both ends	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove gravel mounds along base - 32 labor hrs (\$55/hr) = \$1, 760
Repair Cost:	\$1,760

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

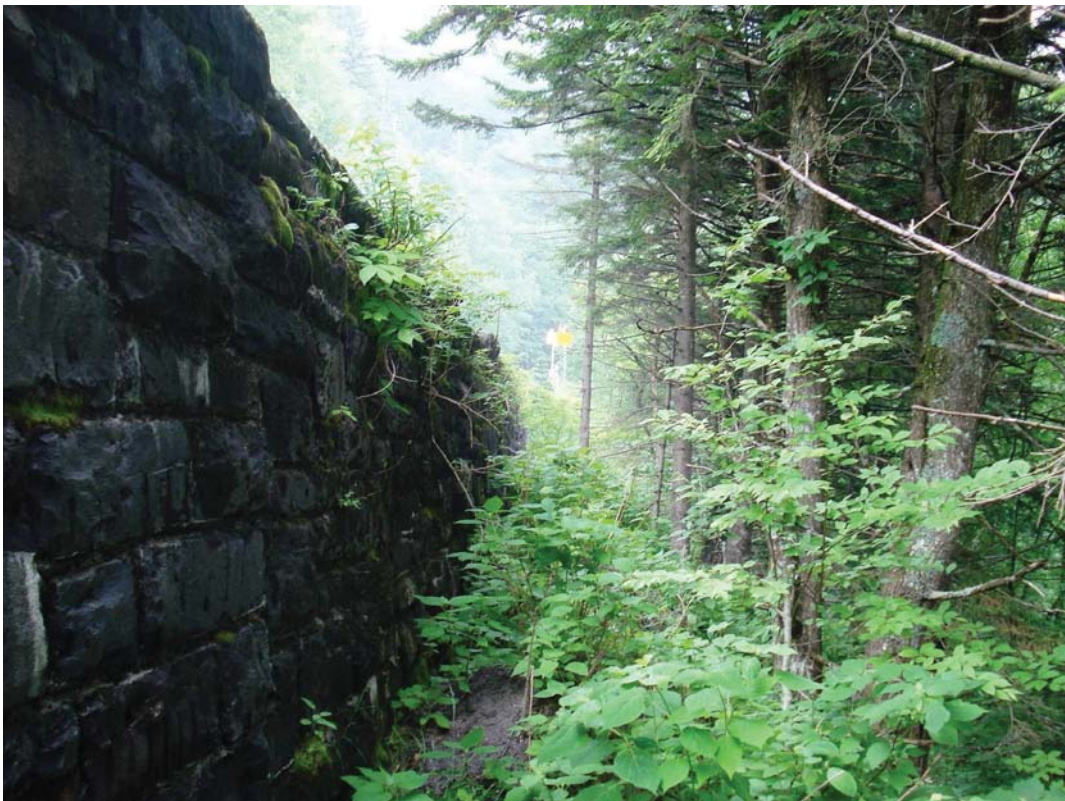
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ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.312_R_1.jpg



GRSM_0010N_14.312_R_2.jpg

Wall ID:	GRSM-0010N-14.424-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM toe at base of steep slope supporting high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	150	Face Area (sq.):	1226
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-24

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; small diameter trees along base of wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering' efflorescence along approximately 20% of wall	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	No distress; 36-in diameter concrete pipe	8
LATERAL SLOPE 0.50	Evidence of minor ongoing erosion at both ends of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking along outboard wheel line of roadway	8
VEGETATION 0.50	Several small diameter trees growing along base of wall	8
WALL DRAINS 0.50	No distress; efflorescence along face may be evidence of water leaching through wall	8

Repair Recommendations

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

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

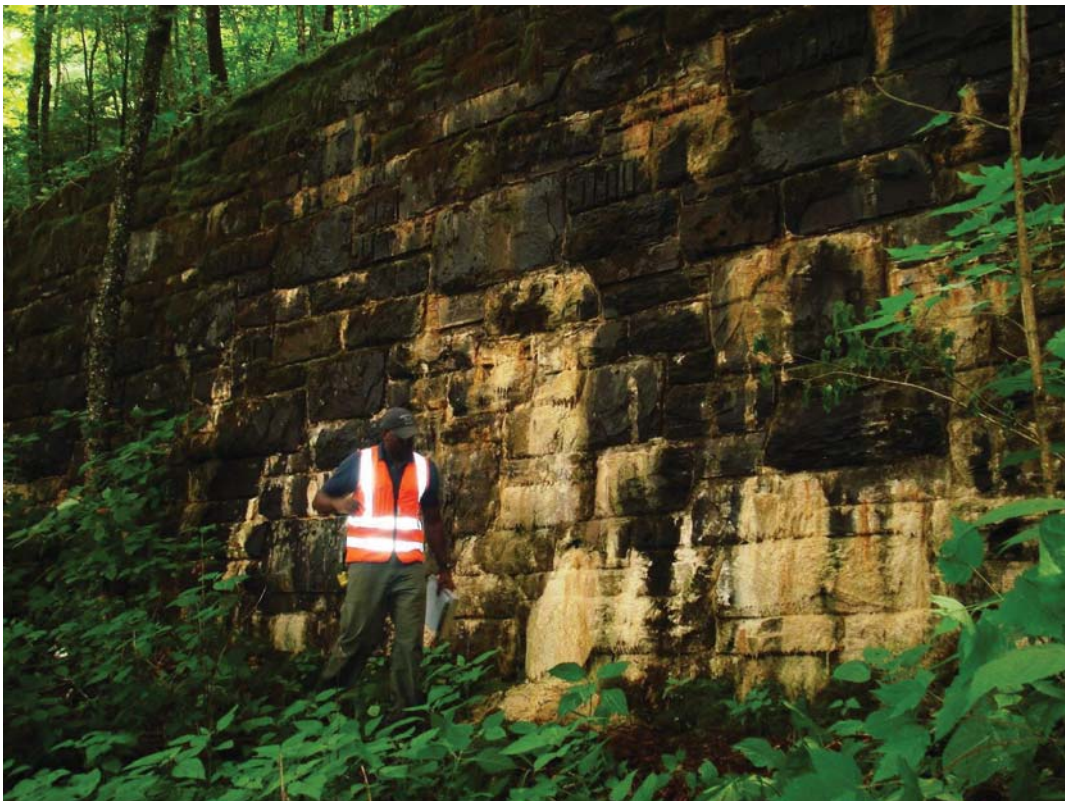
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ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.424_R_1.jpg



GRSM_0010N_14.424_R_2.jpg

Wall ID:	GRSM-0010N-14.624-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM toe wall constructed at base of steep slope supporting high ADT roadway GD walls at both ends high consequence of failure		

Wall Measurements

Wall Length (ft.):	177	Face Area (sq.):	1923
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	-28

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance of wall; evidence of upslope movement translating to cracking and slumping of roadway	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor cracking; efflorescence buildup at isolated locations	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	No evidence of distress; GD wall at north end ties into natural slope; transitions to natural slope at south end	8
VEGETATION 0.50	Several small diameter trees growing along the base and top of wall; trees not currently affecting wall performance but as they grow, their root structure may cause damage	8
DOWNSLOPE 0.50	No distress; steep forested slope	9
WALL DRAINS 0.50	No evidence of drainage related distress; weep holes infrequently spaced along base of wall all appear to be functional	9
ROAD/SIDEWALK/SHOULDER 1.00	Moderate cracking and slumping of southbound travel lane; possibly sue to slope creep	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.624_R_1.jpg

Wall ID:	GRSM-0010N-14.780-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	81	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:	GM fill wall along southbound travel lane of high ADT roadway located immediately south of southbound entrance to Clingmans Dome parking lot constructed atop steep slope high consequence of failure		

Wall Measurements

Wall Length (ft.):	130	Face Area (sq.):	2600
Average Wall Height (ft.):	20	Face Angle (deg.):	85
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; requires minor repointing	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding in isolated areas	8
DOWNSLOPE 0.50	Mounds of gravel debris piled along base of wall; gravel mounds are promoting growth of small brush along base of wall	8
WALL DRAINS 0.50	No evidence of drainage related distress; no visible weep holes	8
CULVERT 0.50	No distress; recently repaired 18-in diameter culvert	9
LATERAL SLOPE 0.50	No distress; wall transitions to approximate 1.5 ft high GM guard wall at both ends	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - 50 sqft (\$75/sqft) = \$3,750. Remove mounds of gravel - 8 labor hrs (\$55/hr) = \$440
Repair Cost:	\$4,190

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

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.780_R_1.jpg

Wall ID:	GRSM-0010N-14.857-L		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall along southbound travel lane of high ADT roadway Appalachian Trail located below wall high consequence of failure		

Wall Measurements

Wall Length (ft.):	180	Face Area (sq.):	3008
Average Wall Height (ft.):	16	Face Angle (deg.):	80
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance overall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; mild to moderate efflorescence buildup	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	No distress; moderate to steep forested slope	8
VEGETATION 0.50	Small vines growing along base of wall	8
WALL DRAINS 0.50	No distress; weep holes infrequently spaced along base of wall; weep holes appear to be functional	8
CULVERT 0.50	No distress; 18-in. diameter culvert	9
LATERAL SLOPE 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.857_L_1.jpg

Wall ID:	GRSM-0010N-14.917-R		
Route Name:	NEWFOUND GAP ROAD NORTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	69	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM toe wall for steep slope supporting pullout area of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	1768
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair. Localized cracking at top at approx. centerline of wall; bulging and tilting along top of wall	6
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation about the base	9
MORTAR 8.00	Full length cracking through mortar at approx. centerline of wall; minor debonding and spalling of mortar	6
STONE MASONRY 8.00	1/4-in. cracks for full height of wall at approx. centerline; bulging and tilting of blocks along top of wall for approx. 50 ft.	6
DOWNSLOPE 0.50	Moderate vegetated and wooded slope; no evidence of distress	8
UPSLOPE 0.50	Steep vegetated and wooded slope with rip rap fill; no evidence of slope movement	8
VEGETATION 0.50	Several medium diameter trees within 3 ft of wall along base and top of wall; trees do not appear to be affecting wall performance	8
WALL DRAINS 0.50	Weep holes spaced approx. 10 ft c-c along base; all weep holes appear to be functioning properly; damage along top of wall may be drainage related	8
LATERAL SLOPE 0.50	Ties into natural slope at north end; no evidence of erosion around wall or distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove/reset stone masonry - 55.5 cuyd (\$3,195/cuyd) = \$177,500. Stone Masonry Repointing - 140 sqft (\$75/sqft) = \$10,500.
Repair Cost:	\$188,000

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

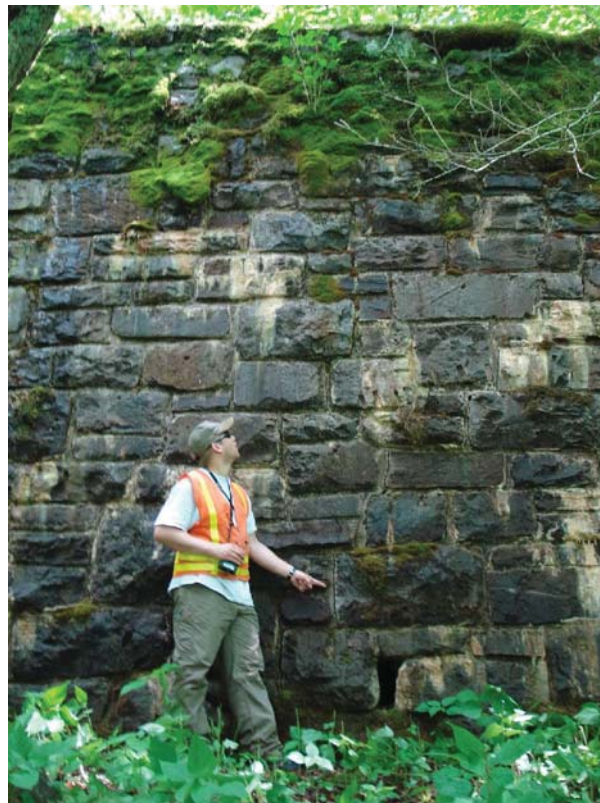
Great Smoky Mountains National Park

ROUTE 0010N: NEWFOUND GAP ROAD NORTH

Retaining Wall Condition Photos



GRSM_0010N_14.917_R_1.jpg



GRSM_0010N_14.917_R_2.jpg

Wall ID:	GRSM-0010S-15.056-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall along southbound travel lane of high ADT roadway constructed atop moderate to steep forested slope high consequence of failure		

Wall Measurements

Wall Length (ft.):	900	Face Area (sq.):	6086
Average Wall Height (ft.):	6	Face Angle (deg.):	80
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	No distress; two 18-in. diameter pipe culverts along the base of wall	9
DOWNSLOPE 0.50	No distress; moderate to steep forested slope	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_15.056_R_1.jpg

Wall ID:	GRSM-0010S-20.035-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 60 in diameter CMP culverts with bitumen lining along northbound travel lane of high ADT roadway		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	171
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	No distress; recently repointed along approximately 70% of wall	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	Two 60-in. diameter CMP culverts with a bitumen lining; minor degradation of the bitumen lining	8
DOWNSLOPE 0.50	No distress; creek bed	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.035_L_1.jpg

Wall ID:	GRSM-0010S-20.045-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for two 60 in diameter CMP culverts with bitumen lining along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	141
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; missing caprock should be replaced	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	No distress; recently repointed along approximately 70% of the wall	9
STONE MASONRY 8.00	Good condition overall; one missing caprock	9
CULVERT 0.50	Two 60-in. diameter CMP culverts with bitumen lining; minor degradation of lining	8
DOWNSLOPE 0.50	No distress; creek bed	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
UPSLOPE 0.50	No distress to vegetated fill embankment	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.045_R_1.jpg

Wall ID:	GRSM-0010S-20.057-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	81	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 36 in diameter concrete pipe culvert along northbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	52
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; general age-related weathering of wall material	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
STONE MASONRY 8.00	Moderate debonding around the culvert has created an annulus	7
MORTAR 8.00	General age-related weathering	8
CULVERT 0.50	No distress; 36-in diameter concrete culvert	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 0.50	No distress; riprap lined creek bed	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or grassy shoulder	10

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 10.49 sqft (\$75/sqft) = \$786.45
Repair Cost:	\$786

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.057_L_1.jpg

Wall ID:	GRSM-0010S-20.057-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	75	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 36 in diameter CMP culvert with a bitumen lining along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	71
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance of wall; however, scour hole at outlet threatens stability of the wall	7
WALL FOUNDATION MATERIAL 8.00	Scour hole forming along base of wall causing undermining of the foundation; no evidence that wall has moved as result of undermining	8
STONE MASONRY 8.00	Moderate debonding along base of wall	7
MORTAR 8.00	General age-related weathering	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or vegetated shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Large scour hole forming along base of wall an extending approximately 24 ft away from wall; pile of rocks downstream promoting negative flow	5
LATERAL SLOPE 1.00	Erosion of lateral slope due to poor downstream drainage	6

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clear stone piles from downstream - 4 labor hrs (\$55/hr) = \$220. Stone Masonry Repointing - 10.64 sqft (\$75/sqft) = \$797.96. Backfill Scour Hole w/ Placed Riprap, Class 1 - 23.11 cuyd (\$80/cuyd) = \$1,848.89
Repair Cost:	\$2,867

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.057_R_1.jpg

Wall ID:	GRSM-0010S-20.258-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 5 ft x 11 ft box culvert opening along southbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	185
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; moderate to severe degradation of mortar threatens the long-term performance of the wall	6
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Severely degraded and spalling along approximately 50% of wall	4
STONE MASONRY 8.00	Degradation of mortar has caused moderate debonding	7
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 0.50	No distress	10
DOWNSLOPE 0.50	Riprap lined stream channel	10
UPSLOPE 0.50	No distress; relatively level grassy shoulder	10

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Stone Masonry Repointing - 185 sqft (\$75/sqft) = \$13,875
Repair Cost:	\$13,875

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.258_R_1.jpg

Wall ID:	GRSM-0010S-20.260-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	95	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall constructed along northbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	231
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-25

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance overall	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Wall appears to have been recently repointed	10
STONE MASONRY 8.00	No distress	10
DOWNSLOPE 0.50	No distress; riprap lined channel extends away from wall	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related issues	9
CULVERT 0.50	No distress	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or relatively level grassy shoulder	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.260_L_1.jpg

Wall ID:	GRSM-0010S-20.388-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 40 in diameter CMP culvert with a bitumen lining along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	56
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; minor degradation of mortar	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related distress; minor spalling around the culvert opening	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	Creek bed; minor accumulation of debris at culvert inlet	8
VEGETATION 0.50	Several medium diameter trees within 3 ft of wall along base and top of wall; trees do not appear to be affecting wall performance	8
WALL DRAINS 0.50	No evidence of drainage related distress	8
CULVERT 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 1.13 sqft (\$75/sqft) = \$84.56. Clear Debris from Inlet - 8 labor hrs (\$55/hr) = \$220.
Repair Cost:	\$305

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.388_R_1.jpg

Wall ID:	GRSM-0010S-20.832-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	91	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 36 in diameter concrete culvert constructed along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	22	Face Area (sq.):	50
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Wall appears to have been recently repointed	9
STONE MASONRY 8.00	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No asphalt pavement with no distress; no distress to relatively level grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 0.50	No distress	10
CURB/BERM/DITCH 0.50	No distress to relatively new GM ditch	10
DOWNSLOPE 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.832_R_1.jpg

Wall ID:	GRSM-0010S-20.988-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for an 18 in diameter concrete pipe culvert along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	34
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
STONE MASONRY 8.00	Minor debonding	8
MORTAR 8.00	General age-related distress	9
CULVERT 0.50	18-in diameter concrete pipe culvert	8
DOWNSLOPE 0.50	No distress; moderately vegetated creek channel	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress to gently sloping vegetated slope	9
WALL DRAINS 0.50	No evidence of drainage-related issues	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_20.988_R_1.jpg

Wall ID:	GRSM-0010S-21.015-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 30 in diameter concrete pipe culvert along southbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	36
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation of wall	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
VEGETATION 0.50	Vegetation growing up to and covering portions of wall; routine cutting of vegetation is recommended	8
CULVERT 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Cut vegetation within 3 ft of culvert entrance - 4 labor hrs (\$55/hr) = \$220
Repair Cost:	\$220

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.015_R_1.jpg

Wall ID:	GRSM-0010S-21.071-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 36 in diameter concrete pipe culverts along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	74
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
STONE MASONRY 8.00	Minor debonding	8
MORTAR 8.00	General age-related weathering	9
DOWNSLOPE 0.50	Minor accumulation of sediment at culvert(s) inlet; small vegetation growing within creek bed	8
VEGETATION 0.50	Small vegetation growing within the creek bed	8
CULVERT 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
LATERAL SLOPE 0.50	No distress	10

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clear debris & cut vegetation - 6 labor hrs (\$55/hr) = \$330
Repair Cost:	\$330

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.071_R_1.jpg

Wall ID:	GRSM-0010S-21.256-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 36 in diameter concrete pipe culvert along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	61
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition; small vegetation growing up to face of wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor efflorescence	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	No distress; relatively level to moderate slope; small vegetation growing up to the face of wall	8
LATERAL SLOPE 0.50	Minor erosion at both ends	8
UPSLOPE 0.50	Vegetated slope; possible areas of hummocky terrain scarps	8
VEGETATION 0.50	Small vegetation growing up to the face of wall	8
CULVERT 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.256_R_1.jpg

Wall ID:	GRSM-0010S-21.258-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recently repaired GM outlet headwall for 36 in diameter concrete pipe culvert along northbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	27
Average Wall Height (ft.):	2	Face Angle (deg.):	80
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Recently repointed; minor efflorescence	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor erosion	8
DOWNSLOPE 0.50	No distress; riprap lined creek bed	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010S-21.258-L.

Wall ID:	GRSM-0010S-21.290-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	93	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 60 in diameter concrete pipe culvert along northbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	95
Average Wall Height (ft.):	5	Face Angle (deg.):	80
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	10
MORTAR 8.00	No distress; recently repointed; minor efflorescence	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	No distress; riprap lined creek channel	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10
WALL DRAINS 0.50	No evidence of drainage-related distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.290_L_1.jpg

Wall ID:	GRSM-0010S-21.380-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 60 in diameter CMP culvert with bitumen lining along southbound travel lane of high ADT roadway moderate consequence of failure due to proximity to roadway		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	45
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	60-in. diameter CMP culvert with bitumen lining; minor degradation of lining	8
LATERAL SLOPE 0.50	Minor erosion along north end of wall	8
DOWNSLOPE 0.50	Minor erosion of creek bed	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.380_L_1.jpg

Wall ID:	GRSM-0010S-21.380-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	81	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet head for 60 in diameter CMP culvert with bitumen lining along northbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	74
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; scour hole forming along base of wall threatens the long-term stability of the wall	8
WALL FOUNDATION MATERIAL 8.00	Slight undermining of the foundation; no evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding above the culvert opening (approx. 1/2-in. crack)	8
CULVERT 0.50	Moderate degradation of the bitumen lining; possible root damage	8
DOWNSLOPE 0.50	Small scour hole forming along base of wall	8
VEGETATION 0.50	One large diameter tree along north end of wall; tree does not appear to be affecting the performance of the wall	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; moderately sloping forested slope	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 37.05 sqft (\$75/sqft) = \$2,778.75. Backfill Scour Hole w/ Placed Riprap, Class 1 - 1.11 cuyd (\$80/cuyd) = \$88.89. General Labor - 8 labor hrs (\$55/hr) = \$440.
Repair Cost:	\$3,308

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.380_R_1.jpg

Wall ID:	GRSM-0010S-21.852-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 54 in diameter CMP culverts with a bitumen lining below pull off area along southbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	28	Face Area (sq.):	123
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; general age-related distress	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding due to cracking of mortar	8
CULVERT 0.50	No distress; two 54-in. diameter CMP culverts with bitumen lining; minor degradation of the bitumen lining	8
LATERAL SLOPE 0.50	Minor erosion along both ends of the wall	8
DOWNSLOPE 0.50	No distress; riprap line creek bed	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.852_L_1.jpg

Wall ID:	GRSM-0010S-21.852-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	65	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 54 in diameter CMP culverts with a bitumen lining below pull off area along northbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	136
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition; moderate degradation of mortar	6
WALL FOUNDATION MATERIAL 8.00	Minor undermining of the foundation due to formation of scour hole at culvert outlet	7
MORTAR 8.00	Moderate degradation of mortar; minor cracking and spalling of mortar around the culvert	6
STONE MASONRY 8.00	Moderate debonding around the culvert opening due to cracking of mortar; several loose stones along base of wall	6
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Small scour hole forming along base of wall at outlet	7
UPSLOPE 1.00	Small voids along top of wall	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Stone Masonry Repointing - (135.73 sqft)(\$75/sqft) = \$10,179.8. Remove/Reset Stone Masonry - 6 sqft (\$620/sqft) = \$3, 720. Placed Riprap, Class 1 - 1.67 cuyd (\$80/cuyd0 = \$133.33.
Repair Cost:	\$14,033

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_21.852_R_1.jpg



GRSM_0010S_21.852_R_2.jpg

Wall ID:	GRSM-0010S-22.291-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	98	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 60 in diameter concrete pipe culvert along southbound travel lane of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	94
Average Wall Height (ft.):	4	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 to excellent performance overall	10
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	No distress; recently repointed	10
STONE MASONRY 8.00	No distress	10
DOWNSLOPE 0.50	No distress; riprap lined stream channel	9
CURB/BERM/DITCH 0.50	No distress; newly constructed paved stone masonry ditch	10
LATERAL SLOPE 0.50	No distress	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress; newly repaved	10
WALL DRAINS 0.50	No evidence of drainage-related distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_22.291_R_1.jpg

Wall ID:	GRSM-0010S-22.758-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	76	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 72 in diameter CMP culvert with a bitumen lining along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	17	Face Area (sq.):	57
Average Wall Height (ft.):	3	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 overall performance; requires repointing	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor spalling along the base of wall	7
STONE MASONRY 8.00	Moderate debonding along base of wall	7
CULVERT 0.50	72-in. CMP with bitumen lining; minor degradation of lining	8
VEGETATION 0.50	Small vegetation growing within creek bed and encroaching on wall	8
DOWNSLOPE 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - (57.2 sqft)(0.30) = 17.16 sqft (\$75/sqft) = \$1,287
Repair Cost:	\$1,287

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_22.758_L_1.jpg

Wall ID:	GRSM-0010S-22.758-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 72 in diameter CMP culvert with a bitumen lining along northbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	26	Face Area (sq.):	89
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-13

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; scour hole forming at culvert outlet; small diameter tree growing out of wall	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding; no distress to blocks	8
CULVERT 0.50	72-in. diameter CMP with bitumen lining; minor degradation of lining	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; moderately sloping vegetated slope with several small diameter trees	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Approximate 12-in. deep scour hole forming adjacent to wall; piles of riprap downstream is promoting negative flow	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Remove riprap and cut tree - 4 labor hrs (\$55/hr) = \$220. Backfill Scour Hole with Place Riprap, Class 1 - 7.41 cuyd (\$80/cuyd) = \$592.80
Repair Cost:	\$813

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0010S-22.758-R.

Wall ID:	GRSM-0010S-23.313-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	69	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 60 in diameter concrete pipe culverts with an epoxy lining along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	150
Average Wall Height (ft.):	5	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 overall performance; degradation of mortar threatens the long-term performance of the wall	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	8
MORTAR 8.00	Moderate degradation of mortar; moderate cracking (approx. 1/2-in. to 1-in.); m	5
STONE MASONRY 8.00	General age-related weathering; minor debonding across entire face of wall	7
CURB/BERM/DITCH 0.50	Minor erosion of ditch along north end of wall	8
DOWNSLOPE 0.50	No distress	8
LATERAL SLOPE 0.50	Minor erosion along north end of wall	8
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - (149.5 sqft) (\$75/sqft) = \$11,212.5. Placed Riprap, Class 1 - 2.78 cuyd (\$80/cuyd) = \$222.22
Repair Cost:	\$11,435

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_23.313_R_1.jpg

Wall ID:	GRSM-0010S-23.315-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for two 60 in diameter concrete pipe culverts with an epoxy lining along northbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	137
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; ongoing erosion of soil adjacent to wall	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; recently repointed at culvert/wall interface	8
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	Minor delaminating along at bottom of culvert	8
LATERAL SLOPE 0.50	Minor erosion	8
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Minor erosion of stream bed has exposed approximately 12-in. of footing	7
UPSLOPE 1.00	Moderately sloping vegetated slope; few erosion rills	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Subexcavation - 1.48 cuyd (\$35/cuyd) = \$51.85. Lean Concrete for Energy Dissipater - 1.48 cuyd (\$175/cuyd) = \$259. General Labor - 24 labor hrs (\$55/hr) = \$1, 320.
Repair Cost:	\$1,631

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_23.315_L_1.jpg

Wall ID:	GRSM-0010S-24.112-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	81	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 48 in diameter CMP culvert with a bitumen lining along southbound travel lane of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	32
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; moderately degraded mortar threatens the long-term stability of the wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor to moderate degradation of mortar across entire length of wall	7
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	No distress; 48-in. diameter CMP with a bitumen lining	9
DOWNSLOPE 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress; recently repaved roadway	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (31.7 sqft) (\$75/sqft) = \$2,377.50
Repair Cost:	\$2,378

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_24.112_L_1.jpg

Wall ID:	GRSM-0010S-24.169-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	54	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GD fill wall constructed along eastern bank of river along base of moderate slope supporting high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	240
Average Wall Height (ft.):	6	Face Angle (deg.):	70
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-9

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor performance; wall is progressively failing; requires immediate repair/replacement	4
WALL FOUNDATION MATERIAL 8.00	Founded on river bed material with a moderate to high scour potential; evidence of ongoing scour; no evidence of wall settlement or rotation about the foundation	6
PLACED STONE 8.00	Mossy, randomly stacked; some blocks are fractured; some large voids; southern 15 ft of wall has collapsed	5
WALL DRAINS 0.50	Wall is self-draining; no evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress; roadway recently repaved	10
LATERAL SLOPE 1.00	Moderate to steep rocky embankment fill; evidence of ongoing minor to moderate erosion	6
DOWNSLOPE 1.00	River bed; evidence of ongoing erosion of foundation material	7
UPSLOPE 1.00	Moderately sloping, well vegetated slope; many erosion rills within slope	7
VEGETATION 1.00	Stone at end of wall have unraveled and are being held in place by a large diameter tree	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Remove and Reset Stone (GD wall) - 264 sqft (\$620/sqft) = \$163,680. Clearing and Grubbing - 240 sqyd (\$5/sqyd) = \$1,200. Embankment Construction - 1, 041.67 cuyd (\$40/cuyd) = \$41,666.70. Furnishing/Placing Topsoil - 27.78 sqyd (\$10/sqy.
Repair Cost:	\$206,880

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_24.169_L_1.jpg

Wall ID:	GRSM-0010S-24.329-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	80	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:	GM fill wall along northbound travel lane directly supports high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	206	Face Area (sq.):	2375
Average Wall Height (ft.):	11	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; small diameter trees growing from face of wall threaten long-term performance of the wall	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation; appears wall is constructed on concrete footing	8
MORTAR 8.00	General age-related weathering; minor spalling	8
STONE MASONRY 8.00	Minor bulging at locations where small diameter trees are growing from face of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8
CULVERT 0.50	No distress; 18-in. diameter CMP culvert	9
DOWNSLOPE 0.50	No distress; river channel	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress; weep holes spaced along base of wall; all weep holes appear to be functional	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove Vegetation from Face of Wall - 6 labor hrs (\$55/hr) = \$330 - \$200 material costs
Repair Cost:	\$530

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_24.329_L_1.jpg

Wall ID:	GRSM-0010S-25.768-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	76	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall constructed along western bank of river wall directly supports high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	588	Face Area (sq.):	4568
Average Wall Height (ft.):	7	Face Angle (deg.):	80
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; localized undermining of foundation	7
WALL FOUNDATION MATERIAL 8.00	Ongoing foundation undermining at two isolated locations along wall; no evidence of settlement or rotation	7
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding; some small bushes growing from face of wall	8
VEGETATION 0.50	Small brush growing from face of wall at several locations	8
DOWNSLOPE 0.50	River channel; ongoing foundation undermining at two isolated locations along wall	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 1.00	Minor transverse and alligator cracking of pavement; pavement occasionally pitted	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Temporary Water Diversion - 60 labor hrs (\$55/hr) = \$3,300. Lean Concrete Backfill - 20 labor hrs (\$55/hr) = \$1,100, 16.11 cuyd (\$175/cuyd) = \$2,819.44
Repair Cost:	\$7,419

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_25.768_L_1.jpg



GRSM_0010S_25.768_L_2.jpg

Wall ID:	GRSM-0010S-27.687-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 8 ft x 9.5 ft box culvert culvert serves as horse passage under high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	350
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor degradation of mortar; minor spalling along base of wall	8
STONE MASONRY 8.00	Minor debonding along base of wall	8
DOWNSLOPE 0.50	No distress; relatively flat ground and creek bed	8
LATERAL SLOPE 0.50	No distress	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8
CULVERT 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	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.

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_27.687_L_1.jpg

Wall ID:	GRSM-0010S-27.687-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 8 ft x 9.5 ft box culvert culvert serves as horse passage under high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	52	Face Area (sq.):	352
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation	9
MORTAR 8.00	General age-related distress; evidence of recent selective repointing	8
STONE MASONRY 8.00	Minor debonding; no distress to blocks	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	No distress; relatively level ground and creek channel	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	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.

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_27.687_R_1.jpg

Wall ID:	GRSM-0010S-28.175-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 15, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall along western river back constructed along northbound travel lane of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	315	Face Area (sq.):	2520
Average Wall Height (ft.):	8	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 overall; minor mortar degradation along base of wall; small brush growing along face and adjacent to base of wall	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Moderate degradation of mortar along the bottom 3 ft of wall	7
STONE MASONRY 8.00	Wall is almost entirely covered with moss; minor debonding	8
CULVERT 0.50	No distress; two 18-in. diameter culverts	8
DOWNSLOPE 0.50	Minor scouring along the southern 155 ft of wall	8
LATERAL SLOPE 0.50	Minor erosion along southern end of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8
VEGETATION 0.50	Small brush growing along face and adjacent to base of wall	8

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (3 ft) (155 ft) (\$75 sqft) = \$34,875. Remove Vegetation from Wall - 16 labor hrs (\$55/hr) = \$880, \$200 material cost
Repair Cost:	\$35,955

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_28.175_L_1.jpg

Wall ID:	GRSM-0010S-29.851-R		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 3 ft x 6 ft box culvert along southbound travel lane of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	64
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 performance; minor cracking and debonding	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor to moderate cracking along outboard wheel line	8
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_29.851_R_1.jpg

Wall ID:	GRSM-0010S-29.852-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 3 ft x 6 ft box culvert along northbound travel lane of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	63
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor to moderate cracking of the pavement	8
CULVERT 0.50	No distress	9
DOWNSLOPE 0.50	No distress	9
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	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.

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_29.852_L_1.jpg

Wall ID:	GRSM-0010S-29.922-L		
Route Name:	NEWFOUND GAP ROAD SOUTH		
Inspection Date:	June 16, 2007	Approximate Year Built:	1938
*Wall Rating:	80	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:	GM fill wall along northbound travel lane of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	60	Face Area (sq.):	266
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; minor debonding	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding; wall is almost entirely covered with moss	8
CULVERT 0.50	No distress; two 18-in. diameter culverts	8
CURB/BERM/DITCH 0.50	Minor erosion of ditch along north end of wall	8
DOWNSLOPE 0.50	Steep vegetated slope; minor raveling	8
LATERAL SLOPE 0.50	Minor erosion	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove vegetation from wall - 8 labor hrs (\$55/hr) = \$440 - \$200 material cost
Repair Cost:	\$640

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

Great Smoky Mountains National Park

ROUTE 0010S: NEWFOUND GAP ROAD SOUTH

Retaining Wall Condition Photos



GRSM_0010S_29.922_L_1.jpg

Wall ID:	GRSM-0011N-0.259-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	92	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall at toe of slope. Immediately adjacent to right side of bypass (Rt 0012) on-ramp to Rt 0011N.		

Wall Measurements

Wall Length (ft.):	204	Face Area (sq.):	1518
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-24

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Paved ditch along bypass on-ramp	9
MORTAR 8.00	Very light debonding (less than 5%).	9
STONE MASONRY 8.00	Like new	10
LATERAL SLOPE 0.50	Stable embankment end, bridge start. No distress	9
UPSLOPE 0.50	Stable embankment, no distress	9
WALL DRAINS 0.50	none visible, no distress	9
DOWNSLOPE 0.50	Road (Gatlinburg Bypass, rt 0012), no distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-0.259-L.

Wall ID:	GRSM-0011N-0.349-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	93	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone fill wall. Guardwall on both ends. Wall starts near end of northbound access ramp from the Gatlinburg Bypass (rt 0012).		

Wall Measurements

Wall Length (ft.):	547	Face Area (sq.):	3840
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	As intended, like new	9
WALL FOUNDATION MATERIAL 8.00	Steep (37 deg), stable soil, no bench, no distress	9
MORTAR 8.00	V. slight debonding, otherwise no distress	9
STONE MASONRY 8.00	No distress, like new	10
DOWNSLOPE 0.50	Steep (37deg), well vegetated, stable. About 80ft SD to River. No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
LATERAL SLOPE 0.50	Guardwalls, no distress	10
WALL DRAINS 0.50	4 inch PE pipe toe drains below wall, no distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-0.349-L.

Wall ID:	GRSM-0011N-0.727-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet for 6 ft x 6 ft cip box culvert		

Wall Measurements

Wall Length (ft.):	32	Face Area (sq.):	176
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable stream channel, no distress	9
MORTAR 8.00	Superficial cracking	8
STONE MASONRY 8.00	No distress	10
DOWNSLOPE 0.50	Stable stream channel	9
LATERAL SLOPE 0.50	Stable road embankment	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	3" drains in side of 6x6 box, no distress	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-0.727-L.

Wall ID:	GRSM-0011N-0.728-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet for 6 ft x 6 ft cip box culvert		

Wall Measurements

Wall Length (ft.):	32	Face Area (sq.):	137
Average Wall Height (ft.):	4	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	8
WALL FOUNDATION MATERIAL 8.00	Undermined .5' at outlet, erosion at outlet, stable stream channel	7
MORTAR 8.00	Light debonding	8
STONE MASONRY 8.00	No distress	10
DOWNSLOPE 0.50	Stream channel ~75' to river, slightly eroded	8
LATERAL SLOPE 0.50	Stable steep embankment	9
WALL DRAINS 0.50	3" drains on inside of pipe	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-0.728-R.

Wall ID:	GRSM-0011N-1.485-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet, twin 6 ft x 6 ft box culvert		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	162
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-15

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable stream bed	9
MORTAR 8.00	Slight weathering	8
PLACED STONE 8.00	No distress	9
DOWNSLOPE 0.50	Stable stream channel, ~75' to river	9
LATERAL SLOPE 0.50	Stable road fill	9
UPSLOPE 0.50	Steep 37 degrees, stable, well vegetated	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-1.485-R.

Wall ID:	GRSM-0011N-1.487-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet, 6 ft x 6 ft double box culvert		

Wall Measurements

Wall Length (ft.):	28	Face Area (sq.):	132
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-11

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable streambed to 3'- stones, no distress	9
MORTAR 8.00	No distress	9
PLACED STONE 8.00	No distress	9
LATERAL SLOPE 0.50	Rock at UW, stable embankment, no distress	9
UPSLOPE 0.50	Stable vegetated fill slope	9
WALL DRAINS 0.50	3" drains on inside of culvert pipe 8' from opening	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-1.487-L.

Wall ID:	GRSM-0011N-1.696-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet twin 3 ft diameter concrete pipes		

Wall Measurements

Wall Length (ft.):	22	Face Area (sq.):	88
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-16

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable stream channel	9
MORTAR 8.00	Slightly weathered	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Steep stream channel upgrade	9
LATERAL SLOPE 0.50	Stable road fill	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-1.696-L.

Wall ID:	GRSM-0011N-1.696-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet, double 3 ft diameter culvert		

Wall Measurements

Wall Length (ft.):	19	Face Area (sq.):	44
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable dry stream channel, angular 3'-	9
MORTAR 8.00	Debonding and cracking at top of wall	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable stream channel, 2h:1v, ~50' to river	9
LATERAL SLOPE 0.50	Stable fill	9
UPSLOPE 0.50	Stable road fill	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-1.696-R.

Wall ID:	GRSM-0011N-2.675-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 6 ft diameter concrete pipe		

Wall Measurements

Wall Length (ft.):	26	Face Area (sq.):	129
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Mortared stone and stable soil	9
MORTAR 8.00	Slight cracking at top of wall	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Stable road fill, well vegetated	9
UPSLOPE 0.50	Stable 30 degree fill, well vegetated	9
WALL DRAINS 0.50	No distress	9
DOWNSLOPE 1.00	Stable stream channel w/ energy dissipater mortared stone; undermined ~7'x6" high x 1' deep at outer lip	7

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-2.675-L.

Wall ID:	GRSM-0011N-2.676-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Inlet 6 ft diameter pvc pipe		

Wall Measurements

Wall Length (ft.):	22	Face Area (sq.):	97
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Stable stream channel, 2'- angular stones and soil	9
MORTAR 8.00	No distress	9
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable stream channel, ~15% up-grade, no distress	9
LATERAL SLOPE 0.50	Stable fill, well vegetated, no distress	9
UPSLOPE 0.50	Stable fill, well vegetated, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-2.676-R.

Wall ID:	GRSM-0011N-3.034-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Twin 9 ft x 8 ft box culvert inlet		

Wall Measurements

Wall Length (ft.):	59	Face Area (sq.):	357
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-11

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Stable stream channel, 3'- angular rock	9
MORTAR 8.00	Weathering, slight debonding	7
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable stream channel	9
LATERAL SLOPE 0.50	Stable embankment, vegetated	9
UPSLOPE 0.50	Stable, well vegetated road fill, ~30 degrees	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.034-R.

Wall ID:	GRSM-0011N-3.035-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	59	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet, twin 9 ft x 8 ft box culvert		

Wall Measurements

Wall Length (ft.):	56	Face Area (sq.):	446
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-14

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to poor	6
WALL FOUNDATION MATERIAL 8.00	Stone foundation under R. portal undermined, upper stones missing, mortar ~50% failed; remaining foundation good	5
MORTAR 8.00	Light debonding from most of wall, ~50-60% mortar loss from stones below R. portal, full height crack on right side of R. portal	6
STONE MASONRY 8.00	9' high 2-4" wide vertical crack through stones on Right side of R. portal, otherwise no distress	6
LATERAL SLOPE 0.50	Stable fill	9
UPSLOPE 0.50	~33 degrees stable fill	9
WALL DRAINS 0.50	3" drains in side of box 10' behind wall face	9
DOWNSLOPE 1.00	Stream channel eroded tail water pool ~3' deep, 20' to river	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repair foundation below rt box façade: 10'x3' = 30sf. Remove and salvage existing stones - no unit cost in cost guide - Use \$100/sf. 30sf x \$100 = \$3000. Rebuild GM wall/façade: 30sf x \$160/sf = \$4800. Place riprap at outlet/façade toe: 2cy x Class 4@\$120/.
Repair Cost:	\$11,600

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

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.035-L.

Wall ID:	GRSM-0011N-3.624-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	10 ft x 10 ft cip box inlet		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	198
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Firm silt, stable stream channel	9
MORTAR 8.00	.25" crack in Left side ~10' long, slight weathering	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable channel probable mortared stone pad ~20' up-channel from invert	9
LATERAL SLOPE 0.50	Stable road fill	9
WALL DRAINS 0.50	Weeps in box ~10' behind portal, no distress	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.624-R.

Wall ID:	GRSM-0011N-3.627-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	10 ft x 10 ft cip outlet		

Wall Measurements

Wall Length (ft.):	46	Face Area (sq.):	480
Average Wall Height (ft.):	10	Face Angle (deg.):	90
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Soil and mortared riprap channel, slight mortar loss at foundation	8
MORTAR 8.00	Slight weathering	8
PLACED STONE 8.00	No distress	9
LATERAL SLOPE 0.50	Stable road embankment	9
WALL DRAINS 0.50	Weeps in box, no distress	9
DOWNSLOPE 1.00	Stable channel, ~20' mortared stone riprap 4'-, downstream end ~5' failed, numerous voids, ~40% mortar loss	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.627-L.

Wall ID:	GRSM-0011N-3.880-L		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	4 ft diameter concrete pipe		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	58
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Dry stream, stable	9
MORTAR 8.00	Slight weathering, debonding	8
PLACED STONE 8.00	No distress	9
DOWNSLOPE 0.50	Stable stream channel	9
LATERAL SLOPE 0.50	Stable embankment	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.880-L.

Wall ID:	GRSM-0011N-3.880-R		
Route Name:	GATLINBURG SPUR ROAD (NORTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 4 ft diameter pipe		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	74
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	9
WALL FOUNDATION MATERIAL 8.00	Firm soil and stone	9
MORTAR 8.00	Slight weathering, debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Stable dry channel	9
LATERAL SLOPE 0.50	Stable embankment	9
UPSLOPE 0.50	Stable slope, well vegetated	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park
ROUTE 0011N: GATLINBURG SPUR ROAD (NORTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011N-3.880-R.

Wall ID:	GRSM-0011S-0.043-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 24 in diameter CMP culvert constructed within slope supporting a high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	29
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; minor erosion of lateral slope	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related distress	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor ongoing erosion of vegetated moderate slope; erosion does not compromise performance or stability of the wall	8
CULVERT 0.50	24-in. diameter CMP with bitumen lining; minor degradation of the lining	9
DOWNSLOPE 0.50	No distress; moderate to steep vegetated slope	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
UPSLOPE 0.50	No distress; moderately sloping grassy shoulder	10

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.043_L_1.jpg

Wall ID:	GRSM-0011S-0.180-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 10 ft x 10 ft box culvert constructed along eastern shoulder of high ADT roadway high consequence of failure due to size and proximity to the roadway		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	385
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; debonding of masonry across approximately 30% of wall; scour hole at outlet causing foundation undermining	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation; minor undermining due to scour hole	7
STONE MASONRY 8.00	Moderate debonding across approximately 30% of wall	7
MORTAR 8.00	General age-related distress; minor efflorescence	8
WALL DRAINS 0.50	No evidence of drainage-related distress; efflorescence may be evidence of weeping through wall	8
CULVERT 0.50	No distress; 10 ft square concrete box culvert	9
DOWNSLOPE 1.00	Scour hole forming at outlet and extending approximately 25 ft from face of wall; ongoing foundation undermining due to scour hole	6
LATERAL SLOPE 1.00	Minor creek/raveling of soils at both ends of wall	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (385 sqft)(0.30)(\$75/sqft) = \$8,662.5. Lean Concrete Backfill - 1.85 cuyd (\$175/cuyd) = \$324.07. Placed Riprap, Class 1 - 14.81 cuyd (\$80/cuyd) = \$1, 184.80.
Repair Cost:	\$10,171

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.180_L_1.jpg

Wall ID:	GRSM-0011S-0.183-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	79	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 10 ft x 10 ft box culvert constructed along west shoulder of high ADT roadway high consequence of failure due to size and proximity to the roadway		

Wall Measurements

Wall Length (ft.):	52	Face Area (sq.):	306
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor ongoing scour of foundation soil along left side of culvert opening	7
WALL FOUNDATION MATERIAL 8.00	Minor ongoing erosion of soil at left side of inlet; no evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding; no distress to blocks	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no distress to shoulder	8
CULVERT 0.50	No distress; 11 ft square concrete box culvert	9
DOWNSLOPE 0.50	No distress; relatively flat stream channel	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
LATERAL SLOPE 0.50	No distress	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Lean Concrete Backfill - 0.185 cuyd (\$175/cuyd) = \$32.41 - 8 labor hrs (\$55/hr) = \$440
Repair Cost:	\$472

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.183_R_1.jpg

Wall ID:	GRSM-0011S-0.190-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	79	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 24 in diameter CMP along east shoulder of high ADT roadway moderate to high consequence of failure due to proximity to roadway		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	24
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; cracked and spalled mortar; minor distress to crown block	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Moderate degradation with some spalling	7
STONE MASONRY 8.00	Minor cracking of crown block; minor debonding	8
CULVERT 0.50	No distress; 24-in. diameter CMP	9
DOWNSLOPE 0.50	No distress; moderate slope	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
LATERAL SLOPE 0.50	No distress	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (23.62 sqft)(0.50)(\$75/sqft) = \$885.75
Repair Cost:	\$886

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.190_L_1.jpg

Wall ID:	GRSM-0011S-0.460-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 24 in diameter bitumen lined CMP constructed along east shoulder of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	39
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor erosion of upslope and lateral slope	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; some recent repointing	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to pavement; minor raveling of shoulder	8
UPSLOPE 0.50	Minor erosion of slope as evidenced by erosion rills	8
CULVERT 0.50	24-in.diameter CMP with a bitumen lining; minor degradation of lining	9
DOWNSLOPE 0.50	No distress; relatively flat to moderate slope	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.

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.460_L_1.jpg

Wall ID:	GRSM-0011S-0.610-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	75	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 24 in diameter CMP culvert constructed along west shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	40
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; moderate debonding and spalled concrete; culvert inlet is clogged with leaves	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Moderate to severely degraded with some spalling	7
STONE MASONRY 8.00	Moderate debonding; no distress to blocks	7
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no distress to moderately shoulder	8
DOWNSLOPE 0.50	No distress; Steep vegetated hillside sloping towards wall	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 1.00	24-in. diameter CMP; minor rusting along invert; inlet is clogged with leaves	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - (40 sqft)(0.40)(\$75/sqft) = \$1,500. Clear Debris from Inlet - 6 Labor hrs (\$55/hr) = \$330.
Repair Cost:	\$1,830

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.610_R_1.jpg

Wall ID:	GRSM-0011S-0.905-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	66	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 72 in diameter bitumen-lined CMP constructed along east shoulder of high ADT roadway high consequence of failure due to size		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	135
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; wall is in fair condition with major cracking along top half of wall possible due to settlement	7
WALL FOUNDATION MATERIAL 8.00	Uniform settlement of wall has caused some major cracking; it's possible that saturation of foundation soils led to settlement; wall currently appears to be stable and not to be undergoing any further settlement	6
MORTAR 8.00	Up to 1/2-in cracks through mortar along top half of wall; cracking has caused moderate debonding	6
STONE MASONRY 8.00	Major debonding at cracked locations along top half of wall; minor distress of blocks	7
CULVERT 0.50	72-in. diameter bitumen lined CMP; moderate degradation of lining has resulted in minor rusting long invert	8
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
WALL DRAINS 0.50	No evidence of drainage-related distress; however, it's possible that seepage under wall resulted in settlement	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (135 sqft)(0.5)(\$75/cuyd) = \$5,062.5. Placed Riprap, Class 1 - 4.81 cuyd (\$80/cuyd) = \$385.18
Repair Cost:	\$5,448

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.905_L_1.jpg

Wall ID:	GRSM-0011S-0.905-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	69	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 72 in diameter bitumen lined CMP culvert constructed along west shoulder of high ADT roadway high consequence of failure due to size		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	102
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; annulus between culvert and headwall resulting in water intrusion behind the wall and possible erosion of backfill material; moderate degradation of lining resulting in minor rusting of invert; debonding across 20% of wall	7
WALL FOUNDATION MATERIAL 8.00	Evidence of minor settlement of wall; suspected undermining of foundation due to scour	7
MORTAR 8.00	Some spalled mortar at culvert/wall interface; spalling has created an annulus that water is flowing through	6
STONE MASONRY 8.00	Moderate debonding of 20% of wall	7
DOWNSLOPE 0.50	Creek bed; minor scour along face of wall at culvert outlet	8
UPSLOPE 0.50	Minor raveling of soil; moderate to steeply sloping, well-vegetated slope	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 1.00	72-in. diameter CMP with bitumen lining; moderate degradation of lining along invert; minor rusting of invert	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (102 sqft)(0.2)(\$75/sqft) = \$1,530 + add 20% to repoint annulus = \$1,836. Temporary Water Diversion - 20 lnft (\$50/lnft) = \$1,000, 32 labor hrs (\$55/hr) = \$1,980.
Repair Cost:	\$4,816

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_0.905_R_1.jpg

Wall ID:	GRSM-0011S-1.190-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	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:	GM fill wall constructed at base of moderate slope supporting a high ADT roadway high consequence of failure due to proximity to roadway		

Wall Measurements

Wall Length (ft.):	140	Face Area (sq.):	915
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor cracking of mortar resulting in minor debonding; medium diameter trees atop and along base of wall threaten wall's long-term stability	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or distress	9
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding resulting from cracked mortar	8
LATERAL SLOPE 0.50	Minor erosion along north end of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no distress to shoulder	8
VEGETATION 0.50	Several medium diameter trees growing atop wall and within 3 ft along base; currently trees are not causing any distress to wall, but may affect long-term stability	8
WALL DRAINS 0.50	No observed drainage-related distress; no drains visible along base of wall	8
DOWNSLOPE 0.50	No distress; relatively flat to moderate slope leading to river	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (0.15)(915sqft (\$75/sqft) = \$10,293.80. Cut tree along base - 1 tree (\$955/tree) = \$955
Repair Cost:	\$11,249

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.190_L_1.jpg

Wall ID:	GRSM-0011S-1.362-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	79	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 24 in diameter CMP culvert constructed adjacent to river and at base of moderate slope along east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	46
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-13

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance of wall; however, ongoing erosion of lateral slope and upslope threatens the long-term stability of wall	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor cracking	8
STONE MASONRY 8.00	Minor debonding, mostly resulting from cracking of mortar	8
CULVERT 0.50	No distress; 24-in. diameter CMP	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
LATERAL SLOPE 1.00	Severe erosion along north end of wall; moderate erosion along south end	6
DOWNSLOPE 1.00	Ongoing erosion, mostly due to high water action	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - $(0.20)(45.75 \text{ sqft})(\$75/\text{sqft}) = \$686.25$. Construct GD wall adjacent to HW at north end - $9 \text{ ft} \times 5 \text{ ft} = 45 \text{ sqft}$ $(\$50 \text{ sqft}) = \$2,250$. Embankment Construction - 12.96 cuyd $(\$40/\text{cu yd}) = \518.52 . Clearing and Grubbing
Repair Cost:	\$3,505

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.362_L_1.jpg

Wall ID:	GRSM-0011S-1.416-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	73	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:	GM fill wall constructed along west bank of river and along east shoulder of high ADT roadway base of wall is submerged below the river high consequence of failure due to size and proximity to roadway		

Wall Measurements

Wall Length (ft.):	265	Face Area (sq.):	3092
Average Wall Height (ft.):	11	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; moderate weathering along base of wall resulting in minor to moderate debonding	7
WALL FOUNDATION MATERIAL 8.00	Wall's foundation is submerged; no evidence of settlement or rotation	9
MORTAR 8.00	Moderate weathering along bottom 2 ft of wall; minor cracking along joints	6
STONE MASONRY 8.00	Moderate debonding resulting from cracking of mortar	7
DOWNSLOPE 0.50	River channel; action of river is causing degradation of mortar along base of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	No distress; relatively flat to moderately slope grassy slope	9
WALL DRAINS 0.50	No evidence of drainage related distress; weep holes infrequently spaced along base of wall; weep holes all appear to be functional	9
LATERAL SLOPE 1.00	Minor erosion of slope along both ends of wall	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (2 ft)(265ft)(\$75 sqft) = \$39,750
Repair Cost:	\$39,750

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.416_L_1.jpg

Wall ID:	GRSM-0011S-1.580-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 30 in diameter CMP constructed within gentle slope supporting a high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	55
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor cracking resulting in minor debonding	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor cracking across face of wall	8
STONE MASONRY 8.00	Minor debonding resulting from cracking of mortar	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no distress to grassy shoulder	8
CULVERT 0.50	No distress; 30-in diameter CMP	9
DOWNSLOPE 0.50	No distress; moderate slope with bedrock outcrop	9
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	9
WALL DRAINS 0.50	No evidence of drainage-related distress	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.

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.580_L_1.jpg

Wall ID:	GRSM-0011S-1.682-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	88	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 30 in diameter CMP culvert constructed along east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	49
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; culvert inlet is clogged with leaves and sediments	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor erosion along both ends of slope	8
CULVERT 0.50	30-in. diameter CMP; inlet is clogged with leaves and sediments	9
DOWNSLOPE 0.50	No distress; moderate vegetated slope leading down to face of wall	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or gently sloping grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clear debris from Culvert Opening - 4 labor hrs (\$55/hr) = \$220
Repair Cost:	\$220

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.682_L_1.jpg

Wall ID:	GRSM-0011S-1.852-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	45	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 70 in diameter bitumen lined CMP constructed along the eastern shoulder of a high ADT roadway and along the west bank of the West Prong Little Pigeon River high consequence of failure		

Wall Measurements

Wall Length (ft.):	26	Face Area (sq.):	156
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor to critical condition; major structural damage to wall with ongoing foundation undermining and scour of lateral slope	3
WALL FOUNDATION MATERIAL 8.00	South half of wall has settled approximately 1-in. resulting in major cracking throughout the wall; major foundation undermining at culvert	5
MORTAR 8.00	Poor condition; moderate degradation with major cracking and major spalling; complete loss of material below the culvert	3
STONE MASONRY 8.00	Fair condition; major debonding and complete loss of integrity below the culvert	5
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no shoulder distress	8
VEGETATION 0.50	Small vines growing along face of wall; small brush growing within 3 ft of wall along the wings	8
DOWNSLOPE 1.00	Scout hole has formed at outlet; downstream is blocked with riprap and debris promoting negative flow; ongoing scour has undermined the foundation and side slope	5
TRAFFIC BARRIER/FENCE 0.50	No distress; steel backed timber guard rail	10
CULVERT 1.00	70-in. diameter CMP with a bitumen lining; major degradation of lining leading to minor to moderate rusting of pipe	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Temporary Water Diversion - 120 lnft (\$50/lnft) = \$7,500. Injection Grouting - 16 sqft (\$105/sqft) = \$4,800. Reset Stone Masonry - 30 sqft (\$620/sqft) = \$18,600. Extend GM Headwall - 100 sqft \$160/sqft) = \$16,000. Placed Riprap, Class
Repair Cost:	\$50,500

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.852_L_1.jpg



GRSM_0011S_1.852_L_2.jpg

Wall ID:	GRSM-0011S-1.852-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 19, 2007	Approximate Year Built:	Unknown
*Wall Rating:	76	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 70 in diameter CMP constructed along east shoulder of high ADT roadway high consequence of failure due to size and proximity to roadway		

Wall Measurements

Wall Length (ft.):	29	Face Area (sq.):	94
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; evidence of past minor settlement; minor cracking and debonding	7
WALL FOUNDATION MATERIAL 8.00	Evidence that wall has undergone minor past settlement; no indication of recent movement; ongoing undermining of foundation along the north end of wall	7
MORTAR 8.00	Minor cracking possibly due to settlement of wall	8
STONE MASONRY 8.00	Minor debonding possibly due to settlement of wall	8
CULVERT 0.50	72-in. diameter CMP; minor rusting along invert; sedimentation at inlet	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Creek bed; scour potential along base of wall	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (0.2)(93.72 sqft)(\$75/sqft) = \$1,405.80. Injection Grouting - 9 sqft (\$105 sqft) = \$945. Temporary Water Diversion - 20 lmf (\$50/lmf) = \$1,000. Clear Debris & General Labor - 48 labor hrs (\$55/hr) = \$2,640
Repair Cost:	\$5,991

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_1.852_R_1.jpg

Wall ID:	GRSM-0011S-2.083-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	75	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 24 in diameter bitumen lined CMP constructed within steep slope along the east shoulder of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	51
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor settlement resulting in minor cracking along mortar joints; ongoing erosion of foundation soil	7
WALL FOUNDATION MATERIAL 8.00	Ongoing erosion at outlet; erosion appears to have resulted in minor settlement of foundation resulting in cracking along mortar joints	7
STONE MASONRY 8.00	Approximate 1/4-in. crack emanating from the crown; crack possibly due to minor settlement of the wall	7
MORTAR 8.00	General age related distress; recently repointed along the wall/culvert interface	9
CULVERT 0.50	24-in. diameter CMP with bitumen lining; minor degradation of lining has resulted in minor rusting	8
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or grassy shoulder	9
DOWNSLOPE 1.00	Steep slope with minor erosion at culvert opening; scour appears to have caused settlement of the wall	7
WALL DRAINS 1.00	No evidence of drainage-related distress	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Stone Masonry Repointing - (5086 sqft)(0.25)(\$75/sqft) = \$953.62. Place riprap, Class 1 - 0.59 cuyd (\$80/cuyd) = \$47.41. General Labor - 8 labor hrs (\$55/hr) = \$440
Repair Cost:	\$1,441

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_2.083_L_1.jpg

Wall ID:	GRSM-0011S-2.132-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 36 in diameter bitumen lined CMP culvert constructed atop steep slope and along east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	65
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent condition; approximately 6-in. of sedimentation has accumulated along invert.	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Minor erosion along north end of wall	8
DOWNSLOPE 0.50	No distress; steep armored slope	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 1.00	36-in. diameter CMP with a bitumen lining; minor degradation of lining; 6-in. of sedimentation along invert	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	General Labor - 8 labor hrs (\$55/hr) = \$440
Repair Cost:	\$440

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_2.132_L_1.jpg

Wall ID:	GRSM-0011S-2.188-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	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:	GM fill wall constructed along west bank of the West Prong Little Pigeon River directly supports high ADT roadway high consequence of failure due to size and proximity to the roadway		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	1708
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; small scour hole forming at the culvert outlet	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation; no observed undermining	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	36-in. diameter CMP with a bitumen lining; towards the southern end of wall; major degradation of lining resulting in moderate rusting along the invert	8
DOWNSLOPE 0.50	Relatively level slope leading to river channel; small scour hole forming at culvert outlet	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of the pavement; no distress to relatively flat shoulder	8
VEGETATION 0.50	Two large diameter trees growing along base of wall; trees not currently affecting performance of the wall; however, their proximity threatens the long-term integrity of the wall and so should be monitored	8
LATERAL SLOPE 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Placed riprap, Class 1 - 0.56 cuyd (\$80/cuyd) = \$44.44. Remove Vegetation from Face - 8 labor hrs (\$55/hr) = \$440, \$200 material cost
Repair Cost:	\$684

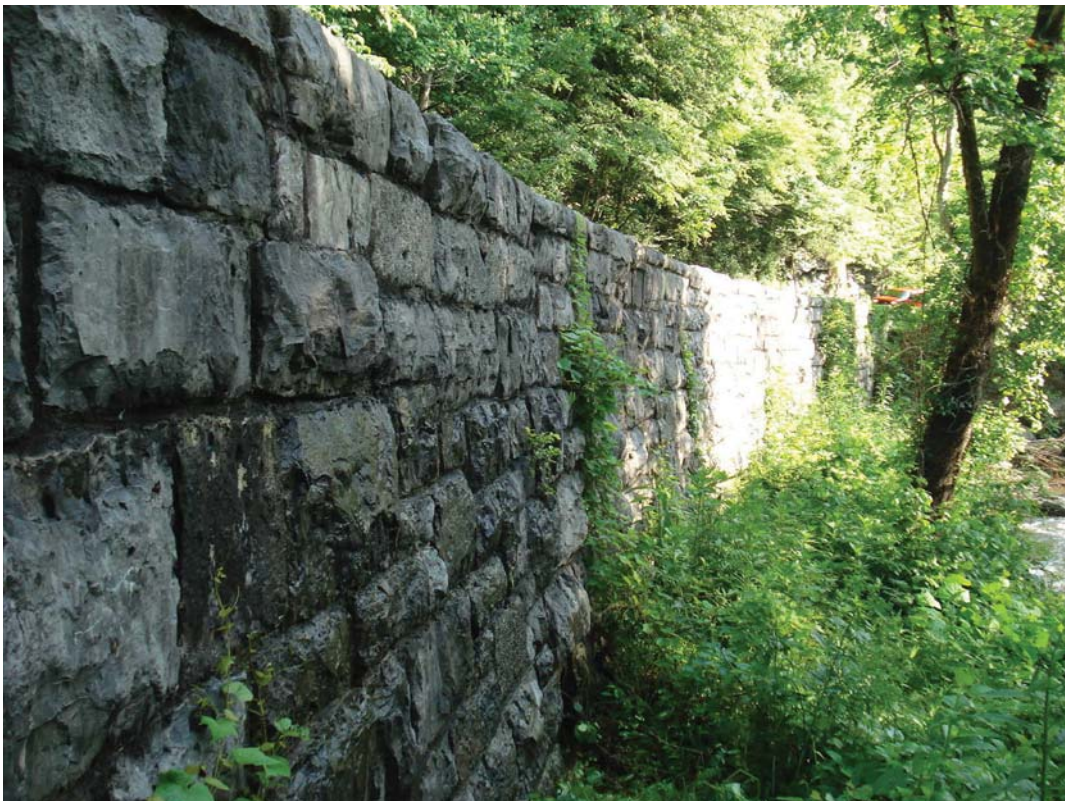
2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_2.188_L_1.jpg



GRSM_0011S_2.188_L_2.jpg

Wall ID:	GRSM-0011S-2.715-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 24 in diameter CMP constructed along east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	12	Face Area (sq.):	36
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; evidence of past settlement resulting in minor cracking of one stone masonry block; small scour hole forming at outfall	7
WALL FOUNDATION MATERIAL 8.00	Cracked stone may indicated past minor settlement; no evidence of ongoing settlement	7
MORTAR 8.00	Loss of mortar around the culvert/wall interface; minor cracking	7
STONE MASONRY 8.00	Vertical crack in crown stone (above opening); approximately 1/16-in. to 1/8-in. wide	7
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
CULVERT 0.50	No distress; 24-in. diameter CMP with a bitumen lining	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or steep grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Small scour hole is forming at outfall	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry repointing - (0.10)(36.25 sqft)(\$75/sqft) = \$271.87. Placed riprap, Class 1 - 0.33 cuyd (\$80/cuyd) = \$26.67. General Labor - 8 labor hrs (\$55/hr) = \$440.
Repair Cost:	\$739

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_2.715_L_1.jpg

Wall ID:	GRSM-0011S-3.020-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for two 36 in diameter concrete pipe culverts constructed along the west shoulder of a high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	41
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-9

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; medium to large diameter trees growing along top of wall threaten the wall's long-term stability; crack above invert	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related distress; one 1/8-in. crack above the right invert	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	Culvert invert is clogged with approximately 1 ft of sediment; culvert's are still performing adequately, but the inverts should be cleaned	8
UPSLOPE 0.50	No distress; moderately sloping forested slope	8
VEGETATION 0.50	Medium to large diameter trees growing immediately along the top of wall; trees are not currently affecting wall performance, but may affect the long-term stability of wall	8
DOWNSLOPE 0.50	No distress; flat stable stream channel	9
LATERAL SLOPE 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0011S-3.020-L.

Wall ID:	GRSM-0011S-3.072-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM headwall for 30 in diameter CMP culvert constructed along west shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	46
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; culvert's inlet is clogged with leaves	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	30-in. diameter CMP; inlet is clogged with leaves	8
DOWNSLOPE 0.50	No distress; steep vegetated slope leading down to culvert inlet	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or relatively flat grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.072_R_1.jpg

Wall ID:	GRSM-0011S-3.337-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for two 30 in diameter concrete pipe culverts constructed along west shoulder of high ADT roadway and at entrance to the Gatlinburg Visitor Center moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	56
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance of wall; minor cracking and debonding; moderate erosion of ditch; debris at culvert inlet is impeding flow	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering with minor cracking	8
STONE MASONRY 8.00	Minor debonding; no distress to blocks	8
CULVERT 0.50	No distress; two 30-in. diameter concrete pipe culverts; debris at inlet is impeding flow	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement; no distress to relatively level grassy shoulder	8
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CURB/BERM/DITCH 1.00	Unlined ditch is moderately scoured; requires a riprap energy dissipater to arrest ongoing erosion	7
DOWNSLOPE 1.00	Loose riprap and sediment has accumulated along face of wall and at culvert inlet and is impeding flow	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - (55.87 sqft)(0.40)(\$75/sqft) = \$1,676.10. Remove Debris from Inlet - 4 labor hrs (\$55/hr) = \$220. Placed riprap, Class 1 - 1.48 cuyd (\$80/cuyd) = \$118.52.
Repair Cost:	\$2,015

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.337_L_1.jpg

Wall ID:	GRSM-0011S-3.340-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	69	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for two 30 in diameter concrete culverts constructed along east shoulder of high ADT roadway high consequence of failure due to size and proximity to roadway		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	62
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; evidence of past minor settlement; minor cracking across face of wall; evidence that water is weeping through wall	7
WALL FOUNDATION MATERIAL 8.00	Cracking along face of wall may be evidence of past minor settlement; no evidence of ongoing settlement	7
MORTAR 8.00	General age-related weathering; minor cracking across face (1/8-in. to 1/4-in.)	6
STONE MASONRY 8.00	Minor debonding as a result of cracking	7
CULVERT 0.50	No distress; two 30-in. diameter concrete pipe culverts	9
DOWNSLOPE 0.50	No distress; recently armored with riprap at the outlet	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or grassy shoulder	9
WALL DRAINS 1.00	Evidence that water is weeping through mortar	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - 10 sqft (\$75/sqft) = \$750
Repair Cost:	\$750

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.340_L_1.jpg

Wall ID:	GRSM-0011S-3.520-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 72 in diameter bitumen lined CMP culvert for creek constructed along west bank of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	115
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition; minor debonding and spalling of mortar along base of wall; minor rusting of culvert invert	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor spalling of mortar along base of wall	8
STONE MASONRY 8.00	Minor debonding along base of wall	8
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
DOWNSLOPE 0.50	No distress; cobbled creek bed	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
CULVERT 1.00	72-in. diameter CMP with a bitumen lining; minor degradation of lining resulting in minor rusting along invert	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 20 sqft (\$75/sqft) = \$1,500
Repair Cost:	\$1,500

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.520_L_1.jpg

Wall ID:	GRSM-0011S-3.520-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	84	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 72 in diameter bitumen lined CMP culvert Constructed along east shoulder of high ADT roadway high consequence of failure due to size and proximity to roadway		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	96
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; scour hole encroaching on wall; ongoing scour of foundation material	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	72-in. diameter CMP with bitumen lining; minor degradation of lining resulting in minor rusting along the invert	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	No distress to steep lightly vegetated slope	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Placed riprap, Class 1 - 4.33 cuyd (\$80/cuyd) = \$346.67. Remove Riprap downstream - 4 labor hrs (\$55/hr) = \$220. Cut Trees - 3 trees (\$955/tree) = \$2,865
Repair Cost:	\$3,432

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.520_R_1.jpg

Wall ID:	GRSM-0011S-3.652-L		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	78	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 72 in diameter bitumen lined CMP constructed along west shoulder of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	91
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; debonding between culvert and headwall; moderate degradation of lining and moderate rusting	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Voids in mortar around culvert	7
STONE MASONRY 8.00	Minor debonding	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or relatively flat grassy shoulder	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 0.50	No distress; cobbled creek bed	10
TRAFFIC BARRIER/FENCE 0.50	No distress; steel backed timber guard rail	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Temporary Water Diversion - 80 lnft (\$50/lnft) = \$4,000, 8 labor hrs (\$55/hr) = \$440. Stone Masonry Repointing - (0.30)(90.86 sqft)(\$75/sqft) = \$2,044.35.
Repair Cost:	\$6,484

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.652_L_1.jpg

Wall ID:	GRSM-0011S-3.652-R		
Route Name:	GATLINBURG SPUR ROAD (SOUTHBOUND)		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	75	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for 72 in diameter bitumen lined CMP constructed along east shoulder of high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	91
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; scour hole threatens near-term stability of the wall; trees atop wall threatens long-term stability of wall; 1/4-in. annulus between culvert and headwall	6
WALL FOUNDATION MATERIAL 8.00	Soil is pulling away from wall due to downslope erosion	8
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	Ongoing erosion of material emanating from outfall out approximately 70 ft; continued erosion will result in foundation undermining and possible settlement of wall	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (0.20)(90.8sqft)(\$75/sqft) = \$1,362. Grout rocks at entrance - 3 sqft (?4160/sqft) = \$480. Placed riprap, Class 1 - 7.41 cuyd (%80/cuyd) = \$592.59. Cut Trees - 4 trees (\$955/tree) = \$3,820.
Repair Cost:	\$6,225

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

Great Smoky Mountains National Park
ROUTE 0011S: GATLINBURG SPUR ROAD (SOUTHBOUND)

Retaining Wall Condition Photos



GRSM_0011S_3.652_R_1.jpg

Wall ID:	GRSM-0012ZZ-0.195-L		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	57	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 6 ft x 8 ft box culvert and an 18 in diameter CMP culvert constructed within moderately sloping embankment supporting seasonally high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	222
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good performance of wall; seepage, scour hole, foundation undermining and obstructed culvert all significantly compromise the near-term stability of the wall	3
WALL FOUNDATION MATERIAL 8.00	Significant undermining on either side of the box culvert; undermining likely due to scour hole adjacent to wall and the large quantity of water seeping from below the wall	5
MORTAR 8.00	Moderate cracking along base of wall; it's likely that cracking is direct result of foundation undermining	7
STONE MASONRY 8.00	Minor to moderate debonding adjacent to culvert; one loose block below 18-in. culvert	7
DOWNSLOPE 1.00	Large scour hole has formed at outfall; ongoing bank erosion and undermining of foundation	4
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
UPSLOPE 0.50	No evidence of distress; moderately sloping forested slope	9
TRAFFIC BARRIER/FENCE 0.50	No distress; steel backed timber guardrail	10
CULVERT 1.00	No distress to box culvert; 18-in. diameter CMP is crushed and obstructed by a boulder approximately 12 ft behind the wall; culvert is still functioning but at a much reduced capacity	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Temporary Water Diversion - 180 lft (\$50/lft) = \$9,000. Replace 18-in. diameter culvert -Remove/Reset Stone Masonry = 96.5 sqft (\$620/sqft) = \$59,830, Structural Excavation = 16 cuyd (\$40/cuyd) = \$640, replace with 24-in. diameter
Repair Cost:	\$86,260

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_0.195_L_1.JPG



GRSM_0012ZZ_0.195_L_2.JPG

Wall ID:	GRSM-0012ZZ-0.201-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	67	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for single 6 ft x 8 ft box culvert constructed along base of moderately sloping fill embankment supporting seasonally high ADT roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	28	Face Area (sq.):	114
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance; however, there is a significant quantity of water flowing directly below the foundation; investigation is required to determine source of water and to determine the require repair alternative.	5
WALL FOUNDATION MATERIAL 8.00	A significant quantity of water is seeping below the wall and possible causing undermining; no evidence of settlement or rotation	6
MORTAR 8.00	Minor to moderate spalling along base of wall	7
STONE MASONRY 8.00	Minor debonding	8
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
WALL DRAINS 0.50	Significant quantity of water is seeping below the foundation; however, there's no evidence of drainage-related distress	8
CULVERT 0.50	No distress; 6 ft x 8 ft box culvert	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
UPSLOPE 0.50	No distress; moderately sloping lightly forested embankment slope	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Temporary Water Diversion - 100 lft (\$50/lft) = \$5,000. Injection Grouting - 36 sqft (\$105 sqft) = \$3,750. Construct Concrete Cutoff Wall - 1.33 cuyd (\$1,470) = \$1,960. Structural Excavation - 1.4 cuyd (\$40/cuyd) = \$56. General Labor
Repair Cost:	\$14,756

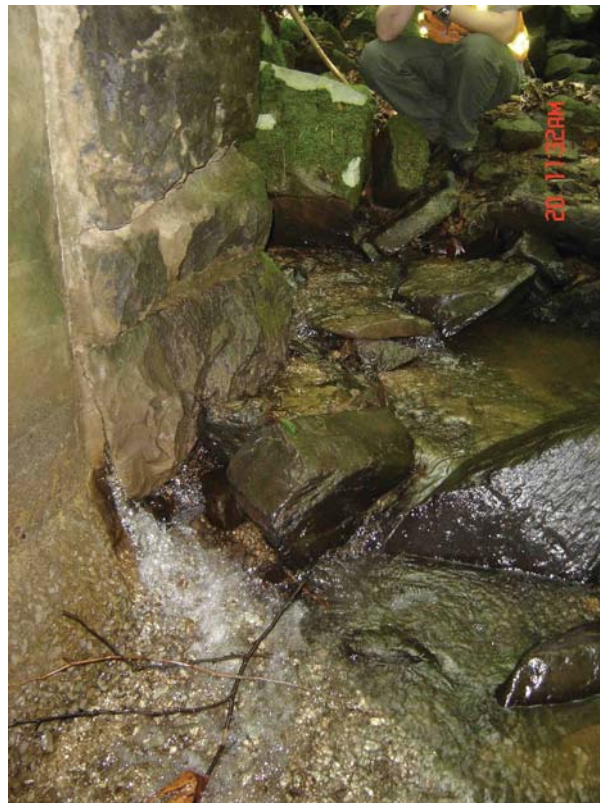
2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_0.201_R_1.JPG



GRSM_0012ZZ_0.201_R_2.JPG

Wall ID:	GRSM-0012ZZ-0.346-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM outlet headwall for a 6 ft x 9 ft concrete box culvert constructed along west shoulder of seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	33	Face Area (sq.):	188
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-25

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; possible foundation undermining	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation; possible undermining of foundation	8
MORTAR 8.00	General age-related weathering; the majority of wall is covered with moss	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	No distress; stable stream channel with deposited sub-rounded to rounded cobbles	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; stable well-vegetated embankment fill slope; moderately sloping	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-0.346-R.

Wall ID:	GRSM-0012ZZ-0.357-L		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 6 ft x 9 ft concrete box culvert constructed along east shoulder of seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	187
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-24

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; possible foundation undermining; debris blocking culvert inlet	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation; possible foundation undermining	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	6 ft x 9 ft concrete box culvert; debris is blocking the inlet, though not significantly affecting slope	8
DOWNSLOPE 0.50	No distress; stable stream channel with deposited sub-rounded to rounded cobbles and boulders	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; moderately sloping, well-vegetated slope	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	General Labor - 6 labor hrs (\$55/hr) = \$330
Repair Cost:	\$330

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-0.357-L.

Wall ID:	GRSM-0012ZZ-0.553-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for a 42 in diameter bitumen lined CMP constructed along east shoulder of seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	116
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; minor cracking of mortar at culvert/wall interface	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or distress	9
MORTAR 8.00	Minor cracking at culvert/wall interface	7
STONE MASONRY 8.00	No distress	9
UPSLOPE 0.50	Evidence of moderate creep of grassy slope	8
DOWNSLOPE 0.50	No distress; stream channel	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or shoulder	9
VEGETATION 0.50	No distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 5 sqft (\$75/sqft) = \$375
Repair Cost:	\$375

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_0.553_R_1.JPG

Wall ID:	GRSM-0012ZZ-0.674-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 24 in diameter CMP with a GD wall constructed on top wall is located immediately south of GRSM entrance sign and pull off area constructed at base of steep slope supporting high ADT roadway		

Wall Measurements

Wall Length (ft.):	28	Face Area (sq.):	269
Average Wall Height (ft.):	9	Face Angle (deg.):	55
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; moderate cracking of mortar around the culvert; culvert inlet is clogged with debris	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation	9
STONE MASONRY 8.00	Moderate debonding	7
MORTAR 8.00	Moderate cracking around the culvert	8
PLACED STONE 8.00	No distress	9
DOWNSLOPE 0.50	No distress; steep, well-vegetated slope leading down to wall	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress to roadway or moderately sloping grassy shoulder	9
VEGETATION 0.50	Small vegetation encroaching on wall	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - (0.30)(268.75 sqft)(\$75/sqft) = \$6,046.88. Remove Debris from inlet - 4 labor hrs (\$55/hr) = \$220.
Repair Cost:	\$6,267

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_0.674_R_1.JPG

Wall ID:	GRSM-0012ZZ-0.846-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	85	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 30 in diameter CMP constructed along the east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	17	Face Area (sq.):	35
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	12

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; requires repointing	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering; face of wall is completely covered with moss	8
STONE MASONRY 8.00	Face of wall is completely covered with moss	9
LATERAL SLOPE 0.50	Minor erosion along both ends of wall	8
UPSLOPE 0.50	Minor erosion of steep, well-vegetated fill embankment	8
CULVERT 0.50	30-in. diameter CMP culvert; minor rusting	9
DOWNSLOPE 0.50	No distress; creek bed	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 0.3(34.7 sqft) = 10.41 sqft (\$75/sqft) = \$780.75
Repair Cost:	\$781

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_0.846_R_1.JPG

Wall ID:	GRSM-0012ZZ-1.027-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	76	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 48 in diameter CMP constructed along east shoulder of high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	140
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor cracking and debonding; accumulation of sediment at inlet and within culvert impeding flow	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor cracking around the culvert; the majority of the wall face is covered with moss	7
STONE MASONRY 8.00	Minor debonding; one loose block; the majority of wall face is covered with moss	7
CULVERT 0.50	No distress; 48-in. diameter CMP; minor rusting	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress to steep, forested slope	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 1.00	No distress; approximately 1-ft of sediment has accumulated at inlet and within culvert	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Stone Masonry Repointing, 0.15 (140 sqft) = 21 sqft (\$75/sqft) = \$1,575. General Labor, 4 labor hrs (\$55/hr) = \$220.
Repair Cost:	\$1,795

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos



GRSM_0012ZZ_1.027_R_1.JPG

Wall ID:	GRSM-0012ZZ-1.144-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	76	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet headwall for 36 in diameter CMP culvert located along base of steep slope supporting a seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	77
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-14

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good overall performance; moderate weathering of mortar; culvert inlet is clogged with debris	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	Minor degradation with minor cracking and spalling	7
STONE MASONRY 8.00	Moderate debonding	7
DOWNSLOPE 0.50	Minor erosion of creek channel	8
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	No distress; steep forest slope with several medium to large diameter trees	9
WALL DRAINS 0.50	No observed drainage-related distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing, 0.25 (77 sqft) (\$75/sqft) = \$1,443.75. Clear Debris from Inlet, 4 labor hrs (\$55/hr) = \$220.
Repair Cost:	\$1,664

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-1.144-R.

Wall ID:	GRSM-0012ZZ-2.138-L		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	83	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	CC fill wall constructed along east shoulder of seasonally high ADT roadway high consequence of failure as failure will result in loss of the majority of roadway within wall limits.		

Wall Measurements

Wall Length (ft.):	547	Face Area (sq.):	5108
Average Wall Height (ft.):	9	Face Angle (deg.):	82
Maximum Wall Height (ft.):	24	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; some small depressions within the shoulder/immediately behind the cribbing elements; small brush is growing from face of wall.	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of wall settlement or rotation	9
BIN OR CRIB 8.00	Good condition overall; minor cracking of a few cribbing elements at isolated locations	8
MORTAR 8.00	Generally good condition; shows sign of normal seasonal weathering; minor cracking and debonding	8
STONE MASONRY 8.00	Good overall condition; blocks shown no distress; minor debonding	8
OTHER PRIMARY ELEMENT 8.00	Medium to coarse angular gravel backfill; there does not appear to be any loss of material	10
VEGETATION 0.50	Several small brush growing from face of wall; vegetation is not currently affecting wall performance	8
DOWNSLOPE 0.50	No distress; steep forested slope	9
TRAFFIC BARRIER/FENCE 0.50	No distress to steel backed timber guard rail	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove Brush from Wall, 32 labor hrs (\$55/hr) = \$1,760, \$200 material costs = \$200. Backfill Depressions w/Unclassified Borrow, 1 cuyd (\$35/cuyd) = \$35.
Repair Cost:	\$1,555

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-2.138-L.

Wall ID:	GRSM-0012ZZ-2.301-L		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	97	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	CC fill wall constructed along east shoulder of seasonally high ADT roadway high consequence of failure due to size and its direct support of roadway failure would result in closure of roadway and possible loss of upslope		

Wall Measurements

Wall Length (ft.):	310	Face Area (sq.):	2809
Average Wall Height (ft.):	9	Face Angle (deg.):	82
Maximum Wall Height (ft.):	18	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; small brush is growing along face and along base of wall	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of distress	10
BIN OR CRIB 8.00	Excellent condition; no distress	10
OTHER PRIMARY ELEMENT 8.00	Medium to coarse angular gravel backfill; there does not appear to be any loss of material	10
VEGETATION 0.50	Small brush is growing from face of wall; several small diameter trees and brush growing within 3 ft of wall along base; brush is not currently affecting wall performance	8
DOWNSLOPE 0.50	No distress to steep forested slope	9
ROAD/SIDEWALK/SHOULDER 0.50	Transverse cracking of pavement; no distress to shoulder	9
LATERAL SLOPE 0.50	No distress; wall is embedded into lateral slope	10
TRAFFIC BARRIER/FENCE 0.50	No distress; steel backed timber guard rail	10

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove Vegetation from Wall - 30 labor hrs (\$55/hr) = \$1,650 - \$200 material costs
Repair Cost:	\$1,850

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-2.301-L.

Wall ID:	GRSM-0012ZZ-2.635-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	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:	CC cut wall supporting moderate to steeply sloping forested slope above a seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	690	Face Area (sq.):	2788
Average Wall Height (ft.):	4	Face Angle (deg.):	80
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; minor corner cracking of a few elements	9
WALL FOUNDATION MATERIAL 8.00	No distress; founded on firm embankment fill or native subgrade; no evidence of settlement or rotation	9
BIN OR CRIB 8.00	Concrete cribbing elements are generally in good condition with a few minor corner breaks	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor longitudinal fatigue cracking of pavement; no distress to narrow vegetated shoulder	8
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; moderate to steeply sloping forested slope	9
WALL DRAINS 0.50	Wall is self-draining with no evidence of drainage-related distress	9
CURB/BERM/DITCH 0.50	No distress to relatively new asphalt-lined ditch	10

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-2.635-R.

Wall ID:	GRSM-0012ZZ-3.196-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM inlet head for a 36 in diameter bitumen-lined CMP culvert constructed along east shoulder of seasonally high ADT roadway moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	16	Face Area (sq.):	38
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or distress	9
MORTAR 8.00	No distress; general age-related weathering	9
STONE MASONRY 8.00	No distress	9
CULVERT 0.50	36-in. diameter CMP with a bitumen lining; moderate degradation of lining	8
CURB/BERM/DITCH 0.50	No distress to GM ditch; ditch outfalls along the face of wall; water from ditch will lead to more rapid degradation of masonry	8
DOWNSLOPE 0.50	No distress; creek bed with deposited sub-rounded to rounded cobble	9
LATERAL SLOPE 0.50	No distress	9
UPSLOPE 0.50	No distress; gently sloping grassy embankment fill	9

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-3.196-R.

Wall ID:	GRSM-0012ZZ-3.414-R		
Route Name:	GATLINBURG BYPASS ROAD AND RAMPS		
Inspection Date:	June 20, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM Headwall for a 24 in diameter and a 36 in diameter CMP culverts located at base of moderate slope supporting seasonally high ADT roadway Moderate consequence of failure.		

Wall Measurements

Wall Length (ft.):	48	Face Area (sq.):	222
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor degradation of mortar; debris clogging inlet to 24-in. diameter culvert; 36-in. diameter culvert is not functioning during low water	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation about the base	9
MORTAR 8.00	Minor degradation of mortar; the majority of wall is covered with moss	8
STONE MASONRY 8.00	No distress; the majority of wall is covered with moss	8
DOWNSLOPE 0.50	Level to gentle slope; minor erosion along the creek channel; culvert inlet is partially clogged with debris	8
UPSLOPE 0.50	Steep vegetated slope with several small to medium diameter trees; no evidence that distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
LATERAL SLOPE 0.50	No distress	10
CULVERT 1.00	24-in. diameter and 36-in. diameter CMP culverts; both are lined with bitumen; 24-in. culvert is clogged with debris, but debris is not significantly impeding flow; 36-in. diameter culvert does not received water from creek due to a large mound of sedimen	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	General Labor - 24 labor hrs (\$55/hr) = \$1,320
Repair Cost:	\$1,320

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

Great Smoky Mountains National Park
ROUTE 0012ZZ: GATLINBURG BYPASS ROAD AND RAMPS

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0012ZZ-3.414-R.

Wall ID:	GRSM-0013ZZ-0.358-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity mortared limestone block headwall, outlet side, for 3 arch culverts.		

Wall Measurements

Wall Length (ft.):	125	Face Area (sq.):	1000
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	9
WALL FOUNDATION MATERIAL 8.00	Alluvial stream channel, solid granular material, no signs of displacement or rotation at the base.	9
MANUFACTURED BLOCK/BRICK 8.00	Moderately to highly weathered bricks and granite blocks; all are intact and appear to be durable.	7
MORTAR 8.00	Minor cracking (about 1/8 inch wide) and spalling, moss covered, lime staining, minor debonding.	8
STONE MASONRY 8.00	Limestone cut blocks with minor to moderate weathering, about 2 feet by 3 feet to 1 foot by 1 foot.	9
CULVERT 0.50	28 feet wide by 6 feet deep by 10 feet high, 3-arch concrete box culvert, performing as intended, occasional missing stone.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor transverse cracking, minor rutting, no signs of displacement associated with walls. Shoulder is about 2H:1V grassy slope down to the top of the wall, good condition.	8
VEGETATION 0.50	There is no vegetation on the wall.	8
DOWNSLOPE 0.50	Active alluvial channel, low slope angle about 5H:1V.	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.

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_0.358_R_1.jpg

Wall ID:	GRSM-0013ZZ-0.365-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at inlet end of three large culverts (3 x 28, 4 x 28, 6 x 28).		

Wall Measurements

Wall Length (ft.):	125	Face Area (sq.):	1000
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	As required. Good performance.	9
WALL FOUNDATION MATERIAL 8.00	Firm soil and gravel.	9
MORTAR 8.00	Minor debonding over most of wall, efflorescence, minor cracking.	7
STONE MASONRY 8.00	Competent, intact, good condition.	9
ROAD/SIDEWALK/SHOULDER 0.50	Flat grass covered shoulder. Road has minor cracks, not likely wall related.	8
CULVERT 0.50	No distress.	9
LATERAL SLOPE 0.50	Shallow grass covered embankment. No distress.	9
UPSLOPE 0.50	Flat, grassy stable.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_0.365_R_1.jpg

Wall ID:	GRSM-0013ZZ-0.803-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	77	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:	Gravity limestone boulder headwall, outlet side.		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	70
Average Wall Height (ft.):	3	Face Angle (deg.):	80
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good condition, performing as intended.	7
WALL FOUNDATION MATERIAL 8.00	Active alluvial stream channel, solid granular material or bedrock at the base.	9
PLACED STONE 8.00	Large rounded limestone boulders, 2-3 feet diameter, moss covered, not straight, performing as intended.	7
CULVERT 0.50	6-foot CMP outlet, minor to moderate corrosion.	8
VEGETATION 0.50	Trees at the top and the base, improving stability of the slope.	8
DOWNSLOPE 0.50	Active alluvial stream channel, good condition.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking, not from the wall. Shoulder has about 2.5H:1V slope down to the top of the culvert, grassy.	9
WALL DRAINS 0.50	None observed, not impacting wall.	9
LATERAL SLOPE 1.00	About 1.5H:1V slope, slightly steep with vegetation and minor to moderate surface erosion, occasional displaced stone.	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.

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_0.803_L_1.jpg

Wall ID:	GRSM-0013ZZ-0.810-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	86	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall of stone masonry and mortar construction with a CMP culvert (60 in diameter).		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	82
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
MORTAR 8.00	Minor debonding, minor cracking, possibly repainted, some moss.	8
STONE MASONRY 8.00	Moss over 35% of stone, intact competent.	9
CULVERT 0.50	Good condition.	8
ROAD/SIDEWALK/SHOULDER 0.50	Grass covered shoulder - flat. Road has minor cracking, not likely wall related.	8
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Start - appears stable, firm embankment fill. End - very steep bedrock exposed possible creep.	7
UPSLOPE 1.00	Steep bedrock with shallow soil and small trees, some raveling.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_0.810_R_1.jpg



GRSM_0013ZZ_0.810_R_2.jpg

Wall ID:	GRSM-0013ZZ-1.461-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall on downstream side of road over two 4 by 8 culverts.		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	164
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm soil.	9
MORTAR 8.00	Efflorescence, some debonding.	8
STONE MASONRY 8.00	Moss covered, intact, good condition.	8
ROAD/SIDEWALK/SHOULDER 0.50	Firm stable grass covered shallow sloping shoulder. Minor cracking in road, does not appear to be wall related.	8
LATERAL SLOPE 0.50	Grass covered shallow slope, appears stable.	9
WALL DRAINS 0.50	No distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.461_L_1.jpg

Wall ID:	GRSM-0013ZZ-1.462-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared 2-arch headwall, inlet side.		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	164
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	9
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of rotation or distress.	9
MORTAR 8.00	Minor unbonding, minor cracking, moss cover occasionally, CaCO3 staining occasionally, performing as intended, occasional minor spalling.	8
STONE MASONRY 8.00	1 foot by 2-foot cut limestone blocks, stones, minor weathering.	9
CULVERT 0.50	4-feet by 8-feet wide double arch concrete box culvert, performing as intended.	8
LATERAL SLOPE 0.50	Tapers to 2H:1V slope at beginning of wall, sloped at 3H:1V at end of wall with minor dry stacked section, good condition.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking, not from the wall. Shoulder is about 2H:1V grassy slope, good condition.	9
UPSLOPE 0.50	Active alluvial channel, upstream, minor sediment trap, good condition.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.462_R_1.jpg

Wall ID:	GRSM-0013ZZ-1.585-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Downstream (outlet) headwall constructed of stone masonry.		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	74
Average Wall Height (ft.):	2	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Rock and firm soil, minor undermining at start.	7
STONE MASONRY 8.00	Competent intact stone, two blocks at top of wall are loose.	8
MORTAR 8.00	Debonding near top of wall otherwise good condition, possibly repainted.	9
ROAD/SIDEWALK/SHOULDER 0.50	Flat grassy shoulder. Road has minor cracks that do not appear to be wall related.	9
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Start - steep with raveling and undermining at toe. End - shallow grass covered embankment fill.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	There is good access consisting of a pullout at wall and wide shoulder areas. 5 sq.ft. wall stone reset using onsite stone -> 2 laborers x 4 hours x \$55/hour = \$440. 24 feet (8 yards) x 3 feet (1 yard) x 9 feet (3 yards) = 24 cubic yards of rip-rap along.
Repair Cost:	\$5,720

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

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.585_L_1.jpg

Wall ID:	GRSM-0013ZZ-1.592-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cut limestone block mortared headwall, on the inlet side.		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	74
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition with moderate surface erosion on lateral slopes.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material in active alluvial stream channel, no signs of undermining or settlement.	9
MORTAR 8.00	Minor unbonding, minor cracking, performing as intended.	7
STONE MASONRY 8.00	Limestone cut blocks, 6-inches to 3-feet, moss covered, good performance.	9
CULVERT 0.50	5-foot CMP, minor to moderate corrosion, performing as intended.	8
UPSLOPE 0.50	Active alluvial stream channel, no signs of impact to wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking, not associated with the wall. Shoulder is about 4H:1V grassy slope, good condition.	9
WALL DRAINS 0.50	None observed, not impacting wall function.	9
LATERAL SLOPE 1.00	Moderate surface erosion at steep slopes about 1.5H:1V, minor erosion at the end of the wall.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.592_R_1.jpg

Wall ID:	GRSM-0013ZZ-1.915-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at downstream (outlet) end of two, 8-foot wide by 7-foot tall, box culvert.		

Wall Measurements

Wall Length (ft.):	45	Face Area (sq.):	265
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-14

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Firm soil.	9
MORTAR 8.00	Good conditions, no distress, some moss.	9
STONE MASONRY 8.00	Some moss, good condition.	9
DOWNSLOPE 0.50	Shallow, forested slope.	9
LATERAL SLOPE 0.50	Treed embankment fill slope appears stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	Treed shoulder appears stable.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.915_L_1.jpg

Wall ID:	GRSM-0013ZZ-1.917-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cut limestone block (2 ft x 1 ft) mortared headwall, double concrete box culvert, on inlet side.		

Wall Measurements

Wall Length (ft.):	45	Face Area (sq.):	313
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-15

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	9
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of distress.	9
MORTAR 8.00	Minor unbonding, minor cracking and spalling.	8
STONE MASONRY 8.00	Limestone cut 1-foot by 2-foot blocks, hard, strong, moss covered, CaCO ₃ staining.	9
LATERAL SLOPE 0.50	About 1.5H:1V slope, well vegetated, minor surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking, not from wall. Shoulder has about 2H:1V slope down to top of headwall, grassy with trees.	8
CULVERT 0.50	Two CBC's, 8-feet wide by 7-feet high, minor corrosion, performing as intended.	9
UPSLOPE 0.50	Active alluvial channel with cobbles and boulders, not impacting wall.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_1.917_R_1.jpg

Wall ID:	GRSM-0013ZZ-3.115-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	74	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Slope Protection	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete crib wall for slope protection in a cut slope side.		

Wall Measurements

Wall Length (ft.):	220	Face Area (sq.):	1220
Average Wall Height (ft.):	5	Face Angle (deg.):	81
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good condition with displaced top elements and erosion of backfill material, performing as intended.	7
WALL FOUNDATION MATERIAL 8.00	Solid granular material, embedment anticipated, good performance.	9
BIN OR CRIB 8.00	Concrete crib, moderate pitting throughout, top run displaced at several locations from settlement of rock backfill materials, at two isolated locations compression break at the top crib.	6
CURB/BERM/DITCH 0.50	Ditch paved in front of the wall, good slope, performing as intended.	9
LATERAL SLOPE 0.50	Tapers to ends of wall with no lateral slopes, no impact on wall.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking not associated with wall.	9
VEGETATION 0.50	Minor vegetation at the face, helps stabilize the sandy backfill material.	9
WALL DRAINS 0.50	None observed, not impacting wall (rock backfill is free-draining).	9
UPSLOPE 1.00	About 10-foot wide flat bench, then sloped 1.5H:1V, voids at the top of the wall between cribs displacing elements, not impacting overall performance yet.	5

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Add riprap at top of wall : 5'x150'x2' = 1,500 ft ³ = 56cyd x \$60/cyd (structure backfill - item #20803) = \$3,360. Markers at \$55/hr x 2 people x 2 hrs = \$220. Truck to haul material @ \$55/hr x 2 hrs = \$110. TOTAL = \$3,690
Repair Cost:	\$3,690

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

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_3.115_L_1.jpg



GRSM_0013ZZ_3.115_L_2.jpg

Wall ID:	GRSM-0013ZZ-3.171-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	MSE wall with precast concrete panel facing.		

Wall Measurements

Wall Length (ft.):	337	Face Area (sq.):	3635
Average Wall Height (ft.):	10	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Firm soil.	9
CONCRETE 8.00	Facing concrete looks in good condition.	9
DOWNSLOPE 0.50	Steep forested slope, appears stable.	8
LATERAL SLOPE 0.50	Steep forested slope, appear stable.	8
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_3.171_R_1.jpg

Wall ID:	GRSM-0013ZZ-4.090-R		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cut limestone block masonry headwall on inlet side.		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	132
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-11

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, covered with moss, but performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, alluvial stream channel, no signs of settlement or scour, good performance.	9
MORTAR 8.00	Minor unbonding in places, covered with moss throughout, minor cracking, performing as intended.	7
STONE MASONRY 8.00	Limestone cut stone (1'-3') blocks, strong, moss covered throughout, performing as intended.	8
CULVERT 0.50	8.5-foot wide by 6-foot high CBC (tapers to 6'x6' inside), moderate corrosion, CaCO3 stains, performing as intended.	8
LATERAL SLOPE 0.50	About 1.5H:1V steep slope with minor surface erosion, not impacting wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is sloped at about 2H:1V, grassy with trees, good performance.	9
UPSLOPE 0.50	Active alluvial stream channel, sand and gravel, low slope angle about 3H:1V.	9
WALL DRAINS 0.50	None observed, not impacting wall.	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.

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_4.090_R_1.jpg

Wall ID:	GRSM-0013ZZ-4.108-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of 6 by 8 culvert.		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	150
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-17

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm soil.	9
MORTAR 8.00	Mossy, no debonding or cracking observed	8
STONE MASONRY 8.00	Intact, competent, moss covered.	8
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Steep forested slope, some possible creep and little raveling.	7
ROAD/SIDEWALK/SHOULDER 1.00	Shoulder is steep, but forested, some possible creep with little raveling.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park
ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_4.108_L_1.jpg

Wall ID:	GRSM-0013ZZ-4.181-L		
Route Name:	FIGHTING CREEK GAP ROAD AND SPUR		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cut limestone block mortared headwall on outlet side.		

Wall Measurements

Wall Length (ft.):	91	Face Area (sq.):	683
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular materials, no signs of distress.	9
MORTAR 8.00	Minor cracking and spalling, minor to moderate unbonding, moss covered.	8
STONE MASONRY 8.00	Limestone cut stone blocks 2-feet by 1-foot, strong, moss covered.	9
CULVERT 0.50	24-inch diameter concrete pipe, minor corrosion.	8
LATERAL SLOPE 0.50	Tapers to adjacent slopes at 1.5H:1V to 2H:1V slope, not impacting wall performance.	8
DOWNSLOPE 0.50	3-foot wide bench, 1.5H:1V slope down below, good condition.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0013ZZ: FIGHTING CREEK GAP ROAD AND SPUR

Retaining Wall Condition Photos



GRSM_0013ZZ_4.181_L_1.jpg

Wall ID:	GRSM-0014-0.130-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	76	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity limestone boulder fill wall.		

Wall Measurements

Wall Length (ft.):	265	Face Area (sq.):	3445
Average Wall Height (ft.):	13	Face Angle (deg.):	70
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition with occasional missing elements at the end of the wall.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular boulders and gravel, active stream channel, scour potential, but no signs of movement.	8
MORTAR 8.00	Concrete mortar, minor cracking and spalling, occasional unbonding.	7
PLACED STONE 8.00	1-3' diameter limestone boulders, occasional loose at the top layer, functioning as intended.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	At end of wall, missing stones from heavy erosion.	5
DOWNSLOPE 1.00	Active stream channel, minor scour, not impacting performance.	7
ROAD/SIDEWALK/SHOULDER 1.00	Wall is located at the edge of a paved shoulder, no signs of distress. Shoulder has about 6-8-foot wide grassy flat bench with occasional voids and soft spots.	7
VEGETATION 1.00	Occasional bushes and trees, pushing out the base of the wall, but stabilizing the top.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_0.130_L_1.jpg

Wall ID:	GRSM-0014-1.575-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large (4 to 6-foot) blocky to sub blocky rock wall with concrete mortar.		

Wall Measurements

Wall Length (ft.):	306	Face Area (sq.):	2282
Average Wall Height (ft.):	7	Face Angle (deg.):	70
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Rocky granular fill (embankment fill) and bedrock.	9
MORTAR 8.00	Concrete mortar - appears to be a recent addition.	9
PLACED STONE 8.00	Intact, competent, no distress.	9
DOWNSLOPE 0.50	Stream, moderate scour potential.	8
LATERAL SLOPE 0.50	Rocky embankment fill, appears stable.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_1.575_L_1.jpg

Wall ID:	GRSM-0014-1.707-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large rock wall with concrete mortar.		

Wall Measurements

Wall Length (ft.):	219	Face Area (sq.):	2409
Average Wall Height (ft.):	11	Face Angle (deg.):	55
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock stream channel. No distress.	9
MORTAR 8.00	Concrete mortar. No distress observed.	9
PLACED STONE 8.00	Large irregular chunks of stone, generally 3 to 6 foot dimensions, sound/intact.	9
LATERAL SLOPE 0.50	Steep rocky embankment fill with some vegetation, appears stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_1.707_L_1.jpg

Wall ID:	GRSM-0014-2.210-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	70	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to a stream.		

Wall Measurements

Wall Length (ft.):	703	Face Area (sq.):	10193
Average Wall Height (ft.):	14	Face Angle (deg.):	65
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition, occasional missing element, but not impacting wall performance.	7
WALL FOUNDATION MATERIAL 8.00	Strong granular material in active stream channel, minor scour, performing as intended.	8
STONE MASONRY 8.00	Limestone 1-3' diameter rounded boulders, strong. At begin of wall, missing elements, but not impacting roadway (no repairs recommended), severe surface erosion.	6
MORTAR 8.00	Concrete mortar (shot application), occasional unbonded, minor cracking throughout, moss covered.	7
CULVERT 0.50	6-foot diameter CMP at end of wall, performing as intended.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
VEGETATION 1.00	Trees, brush, and grass, pushing out some boulders at isolated locations.	6
DOWNSLOPE 1.00	Active alluvial channel, minor scour and undermining.	7
LATERAL SLOPE 1.00	Steep slopes at begin and end of wall, about 1.5H:1V, minor surface erosion.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_2.210_L_1.jpg



GRSM_0014_2.210_L_2.jpg

Wall ID:	GRSM-0014-2.357-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry headwall over 7-foot diameter CMP culvert.		

Wall Measurements

Wall Length (ft.):	24	Face Area (sq.):	120
Average Wall Height (ft.):	5	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	Good performance.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
MORTAR 8.00	Some debonding and weathering. One 1/8 to 1/4-inch crack left of culvert. Some small voids around culvert.	7
STONE MASONRY 8.00	Intact sound rock, slight surface weathering.	8
LATERAL SLOPE 0.50	Start - bedrock outcrop. End - slight erosion of embankment fill.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
UPSLOPE 0.50	Bedrock stream channel.	9
WALL DRAINS 0.50	No distress.	9
CULVERT 1.00	Some minor corrosion.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_2.357_R_1.jpg

Wall ID:	GRSM-0014-2.522-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to a stream.		

Wall Measurements

Wall Length (ft.):	209	Face Area (sq.):	2559
Average Wall Height (ft.):	12	Face Angle (deg.):	80
Maximum Wall Height (ft.):	19	Vertical Offset (ft.):	-14

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock at active stream channel.	9
MORTAR 8.00	Concrete mortar, minor undermining and cracking, good condition overall.	8
STONE MASONRY 8.00	1-8-foot diameter limestone boulders, strong competent stone. Minor surface weathering, good condition.	8
DOWNSLOPE 0.50	Active stream channel, minor scour at base.	8
TRAFFIC BARRIER/FENCE 0.50	Guardrail at top of slope, no signs of distress.	9
WALL DRAINS 0.50	None observed, not impacting wall.	9
LATERAL SLOPE 1.00	About 1.5H:1V steep slope with trees and grass, minor surface erosion.	7
ROAD/SIDEWALK/SHOULDER 1.00	Road has minor longitudinal cracking parallel to wall. Shoulder is sloped about 1.5H:1V with trees and grass, moderate surface erosion.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_2.522_R_1.jpg

Wall ID:	GRSM-0014-2.829-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	65	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:	Limestone boulder mortared fill wall adjacent to a stream.		
Wall Measurements			
Wall Length (ft.):	691	Face Area (sq.):	9674
Average Wall Height (ft.):	14	Face Angle (deg.):	60
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0
Assessed Elements			
Element (Weighting Factor)	Narrative		Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good conditions observed, but maintenance history indicates serious settlement issues with repairs 5-6 times, including pumping concrete at the back of the wall, needs further investigation.		7
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock at active stream channel, solid foundation. However, maintenance crew noted that this is a location that has been patched numerous times due to settlement issues.		3
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, good condition.		8
STONE MASONRY 8.00	1-6-foot diameter limestone boulders, strong competent material. Minor surface weathering, epoxy rebar at bottom (dowelled into bedrock?) for stability.		8
WALL DRAINS 0.50	None observed, not impacting wall performance.		9
ROAD/SIDEWALK/SHOULDER 1.00	Road has minor longitudinal and transverse cracking. Shoulder is about 6-8 feet wide, flat, grassy, occasional voids at the top.		6
VEGETATION 1.00	Minor trees pushing out boulders.		6
DOWNSLOPE 1.00	Active stream channel, minor scour.		7
LATERAL SLOPE 1.00	Steep slopes at about 1.5H:1V, well vegetated, moss covered.		7
Repair Recommendations			
Failure Consequence:	HIGH		
Recommendation Narrative:	Subsurface Investigation: Drill and sample with truck mounted rig @ back of wall in right land and left lane at 6 locations to determine extent of lateral settlement area. Assume \$3,000/day @ 3 days = \$9,000. Mob/Demob/Travel/Per Diem Crew = \$5,000. Traffic		
Repair Cost:	\$42,000		

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_2.829_R_1.jpg

Wall ID:	GRSM-0014-3.135-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Moss covered rockery with small trees.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	818
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Streambed boulders and bedrock. No undermining observed.	9
PLACED STONE 8.00	Moss covered appear intact. Some voids not affecting wall performance.	8
DOWNSLOPE 0.50	Streambed with moderate scour potential.	8
LATERAL SLOPE 0.50	Treed, rocky embankment fill and large boulder fill, appears stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_3.135_R_1.jpg

Wall ID:	GRSM-0014-3.177-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to a stream.		

Wall Measurements

Wall Length (ft.):	303	Face Area (sq.):	3633
Average Wall Height (ft.):	11	Face Angle (deg.):	60
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and solid granular material at the base in active stream channel, minor scour possible.	8
MORTAR 8.00	Concrete mortar, minor cracking, minor unbonding.	8
STONE MASONRY 8.00	1-8-foot diameter limestone boulders, slight weathering at the surface.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active stream channel, minor scour.	7
LATERAL SLOPE 1.00	About 1.5H:1V steep slope with trees, moderate surface erosion.	7
ROAD/SIDEWALK/SHOULDER 1.00	Road has minor cracks, not from the wall. Shoulder has about 6-foot wide grassy bench, minor soft spots.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_3.177_R_1.jpg

Wall ID:	GRSM-0014-3.360-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar in void space.		

Wall Measurements

Wall Length (ft.):	152	Face Area (sq.):	1742
Average Wall Height (ft.):	11	Face Angle (deg.):	75
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
MORTAR 8.00	No distress observed.	9
PLACED STONE 8.00	Large intact rock	9
DOWNSLOPE 0.50	Bedrock streambed, moderate scour potential.	8
LATERAL SLOPE 0.50	Treed rock embankment fill, appears stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_3.360_R_1.jpg

Wall ID:	GRSM-0014-6.172-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall.		

Wall Measurements

Wall Length (ft.):	137	Face Area (sq.):	1233
Average Wall Height (ft.):	9	Face Angle (deg.):	70
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and solid granular material at active stream channel, good condition.	9
MORTAR 8.00	Concrete mortar, minor cracking, minor spalling, minor unbonding, minor moss cover.	8
STONE MASONRY 8.00	1-6-foot diameter solid limestone boulders, minor surface weathering, good condition.	9
DOWNSLOPE 0.50	Active stream channel, minor scour possible.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V with trees, moderate surface erosion.	7
ROAD/SIDEWALK/SHOULDER 1.00	Road has no signs of distress. Shoulder is about 3-6 feet wide, flat, grassy, minor soft spots.	7
VEGETATION 1.00	Minor small brush, pushing out boulders.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0014-6.172-R.

Wall ID:	GRSM-0014-6.638-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery constructed of large irregular shaped stone.		

Wall Measurements

Wall Length (ft.):	169	Face Area (sq.):	1690
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Performing as required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
PLACED STONE 8.00	Large intact platy shaped stone, not well constructed.	7
DOWNSLOPE 0.50	Bedrock stream bed with low scour potential.	8
LATERAL SLOPE 0.50	Bedrock outcrop and rocky embankment fill.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_6.638_R_1.jpg

Wall ID:	GRSM-0014-6.735-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder dry-stacked fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	123	Face Area (sq.):	1230
Average Wall Height (ft.):	10	Face Angle (deg.):	65
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and solid alluvial gravel, not signs of distress.	8
PLACED STONE 8.00	1-3 foot diameter limestone boulders, strong, competent, minor surface weathering, occasional displaced element, not impacting roadway. Top level has minor concrete grout, minor voids throughout, performing as intended.	8
DOWNSLOPE 0.50	Active alluvial channel, minor chance for scour, mostly bedrock.	8
LATERAL SLOPE 0.50	Large boulders, trees on steep slopes about 1.5H:1V, moderate surface erosion.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
VEGETATION 1.00	Minor brush, pulling out elements.	6
ROAD/SIDEWALK/SHOULDER 1.00	Road has minor surface cracks, not associated with the wall. Shoulder is about 3-4 feet wide bench, grassy, minor voids at the top.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_6.735_R_1.jpg

Wall ID:	GRSM-0014-6.890-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Bridge Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wing wall for bridge.		

Wall Measurements

Wall Length (ft.):	84	Face Area (sq.):	1076
Average Wall Height (ft.):	12	Face Angle (deg.):	90
Maximum Wall Height (ft.):	19	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and bedrock.	9
MORTAR 8.00	Some debonding, minor cracks.	8
STONE MASONRY 8.00	Intact, good condition.	9
LATERAL SLOPE 0.50	Start - bridge abutment. End - steep rock outcrop possible raveling.	8
DOWNSLOPE 0.50	Steep rock outcrop, appears stable, minor surface raveling.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_6.890_L_1.jpg

Wall ID:	GRSM-0014-7.392-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	71	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	171	Face Area (sq.):	1878
Average Wall Height (ft.):	10	Face Angle (deg.):	60
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition, occasional missing elements from surface erosion, recent repairs successful, performing as intended.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock, solid base, minor scour, not impacting wall performance.	8
STONE MASONRY 8.00	1-5 foot diameter limestone boulders, strong, competent, occasionally missing section at the top from surface erosion, not yet impacting roadway.	6
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling, fresh shotcrete mortar at begin of wall, good performance.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
ROAD/SIDEWALK/SHOULDER 1.00	Road has no signs of distress. Shoulder is about 4-8 feet wide flat bench, grassy, occasional void and soft spot, washed out sections at top of wall at 3 locations.	5
VEGETATION 1.00	Brush is pushing out boulders.	5
DOWNSLOPE 1.00	Active stream channel, minor scour potential, not impacting wall.	7
LATERAL SLOPE 1.00	Boulders and vegetated slope at 1.5H:1V, moderate surface erosion.	7

Repair Recommendations

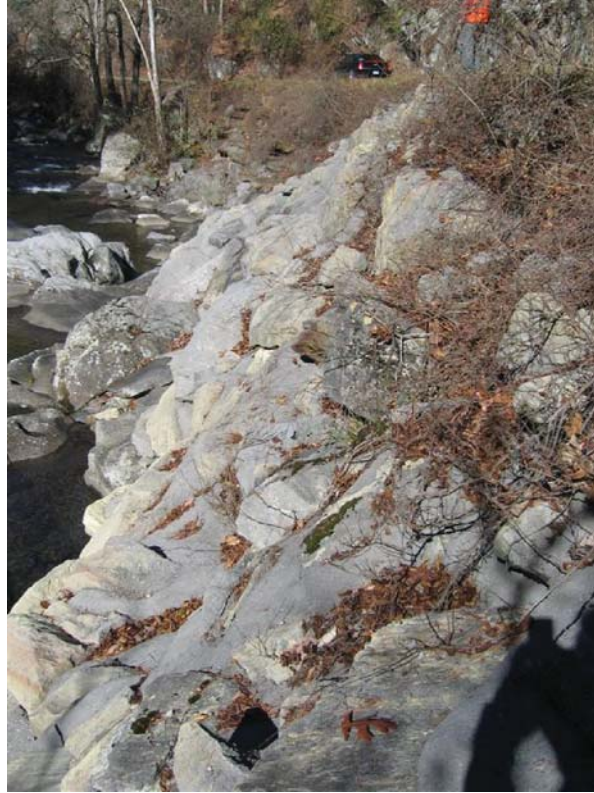
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_7.392_L_1.jpg

Wall ID:	GRSM-0014-7.495-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with mortar. Rocks range from irregular shaped boulders to rectangular blocks.		

Wall Measurements

Wall Length (ft.):	741	Face Area (sq.):	9560
Average Wall Height (ft.):	12	Face Angle (deg.):	75
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock streambed. Some stones are bolted to underlying bedrock. Some areas of undermining - not impacting wall performance.	7
MORTAR 8.00	Concrete mortar with small hairline cracks.	9
PLACED STONE 8.00	Sound, intact stone ranging from irregular to rectangular masoned stone.	9
LATERAL SLOPE 0.50	Steep rockfill embankment with trees, some creep/raveling possible.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9
DOWNSLOPE 1.00	Streambed with low to moderate scour potential.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_7.495_L_1.jpg

Wall ID:	GRSM-0014-7.777-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	606	Face Area (sq.):	6858
Average Wall Height (ft.):	11	Face Angle (deg.):	70
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, solid foundation, no settlement or rotation.	9
MORTAR 8.00	Concrete mortar, minor cracking, minor spalling, good condition.	8
STONE MASONRY 8.00	1-8 foot diameter limestone boulders, strong, competent, minor surface weathering.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracks with paved pullout in good condition. Shoulder is about 2-8 feet wide flat grassy slope, occasional soft spot.	8
TRAFFIC BARRIER/FENCE 0.50	Guardwall at top at 200 feet from begin of wall, good condition, no signs of distress.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
VEGETATION 1.00	Occasional trees pushing out elements.	6
DOWNSLOPE 1.00	Active stream channel, minor scour and undermining.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_7.777_L_1.jpg

Wall ID:	GRSM-0014-8.285-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery constructed of large rectangular blocks of rock.		

Wall Measurements

Wall Length (ft.):	517	Face Area (sq.):	8161
Average Wall Height (ft.):	15	Face Angle (deg.):	70
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	No distress.	9
STONE MASONRY 8.00	No distress. Large rectangular blocks up to 6-foot dimensions.	9
LATERAL SLOPE 0.50	Steep, treed rockfill embankment with some possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9
DOWNSLOPE 1.00	Bedrock streambed with low to high scour potential.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_8.285_L_1.jpg

Wall ID:	GRSM-0014-9.013-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	531	Face Area (sq.):	6192
Average Wall Height (ft.):	11	Face Angle (deg.):	55
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to fair condition, with some boulders sliding out at the top of the wall at the begin of wall.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock and solid granular material, no signs of distress.	9
STONE MASONRY 8.00	1-6 foot diameter limestone boulders, at begin of wall sliding out of boulders at top of wall, not impacting roadway.	7
MORTAR 8.00	Concrete mortar, at begin of wall no mortar, minor cracks, minor spalling, minor unbonding.	8
DOWNSLOPE 0.50	Active alluvial channel, not impacting wall.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V, moderate surface erosion.	7
ROAD/SIDEWALK/SHOULDER 1.00	Road has no signs of distress. Shoulder is about 3-6 foot wide bench, grassy, occasional soft spot.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.013_R_1.jpg

Wall ID:	GRSM-0014-9.119-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar at start, going into a near vertical rockery without mortar.		

Wall Measurements

Wall Length (ft.):	163	Face Area (sq.):	1689
Average Wall Height (ft.):	10	Face Angle (deg.):	80
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
PLACED STONE 8.00	Some degradation of stone, cracking.	7
MORTAR 8.00	Slight hairline cracks and debonding.	8
DOWNSLOPE 0.50	Rock outcrop / bedrock streambed with low scour potential.	8
LATERAL SLOPE 0.50	Start - rock outcrop. End - rock outcrop / rockfill.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.119_R_1.jpg

Wall ID:	GRSM-0014-9.236-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar		

Wall Measurements

Wall Length (ft.):	72	Face Area (sq.):	1080
Average Wall Height (ft.):	15	Face Angle (deg.):	53
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
PLACED STONE 8.00	Weathered rock, largely intact with few cracks.	7
MORTAR 8.00	Little debonding and cracking.	8
DOWNSLOPE 0.50	Bedrock, streambed with low scour potential.	8
LATERAL SLOPE 0.50	Rock outcrop and steep rock fill embankment.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0014-9.236-R.

Wall ID:	GRSM-0014-9.274-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	357	Face Area (sq.):	3828
Average Wall Height (ft.):	10	Face Angle (deg.):	70
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Strong granular material at active stream channel, no signs of undermining or erosion.	8
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-3 foot limestone boulders, strong, competent, good condition.	8
DOWNSLOPE 0.50	Active alluvial channel, not impacting wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3-8 feet wide bench, grassy, good condition.	8
WALL DRAINS 0.50	None observed, not impacting wall.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V, moderate to severe surface erosion.	6

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.274_R_1.jpg

Wall ID:	GRSM-0014-9.493-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	281	Face Area (sq.):	2875
Average Wall Height (ft.):	10	Face Angle (deg.):	52
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
PLACED STONE 8.00	Some degradation / weathering of stone including hairline cracks	7
MORTAR 8.00	Slight debonding and cracks	8
DOWNSLOPE 0.50	Bedrock streambed with low to moderate scour potential.	8
LATERAL SLOPE 0.50	Rock outcrop and steep rock fill.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.493_R_1.jpg

Wall ID:	GRSM-0014-9.524-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	145	Face Area (sq.):	1740
Average Wall Height (ft.):	12	Face Angle (deg.):	51
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material or bedrock, no signs of foundation distress.	9
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking.	8
STONE MASONRY 8.00	2-3 foot diameter limestone boulders, strong, competent, slight weathering at surface.	9
DOWNSLOPE 0.50	Active stream channel, no scour yet.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is about 2H:1V grassy slope down to top of wall, good condition.	8
LATERAL SLOPE 0.50	Large boulders, solid material, stable.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9

Repair Recommendations

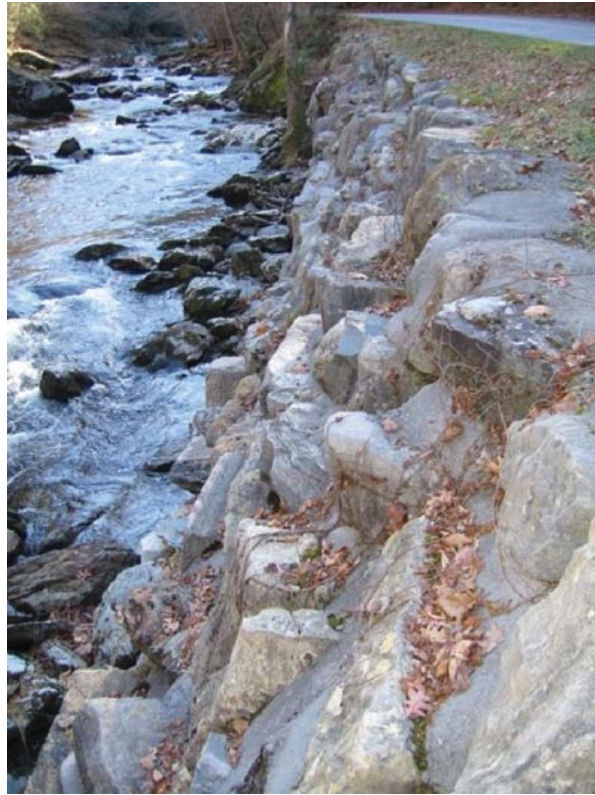
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.524_R_1.jpg

Wall ID:	GRSM-0014-9.616-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	December 10, 2007	Approximate Year Built:	1930
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Irregular shaped rocks making up rockery with concrete rockery.		

Wall Measurements

Wall Length (ft.):	84	Face Area (sq.):	1035
Average Wall Height (ft.):	12	Face Angle (deg.):	55
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
PLACED STONE 8.00	Slight weathering, rebar doweling rocks into underlying bedrock.	8
MORTAR 8.00	Slight debonding and cracking	9
DOWNSLOPE 0.50	Bedrock streambed with low scout potential.	8
LATERAL SLOPE 0.50	Rock outcrops.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.616_R_1.jpg

Wall ID:	GRSM-0014-9.635-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	140	Face Area (sq.):	1109
Average Wall Height (ft.):	7	Face Angle (deg.):	55
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, no signs of foundation distress.	9
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-3 foot diameter limestone blocks, solid, competent, good condition.	9
DOWNSLOPE 0.50	Active alluvial channel, scour potential, good condition.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is about 3-4 feet wide flat bench, grassy, good condition.	8
LATERAL SLOPE 0.50	Large boulders, solid, stable.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.635_R_1.jpg

Wall ID:	GRSM-0014-9.677-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	218	Face Area (sq.):	1807
Average Wall Height (ft.):	8	Face Angle (deg.):	60
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and boulders.	9
MORTAR 8.00	Little debonding and slight cracks.	8
PLACED STONE 8.00	Some weathering of stone.	8
LATERAL SLOPE 0.50	Start - rock outcrop. End - Bouldery embankment fill.	8
DOWNSLOPE 0.50	Flat, treed stream bottom.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.677_R_1.jpg

Wall ID:	GRSM-0014-9.764-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	140	Face Area (sq.):	1805
Average Wall Height (ft.):	12	Face Angle (deg.):	48
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at active stream channel, no signs of foundation distress.	9
MORTAR 8.00	Concrete mortar, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-2 foot diameter limestone boulders, solid, competent, slight weathering at the surface.	9
DOWNSLOPE 0.50	Active stream channel, scour potential.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 2-3 feet wide bench, grassy, good condition.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V with trees and heavy vegetation.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_9.764_R_1.jpg

Wall ID:	GRSM-0014-10.412-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Slope Protection	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Heavily mortared rip-rap slope protection.		

Wall Measurements

Wall Length (ft.):	143	Face Area (sq.):	1716
Average Wall Height (ft.):	12	Face Angle (deg.):	50
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm granular soil.	9
PLACED STONE 8.00	Slightly weathered.	8
MORTAR 8.00	As new, no distress.	10
DOWNSLOPE 0.50	Flat, gravel and boulder stream bank with low erosion potential.	8
LATERAL SLOPE 0.50	Steep, treed, rock fill with some creep possible.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_10.412_R_1.jpg

Wall ID:	GRSM-0014-10.494-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	525	Face Area (sq.):	4985
Average Wall Height (ft.):	9	Face Angle (deg.):	65
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of foundation distress.	8
MORTAR 8.00	Concrete mortar, minor spalling, minor cracking, minor unbonding.	8
STONE MASONRY 8.00	1-3 foot diameter limestone boulders, strong, competent, slight weathering at the surface.	9
CULVERT 0.50	24-inch CMP outlet midway, performing as intended.	8
DOWNSLOPE 0.50	Active stream channel, scour potential, not impacting wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking, not associated with the wall. Shoulder is 3-5 foot flat bench, grassy, good condition.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V, well vegetated, moderate surface erosion.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_10.494_R_1.jpg

Wall ID:	GRSM-0014-10.630-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	342	Face Area (sq.):	2500
Average Wall Height (ft.):	7	Face Angle (deg.):	45
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock in stream with low scour potential.	8
PLACED STONE 8.00	Slight weathering with moss in areas.	8
MORTAR 8.00	No distress observed.	9
DOWNSLOPE 0.50	Streambank, rock moderate scour potential.	8
LATERAL SLOPE 0.50	Steep rock fill embankment with some potential creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_10.630_R_1.jpg

Wall ID:	GRSM-0014-11.453-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	342
Average Wall Height (ft.):	9	Face Angle (deg.):	45
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at stream channel, no signs of foundation distress.	8
MORTAR 8.00	Concrete mortar, minor unbonding at isolated locations, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-3 foot diameter limestone boulders, strong, competent, slight weathering at surface.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is about 1-2 foot wide grassy bench, minor surface erosion.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V, moderate to severe surface erosion.	6
DOWNSLOPE 1.00	Active alluvial channel, scour potential, water at base of wall, not impacting wall yet.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_11.453_R_1.jpg

Wall ID:	GRSM-0014-11.602-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with mortar.		

Wall Measurements

Wall Length (ft.):	184	Face Area (sq.):	1485
Average Wall Height (ft.):	8	Face Angle (deg.):	47
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bouldery streambank and bedrock with low scour potential.	8
MORTAR 8.00	Debonding and cracking present.	8
PLACED STONE 8.00	Slight weathering.	8
DOWNSLOPE 0.50	Flat streambank with boulders.	8
LATERAL SLOPE 0.50	Steep rock embankment fill, some possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_11.602_R_1.jpg

Wall ID:	GRSM-0014-11.812-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	248	Face Area (sq.):	2083
Average Wall Height (ft.):	8	Face Angle (deg.):	50
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at stream channel, potential scour, no signs of foundation distress.	8
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-4 foot diameter limestone boulders, strong, competent, slight weathering at the surface, dowel with rebar at stream level.	9
CULVERT 0.50	24-inch CMP outlet at begin of wall, performing as intended.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking not associated with the wall. Shoulder is about 2-3 feet wide bench, grassy.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active alluvial channel, potential scour, not yet impacting wall.	7
LATERAL SLOPE 1.00	Steep slope at 1.5H:1V with moderate to severe surface erosion.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_11.812_R_1.jpg

Wall ID:	GRSM-0014-12.030-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	86	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Dry Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared rockery at start and dry stack rockery at end, with a stone masonry head wall over the outlet of two 7-foot high by 6-foot wide cast in-place culverts.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	883
Average Wall Height (ft.):	8	Face Angle (deg.):	83
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Boulders and granular soil, no distress.	9
MORTAR 8.00	Moss covered with little to some debonding and cracks.	8
STONE MASONRY 8.00	Moss covered with slight weathering.	8
PLACED STONE 8.00	Slight weathering, rectangular stone 2 to 6 foot dimensions with some small voids.	9
DOWNSLOPE 0.50	Rocky streambank, fairly flat, low erosion potential.	8
LATERAL SLOPE 0.50	Steep rock fill embankment with trees and some possible creep / raveling.	8
CULVERT 0.50	No distress. Concrete box.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_12.030_R_1.jpg

Wall ID:	GRSM-0014-12.038-L		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Cast in place head wall over the inlet end of two 7-foot high by 6-foot wide cast in-place wide box culverts.		

Wall Measurements

Wall Length (ft.):	44	Face Area (sq.):	253
Average Wall Height (ft.):	5	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	As designed.	9
WALL FOUNDATION MATERIAL 8.00	Rocky fill / granular soil and bedrock.	9
CONCRETE 8.00	As new / no distress with slight moss staining.	9
CULVERT 0.50	As new / no distress. Two 7-foot high by 6-foot wide cast-in-place box culverts.	9
LATERAL SLOPE 0.50	Start - rocky embankment fill. End - rock outcrop.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_12.038_L_1.jpg

Wall ID:	GRSM-0014-12.123-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder mortared fill wall adjacent to stream.		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	653
Average Wall Height (ft.):	7	Face Angle (deg.):	61
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, with recent rock fill at end of wall.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, gravel and boulders at streambed, no signs of undermining or foundation distress.	8
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling.	8
STONE MASONRY 8.00	1-3 foot diameter limestone boulders, strong, competent, minor surface weathering.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Stream channel, scour potential, not yet impacting wall.	7
LATERAL SLOPE 1.00	Begin of wall steep slope at 1.5H:1V with moderate surface erosion. End of wall has rock fill with geotextile separator (appears recent).	7
ROAD/SIDEWALK/SHOULDER 1.00	Road has longitudinal cracking, minor at the edge of pavement. Shoulder is about 2-3 foot wide flat bench, grassy.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos



GRSM_0014_12.123_R_1.jpg

Wall ID:	GRSM-0014-12.252-R		
Route Name:	LITTLE RIVER GORGE ROAD		
Inspection Date:	November 28, 2007	Approximate Year Built:	1930
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Slope Protection	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Heavily mortared slope protection / rockery wall.		

Wall Measurements

Wall Length (ft.):	179	Face Area (sq.):	1904
Average Wall Height (ft.):	10	Face Angle (deg.):	48
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
PLACED STONE 8.00	Slightly weathered 2 to 3 foot rounded boulders.	8
MORTAR 8.00	As new, only slight debonding and hairline cracks.	9
LATERAL SLOPE 0.50	Steep rock fill embankment with trees. Some possible raveling.	8
DOWNSLOPE 0.50	Bedrock.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0014: LITTLE RIVER GORGE ROAD

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0014-12.252-R.

Wall ID:	GRSM-0015-0.527-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall along stream.		

Wall Measurements

Wall Length (ft.):	336	Face Area (sq.):	3970
Average Wall Height (ft.):	11	Face Angle (deg.):	80
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
MORTAR 8.00	Mossy, some debonding.	8
STONE MASONRY 8.00	Mossy, some weathering.	8
DOWNSLOPE 0.50	Stream with moderate scour potential.	8
LATERAL SLOPE 0.50	Start - rock outcrop. End - embankment fill.	8
TRAFFIC BARRIER/FENCE 0.50	Stone masonry guardwall, mossy stone, some debonding and cracks in mortar.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_0.527_R_1.jpg

Wall ID:	GRSM-0015-0.628-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	116	Face Area (sq.):	1300
Average Wall Height (ft.):	11	Face Angle (deg.):	46
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	River rock and bedrock.	9
MORTAR 8.00	No distress observed.	8
PLACED STONE 8.00	Rock is up to 6-foot dimensions, irregular shaped, angular, not well constructed.	8
DOWNSLOPE 0.50	Bedrock and river rock, low scour potential.	8
LATERAL SLOPE 0.50	Steep embankment fill with trees, some raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_0.628_R_1.jpg

Wall ID:	GRSM-0015-0.676-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Mortared Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Compound wall - starts as a stone masonry on poured foundation turns into a rockery with mortar.		

Wall Measurements

Wall Length (ft.):	248	Face Area (sq.):	2583
Average Wall Height (ft.):	10	Face Angle (deg.):	65
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
STONE MASONRY 8.00	Moss, covered, weathered stone.	7
MORTAR 8.00	No distress to weathered and moss covered.	8
PLACED STONE 8.00	Slightly, weathered, large intact rock.	9
DOWNSLOPE 0.50	Bedrock and river rock. Moderate to high scour potential.	8
LATERAL SLOPE 0.50	Steep, embankment fill with trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_0.676_R_1.jpg

Wall ID:	GRSM-0015-0.835-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Mortared Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Some masonry wall along stream with stone masonry guardwall at top and mortared rockery at ends.		

Wall Measurements

Wall Length (ft.):	309	Face Area (sq.):	4016
Average Wall Height (ft.):	12	Face Angle (deg.):	81
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is performing as designed.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
MORTAR 8.00	No distress on rockeries. High weathered, mossy, debonded on stone masonry wall. Mortar missing on lower block near river level. Does not appear to be affecting wall performance.	6
STONE MASONRY 8.00	Weathered, mossy, appears solid and intact.	8
PLACED STONE 8.00	Large, tabular stone to 6 feet, intact.	9
LATERAL SLOPE 0.50	Steep, treed rock embankment fill, some raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 1.00	Extensive debonding.	6

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Tough access, limited staging area, on curve of road. Flaggers and lane closure possible. Divert 110 feet of river along wall face 4 laborers x 8 hours/day x 2 days x \$55/hour. Remove river diversion 4 laborers x 8 hours x \$55/hour. 200 sq.ft. of mortar
Repair Cost:	\$20,280

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_0.835_R_1.jpg

Wall ID:	GRSM-0015-1.121-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared Rockery.		

Wall Measurements

Wall Length (ft.):	150	Face Area (sq.):	1900
Average Wall Height (ft.):	12	Face Angle (deg.):	55
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
MORTAR 8.00	Some debonding, otherwise good condition.	8
PLACED STONE 8.00	Intact, sound, no distress observed.	9
DOWNSLOPE 0.50	Bedrock, river rock, streambed with moderated scour potential.	8
LATERAL SLOPE 0.50	Embankment fill with trees, some possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_1.121_R_1.jpg

Wall ID:	GRSM-0015-1.236-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	Gravity - Mortared Stone
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared rockery at beginning and end of stone masonry wall.		

Wall Measurements

Wall Length (ft.):	137	Face Area (sq.):	1283
Average Wall Height (ft.):	9	Face Angle (deg.):	81
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
STONE MASONRY 8.00	Weathered.	7
MORTAR 8.00	Weathered and mossy, some debonding.	8
PLACED STONE 8.00	Big intact, sub angular four foot rock.	9
DOWNSLOPE 0.50	Stream, bedrock and river rock, moderate scour potential.	8
LATERAL SLOPE 0.50	Embankment fill with trees, some possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_1.236_R_1.jpg

Wall ID:	GRSM-0015-1.283-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall over inlet of 7 tall by 10 wide masonry culvert.		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	131
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and rock.	9
MORTAR 8.00	Little debonding, generally good condition.	8
STONE MASONRY 8.00	moss covered weathered.	8
CULVERT 0.50	No distress.	9
LATERAL SLOPE 0.50	Rocky outcrops, some raveling.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
UPSLOPE 0.50	Flat streambed bedrock.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_1.283_L_1.jpg

Wall ID:	GRSM-0015-1.284-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of 6 high by 10 wide masonry culvert along stream.		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	205
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and rock.	9
MORTAR 8.00	Little debonding, moss.	8
STONE MASONRY 8.00	moss covered, weathered.	8
DOWNSLOPE 0.50	Stream, bedrock and river rock, flat, low scour potential.	8
LATERAL SLOPE 0.50	Rocky, embankment fill with trees, some raveling, possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_1.284_R_1.jpg

Wall ID:	GRSM-0015-1.778-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry along creek with mortared rockery at start and end.		

Wall Measurements

Wall Length (ft.):	417	Face Area (sq.):	3756
Average Wall Height (ft.):	9	Face Angle (deg.):	81
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required..	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock	9
MORTAR 8.00	Some debonding, moss, generally good condition.	8
STONE MASONRY 8.00	Moss and weathered appears competent, concrete footing.	8
PLACED STONE 8.00	Up to 4 foot boulders, some moss, little weathering.	9
DOWNSLOPE 0.50	Streambed, river rock and bedrock, high scour potential	8
LATERAL SLOPE 0.50	Treed slopes with some raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	4-inch plastic drains, no distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_1.778_R_1.jpg

Wall ID:	GRSM-0015-2.022-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall with mortared rockery at end.		

Wall Measurements

Wall Length (ft.):	269	Face Area (sq.):	1687
Average Wall Height (ft.):	6	Face Angle (deg.):	81
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
MORTAR 8.00	Little debonding, some moss.	8
STONE MASONRY 8.00	Moss covered, weathered, concrete foundation.	8
LATERAL SLOPE 0.50	Shallow, treed slope, little raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	4-inch plastic pipe, no distress.	9
DOWNSLOPE 1.00	Streambed, flat, high scour potential	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.022_R_1.jpg

Wall ID:	GRSM-0015-2.270-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry along stream.		

Wall Measurements

Wall Length (ft.):	245	Face Area (sq.):	3340
Average Wall Height (ft.):	13	Face Angle (deg.):	81
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock	9
MORTAR 8.00	Weathered little debonding, good condition.	9
STONE MASONRY 8.00	Moss, weathered, but good condition, poured concrete footing possibly in one area.	9
DOWNSLOPE 0.50	Stream, bedrock and river rock, moderate scour potential.	8
LATERAL SLOPE 0.50	Steep embankment fill little raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.270_L_1.jpg

Wall ID:	GRSM-0015-2.378-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Masonry wall supporting a fill.		

Wall Measurements

Wall Length (ft.):	183	Face Area (sq.):	1568
Average Wall Height (ft.):	8	Face Angle (deg.):	81
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	High wall performing as intended.	9
WALL FOUNDATION MATERIAL 8.00	Solid streambed material.	9
MORTAR 8.00	Minimal debonding.	9
STONE MASONRY 8.00	Minor efflorescence No distress, moss covered.	9
DOWNSLOPE 0.50	Streambed with boulders low scour potential.	8
LATERAL SLOPE 0.50	Gentle slope that is vegetated.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	None observed, no distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.378_L_1.jpg

Wall ID:	GRSM-0015-2.429-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	1938
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall along stream.		

Wall Measurements

Wall Length (ft.):	198	Face Area (sq.):	2350
Average Wall Height (ft.):	11	Face Angle (deg.):	81
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock.	9
MORTAR 8.00	Moss, weathered, and some debonding.	8
STONE MASONRY 8.00	Mossy weathered good condition.	9
DOWNSLOPE 0.50	Stream, bedrock, and river rock, with moderate scour potential.	8
LATERAL SLOPE 0.50	Steep rock fill embankment with trees and a little raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.429_L_1.jpg

Wall ID:	GRSM-0015-2.665-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block fill wall, with guardwall parapet, adjacent to stream.		

Wall Measurements

Wall Length (ft.):	233	Face Area (sq.):	2914
Average Wall Height (ft.):	12	Face Angle (deg.):	85
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock, solid foundation.	9
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking.	8
STONE MASONRY 8.00	1-3-foot cut limestone blocks, strong, competent, moss covered.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 2-3 foot wide bench, grassy.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active stream channel, no scour observed.	7
LATERAL SLOPE 1.00	Begin of wall, dry stacked boulders on steep 1.5H:1v slope. End of wall is level.	7

Repair Recommendations

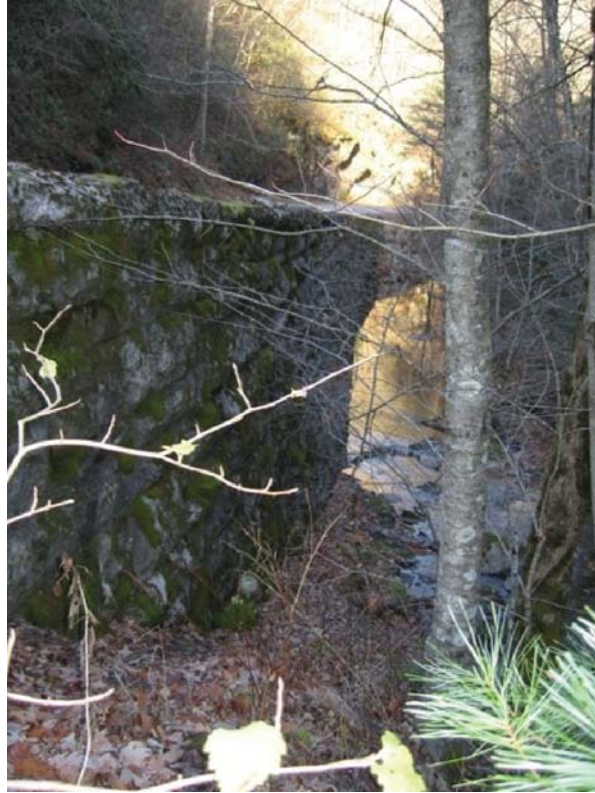
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.665_L_1.jpg

Wall ID:	GRSM-0015-2.788-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared headwall on outlet side.		

Wall Measurements

Wall Length (ft.):	70	Face Area (sq.):	333
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, active stream channel, minor erosion, not impacting wall performance.	8
MORTAR 8.00	Concrete mortar, minor unbonding, moderate horizontal cracking throughout, occasional spalling, minor cracking.	7
STONE MASONRY 8.00	1-3 foot cut limestone blocks, moss covered, efflorescence, strong, competent, no missing elements.	8
CULVERT 0.50	2 CBC's about 15 feet wide x 10 feet high, performing as intended.	8
DOWNSLOPE 0.50	Active stream channel, no scour observed.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is flat grassy slope with no signs of distress.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slope at 1.5H:1V slope with moderate erosion.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.788_R_1.jpg

Wall ID:	GRSM-0015-2.790-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Huge, headwall over inlet of two 10 high by 15 wide culverts.		

Wall Measurements

Wall Length (ft.):	70	Face Area (sq.):	320
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-9

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm soil.	9
MORTAR 8.00	Weathered, little debonding, one crack along top of wall in mortar, efflorescence.	7
STONE MASONRY 8.00	Weathered, lichen covered with some moss otherwise sound.	8
DOWNSLOPE 0.50	Flat, stream bed, low scour potential.	8
LATERAL SLOPE 0.50	Start - rock outcrop. End - grassy steep embankment fill.	8
CULVERT 0.50	No distress observed.	9
ROAD/SIDEWALK/SHOULDER 0.50	Steep grassy shoulder. No distress in road.	9
WALL DRAINS 0.50	4-inch by 4-inch opening in stone, not distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.790_L_1.jpg

Wall ID:	GRSM-0015-2.944-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall along stream with 30 in by 30 in box culvert.		

Wall Measurements

Wall Length (ft.):	196	Face Area (sq.):	2157
Average Wall Height (ft.):	11	Face Angle (deg.):	81
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock and river rock no undermining	9
MORTAR 8.00	Weathered and moss covered, possible debonding.	7
STONE MASONRY 8.00	Weathered surface, mossy and lichen, otherwise sound.	8
DOWNSLOPE 0.50	Stream, bedrock and river rock, moderate scour potential.	8
LATERAL SLOPE 0.50	Treed embankment, some raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_2.944_L_1.jpg

Wall ID:	GRSM-0015-3.035-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut stone mortared fill wall with guardwall parapet.		

Wall Measurements

Wall Length (ft.):	311	Face Area (sq.):	3082
Average Wall Height (ft.):	9	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Active alluvial stream channel, solid granular material, occasional undermining from stream, not impacting performance.	8
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling, moss cover.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, minor surface weathering.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3-4 feet wide grassy bench.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active stream channel, minor scour.	7
LATERAL SLOPE 1.00	Steep slope at 1.5H:1V with minor surface erosion.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.035_L_1.jpg

Wall ID:	GRSM-0015-3.160-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block culvert headwall at upstream inlet.		

Wall Measurements

Wall Length (ft.):	68	Face Area (sq.):	345
Average Wall Height (ft.):	5	Face Angle (deg.):	81
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and river rock.	9
MORTAR 8.00	Weathered, some small areas of missing mortar, generally good conditions, mossy.	7
STONE MASONRY 8.00	Weathered, mossy, sound/intact.	8
LATERAL SLOPE 0.50	Start - bedrock. End - embankment fill, possible creep.	8
UPSLOPE 0.50	Stream bedrock and river rock, low scour potential.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.160_L_1.jpg

Wall ID:	GRSM-0015-3.160-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall over outlet of two 20 wide by 10 high culverts.		

Wall Measurements

Wall Length (ft.):	65	Face Area (sq.):	300
Average Wall Height (ft.):	4	Face Angle (deg.):	81
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm granular soil and river rock.	9
MORTAR 8.00	Efflorescence, small area of highly weathered, generally weathered.	7
STONE MASONRY 8.00	Weathered mossy generally sound	8
DOWNSLOPE 0.50	Flat, stream, bedrock, low scour potential.	8
LATERAL SLOPE 0.50	Embankment fill little raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress, grassy shoulder.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.160_R_1.jpg

Wall ID:	GRSM-0015-3.285-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared gravity toe wall with concrete box culvert on outlet side.		

Wall Measurements

Wall Length (ft.):	257	Face Area (sq.):	1720
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, minor scour not impacting wall performance.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, boulders and gravel, minor undercutting from stream at 2 isolated locations, not impacting performance.	8
MORTAR 8.00	Concrete mortar, minor unbonding, minor cracking, minor spalling, moss cover.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, moss at surface.	9
CULVERT 0.50	7'x7' CBC, performing as intended.	8
LATERAL SLOPE 0.50	Begin of wall has 1.5H:1V steep slope. End of wall terminates at start of next wall at MP 3.30.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
ROAD/SIDEWALK/SHOULDER 1.00	Road has no signs of distress. Shoulder has steep slope at 1.5H:1V with heavy vegetation and occasional voids.	6
DOWNSLOPE 1.00	Active alluvial channel adjacent to wall, minor scour.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.285_R_1.jpg

Wall ID:	GRSM-0015-3.307-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at inlet of 7 high by 7 wide culvert.		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	189
Average Wall Height (ft.):	6	Face Angle (deg.):	81
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-12

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	Some, efflorescence, little moss, otherwise as new.	9
STONE MASONRY 8.00	Mossy, otherwise no distress.	9
LATERAL SLOPE 0.50	Bedrock.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
UPSLOPE 0.50	Bedrock.	9
WALL DRAINS 0.50	No distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.307_R_1.jpg

Wall ID:	GRSM-0015-3.330-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block cut mortared fill wall with guardwall parapet adjacent to stream.		

Wall Measurements

Wall Length (ft.):	536	Face Area (sq.):	8145
Average Wall Height (ft.):	15	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, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at stream channel, no undermining observed.	8
MORTAR 8.00	Concrete mortar, minor debonding, minor efflorescence, minor moss cover.	8
STONE MASONRY 8.00	1-3 foot limestone blocks, strong, competent, minor surface weathering, moss covered.	9
CULVERT 0.50	3 - 18-inch CMPs, performing as intended, good condition.	8
DOWNSLOPE 0.50	Active stream channel with granular material, minor undermining possible.	8
LATERAL SLOPE 0.50	Begin of wall has slope with wall below. End of wall has steep slope at 1.5H:1V slope and moderate surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 1-2 foot wide bench, good condition.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.330_R_1.jpg



GRSM_0015_3.330_R_2.jpg

Wall ID:	GRSM-0015-3.453-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large stone masonry wall along stream.		

Wall Measurements

Wall Length (ft.):	197	Face Area (sq.):	3010
Average Wall Height (ft.):	15	Face Angle (deg.):	85
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	Efflorescence, mossy, slight debonding.	7
STONE MASONRY 8.00	Moss covered, weathered, competent.	8
DOWNSLOPE 0.50	Bedrock, streambed, moderate scour potential.	8
LATERAL SLOPE 0.50	Start - rock outcrop and trees. End - rocky slope and rock outcrop trees.	8
TRAFFIC BARRIER/FENCE 0.50	Slight debonding, mossy.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.453_R_1.jpg

Wall ID:	GRSM-0015-3.627-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of 8 high by 10 wide culvert.		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	287
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm, granular soil and river rock	9
MORTAR 8.00	Mossy, slight debonding, good condition.	8
STONE MASONRY 8.00	Mossy, weathered, sound.	8
DOWNSLOPE 0.50	Flat streambed with a low scour potential.	8
LATERAL SLOPE 0.50	Rocky embankment fill.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.627_R_1.jpg

Wall ID:	GRSM-0015-3.628-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared headwall on inlet side.		

Wall Measurements

Wall Length (ft.):	33	Face Area (sq.):	170
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at stream channel, no signs of foundation distress.	9
MORTAR 8.00	Concrete mortar, minor debonding, minor cracking, minor moss cover, minor efflorescence.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, moss cover, minor efflorescence.	9
CULVERT 0.50	10-foot wide x 8 feet high CBC, performing as intended.	8
LATERAL SLOPE 0.50	Steep slopes at 1.5H:1V, well vegetated, minor surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is about 5-foot wide bench, grassy, well vegetated.	8
UPSLOPE 0.50	Active stream channel, not impacting wall performance.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.628_L_1.jpg

Wall ID:	GRSM-0015-3.993-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut stone mortared fill wall with guardwall parapet.		

Wall Measurements

Wall Length (ft.):	145	Face Area (sq.):	1471
Average Wall Height (ft.):	10	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at active stream channel, minor undercutting at one isolated location, not impacting wall performance.	8
MORTAR 8.00	Concrete mortar, minor debonding, minor moss cover, minor cracking.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, minor moss cover, minor surface weathering.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3-feet wide bench, grassy, no signs of distress.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active stream channel, minor undermining.	7
LATERAL SLOPE 1.00	Begin of wall has dry stack slope protection in good condition. End of wall has steep slope at 1.5H:1V.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_3.993_L_1.jpg

Wall ID:	GRSM-0015-4.152-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall along stream.		

Wall Measurements

Wall Length (ft.):	123	Face Area (sq.):	1111
Average Wall Height (ft.):	9	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	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	Moss covered, efflorescence, slight debonding.	8
STONE MASONRY 8.00	Weathered, mossy, sound.	8
DOWNSLOPE 0.50	Bedrock, streambed, high scour potential.	8
LATERAL SLOPE 0.50	Rocky embankment fill.	8
TRAFFIC BARRIER/FENCE 0.50	Debonding, weathered.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.152_L_1.jpg

Wall ID:	GRSM-0015-4.298-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of double 6 by 9 culverts.		

Wall Measurements

Wall Length (ft.):	38	Face Area (sq.):	180
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	River rock and granular soil.	9
MORTAR 8.00	Some debonding, possible repointing, good condition.	8
STONE MASONRY 8.00	Weathered, some moss, sound.	8
DOWNSLOPE 0.50	Flat streambed with low scour potential.	8
LATERAL SLOPE 0.50	Embankment fill moderately sloping covered by grass and trees.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.298_L_1.jpg

Wall ID:	GRSM-0015-4.298-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared headwall for 2 concrete box culverts on inlet side, with guardwall parapet.		

Wall Measurements

Wall Length (ft.):	40	Face Area (sq.):	138
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material in active stream channel, no signs of foundation distress.	9
MORTAR 8.00	Concrete mortar, minor debonding, minor cracking, occasional spalling.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, occasional moss cover, strong, competent, occasional efflorescence.	9
CULVERT 0.50	9 foot wide by 6 foot high CBC 2-arched culvert, performing as intended.	8
LATERAL SLOPE 0.50	Gentle slope about 2H:1V, grassy, minor surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 2-3 foot wide grassy bench with no signs of distress.	8
UPSLOPE 0.50	Active stream channel with granular material, no signs of undermining.	8
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.298_R_1.jpg

Wall ID:	GRSM-0015-4.586-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of double 7 high by 17 wide culverts.		

Wall Measurements

Wall Length (ft.):	65	Face Area (sq.):	362
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm, granular soil.	9
MORTAR 8.00	Weathered, little debonding, moss, efflorescence.	8
STONE MASONRY 8.00	Moss, weathered, sound	8
DOWNSLOPE 0.50	Flat, streambed with low scour potential.	8
LATERAL SLOPE 0.50	Treed and grassy embankment fill.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.586_L_1.jpg

Wall ID:	GRSM-0015-4.586-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared headwall on inlet side.		

Wall Measurements

Wall Length (ft.):	66	Face Area (sq.):	307
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at active stream channel, no signs of settlement or erosion.	8
MORTAR 8.00	Concrete mortar, minor debonding, minor cracking, moderate spalling, moss covered, minor efflorescence.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, minor surface weathering, no missing or displaced elements.	9
CULVERT 0.50	2 - 17' wide x 7' high CBC culvert, performing as intended.	8
LATERAL SLOPE 0.50	Slope at 2H:1V with minor surface erosion, well vegetated.	8
UPSLOPE 0.50	Active stream channel, scour potential.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3-4 feet wide bench, grassy, no signs of distress.	9
WALL DRAINS 0.50	Occasional open holes.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.586_R_1.jpg

Wall ID:	GRSM-0015-4.988-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut stone mortared headwall for double concrete box culvert, on inlet side.		

Wall Measurements

Wall Length (ft.):	61	Face Area (sq.):	274
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material at active stream channel, no signs of scour or settlement.	9
MORTAR 8.00	Concrete mortar, horizontal cracking continuous throughout, minor spalling, minor debonding, minor cracks throughout, moss cover, efflorescence.	7
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, moss cover, efflorescence, moderate surface weathering.	8
CULVERT 0.50	2- 18' wide x 6' high CBC culverts, moderate erosion, but performing as intended.	8
LATERAL SLOPE 0.50	About 2H:1V moderate slopes with trees and grass, minor surface erosion, not impacting wall.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3 feet wide bench, grassy, good condition.	8
UPSLOPE 0.50	Granular material, relatively flat channel, not impacting wall.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.988_R_1.jpg

Wall ID:	GRSM-0015-4.993-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	75	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall along creek with inlet for double culverts, 18 wide by 6 high, at start.		

Wall Measurements

Wall Length (ft.):	430	Face Area (sq.):	4216
Average Wall Height (ft.):	9	Face Angle (deg.):	85
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
MORTAR 8.00	Efflorescence and moss with little debonding.	7
STONE MASONRY 8.00	Weathered, some degradation, moss covered.	7
DOWNSLOPE 0.50	Bedrock, stream with moderate scour potential.	8
LATERAL SLOPE 0.50	Start - Bedrock. End - Steep Rocky fill with trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9
TRAFFIC BARRIER/FENCE 1.00	Degradation of rock.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_4.993_L_1.jpg

Wall ID:	GRSM-0015-5.547-R		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone cut block mortared culvert headwall on outlet side.		

Wall Measurements

Wall Length (ft.):	45	Face Area (sq.):	390
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, minor undermining, not impacting wall performance.	8
MORTAR 8.00	Concrete mortar, minor debonding, occasional minor cracking, moss cover.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, moss cover, moderate surface weathering.	9
CULVERT 0.50	10' x10' CBC, animal crossing and trail crossing, old wood deck underneath, performing as intended.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress.	9
UPSLOPE 0.50	Granular stream material, relatively flat.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Steep slopes at 1.5H:1V, moderate surface erosion, minor riprap protection at end of wall.	6

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_5.547_R_1.jpg

Wall ID:	GRSM-0015-5.548-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Head wall over the inlet end of a 10 by 10 box culvert.		

Wall Measurements

Wall Length (ft.):	45	Face Area (sq.):	390
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm granular soil.	9
MORTAR 8.00	Efflorescence, otherwise no distress.	9
STONE MASONRY 8.00	No distress.	9
LATERAL SLOPE 0.50	Steep embankment fill with trees, minor raveling.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
UPSLOPE 0.50	Flat wooded area.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_5.548_L_1.jpg

Wall ID:	GRSM-0015-6.630-L		
Route Name:	LAUREL CREEK ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1938
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared fill wall.		

Wall Measurements

Wall Length (ft.):	76	Face Area (sq.):	380
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, 3 wide benches, no signs of rotation or settlement.	9
MORTAR 8.00	Concrete mortar, minor cracks, minor debonding, moss cover.	8
STONE MASONRY 8.00	1-3 foot cut limestone blocks, strong, competent, moss cover, minor surface weathering.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress. Shoulder is 3-feet wide bench, grassy.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
LATERAL SLOPE 1.00	Headwall at begin of wall below and offset 10 feet, steep 1.5H:1V slopes with moderate to severe surface erosion.	6
DOWNSLOPE 1.00	3-foot wide bench with steep 1.5H:1V slopes below.	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.

Great Smoky Mountains National Park

ROUTE 0015: LAUREL CREEK ROAD

Retaining Wall Condition Photos



GRSM_0015_6.630_L_1.jpg

Wall ID:	GRSM-0017-0.161-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 6 ft x 9 ft culvert - underpass for abandoned trail, at road edge		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	312
Average Wall Height (ft.):	6	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	Maintenance required on mortar; otherwise good	7
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Moderate weathering and debonding; some efflorescence	7
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Fill embankment, moderate slope, vegetated	8
DOWNSLOPE 0.50	Low gradient path/drainage	9
ROAD/SIDEWALK/SHOULDER 0.50	4' wide flat grass shoulder, no distress	9
WALL DRAINS 1.00	Evidence of seepage through mortar	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint 20% of wall face area: 0.2 x 312 = 62.4sf Use 65sf 65sf x \$75 = \$4875
Repair Cost:	\$4,875

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.161_L_1.jpg

Wall ID:	GRSM-0017-0.161-R		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	86	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Has a 6 ft x 9 ft hiking path at base, directly supports road		

Wall Measurements

Wall Length (ft.):	705	Face Area (sq.):	5468
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	72	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent	9
WALL FOUNDATION MATERIAL 8.00	Founded on bedrock	9
MORTAR 8.00	Minor debonding/cracking	8
OTHER PRIMARY ELEMENT 8.00	Hiking path under roadway; minor cracking at top of box w/ exposed rebar	8
STONE MASONRY 8.00	Minor debonding	9
TRAFFIC BARRIER/FENCE 0.50	Guardwall has minor cracking/debonding	8
DOWNSLOPE 0.50	Steep slope, rocks, heavily vegetated; no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Pavement in good condition	9
WALL DRAINS 0.50	Weep holes evenly spaced along wall; appear functional	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.

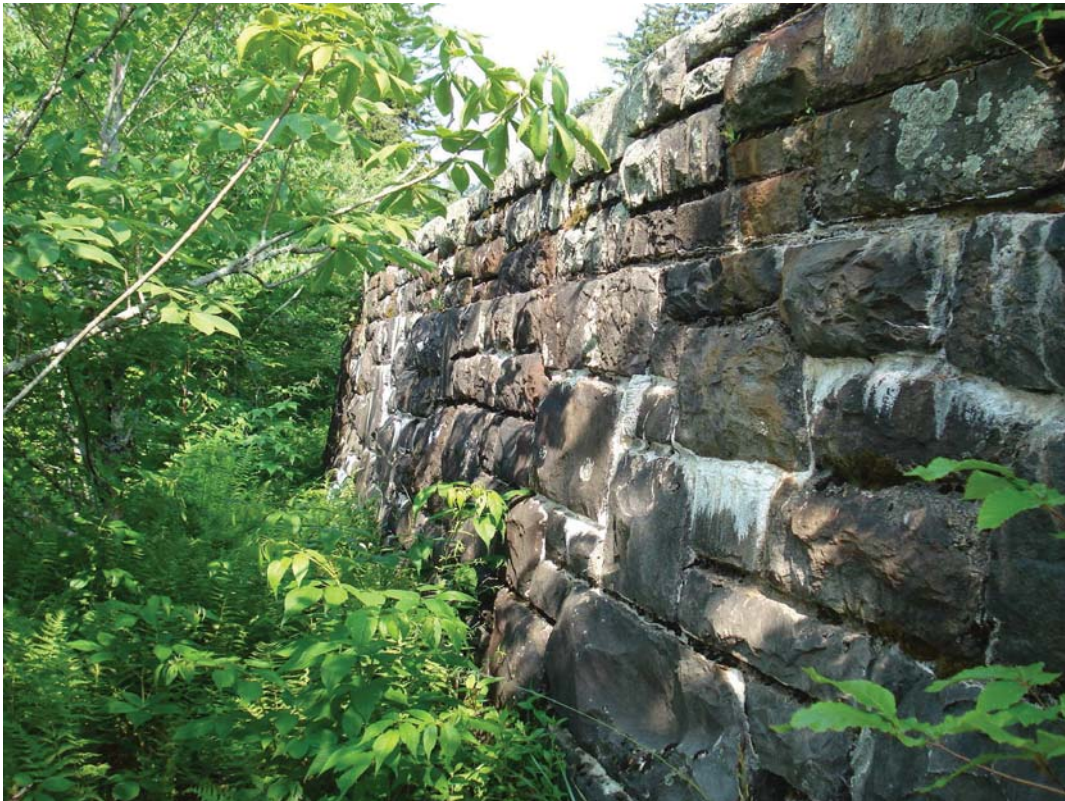
Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.161_R_1.jpg



GRSM_0017_0.161_R_2.jpg

Wall ID:	GRSM-0017-0.361-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Foot wall 7 ft off road poor foot access, large amounts of detritus at base of wall		

Wall Measurements

Wall Length (ft.):	230	Face Area (sq.):	3312
Average Wall Height (ft.):	14	Face Angle (deg.):	80
Maximum Wall Height (ft.):	21	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Steep, vegetated, large amount of slash brush piled at base of wall, coarse rock + soil fill	8
LATERAL SLOPE 0.50	Steep embankment fill, vegetated	8
CULVERT 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	5' grass shoulder; no distress	9
WALL DRAINS 0.50	Weep holes evenly spaced; no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.361_L_1.jpg

Wall ID:	GRSM-0017-0.420-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	71	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:	Along roadway		

Wall Measurements

Wall Length (ft.):	31	Face Area (sq.):	181
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	Undermining has caused wall distress and shoulder/guardwall settlement; overall fair condition	6
WALL FOUNDATION MATERIAL 8.00	Founded atop slope; undermining has caused separation of stones	6
MORTAR 8.00	Minor cracking/debonding; spalling at undermined location	8
STONE MASONRY 8.00	Separation at undermined area (.5"); otherwise good	8
DOWNSLOPE 0.50	Slash debris along base of wall; no distress	8
VEGETATION 0.50	Bushes at base of wall should be cut back	8
CULVERT 0.50	1.5' circular concrete culvert in good condition	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 1.00	Small depression of shoulder at undermined spot	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint 15% of wall: .15 x 181sf = 27sf Use 30sf - 30sf x \$75 = \$2250. Repair undermine near wall end - 5'long x 1' high x 1' deep: Subexc 1' - place mortared stones in void. Ensure contact with wall: 2 crew 16 hrs - materials incidental: 2 x 16 x \$55 = \$
Repair Cost:	\$4,010

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

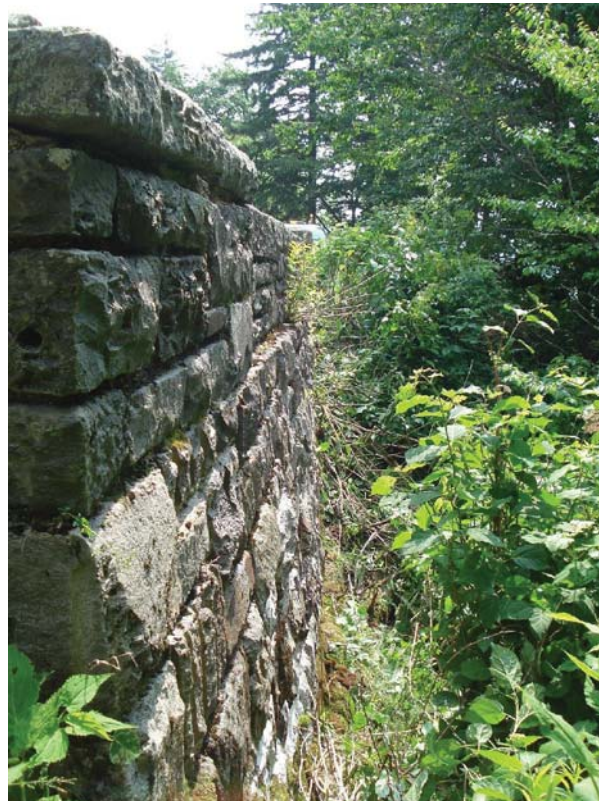
Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.420_L_1.jpg



GRSM_0017_0.420_L_2.jpg

Wall ID:	GRSM-0017-0.424-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall at base of fill slope		

Wall Measurements

Wall Length (ft.):	200	Face Area (sq.):	1848
Average Wall Height (ft.):	9	Face Angle (deg.):	80
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Weathering, otherwise good	7
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild debonding	7
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Moderate vegetated slight settlement at base of wall	8
LATERAL SLOPE 0.50	Steep vegetated, minor raveling	8
WALL DRAINS 0.50	No distress	9
UPSLOPE 1.00	Steep, coarse loose fill embankment, voids, minor raveling	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.424_L_1.jpg

Wall ID:	GRSM-0017-0.464-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	81	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along side of road		

Wall Measurements

Wall Length (ft.):	200	Face Area (sq.):	771
Average Wall Height (ft.):	3	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	Minor undermining, several bushes too close to wall; otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Minor undermining of foundation at several locations, founded on moderate to steep slope	8
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	Minor cracking/debonding	8
DOWNSLOPE 0.50	Highly vegetated slope, debris along wall may be causing slope creep away from wall	8
LATERAL SLOPE 0.50	Vegetated	8
VEGETATION 0.50	Bushes should be cut back 3' from wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Pavement/roadway in excellent condition	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.464_L_2.jpg

Wall ID:	GRSM-0017-0.558-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill and slash piled at base of wall		

Wall Measurements

Wall Length (ft.):	103	Face Area (sq.):	660
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild debonding	8
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	No distress	8
CULVERT 0.50	Partially covered with slash; otherwise ok	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
DOWNSLOPE 1.00	Minor settling and raveling at base of wall, moderate to steep fill embankment	7
LATERAL SLOPE 1.00	~30' of roadway before start of wall is settling/cracking; downwall end ok	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.558_L_1.jpg

Wall ID:	GRSM-0017-0.620-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Head wall / fill wall with 1.5 ft x 1.5 ft culvert		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	150
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 to excellent	9
WALL FOUNDATION MATERIAL 8.00	Minor localized undermining; otherwise no distress	9
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	Good to excellent	9
CULVERT 0.50	1.5' cmp culvert; no distress	9
DOWNSLOPE 0.50	Moderate to steep slope; no distress	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.620_L_1.jpg

Wall ID:	GRSM-0017-0.655-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall at base of moderate to steep slope		

Wall Measurements

Wall Length (ft.):	115	Face Area (sq.):	836
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-16

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor spalling; otherwise good	8
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	Age related weathering	7
STONE MASONRY 8.00	Minor cracking	8
DOWNSLOPE 0.50	Moderate slope, no distress	8
LATERAL SLOPE 0.50	No distress	8
VEGETATION 0.50	Several trees growing at top of wall (some big, some small)	8
WALL DRAINS 0.50	Occasional weep holes, no distress	8
UPSLOPE 0.50	No distress	9

Repair Recommendations

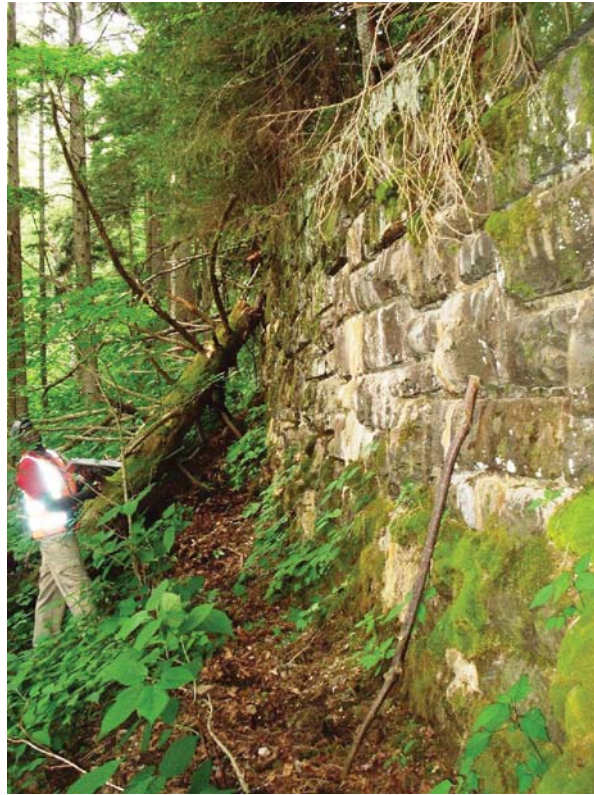
Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.655_L_1.jpg

Wall ID:	GRSM-0017-0.901-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Outlet 3 ft diameter corrugated metal pipe		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	165
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild degradation of mortar	8
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	Minor rusting, no distress	8
DOWNSLOPE 0.50	Mod/steep slope w/ riprap erosion protection at culvert opening	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking in the pavement, no distress to shoulder	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_0.901_L_1.jpg



GRSM_0017_0.901_L_2.jpg

Wall ID:	GRSM-0017-1.979-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Along road edge, 3 ft x 3 ft culvert		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	161
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 to excellent	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	Minor debonding	8
WALL DRAINS 0.50	No distress	8
DOWNSLOPE 0.50	Moderate slope w/ heavy brush and tree cover, no distress	9
LATERAL SLOPE 0.50	No distress	9
VEGETATION 0.50	Heavy brush adjacent to wall	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_1.979_L_1.jpg

Wall ID:	GRSM-0017-2.025-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Has 20 in x 20 in 50 ft from beginning of wall		

Wall Measurements

Wall Length (ft.):	150	Face Area (sq.):	1640
Average Wall Height (ft.):	10	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	8
WALL FOUNDATION MATERIAL 8.00	Firm soil and rock fill; some loose areas and slash debris	8
MORTAR 8.00	Weathering distress	8
STONE MASONRY 8.00	Minor spalling	8
DOWNSLOPE 0.50	Moderate to steep, minor erosion away from wall	8
LATERAL SLOPE 0.50	Moderate to steep slope, vegetated	8
ROAD/SIDEWALK/SHOULDER 0.50	Flat grass shoulder, no distress	9
WALL DRAINS 0.50	Weep hole present, no distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.025_L_1.jpg

Wall ID:	GRSM-0017-2.070-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Culvert outlet, 2 ft x 2 ft		

Wall Measurements

Wall Length (ft.):	11	Face Area (sq.):	26
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Steep heavily vegetated	8
WALL FOUNDATION MATERIAL 8.00	Heavily moss covered --> chemical weathering due to biological processes	9
MORTAR 8.00	Round pipe from square culvert, rebar exposed	8
STONE MASONRY 8.00	Good	8
DOWNSLOPE 0.50	No distress	8
LATERAL SLOPE 0.50	Shallow slope, grass shoulder	8
ROAD/SIDEWALK/SHOULDER 0.50	Firm soil + rock	9
WALL DRAINS 0.50	Heavily moss covered --> chemical weathering due to biological processes	9
CULVERT 1.00	Steep forested	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0017-2.070-L.

Wall ID:	GRSM-0017-2.075-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall at base of fill		

Wall Measurements

Wall Length (ft.):	158	Face Area (sq.):	1140
Average Wall Height (ft.):	7	Face Angle (deg.):	90
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild debonding, mild efflorescence	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Moderate, mild creep, vegetated	8
LATERAL SLOPE 0.50	Riprap, coarse granular fill, voids, mild raveling/creep	8
WALL DRAINS 0.50	No distress	9
UPSLOPE 1.00	Steep coarse fill, moderate creep/raveling over edge of wall, vegetated	7

Repair Recommendations

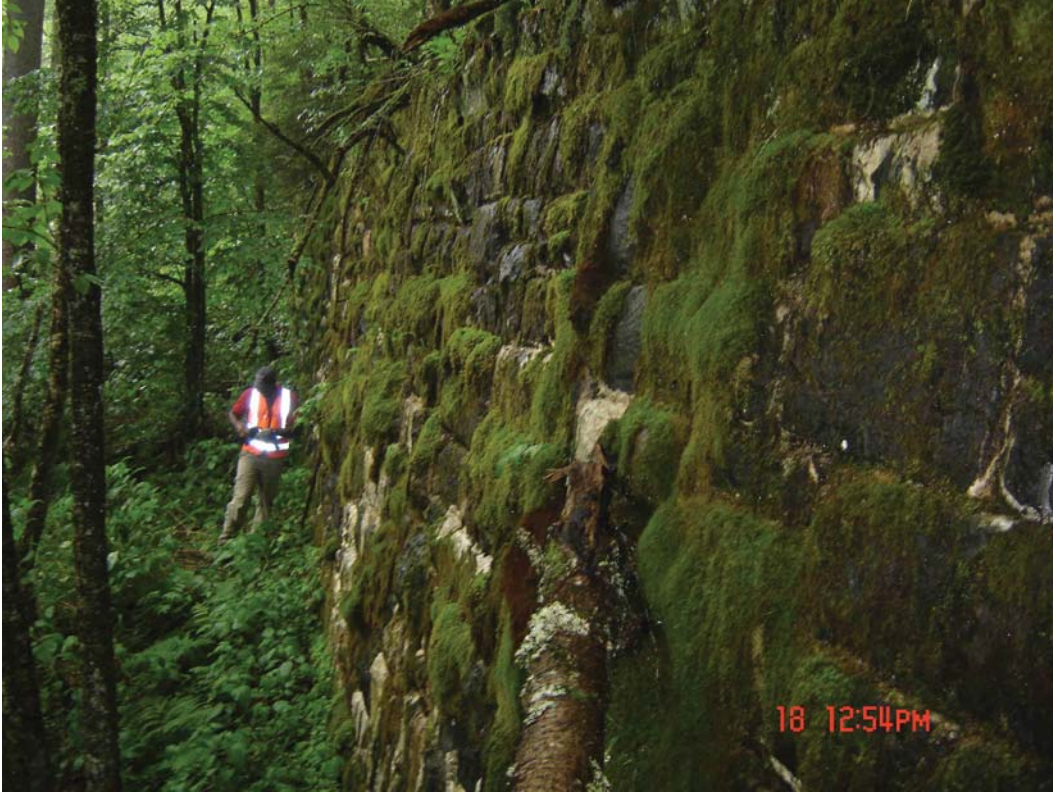
Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.075_L_1.jpg

Wall ID:	GRSM-0017-2.107-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	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:	Many voids behind guardwall		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	346
Average Wall Height (ft.):	2	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor voids underneath wall and guardwall, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Firm soil + rock; 30% voids	7
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	Good condition	9
DOWNSLOPE 0.50	Minor lateral slope creep	8
LATERAL SLOPE 0.50	Minor erosion, heavily vegetated	8
WALL DRAINS 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 1.00	Shoulder has many voids.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Fill voids in shoulder and wall base with compacted soil: Use local material (cost incidental): Approx 70cf material needed - Use 3 cy: 3 crew, dump truck, vibratory compactor, 8 hrs. ((3 x \$55/hr) + \$20/hr (compactor) + 120/hr (truck)) x 8 = \$2440
Repair Cost:	\$2,440

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.107_L_1.jpg

Wall ID:	GRSM-0017-2.260-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall		

Wall Measurements

Wall Length (ft.):	230	Face Area (sq.):	1374
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	No distress	8
WALL DRAINS 0.50	No distress	8
DOWNSLOPE 0.50	Steep, vegetated, o movement; slash debris along base	9
LATERAL SLOPE 0.50	No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Minor pavement cracking, no distress to shoulder	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.260_L_1.jpg

Wall ID:	GRSM-0017-2.270-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	85	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:	Toe wall at base of fill embankment		

Wall Measurements

Wall Length (ft.):	114	Face Area (sq.):	858
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-25

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Mild debonding, efflorescence	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Mild creep	8
LATERAL SLOPE 0.50	Riprap, mild creep	8
CULVERT 0.50	1.5' diameter cmp, no distress	9
WALL DRAINS 0.50	Few weep holes, no distress	9
UPSLOPE 1.00	Steep coarse full of voids	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Remove double-trunk tree at wall start - treat with herbicide to kill roots: 2 crew, 4 hrs: 2 x \$55 x 4 = 440 Use \$500
Repair Cost:	\$500

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.270_L_1.jpg

Wall ID:	GRSM-0017-2.500-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Riprap protection at base of slope		

Wall Measurements

Wall Length (ft.):	100	Face Area (sq.):	576
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-38

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Minor weathering	8
STONE MASONRY 8.00	No distress	8
DOWNSLOPE 0.50	No distress	8
VEGETATION 0.50	Large diameter tree at top of wall on west end, no distress	8
CULVERT 0.50	2'x2' cmp culvert, no distress	9
LATERAL SLOPE 0.50	No distress, no erosion	9
WALL DRAINS 0.50	No seen drainage, no distress	9

Repair Recommendations

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

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

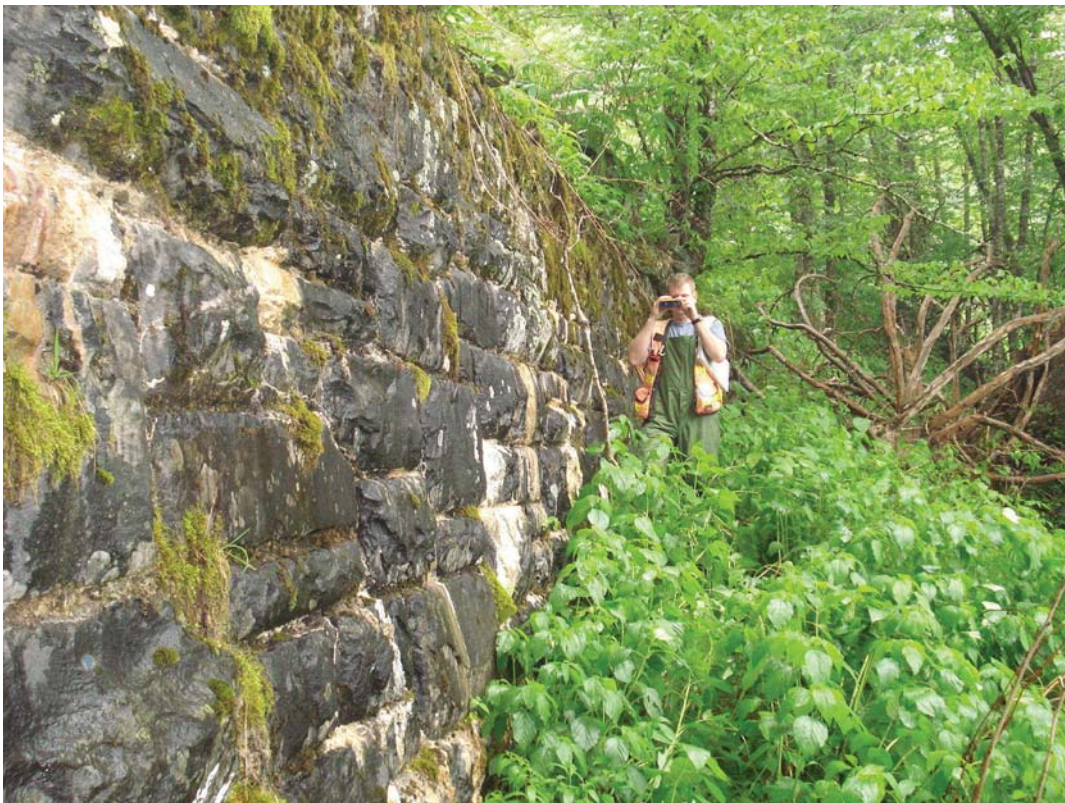
Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_2.500_L_1.jpg



GRSM_0017_2.500_L_2.jpg

Wall ID:	GRSM-0017-3.093-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	85	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:	Poor vehicle access to wall area		

Wall Measurements

Wall Length (ft.):	175	Face Area (sq.):	1419
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-12

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Tree anchoring on top of hill	8
WALL FOUNDATION MATERIAL 8.00	No distress, not visible	9
MORTAR 8.00	Mild weathering + efflorescence	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Coarse fill, mild creep, vegetated	8
UPSLOPE 0.50	Steep coarse fill vegetated, minor creep	8
DOWNSLOPE 0.50	Steep vegetated, no distress	9
WALL DRAINS 0.50	Weep holes, no distress	9
VEGETATION 1.00	Trees growing at top of wall causing minor cracking due to roots	7

Repair Recommendations

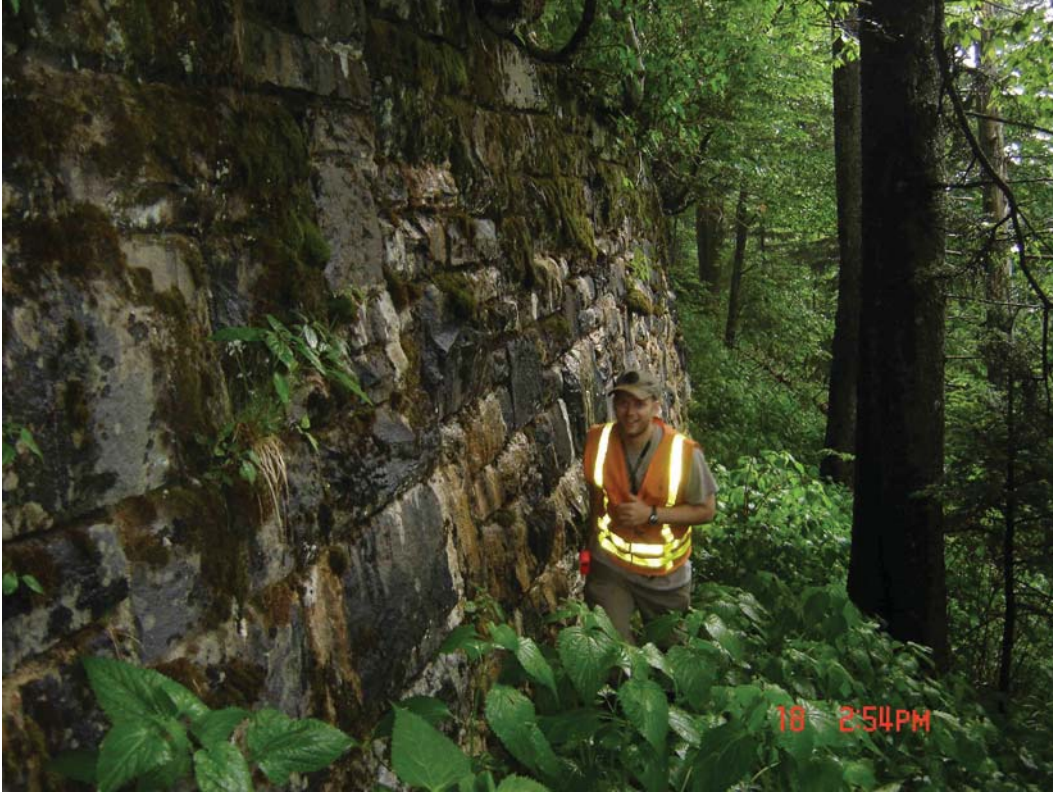
Failure Consequence:	MODERATE
Recommendation Narrative:	Remove Trees along top of wall - treat with herbicide to kill roots: 2 crew, 8 hrs: 2 x \$55/hr x 8 = \$880
Repair Cost:	\$880

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_3.093_L_1.jpg

Wall ID:	GRSM-0017-3.234-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Close to roadway, directly supporting road		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	687
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	No distress	8
MORTAR 8.00	General age related distress	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	Steep vegetated, no distress, debris at base of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor asphalt cracking	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_3.234_L_1.jpg



GRSM_0017_3.234_L_2.jpg

Wall ID:	GRSM-0017-4.241-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	81	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall at base of blast rock fill slope		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	982
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-44

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	7
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	General weathering	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Steep slope w/ loose blast rock fill; no distress	8
LATERAL SLOPE 0.50	No distress; blast rock fill	8
WALL DRAINS 0.50	Weep holes appear functional	9
ROAD/SIDEWALK/SHOULDER 1.00	Moderate to severe cracking in pavement, caused by general unraveling of upslope fill	6
UPSLOPE 1.00	Steep slope w/ large size loose angular riprap fill; evidence that slope is moving	6

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.

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.241_L_1.jpg



GRSM_0017_4.241_L_2.jpg

Wall ID:	GRSM-0017-4.514-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	83	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 stack wall with guardwall on top		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	452
Average Wall Height (ft.):	3	Face Angle (deg.):	80
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good	8
WALL FOUNDATION MATERIAL 8.00	Exposed at wall start, appears to be riprap, large voids but no distress	8
PLACED STONE 8.00	Dimensional, good fit, 80% vegetated	9
CULVERT 0.50	2'x2' culvert box, no distress	8
DOWNSLOPE 0.50	Coarse fill, steep vegetated, minor creep	8
LATERAL SLOPE 0.50	Riprap, vegetated, minor creep	8
WALL DRAINS 0.50	Self draining	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove vegetation from wall: 2 crew, 4 hrs: 2 x \$55/hr x 4 = \$440 Use \$500
Repair Cost:	\$500

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.514_L_1.jpg

Wall ID:	GRSM-0017-4.583-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall at base of steep blast rock fill slope		

Wall Measurements

Wall Length (ft.):	167	Face Area (sq.):	2365
Average Wall Height (ft.):	14	Face Angle (deg.):	90
Maximum Wall Height (ft.):	19	Vertical Offset (ft.):	-30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Evidence of upslope movement causing pavement distress, otherwise ok	7
WALL FOUNDATION MATERIAL 8.00	Founded atop blast rock and bedrock; no indication of settlement	9
MORTAR 8.00	Moderate calcium buildup, general weathering	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Evidence of past slope movement	8
LATERAL SLOPE 0.50	Blast rock fill east, bedrock west, no distress	8
WALL DRAINS 0.50	Weep holes appear functional	9
ROAD/SIDEWALK/SHOULDER 1.00	Moderate pavement distress contained to the limits of the wall, possibly caused by slope movement	7
UPSLOPE 1.00	Steep blast rock fill slope; evidence of ~1.5' slope movement	7

Repair Recommendations

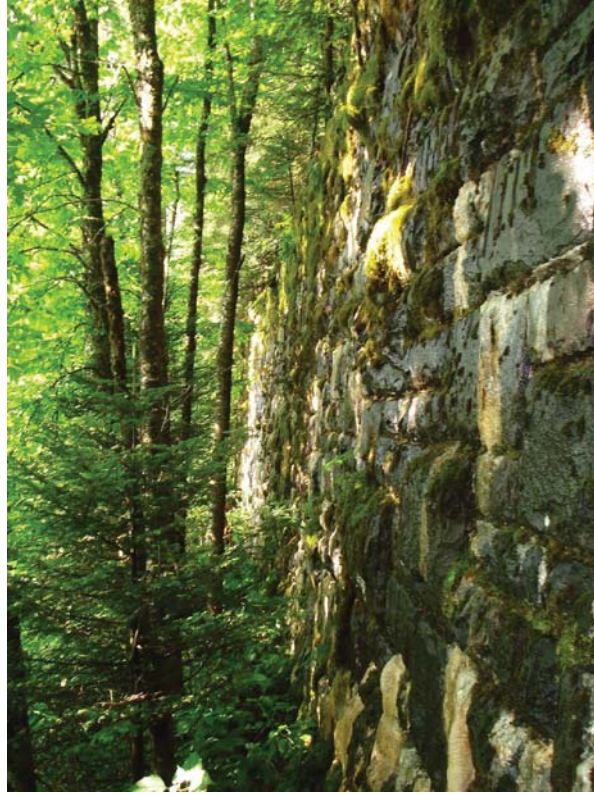
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.583_L_1.jpg



GRSM_0017_4.583_L_2.jpg

Wall ID:	GRSM-0017-4.866-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	80	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:	Fill wall, adjacent to wall		

Wall Measurements

Wall Length (ft.):	205	Face Area (sq.):	1616
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor seepage	7
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Minor debonding, some seepage through mortar in locations (no mortar loss), minor efflorescence	7
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Moderate to steep, thickly vegetated	8
LATERAL SLOPE 0.50	Coarse rock fill, thickly vegetated	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor distress in road at grassy shoulder, some low spots	8
WALL DRAINS 1.00	No weep holes at base, some water seeping through face after heavy rain day before	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove vegetation from wall: 2 crew, 8hrs: 2 x \$55/hr x 8 = \$880
Repair Cost:	\$880

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.866_L_1.jpg

Wall ID:	GRSM-0017-4.869-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Low fill wall adjacent to wall, vegetated on top		

Wall Measurements

Wall Length (ft.):	50	Face Area (sq.):	150
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	May be settlement of slope prism, otherwise good	7
WALL FOUNDATION MATERIAL 8.00	Not visible, no distress	8
MORTAR 8.00	Very minor efflorescence	8
STONE MASONRY 8.00	No distress	9
DOWNSLOPE 0.50	Minor creep in blast rock +soil steep embankment	8
WALL DRAINS 0.50	No distress	9
LATERAL SLOPE 1.00	Similar to downslope, minor creep likely	7
ROAD/SIDEWALK/SHOULDER 1.00	Flat grassy shoulder, cracks in roadway representing global settlement/creep of fill prism	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.

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.869_L_1.jpg

Wall ID:	GRSM-0017-4.968-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	15 ft to 20 ft offset		

Wall Measurements

Wall Length (ft.):	80	Face Area (sq.):	681
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-6

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor cracking, trees should be removed, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	Founded atop moderate to steep blast rock fill slope, no distress	8
MORTAR 8.00	General age related degradation	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	Steep vegetated slope with blast rock fill along face, no distress	8
LATERAL SLOPE 0.50	Blast rock fill E and W, minor erosion on W side	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking of pavement	8
UPSLOPE 0.50	Moderate slope with numerous trees, no slope movement	8
VEGETATION 0.50	Many small-medium trees along wall not affecting it, but should be cut back	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.968_L_1.jpg

Wall ID:	GRSM-0017-4.988-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	45	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Toe wall, coarse fill has voids above and below		

Wall Measurements

Wall Length (ft.):	135	Face Area (sq.):	1098
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-45

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall failed, needs replacing	1
WALL FOUNDATION MATERIAL 8.00	Wall failing and foundation not visible, but no settlement is apparent	7
MORTAR 8.00	Moderate to high efflorescence, 1"-4" cracks form wall failure, mortar is weathered	4
STONE MASONRY 8.00	Wall face has rotated out past vertical in several locations. Stones themselves intact, can be reused.	5
DOWNSLOPE 0.50	Boulders voids little creep	8
UPSLOPE 1.00	Steep boulder fill, loose, settling/creeping, big voids , over steepened	5
LATERAL SLOPE 1.00	Boulders loose, large voids, creep	6
WALL DRAINS 1.00	Evidence of high weepage through wall, scattered weep holes	6
ROAD/SIDEWALK/SHOULDER 1.00	Moderate pavement distress	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Replace in kind, salvage existing stones - re-use if possible: 1097.5sf x \$160/sf = \$175600. Salvage existing material: No cost in cost guide - use \$50/sf: 1097.5 x 50 = \$54875. Total = 54875 + \$175600 = \$230475. Very poor access - increase 50% \$230475 x 1.
Repair Cost:	\$345,713

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_4.988_L_1.jpg



GRSM_0017_4.988_L_2.jpg

Wall ID:	GRSM-0017-5.512-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall is on top of a steep slope		

Wall Measurements

Wall Length (ft.):	150	Face Area (sq.):	887
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor cracking/debonding	8
WALL FOUNDATION MATERIAL 8.00	No distress	9
MORTAR 8.00	Minor cracking/spalling	8
STONE MASONRY 8.00	Minor debonding	8
CULVERT 0.50	1.5'x1.5' culvert at 14 aft at base of wall, clogged w/ debris	8
DOWNSLOPE 0.50	Steep wooded blast rock fill face, no distress	8
ROAD/SIDEWALK/SHOULDER 0.50	Minor cracking in pavement	8
VEGETATION 0.50	Small trees near wall, no distress	8
WALL DRAINS 0.50	Weep holes infrequently spaced along base, no distress	8

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_5.512_L_1.jpg

Wall ID:	GRSM-0017-7.255-R		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 19, 2007	Approximate Year Built:	1936
*Wall Rating:	65	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GD fill wall supporting the exit road from the Clingmans Dome parking area high consequence of failure		

Wall Measurements

Wall Length (ft.):	110	Face Area (sq.):	2125
Average Wall Height (ft.):	19	Face Angle (deg.):	55
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition; general unraveling of slope; ongoing erosion of shoulder material and possible loss of backfill	6
WALL FOUNDATION MATERIAL 8.00	Founded on loose-placed blast rock fill and the natural slope; unraveling of wall may be due to movement of the rock fill foundation	7
PLACED STONE 8.00	Large angular blast rock; evidence of wall movement indicated by general unraveling of wall; several large voids between rocks;	6
DOWNSLOPE 0.50	Loose-placed blast rock fill along the base of wall and extending downslope approximately 20 ft; medium to large diameter cut trees are pile along base of wall	8
LATERAL SLOPE 0.50	Minor erosion of lateral slope	8
VEGETATION 0.50	No distress to wall; small diameter brush growing along face of wall	8
ROAD/SIDEWALK/SHOULDER 1.00	Minor reflexive cracking of pavement; shoulder material, immediate to wall is being eroded	7
WALL DRAINS 1.00	Wall self draining; loss of ground along the top of wall is most likely due to erosion of backfill material	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Grout Boulders In Place (30% of wall) - $0.30(2,125 \text{ sqft})(2.5 \text{ ft})(\$105) = \$66,937.5$. Unclassified Borrow - $4.1 \text{ sqft}(\$35/\text{sqft}) = \142.59 .
Repair Cost:	\$67,080

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos



GRSM_0017_7.255_R_1.jpg



GRSM_0017_7.255_R_2.jpg

Wall ID:	GRSM-0017-9.370-L		
Route Name:	CLINGMANS DOME ACCESS ROAD		
Inspection Date:	June 18, 2007	Approximate Year Built:	1936
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Tow wall at base of fill embankment below roadway		

Wall Measurements

Wall Length (ft.):	185	Face Area (sq.):	1358
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-24

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Minor efflorescence of mortar, otherwise good	8
WALL FOUNDATION MATERIAL 8.00	No distress, not visible	9
MORTAR 8.00	Mild debonding, moderate efflorescence, mild weathering	7
STONE MASONRY 8.00	Mo distress	9
DOWNSLOPE 0.50	Angular-platy cobble fill over native soil; minor raveling	8
WALL DRAINS 0.50	No distress	8
LATERAL SLOPE 1.00	Angular coarse cobble, voids, minor raveling	7
UPSLOPE 1.00	Over steepened, moderate slope creep, moderate raveling over wall top	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0017: CLINGMANS DOME ACCESS ROAD

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0017-9.370-L.

Wall ID:	GRSM-0018-0.698-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	89	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large blocky rock wall with concrete mortar along outside bend in stream.		

Wall Measurements

Wall Length (ft.):	309	Face Area (sq.):	3722
Average Wall Height (ft.):	12	Face Angle (deg.):	70
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock some minor voids between bedrock and stone, do not appear to be impacting wall.	9
MORTAR 8.00	Massive concrete mortar, no distress.	9
PLACED STONE 8.00	Competent intact rock.	9
DOWNSLOPE 0.50	Stream bed with high scour potential.	8
ROAD/SIDEWALK/SHOULDER 0.50	Shoulder is flat grass covered. Road has minor cracks that do not appear to be related to the wall.	8
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Steep treed streambanks, some creep possible.	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.

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_0.698_R_1.jpg

Wall ID:	GRSM-0018-0.939-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	58	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone boulder gravity fill wall adjacent to a stream.		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	1200
Average Wall Height (ft.):	10	Face Angle (deg.):	70
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 condition with failed section in the middle.	6
WALL FOUNDATION MATERIAL 8.00	Active stream channel material, slope about 1.5H:1V with minor to moderate scour at the base.	7
PLACED STONE 8.00	1-2 foot limestone boulders, moss covered throughout, minor voids throughout, 1 failed section at 71 feet from begin of wall. About 10'x10' section fell into stream, not impacting road yet, but eventually will encroach on roadway if not repaired.	4
LATERAL SLOPE 1.00	Washed out at the end of wall.	4
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking associated with failed section. Shoulder has about 2-feet wide flat bench with minor soft spots.	8
WALL DRAINS 0.50	None observed, not impacting wall.	8
DOWNSLOPE 1.00	Active stream channel with potential for undermining and scour.	6
VEGETATION 1.00	Grass and brush throughout with one large tree, both stabilize above and below slope.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Located about 71-feet from the begin of wall, a 10'x10' failed wall section needs to be replaced: Riprap Class 3 - place @ failed section 10'x10'x3' = 300 cft = 11 cyd @ \$220/cyd = \$2,444. Labor = 2 people x 4hrs x \$55/hr = \$440.
Repair Cost:	\$3,284

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

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_0.939_R_1.jpg

Wall ID:	GRSM-0018-1.013-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	75	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Headwall at outlet of CMP culvert (48 in diameter squash).		

Wall Measurements

Wall Length (ft.):	14	Face Area (sq.):	145
Average Wall Height (ft.):	10	Face Angle (deg.):	73
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Firm soil and embankment rock fill, slight undermining.	8
MORTAR 8.00	Extensive weathering and debonding	6
STONE MASONRY 8.00	Moss covered, some weathering.	8
DOWNSLOPE 0.50	Flat streambed cobbles.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	9
LATERAL SLOPE 1.00	Steep, some raveling, possible creep.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_1.013_R_1.jpg

Wall ID:	GRSM-0018-1.264-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	56	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 limestone boulder fill wall adjacent to a stream.		

Wall Measurements

Wall Length (ft.):	286	Face Area (sq.):	3432
Average Wall Height (ft.):	12	Face Angle (deg.):	80
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to poor, 2 failed sections in shoulder not yet impacting roadway.	6
WALL FOUNDATION MATERIAL 8.00	Solid granular material in active stream channel, scour and undermining possible.	6
PLACED STONE 8.00	Limestone boulders (1-5-ft diameter) with occasional missing elements at 2 locations, failing in shoulder area, but not yet impacting roadway.	4
CULVERT 0.50	24-inch CMP at end of wall, performing as intended.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
DOWNSLOPE 1.00	Active stream channel, scour possible.	6
ROAD/SIDEWALK/SHOULDER 1.00	Road has slight cracking and depression above failed area. Shoulder is about 2-3 feet wide, occasional loose, soft ground, 2 local failed sections.	6
LATERAL SLOPE 1.00	1.5H:1V slope at begin and end of wall, moderate surface erosion.	7
VEGETATION 1.00	Trees and brush, both pushing out base of wall, but preventing erosion at the top of the wall.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Replace boulders at 2 failed shoulder locations: @ 30 feet from begin of wall = 15'widex10'htx3'deep = 450 ft ³ , @ 48 feet from begin of wall = 5'widex10'htx3'deep = 150 ft ³ , Total = 600 ft ³ = 22cyd. Riprap Class 6 @\$220/yd ³ = 22x220 = \$4,840
Repair Cost:	\$6,760

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

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_1.264_R_1.jpg

Wall ID:	GRSM-0018-1.373-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

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 stack boulders with minor amounts of concrete mortar		

Wall Measurements

Wall Length (ft.):	152	Face Area (sq.):	1520
Average Wall Height (ft.):	10	Face Angle (deg.):	75
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-3

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm rock fill	9
PLACED STONE 8.00	Minor lichen growth, no distress.	9
DOWNSLOPE 0.50	Stream - low scour potential.	8
LATERAL SLOPE 0.50	Steep rocky embankment fill, possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	Shallow grassy shoulder slope. Road has minor cracking not likely wall related.	9
WALL DRAINS 0.50	6-inch PVC pipe no distress.	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.

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_1.373_R_1.jpg

Wall ID:	GRSM-0018-1.438-R		
Route Name:	ELKMONT ROAD		
Inspection Date:	November 27, 2007	Approximate Year Built:	1930
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Fill wall consisting of large blocky rocks with concrete mortar.		

Wall Measurements

Wall Length (ft.):	102	Face Area (sq.):	1224
Average Wall Height (ft.):	12	Face Angle (deg.):	58
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Concreted. Streambed rock and bedrock.	9
MORTAR 8.00	Concrete mortar - no distress.	9
PLACED STONE 8.00	Slight weathering, otherwise no distress.	9
LATERAL SLOPE 0.50	Very steep rock fill embankment with some trees and slight raveling	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0018: ELKMONT ROAD

Retaining Wall Condition Photos



GRSM_0018_1.438_R_1.jpg

Wall ID:	GRSM-0019-0.293-L		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	79	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone head wall 6x6 CIP concrete box below fill		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	124
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-21

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	as intended. Mortar loss may lead to further deterioration within a few years	8
WALL FOUNDATION MATERIAL 8.00	Stable channel and soil, no distress	9
MORTAR 8.00	Debonded or missing ~20%. 0.5-2" voids	6
PLACED STONE 8.00	No distress	9
CULVERT 0.50	6x6 CIP box - grout loss at waterline ~ 10inches long (visible) x 1" deep	8
LATERAL SLOPE 0.50	stable embankment, no distress	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint 25% of wall face 125 sf x .25 x \$70/sf = \$2190
Repair Cost:	\$2,190

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

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0019-0.293-L.

Wall ID:	GRSM-0019-0.300-R		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone head wall 6x6 CIP box culvert wingwalls		

Wall Measurements

Wall Length (ft.):	36	Face Area (sq.):	158
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-15

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable boulder/cobble/soil channel	9
MORTAR 8.00	Slight debonding (~15%, 1/2"max), moss	8
STONE MASONRY 8.00	No distress	9
LATERAL SLOPE 0.50	Stable embankment, 33 degrees, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, 33 degrees, no distress	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos



GRSM_0019_0.300_R_1.jpg

Wall ID:	GRSM-0019-2.430-L		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone head wall 6 ft x 5 ft ellipse coated CMP.		

Wall Measurements

Wall Length (ft.):	23	Face Area (sq.):	77
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable cobble channel	9
MORTAR 8.00	v.slight debond (>10%, 1/4" max). No other distress	9
PLACED STONE 8.00	No distress	9
LATERAL SLOPE 0.50	Stable embankment, 26 degrees, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, 26 degrees, no distress	9
WALL DRAINS 0.50	No distress	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.

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos



GRSM_0019_2.430_L_1.jpg

Wall ID:	GRSM-0019-2.432-R		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	88	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone head wall 6x5 ellipse, coated CMP.		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	101
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-7

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable cobble channel, no distress	9
MORTAR 8.00	Slight debonding and some spalling (~15%, 1/4"max). No other distress	8
PLACED STONE 8.00	No distress	9
CULVERT 0.50	No distress	9
LATERAL SLOPE 0.50	Stable embankment, 24 degrees, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Stable embankment, 24 degrees, no distress	9
WALL DRAINS 0.50	4" weep left side, no distress	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.

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos



GRSM_0019_2.432_R_1.jpg

Wall ID:	GRSM-0019-5.795-L		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	94	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete head wall with 6x6.5 CIP box culvert at base of big fill just before parking area at road end.		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	68
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-35

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable channel, no visible distress	9
CONCRETE 8.00	No distress	10
WALL DRAINS 0.50	Weep holes in box. No distress	9
LATERAL SLOPE 0.50	Stable rock embankment, 36 degrees, no distress	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10
UPSLOPE 0.50	Stable rock embankment, 36 degrees, no distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos



GRSM_0019_5.795_L_1.jpg

Wall ID:	GRSM-0019-5.807-R		
Route Name:	LAKEVIEW DRIVE EAST		
Inspection Date:	December 01, 2007	Approximate Year Built:	1948
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete head wall with 6.5x 10 CIP box culvert at base of large fill just before parking area at end of road at barricade		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	96
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-34

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	concrete approach pad. No distress.	9
CONCRETE 8.00	minor damage on upper right corner (2'x1' piece broken off). No other distress.	9
LATERAL SLOPE 0.50	stable, well vegetated road embankment. No distress	9
UPSLOPE 0.50	Stable, well vegetated road embankment. No distress	9
WALL DRAINS 0.50	Weep holes in box culvert. No distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0019: LAKEVIEW DRIVE EAST

Retaining Wall Condition Photos



GRSM_0019_5.807_R_1.jpg



GRSM_0019_5.807_R_2.jpg

Wall ID:	GRSM-0021-0.077-L		
Route Name:	COSBY ENTRANCE ROAD		
Inspection Date:	November 30, 2007	Approximate Year Built:	1956
*Wall Rating:	59	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone fill wall with river at wall toe over 200 ft of wall length. Wall stones are rounded river rock.		

Wall Measurements

Wall Length (ft.):	333	Face Area (sq.):	1774
Average Wall Height (ft.):	5	Face Angle (deg.):	95
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No roadway distress but mortar decay may threaten performance within a few years. Foundation void may threaten near term stability.	5
WALL FOUNDATION MATERIAL 8.00	Concrete footer undermined along river - 25'x3'x2'. Soil cobble material otherwise - no distress.	7
MORTAR 8.00	Badly weathered (1/2" grout loss) or missing over about 50% of joints	5
PLACED STONE 8.00	Rounded river stones 2.5ft minus. Wall tipped out 2-5 degrees past vertical along about 100ft of wall	6
DOWNSLOPE 0.50	River, stable channel	9
LATERAL SLOPE 0.50	Stable, well vegetated road embankment	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	12"x15" cmp culvert through wall. Clear, bottom corroded slightly. Functional	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint wall 50% of wall face. 1773 sf x 0.5 x \$70/sf = \$62,055. Repair foundation void - place mortared stones in void 25'x3'x2'/27 x \$330/cy = \$1,830.
Repair Cost:	\$63,885

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

Great Smoky Mountains National Park

ROUTE 0021: COSBY ENTRANCE ROAD

Retaining Wall Condition Photos



GRSM_0021_0.077_L_1.jpg

Wall ID:	GRSM-0022-0.596-L		
Route Name:	CATALOOCHEE ENTRANCE ROAD		
Inspection Date:	December 03, 2007	Approximate Year Built:	1930
*Wall Rating:	58	Maintenance Action:	No Action

Wall Description

Wall Function:	Head Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared headwall at culvert inlet. No work order despite voids and loss of mortar because undermining in a rock fill will unlikely lead to impacts to the roadway.		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	175
Average Wall Height (ft.):	7	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-55

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Poor condition with voids and undermining, not impacting roadway.	6
WALL FOUNDATION MATERIAL 8.00	Solid granular material in stream channel, undermining throughout, voids at culvert inlet.	6
MORTAR 8.00	75 % missing, but not necessary for wall performance.	3
STONE MASONRY 8.00	Blocks degrading, solid limestone 1' to 3' blocks.	7
CULVERT 0.50	6' CMP, moderate weathering, performing as intended.	8
LATERAL SLOPE 0.50	Moderate slope at 2H:1V, well vegetated, minor surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has minor cracking not associated with wall.	8
TRAFFIC BARRIER/FENCE 0.50	Guardrail has no signs of distress.	9
UPSLOPE 0.50	Moderate slope at 2H:1V slope, heavy vegetation with trees, good condition.	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.

Great Smoky Mountains National Park

ROUTE 0022: CATALOCHEE ENTRANCE ROAD

Retaining Wall Condition Photos



GRSM_0022_0.596_L_1.jpg

Wall ID:	GRSM-0022-0.770-L		
Route Name:	CATALOOCHEE ENTRANCE ROAD		
Inspection Date:	December 03, 2007	Approximate Year Built:	1930
*Wall Rating:	75	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared cut wall.		

Wall Measurements

Wall Length (ft.):	87	Face Area (sq.):	957
Average Wall Height (ft.):	11	Face Angle (deg.):	80
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition, mortar in poor condition, but performing function.	8
WALL FOUNDATION MATERIAL 8.00	Solid granite material, so signs of foundation distress.	9
MORTAR 8.00	Missing pieces throughout, debonding and cracking throughout, but performing function.	6
STONE MASONRY 8.00	Limestone cut blocks, strong, competent, moderate surface erosion throughout, occasional cracking and missing pieces, none displaced, no missing elements.	7
LATERAL SLOPE 0.50	Bedrock outcrops, good condition, little soil cover.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has cracks not associated with wall.	9
WALL DRAINS 0.50	6-inch CMP's , open and functioning as intended.	9
UPSLOPE 1.00	Steep vegetated slope at 1.5H:1V, minor erosion at top of wall.	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.

Great Smoky Mountains National Park

ROUTE 0022: CATALOCHEE ENTRANCE ROAD

Retaining Wall Condition Photos



GRSM_0022_0.770_L_1.jpg

Wall ID:	GRSM-0022-0.834-L		
Route Name:	CATALOOCHEE ENTRANCE ROAD		
Inspection Date:	December 03, 2007	Approximate Year Built:	1930
*Wall Rating:	77	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Limestone block mortared cut wall.		

Wall Measurements

Wall Length (ft.):	115	Face Area (sq.):	920
Average Wall Height (ft.):	8	Face Angle (deg.):	80
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition overall, mortar in poor condition, but performing function.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, no signs of foundation distress.	9
MORTAR 8.00	Missing pieces throughout, debonding and cracking throughout, moss cover, minor efflorescence, but performing function.	6
STONE MASONRY 8.00	Limestone 1' x 3' cut blocks, strong, competent, moderate surface erosion throughout, occasional cracking, no missing elements.	8
LATERAL SLOPE 0.50	Bedrock outcrop at begin of wall, solid granular material at end of wall, good condition.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has cracks not associated with roadway.	9
WALL DRAINS 0.50	6-inch CMP's, open and functioning as intended.	9
UPSLOPE 1.00	Steep slope at 1.5H:1V, well vegetated, some erosion at top of wall.	7
VEGETATION 1.00	Grass and vines, eroding mortar.	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.

Great Smoky Mountains National Park

ROUTE 0022: CATALOCHEE ENTRANCE ROAD

Retaining Wall Condition Photos



GRSM_0022_0.834_L_1.jpg

Wall ID:	GRSM-0102-0.500-L		
Route Name:	GREENBRIER ROAD		
Inspection Date:	December 03, 2007	Approximate Year Built:	1965
*Wall Rating:	75	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity dry stack stone fill wall with flat, angular stones 25 ft from river.		

Wall Measurements

Wall Length (ft.):	93	Face Area (sq.):	558
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Failed area a threat to long term performance. Still holding road	7
WALL FOUNDATION MATERIAL 8.00	Stable, flat soil. No distress	9
PLACED STONE 8.00	Wall face bulged at wall start over 6'x5' area. Irregular in other areas also - generally good interlock. Wall failed over pipe 4'x5' area.	6
CULVERT 0.50	3'x6' squish cmp. ~15% plugged, still functioning well.	8
DOWNSLOPE 0.50	10 degree stable slope. No distress.	9
LATERAL SLOPE 0.50	Rock at start, stable fill at end. No distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	Free draining face. No distress.	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Replace wall face above culvert: 6'x8' = 48sf, 48sf x \$50/sf dry stack wall = \$2400. Pavement Patch: (10'x6'x(6/12)'x150lb/ft ³)/2000 = 2.25 tons, \$360/ton x 2.25 = \$810.
Repair Cost:	\$3,210

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

Great Smoky Mountains National Park

ROUTE 0102: GREENBRIER ROAD

Retaining Wall Condition Photos



GRSM_0102_0.500_L_1.jpg



GRSM_0102_0.500_L_2.jpg

Wall ID:	GRSM-0102-0.508-R		
Route Name:	GREENBRIER ROAD		
Inspection Date:	December 03, 2007	Approximate Year Built:	1965
*Wall Rating:	80	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:	Gravity dry stack head wall with lots of moss, some bulging.		

Wall Measurements

Wall Length (ft.):	37	Face Area (sq.):	205
Average Wall Height (ft.):	5	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Mortar not contributing to wall function. Performing well as dry stack. Failure at wall start not effecting performance.	8
WALL FOUNDATION MATERIAL 8.00	Stable channel, no distress.	9
MORTAR 8.00	Almost gone - may have ben mortared at one time but now functioning as dry stack	7
PLACED STONE 8.00	Subangular to rounded 2.5' minus - good interlock. Voids to 1'. Wall failure at start ~ 6'x6' area. Failure area deleted from wall length - no need to replace.	8
CULVERT 0.50	3'x6' squash cmp, no distress	9
LATERAL SLOPE 0.50	Stable embankment, no distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
UPSLOPE 0.50	Flat stable channel, no distress	9
WALL DRAINS 0.50	Free draining face, no distress.	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0102: GREENBRIER ROAD

Retaining Wall Condition Photos



GRSM_0102_0.508_R_1.jpg



GRSM_0102_0.508_R_2.jpg

Wall ID:	GRSM-0116-0.415-R		
Route Name:	WEST DEEP CREEK ROAD		
Inspection Date:	December 01, 2007	Approximate Year Built:	1965
*Wall Rating:	90	Maintenance Action:	No Action

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 stack stone fill wall at creek edge w/concrete sidewalk on top. Some mortar in joints. Face angle varies.		

Wall Measurements

Wall Length (ft.):	300	Face Area (sq.):	3321
Average Wall Height (ft.):	11	Face Angle (deg.):	77
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable river channel and placed 6ft minus boulders. No undermining, no distress.	9
MORTAR 8.00	Spot mortared over 50-60% of joints - looks like it was built that way. Mortar sound, not primary interlock mechanism, no distress.	9
PLACED STONE 8.00	Angular machine-placed stone 10ft minus. Large voids (1-2 ft) but good interlock (large voids because of large stone size). No distress	9
DOWNSLOPE 0.50	Stable river channel, no distress.	9
LATERAL SLOPE 0.50	Stable road embankment, no distress.	9
WALL DRAINS 0.50	Self-draining face, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10

Repair Recommendations

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

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

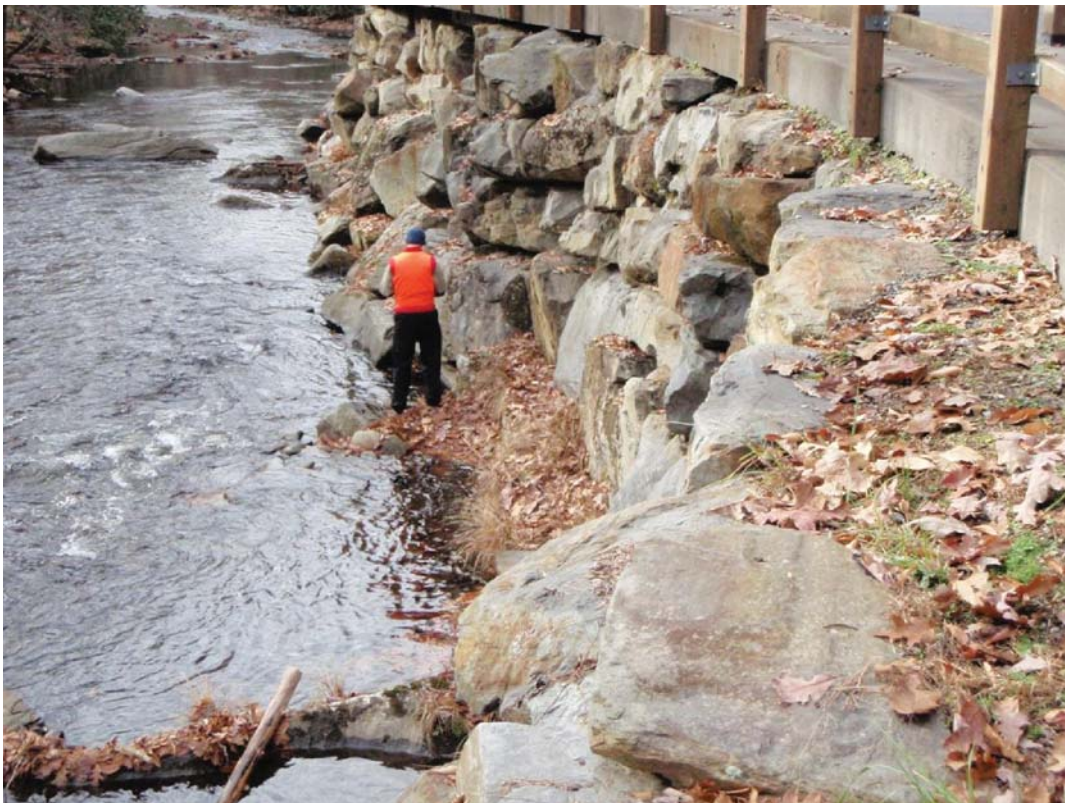
Great Smoky Mountains National Park

ROUTE 0116: WEST DEEP CREEK ROAD

Retaining Wall Condition Photos



GRSM_0116_0.415_R_1.jpg



GRSM_0116_0.415_R_2.jpg

Wall ID:	GRSM-0128-0.257-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	78	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Jumbled mass of irregular shaped 3-foot boulders with concrete mortar.		

Wall Measurements

Wall Length (ft.):	95	Face Area (sq.):	590
Average Wall Height (ft.):	6	Face Angle (deg.):	45
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Stream bed granular material, low to moderate scour potential.	8
PLACED STONE 8.00	Some weathering, moss covered, largely intact.	7
MORTAR 8.00	Mossy, good condition where observed.	8
DOWNSLOPE 0.50	Stream bed granular and possible bedrock, low to moderate scour potential.	8
LATERAL SLOPE 0.50	Steep, rockfill embankment with trees, possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_0.257_L_1.jpg

Wall ID:	GRSM-0128-0.363-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large, irregular shaped rock up to 5 foot dimension with concrete mortar.		

Wall Measurements

Wall Length (ft.):	119	Face Area (sq.):	1210
Average Wall Height (ft.):	10	Face Angle (deg.):	46
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Firm, granular soil and bedrock.	9
MORTAR 8.00	No distress.	9
PLACED STONE 8.00	No distress, little moss.	9
DOWNSLOPE 0.50	Stream, bedrock, low scour potential.	8
LATERAL SLOPE 0.50	Steep, rock fill embankment with trees, possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_0.363_L_1.jpg

Wall ID:	GRSM-0128-0.810-R		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Rockery with concrete mortar. Rock consists of rectangular stone with up to 6-foot dimensions.		

Wall Measurements

Wall Length (ft.):	245	Face Area (sq.):	2477
Average Wall Height (ft.):	10	Face Angle (deg.):	48
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock and stream boulders, some rebar dowels into bedrock.	8
PLACED STONE 8.00	Slight degradation of few rocks and general weathering of all.	8
MORTAR 8.00	No distress.	9
DOWNSLOPE 0.50	Streambed boulders and bedrock, low to moderate scour potential.	8
LATERAL SLOPE 0.50	Steep rock fill embankment with trees, some raveling and possible creep.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_0.810_R_1.jpg

Wall ID:	GRSM-0128-1.280-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	82	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Stone masonry wall with up to 3 foot blocks.		

Wall Measurements

Wall Length (ft.):	107	Face Area (sq.):	690
Average Wall Height (ft.):	6	Face Angle (deg.):	81
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	8
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
STONE MASONRY 8.00	Moderately weathered and mossy, little degradation.	7
MORTAR 8.00	Possible repointed, no distress observed.	9
DOWNSLOPE 0.50	Bedrock, stream channel, low to moderate scour potential.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	4-inch diameter black plastic pipe, appears more recent than wall construction.	9
LATERAL SLOPE 1.00	Start - bedrock. End - steep rock fill, some raveling.	7

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_1.280_L_1.jpg

Wall ID:	GRSM-0128-1.413-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Irregular shaped boulder, up to 3-foot dimension, rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	311	Face Area (sq.):	2634
Average Wall Height (ft.):	8	Face Angle (deg.):	45
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock	9
MORTAR 8.00	No distress.	9
PLACED STONE 8.00	Angular, slightly weathered, up to 3 foot.	9
DOWNSLOPE 0.50	Stream channel bedrock, low scour potential.	8
LATERAL SLOPE 0.50	Steep, rockfill embankment with trees, some raveling and creep possible.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_1.413_L_1.jpg

Wall ID:	GRSM-0128-1.549-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large, angular boulder rockery with concrete mortar.		

Wall Measurements

Wall Length (ft.):	200	Face Area (sq.):	1340
Average Wall Height (ft.):	6	Face Angle (deg.):	62
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	No distress.	9
PLACED STONE 8.00	Angular, 3-foot dimension stone, no distress.	9
DOWNSLOPE 0.50	Bedrock, streambed, moderate scour potential.	8
LATERAL SLOPE 0.50	Steep, rockfill, some raveling potential, treed.	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_1.549_L_1.jpg

Wall ID:	GRSM-0128-1.806-L		
Route Name:	TREMONT ROAD		
Inspection Date:	November 29, 2007	Approximate Year Built:	Unknown
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Angular, irregular shaped rocks up to 3-foot dimensions. Rockery wall along stream.		

Wall Measurements

Wall Length (ft.):	238	Face Area (sq.):	2070
Average Wall Height (ft.):	8	Face Angle (deg.):	45
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As required.	9
WALL FOUNDATION MATERIAL 8.00	Bedrock.	9
MORTAR 8.00	No distress.	9
PLACED STONE 8.00	Some moss, little weathering, generally good condition.	9
DOWNSLOPE 0.50	Bedrock, stream bed with low scour potential.	8
LATERAL SLOPE 0.50	Gentle sloping embankment fill, some trees.	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress.	9
WALL DRAINS 0.50	No distress.	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.

Great Smoky Mountains National Park

ROUTE 0128: TREMONT ROAD

Retaining Wall Condition Photos



GRSM_0128_1.806_L_1.jpg

Wall ID:	GRSM-0150-4.392-L		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	69	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone fill wall 60 ft from river, rounded river stones 1.5 ft minus,		

Wall Measurements

Wall Length (ft.):	52	Face Area (sq.):	188
Average Wall Height (ft.):	3	Face Angle (deg.):	95
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Rotation and road settlement indicate performance problems. Road still supported	6
WALL FOUNDATION MATERIAL 8.00	Stable soil and 2 ft bench	8
STONE MASONRY 8.00	Tipped out from vertical about 5 degrees. Stones sound	6
MORTAR 8.00	Poor workmanship - voids and gaps between mortar and stone ~50% of wall. Still good interlock	7
DOWNSLOPE 0.50	Stable well vegetated fill/soil, 35 degrees, no distress	9
LATERAL SLOPE 0.50	Stable embankment, no distress	9
WALL DRAINS 0.50	5 mid-height PVC 2" pvc weeps. No distress	9
ROAD/SIDEWALK/SHOULDER 1.00	Outside lane and shoulder settled 2-3" above wall. Cracking in outside wheelpath	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Remove and replace upper 2 feet of wall - $52' \times 2' \times 2' / 27 = 7.7\text{cy}$, $7.7\text{cy} \times \$735/\text{cy} = \5660 . Deep patch asphalt pavement - $60' \times 6' = 360\text{sf}$, $(360\text{sf} \times 6 / 12 \times 150\text{lb/cf}) / 2000 = 13.5\text{ tons}$. $13.5\text{ tons} \times \$360/\text{ton} = \$4860$.
Repair Cost:	\$10,520

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.392_L_1.jpg



GRSM_0150_4.392_L_2.jpg

Wall ID:	GRSM-0150-4.471-L		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	85	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone fill wall toe of wall in river.		

Wall Measurements

Wall Length (ft.):	65	Face Area (sq.):	234
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable soil and large boulders, stable boulder stream channel, no distress	9
MORTAR 8.00	Voids and gaps to 1.5" over ~ 40% of wall - still good interlock	8
STONE MASONRY 8.00	2' minus angular w/some river stones - plumb, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	Slight wheelpath cracking, probably not wall related	8
DOWNSLOPE 0.50	Stable river channel, no distress	9
LATERAL SLOPE 0.50	Boulder, stable embankment, no distress	9
WALL DRAINS 0.50	No distress	9

Repair Recommendations

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

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

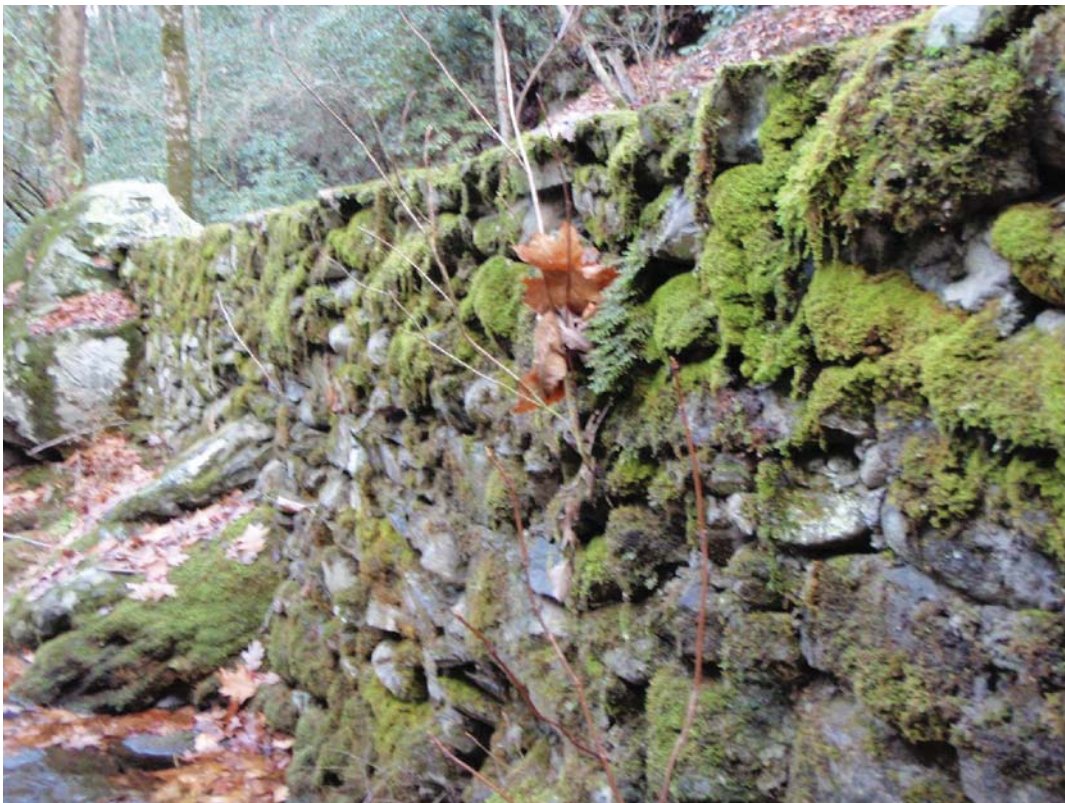
Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.471_L_1.jpg



GRSM_0150_4.471_L_2.jpg

Wall ID:	GRSM-0150-4.548-R		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	72	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:	Mortared stone fill wall starts at wood deck bridge w/steel stringers. Wall 30 ft from river		

Wall Measurements

Wall Length (ft.):	96	Face Area (sq.):	888
Average Wall Height (ft.):	9	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	Still holding road ok - needs preventive maintenance	7
WALL FOUNDATION MATERIAL 8.00	6'x2.5'x2' void near wall end, remainder stable, flat soil and river boulders - 2" vertical rebar exposed in voids	7
MORTAR 8.00	Void and gaps to 3" over ~ 50% of wall. Fairly good interlock	7
STONE MASONRY 8.00	2.5' minus subangular w/some rounded stones. Plumb, mossy.	9
WALL DRAINS 0.50	Wall face wet, draining through face. 2" pvc weepholes throughout.	8
DOWNSLOPE 0.50	Stable, flat soil and river boulders. No distress	9
LATERAL SLOPE 0.50	Bridge at start, stable fill at end. No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Underpin foundation void: Subexc 1 foot and place mortared stone 6x3x3/27 = 2cy, 2cy * \$735/cy rubble masonry = \$1470. Repoint mortar, 50% of wall face: 888sf x .5 = 444sf, 444sf x \$50/sf = \$22,200. Note: cost guide unit for repoint is \$75/sf.
Repair Cost:	\$23,670

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.548_R_1.jpg



GRSM_0150_4.548_R_2.jpg

Wall ID:	GRSM-0150-4.692-R		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	74	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:	Mortared stone fill wall above steep slope, 300 ft to river		

Wall Measurements

Wall Length (ft.):	35	Face Area (sq.):	132
Average Wall Height (ft.):	3	Face Angle (deg.):	85
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Crack not effecting performance much. Needs preventive maintenance	7
WALL FOUNDATION MATERIAL 8.00	Stable soil, no distress	9
MORTAR 8.00	Voids and gaps 2-5" ~ 50% of wall.	7
STONE MASONRY 8.00	Full height crack 6" wide at top ` 10ft from wall start. Crack looks old. Wall plumb. Stone interlock fair	7
DOWNSLOPE 0.50	40 degree stable soil, good veg. No distress	9
LATERAL SLOPE 0.50	40 degree stable soil, good veg. No distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	9
WALL DRAINS 0.50	2" pvc weeps, no distress	9

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint wall face: Repoint 50% wall face - 132.5sf x .5 x \$50/sf = \$3312
Repair Cost:	\$3,312

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

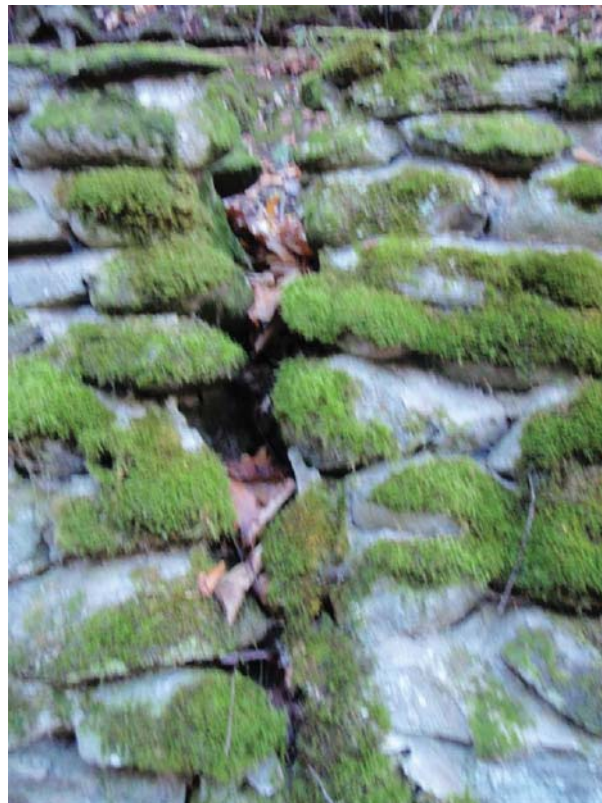
Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.692_R_1.jpg



GRSM_0150_4.692_R_2.jpg

Wall ID:	GRSM-0150-4.787-R		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	84	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity dry stack fil wall below opposite side of cliff		

Wall Measurements

Wall Length (ft.):	68	Face Area (sq.):	324
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Stable soil and boulders. No distress	9
MORTAR 8.00	Dry stack at base, mortar mid-height and up. Mortar not primary interlock mechanism. Voids/gaps 2-3" ~ 40% of wall	8
PLACED STONE 8.00	Voids in dry stack to 8" - good interlock. Angular 3' minus stones. Slight bulging in upper wall	8
DOWNSLOPE 0.50	30 degree stable talus, soil. No distress	9
LATERAL SLOPE 0.50	Stable embankment. No distress.	9
ROAD/SIDEWALK/SHOULDER 0.50	No wall distress	9
WALL DRAINS 0.50	2 12x18" cmp in wall face. 2" pvc weeps. No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.787_R_1.jpg



GRSM_0150_4.787_R_2.jpg

Wall ID:	GRSM-0150-4.863-R		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Dry Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gravity dry stack fill wall below cliff/waterfall opposite side of roadway.		

Wall Measurements

Wall Length (ft.):	101	Face Area (sq.):	527
Average Wall Height (ft.):	5	Face Angle (deg.):	86
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended. Mortar not contributing much to wall performance	9
WALL FOUNDATION MATERIAL 8.00	Large boulders, talus. Stable, no distress.	9
MORTAR 8.00	Mortar mostly gone - not main interlock mechanism.	7
PLACED STONE 8.00	Mostly dry stack, some mortar in upper wall. Angular 3' minus stones in base, subangular in upper wall. Voids to 8", good interlock, plumb	9
WALL DRAINS 0.50	5 12x18" cmp's in wall face, 2" pvc weeps in upper wall. No distress in cmp/pvc. Wall face wet at wall end	8
DOWNSLOPE 0.50	Stable boulder/soil slope 30-35 degrees. No distress	9
LATERAL SLOPE 0.50	Stable embankment	9
ROAD/SIDEWALK/SHOULDER 0.50	No wall distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.863_R_1.jpg



GRSM_0150_4.863_R_2.jpg

Wall ID:	GRSM-0150-4.988-R		
Route Name:	ROARING FORK MOTOR NATURE TRAIL		
Inspection Date:	December 03, 2007	Approximate Year Built:	1963
*Wall Rating:	87	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Mortared stone fill wall in good condition.		

Wall Measurements

Wall Length (ft.):	44	Face Area (sq.):	253
Average Wall Height (ft.):	5	Face Angle (deg.):	82
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	As intended	9
WALL FOUNDATION MATERIAL 8.00	Plumb, no distress. Sub-angular 1.5' munis	9
MORTAR 8.00	Voids/debonding 1/4-2", 30% of wall. Good interlock	8
DOWNSLOPE 0.50	30 degree stable soil, no distress.	9
LATERAL SLOPE 0.50	30 degree stable soil, no distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No wall-related distress	9
WALL DRAINS 0.50	2" pvc weeps throughout, 18" cmp at base. No distress	9

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0150: ROARING FORK MOTOR NATURE TRAIL

Retaining Wall Condition Photos



GRSM_0150_4.988_R_1.jpg

Wall ID:	GRSM-0700-0.000-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall.		

Wall Measurements

Wall Length (ft.):	92	Face Area (sq.):	1864
Average Wall Height (ft.):	20	Face Angle (deg.):	85
Maximum Wall Height (ft.):	29	Vertical Offset (ft.):	-50

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, no signs of foundation distress.	9
CONCRETE 8.00	Reinforced Earth Company concrete precast facing panels for MSE wall, giant panels with minor efflorescence, otherwise like new condition.	8
ARCHITECTURAL FACING 0.50	Concrete wood-textured panel facing, good condition.	8
CULVERT 0.50	24-inch CMP, performing as intended.	8
LATERAL SLOPE 0.50	1.5H:1V well vegetated slopes, vegetation stabilizing slope.	8
UPSLOPE 0.50	Steep slopes at 1.5H:1V, well vegetated, platy rocks and clay, minor raveling.	8
DOWNSLOPE 0.50	Gentle stable slope, good condition, not impacting wall.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is grassy steep 1.5H:1V slopes.	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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-0.000-R.

Wall ID:	GRSM-0700-6.850-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall.		

Wall Measurements

Wall Length (ft.):	281	Face Area (sq.):	8100
Average Wall Height (ft.):	28	Face Angle (deg.):	85
Maximum Wall Height (ft.):	41	Vertical Offset (ft.):	-30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, no signs of foundation distress.	9
CONCRETE 8.00	Reinforced Earth Co. concrete wood-textured precast panels, minor efflorescence, top rail damage to end of wall, bottom 3 panels cracked in middle of wall.	8
ARCHITECTURAL FACING 0.50	Concrete wood-panel facing, good condition.	8
LATERAL SLOPE 0.50	Steep 1.5H:1V slopes, vegetated with grass and trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is grassy slope, good condition.	9
UPSLOPE 0.50	Steep 1.5H:1V slope, well vegetated with grass and trees.	9
WALL DRAINS 0.50	Gaps in panels, good condition.	9
DOWNSLOPE 1.00	Gentle stable slope, platy rock fill, potential for creep, vegetation cover holds in place.	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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-6.850-R.

Wall ID:	GRSM-0700-7.000-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	34	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall. Wall is missing (washed out), and replaced with rock buttress. Low impact and distance to roadway prompt no action wall replacement is not recommended.		

Wall Measurements

Wall Length (ft.):	120	Face Area (sq.):	(1)
Average Wall Height (ft.):	0	Face Angle (deg.):	85
Maximum Wall Height (ft.):	0	Vertical Offset (ft.):	-126

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall is missing, completely failed or removed. Existing slope is rock buttressed and not impacting the roadway.	4
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, tension crack about 100 feet down slope, 1-foot wide, now 2H:1V slope with bench.	5
CONCRETE 8.00	Reinforced Earth Co. concrete precast panels, panels missing with straps exposed at the face, failed wall, appears to be from long time ago (shortly after construction?), rocks in slope possibly as repair to stabilize slope, material placed downslope (roc	1
DOWNSLOPE 0.50	1.5H:1V steep slope, we vegetated with trees and grass.	8
LATERAL SLOPE 0.50	1.5H:1V steep slope, we vegetated with trees and grass.	8
UPSLOPE 0.50	1.5H:1V steep slope, we vegetated with trees and grass.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is grassy slope.	9
WALL DRAINS 0.50	None observed, not impacting existing slope.	9
ARCHITECTURAL FACING 5.00	None observed - missing completely.	1

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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-7.000-R.

Wall ID:	GRSM-0700-7.350-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	62	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall.		

Wall Measurements

Wall Length (ft.):	135	Face Area (sq.):	1785
Average Wall Height (ft.):	13	Face Angle (deg.):	85
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	-53

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair condition, settlement at end of wall and lateral slope, but performing function.	6
WALL FOUNDATION MATERIAL 8.00	Solid granular material and bedrock, settlement at end 55 feet of wall.	6
CONCRETE 8.00	Reinforced Earth Co. MSE wall precast-panel facing, minor efflorescence, end 55 feet of wall significant settlement and cracking, but performing as intended, crack monitors at 25 foot spacing (looks like old monitoring from early 1990's, not currently in	6
ARCHITECTURAL FACING 0.50	Panel facing, good condition, minor cracking.	8
UPSLOPE 0.50	Steep 1.5H:1V slope, well vegetated with grass and trees.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is grassy slope.	9
WALL DRAINS 0.50	Gaps in panels, good condition.	9
LATERAL SLOPE 1.00	Steep 1.5H:1V slopes, well vegetated with grass and trees, begin of wall moderate surface erosion, active slump at end of wall (minor size, 1-foot).	6
DOWNSLOPE 1.00	Gentle to steep stable slope with platy rock fill, potential for creep.	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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-7.350-R.

Wall ID:	GRSM-0700-8.050-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	71	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall.		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	1000
Average Wall Height (ft.):	13	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	-75

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good condition, with minor settlement at end of wall, performing function.	7
WALL FOUNDATION MATERIAL 8.00	Bedrock foundation, solid. Minor distress observed at begin and end of wall.	8
CONCRETE 8.00	Reinforced Earth Co. precast panel facing for MSE wall, minor efflorescence, minor surface staining. At begin of wall, first 15 feet, rotation (old movement). At 10 feet from end of wall, settlement (old movement), not active. Wall is performing funct	6
ARCHITECTURAL FACING 0.50	Concrete pre-cast panels, minor efflorescence, performing as intended.	8
DOWNSLOPE 0.50	Gentle slope with rock and granular material.	8
LATERAL SLOPE 0.50	Steep slopes at 1.5H:1V, moderate surface erosion.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is grassy slope, stable.	9
WALL DRAINS 0.50	Gaps in panels, performing as intended.	9
CULVERT 1.00	36-inch CMP, half burried, still performing function.	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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-8.050-R.

Wall ID:	GRSM-0700-9.050-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	83	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	MSE - Precast Panel
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced Earth Company - MSE toe wall.		

Wall Measurements

Wall Length (ft.):	319	Face Area (sq.):	3934
Average Wall Height (ft.):	12	Face Angle (deg.):	85
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-26

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, performing as intended.	8
WALL FOUNDATION MATERIAL 8.00	Solid granular material, good bench in front, good condition.	9
CONCRETE 8.00	Reinforced Earth Co. precast panels for MSE wall (5' x 5' panel), metal strip reinforcing, moderate surface erosion, minor efflorescence, good condition.	8
ARCHITECTURAL FACING 0.50	Precast concrete panels (5' x5'), minor efflorescence, good condition.	8
DOWNSLOPE 0.50	Slope at 2H:1V, stabilized with trees.	8
LATERAL SLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	8
UPSLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	8
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder has gentle grassy slopes.	9
WALL DRAINS 0.50	Gaps in panels, 2-inch PVC weepholes at 10 feet on center.	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.

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-9.050-R.

Wall ID:	GRSM-0700-9.350-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever wall with granite block veneer and guardwall parapet.		

Wall Measurements

Wall Length (ft.):	117	Face Area (sq.):	936
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	16	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent condition, like new.	9
WALL FOUNDATION MATERIAL 8.00	Solid granular material, stable, no signs of distress.	9
CONCRETE 8.00	Covered with granite stones at face, no signs of distress, like new.	9
DOWNSLOPE 0.50	Steep slope at 1.5H:1V, stable.	9
LATERAL SLOPE 0.50	Steep slope at 1.5H:1V, stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress (unpaved). Shoulder is gentle slope, grassy.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
ARCHITECTURAL FACING 0.50	Granite cut stones, 3' x 1' blocks, like new.	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-9.350-R.

Wall ID:	GRSM-0700-9.600-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	2005
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever fill wall with granite block veneer and guardwall parapet.		

Wall Measurements

Wall Length (ft.):	250	Face Area (sq.):	4250
Average Wall Height (ft.):	17	Face Angle (deg.):	85
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent condition, like new.	9
WALL FOUNDATION MATERIAL 8.00	Solid granular material, stable, no signs of distress.	9
CONCRETE 8.00	Covered with granite stones at face, no signs of distress, like new.	9
DOWNSLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	9
LATERAL SLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress, like new PCC.	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
ARCHITECTURAL FACING 0.50	Granite cut stones, 3' x 1' blocks, like new.	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-9.600-R.

Wall ID:	GRSM-0700-9.700-R		
Route Name:	UNKNOWN ROUTE		
Inspection Date:	December 01, 2007	Approximate Year Built:	1968
*Wall Rating:	90	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	Stone Veneer
General Description:	Concrete cantilever fill wall with granite block veneer and guardwall parapet.		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	130
Average Wall Height (ft.):	6	Face Angle (deg.):	85
Maximum Wall Height (ft.):	13	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent condition, like new.	9
WALL FOUNDATION MATERIAL 8.00	Solid granular material, stable, no signs of distress.	9
CONCRETE 8.00	Covered with granite stones at the face, no signs of distress, like new.	9
DOWNSLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	9
LATERAL SLOPE 0.50	Steep slope at 1.5H:1V, well vegetated, stable.	9
ROAD/SIDEWALK/SHOULDER 0.50	Road has no signs of distress, like new (PCC).	9
WALL DRAINS 0.50	None observed, not impacting wall performance.	9
ARCHITECTURAL FACING 0.50	Granite cut stone, 3' x 1' blocks, like new.	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0700: UNKNOWN ROUTE

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0700-9.700-R.

Wall ID:	GRSM-0954-0.000-P1		
Route Name:	PARKING AT MP 14.4		
Inspection Date:	June 15, 2007	Approximate Year Built:	Unknown
*Wall Rating:	77	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall constructed atop moderate to steep slope constructed at pullout area along southbound travel lane of high ADT roadway directly supports roadway high consequence of failure		

Wall Measurements

Wall Length (ft.):	255	Face Area (sq.):	2058
Average Wall Height (ft.):	8	Face Angle (deg.):	85
Maximum Wall Height (ft.):	14	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Fair to good performance; mounds of gravel along base may be obstructing weep holes; moderate cracking and debonding	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation; no voids below wall	9
MORTAR 8.00	Evidence that water is weeping through mortar within the first 35 ft of wall; two full height cracks through mortar	7
STONE MASONRY 8.00	Minor debonding; no distress to blocks	8
LATERAL SLOPE 0.50	Minor ongoing erosion at start of wall; no distress at end of wall	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to small paved pullout area	9
DOWNSLOPE 1.00	Mounds of gravel piled along base of wall and are promoting vegetation growth adjacent to wall; gravel mounds may also be impeding discharge from weep holes	7
VEGETATION 1.00	Small brush growing from joints in wall and along base	7
WALL DRAINS 1.00	No observed weep holes; however, gravel mounds may also be obstructing weep holes and preventing the discharge of water; weeping through mortar along start of wall	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Stone Masonry Repointing - 251 sqft ((\$75/sqft) = \$18,818.80. Remove Gravel & Vegetation - 32 labor hrs (\$55/hr) = \$1,760.
Repair Cost:	\$20,579

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

Great Smoky Mountains National Park

ROUTE 0954: PARKING AT MP 14.4

Retaining Wall Condition Photos



GRSM_0954_0.000_P1_1.jpg

Wall ID:	GRSM-0955-0.000-P1		
Route Name:	NEWFOUND GAP PARKING AREA		
Inspection Date:	June 15, 2007	Approximate Year Built:	1952
*Wall Rating:	91	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall supporting parking area constructed along high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	230	Face Area (sq.):	920
Average Wall Height (ft.):	4	Face Angle (deg.):	80
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance	9
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	No distress; general age-related weathering	9
STONE MASONRY 8.00	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 0.50	No distress to relatively flat grassy area, concrete pavement, and paved roadway	10
LATERAL SLOPE 0.50	No distress	10
ROAD/SIDEWALK/SHOULDER 0.50	No distress to paved roadway or concrete pavement	10
UPSLOPE 0.50	No distress	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0955: NEWFOUND GAP PARKING AREA

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0955-0.000-P1.

Wall ID:	GRSM-0955-0.000-P2		
Route Name:	NEWFOUND GAP PARKING AREA		
Inspection Date:	June 15, 2007	Approximate Year Built:	1952
*Wall Rating:	80	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall constructed along the southeastern limits of the Newfound Gap Parking area moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	85	Face Area (sq.):	340
Average Wall Height (ft.):	4	Face Angle (deg.):	85
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition overall; minor debonding; small brush and trees growing adjacent to wall may adversely affect the wall's long-term performance	7
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	9
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding	8
DOWNSLOPE 0.50	No distress; moderate to steep forested slope	8
LATERAL SLOPE 0.50	No distress	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
ROAD/SIDEWALK/SHOULDER 0.50	No distress	10
VEGETATION 1.00	Several small and medium diameter trees and small brush growing along the base of wall	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Stone Masonry Repointing - 34 sqft (\$75/sqft) = \$2,550. Cut trees & Remove Vegetation - 40 labor hrs (\$55/hr) = \$2,200.
Repair Cost:	\$4,750

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

Great Smoky Mountains National Park

ROUTE 0955: NEWFOUND GAP PARKING AREA

Retaining Wall Condition Photos



GRSM_0955_0.000_P2_1.jpg

Wall ID:	GRSM-0955-0.000-P3		
Route Name:	NEWFOUND GAP PARKING AREA		
Inspection Date:	June 15, 2007	Approximate Year Built:	1952
*Wall Rating:	81	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	GM fill wall with 1.5 to 2.0 ft high GM guard wall supporting a portion of the NFG parking area moderate consequence of failure		

Wall Measurements

Wall Length (ft.):	345	Face Area (sq.):	1695
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	7	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good to excellent performance; minor debonding of mortar	8
WALL FOUNDATION MATERIAL 8.00	No distress; no evidence of settlement or rotation	8
MORTAR 8.00	General age-related weathering	8
STONE MASONRY 8.00	Minor debonding	8
ROAD/SIDEWALK/SHOULDER 0.50	No distress to paved roadway and concrete sidewalk	9
TRAFFIC BARRIER/FENCE 0.50	No distress to GM guard wall	9
WALL DRAINS 0.50	No evidence of drainage-related distress	9
DOWNSLOPE 0.50	No distress; relatively flat stone paved sidewalk transitioning to steep forested slope	10
LATERAL SLOPE 0.50	No distress; transitions to natural slope at start of wall and guard wall at end of wall	10

Repair Recommendations

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

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

Great Smoky Mountains National Park

ROUTE 0955: NEWFOUND GAP PARKING AREA

Retaining Wall Condition Photos



GRSM_0955_0.000_P3_1.jpg



GRSM_0955_0.000_P3_2.jpg

Wall ID:	GRSM-0955-0.000-P4		
Route Name:	NEWFOUND GAP PARKING AREA		
Inspection Date:	June 15, 2007	Approximate Year Built:	1952
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Buttressed GM toe wall at the base of steep slope supporting the NFG parking area 7 GM buttresses, approximately 30 ft high, inclined on a 50 degree angle GD fill wall supports lateral slope at start of wall		

Wall Measurements

Wall Length (ft.):	373	Face Area (sq.):	8314
Average Wall Height (ft.):	22	Face Angle (deg.):	90
Maximum Wall Height (ft.):	30	Vertical Offset (ft.):	-43

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good performance overall; minor undermining of No. 6 & 7 buttresses; GD wall is beginning to unravel	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or rotation about the base; slight undermining of No. 7 and No. 6 buttresses	8
PLACED STONE 8.00	GD at start of wall is beginning to unravel; failure of this wall is not likely to affect parking area	7
MORTAR 8.00	General age-related weathering; minor cracking	8
STONE MASONRY 8.00	Minor debonding; moss and small vegetation growing along face of wall	8
LATERAL SLOPE 0.50	No distress at end of wall; GD fill wall at beginning of wall is beginning to unravel	8
WALL DRAINS 0.50	No evidence of drainage-related distress; no visible weep holes	8
CURB/BERM/DITCH 0.50	No distress to GM buttresses	9
DOWNSLOPE 0.50	No distress; moderate to steep forested slope	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.

Great Smoky Mountains National Park

ROUTE 0955: NEWFOUND GAP PARKING AREA

Retaining Wall Condition Photos



GRSM_0955_0.000_P4_1.jpg



GRSM_0955_0.000_P4_2.jpg

Wall ID:	GRSM-0982-0.000-P1		
Route Name:	COUCHES CREEK PARKING (OCONALUFTEE RIVER PULLOUT PARKING #12)		
Inspection Date:	June 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	48	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	CC crib wall supporting a portion of pullout area located along the northbound travel lane of high ADT roadway low consequence of failure		

Wall Measurements

Wall Length (ft.):	28	Face Area (sq.):	161
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	8	Vertical Offset (ft.):	-1

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Critical; wall has effectively failed and requires immediate replacement	1
WALL FOUNDATION MATERIAL 8.00	Foundation has scoured away; 50% of wall is not in contact with ground	2
BIN OR CRIB 8.00	Members are cracked, broken and dislodged; some loss of backfill material	2
ROAD/SIDEWALK/SHOULDER 1.00	Moderate cracking and pitting of pavement	4
VEGETATION 0.50	Large diameter tree at southern end of wall is protecting the lateral slope	8
WALL DRAINS 0.50	Wall is self-draining; no evidence of drainage-related distress	9
DOWNSLOPE 1.00	Bedrock outcropping and stream channel; evidence of ongoing scour	7
LATERAL SLOPE 5.00	Large void at both ends of wall	2

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Replace wall & Lengthen and Increase height - 632 sqft (\$55/sqft) = \$34,760. Remove Tree - 1 tree (\$955/tree) = \$955. Remove/Reset Concrete Curb - 40 lnft (\$10/lnft) (2) = \$800. Remove/Reconstruct Asphalt Pavement - 66.67 sqyd (\$10/sqy.
Repair Cost:	\$43,526

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

Great Smoky Mountains National Park

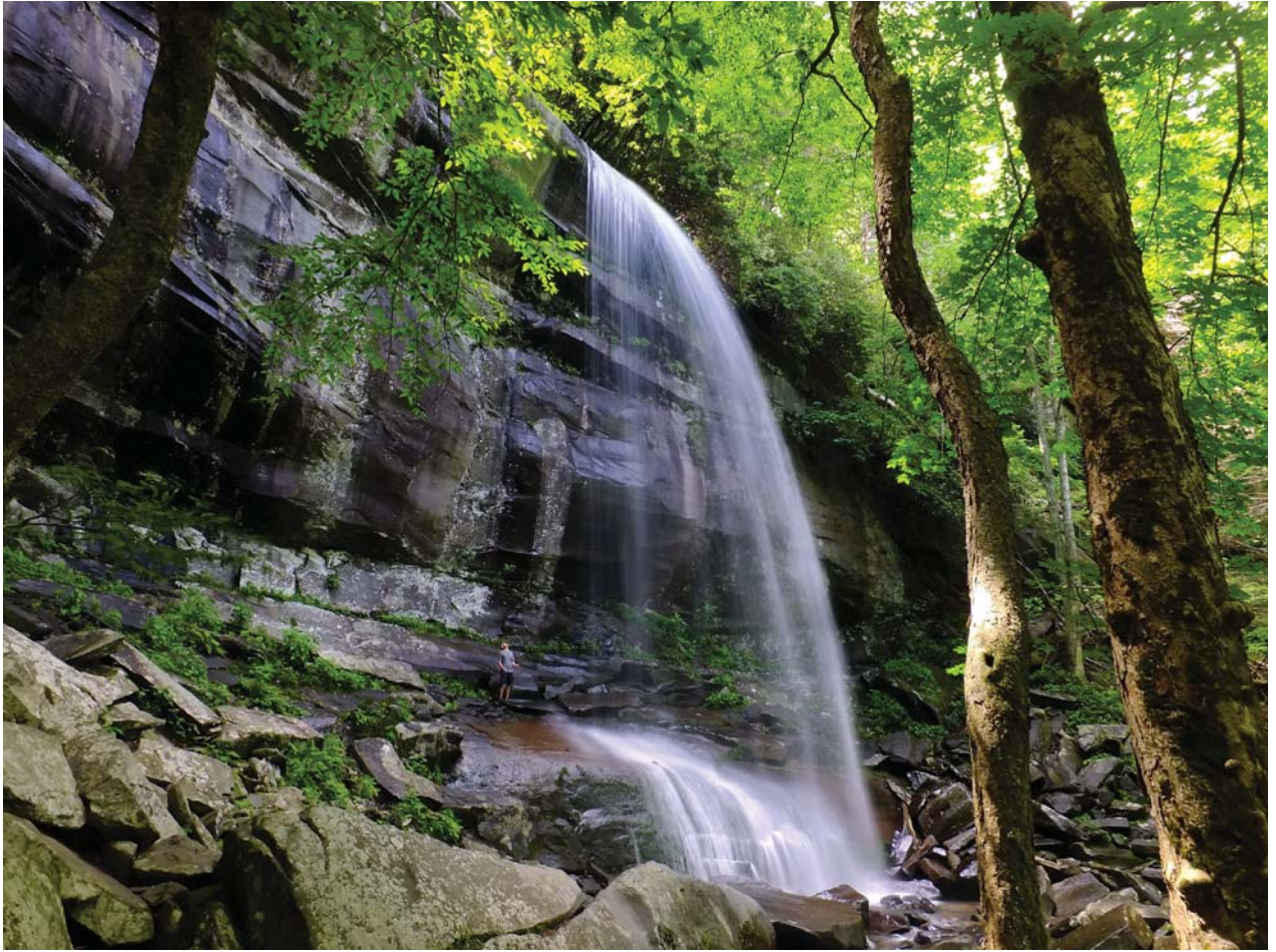
ROUTE 0982: COUCHES CREEK PARKING (OCONALUFTEE RIVER PULLOUT PARKING #12)

Retaining Wall Condition Photos

Condition photos are not available for GRSM-0982-0.000-P1.

Appendix A

Summary of WIP Definitions



Great Smoky Mountains National Park



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.	<p>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.</p> <p>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.</p> <p>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.</p>
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