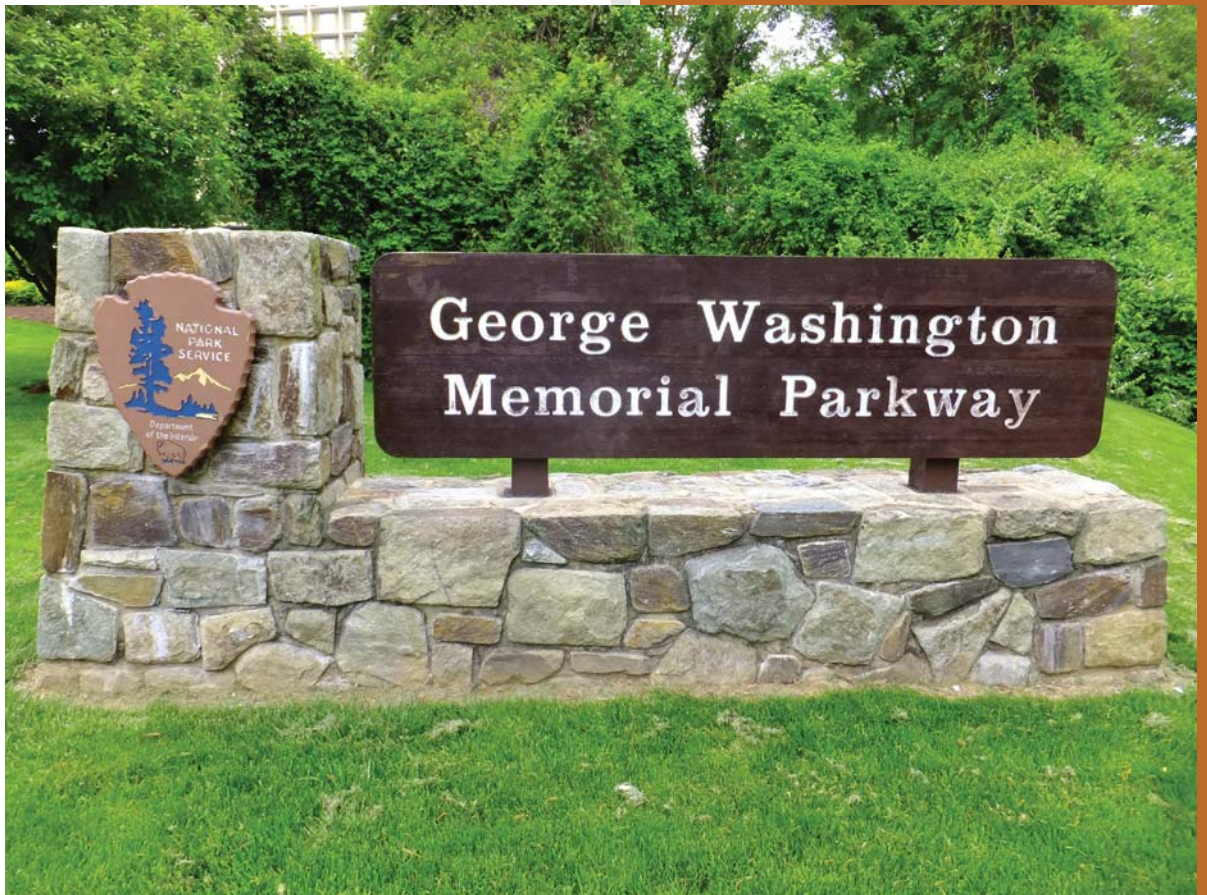


GWMP WIP Report

NPS Retaining Wall Inventory Program George Washington Memorial Parkway



**Federal Lands Highway
Road Inventory Program**

Prepared By:

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

**Data Collection Date: December 2007
Report Date: October 2015**

George Washington Memorial Parkway in District of Columbia, Maryland, and Virginia



George Washington Memorial Parkway

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



George Washington Memorial Parkway



**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.

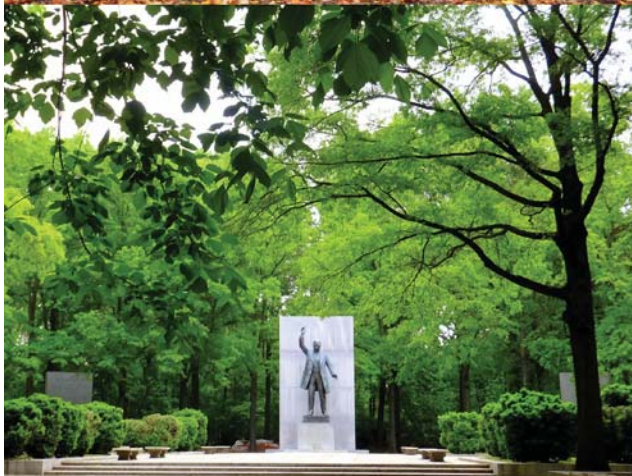
In support of WIP, a comprehensive procedures manual (available at the following link: <http://www.cflhd.gov/programs/techDevelopment/geotech/WIP/>) was developed to document the data collection and management process, wall attribute and element definitions, and team member responsibilities for conducting 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



George Washington Memorial Parkway

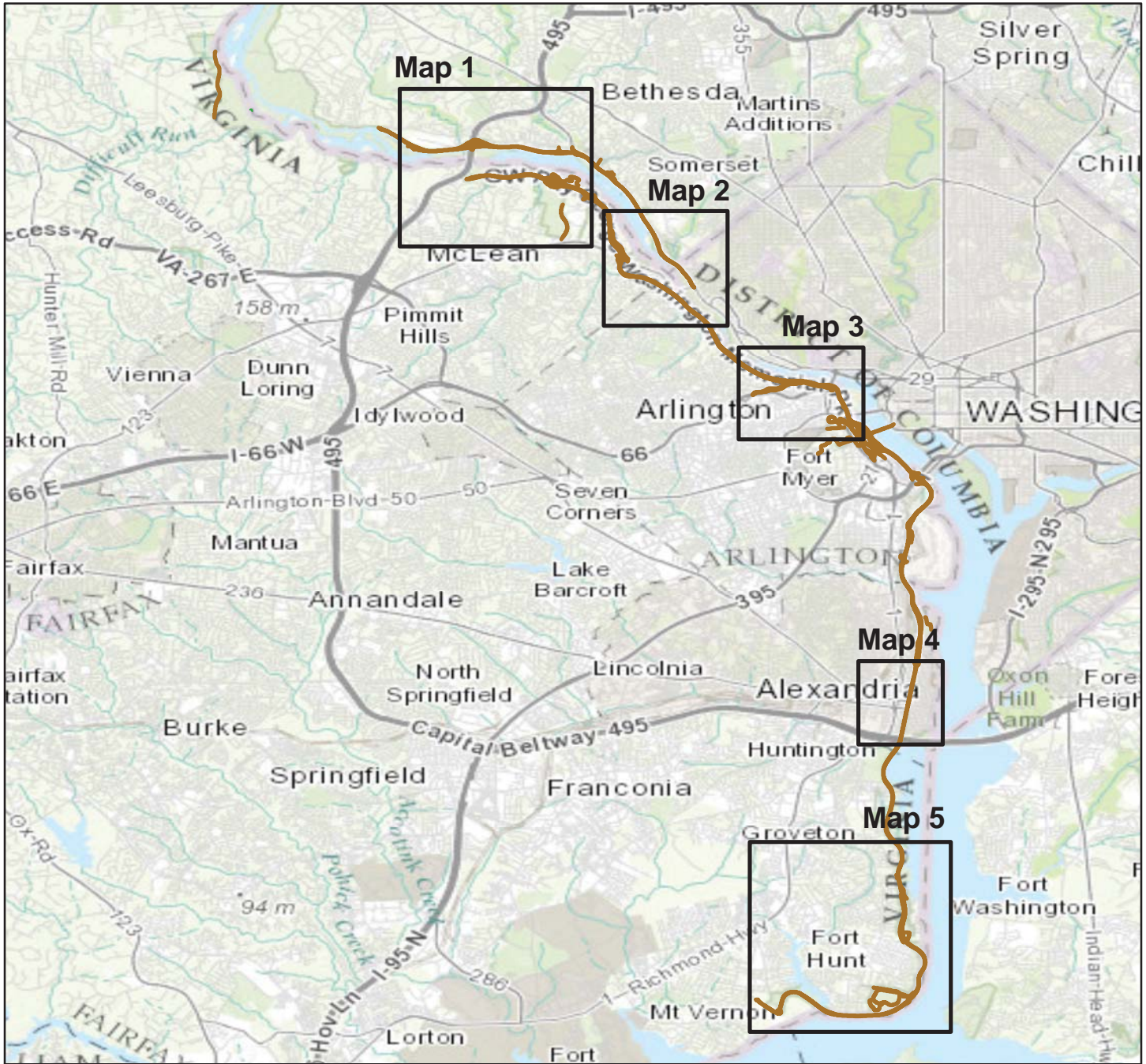


Federal Lands Highway
Road Inventory Program

George Washington Memorial Parkway

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

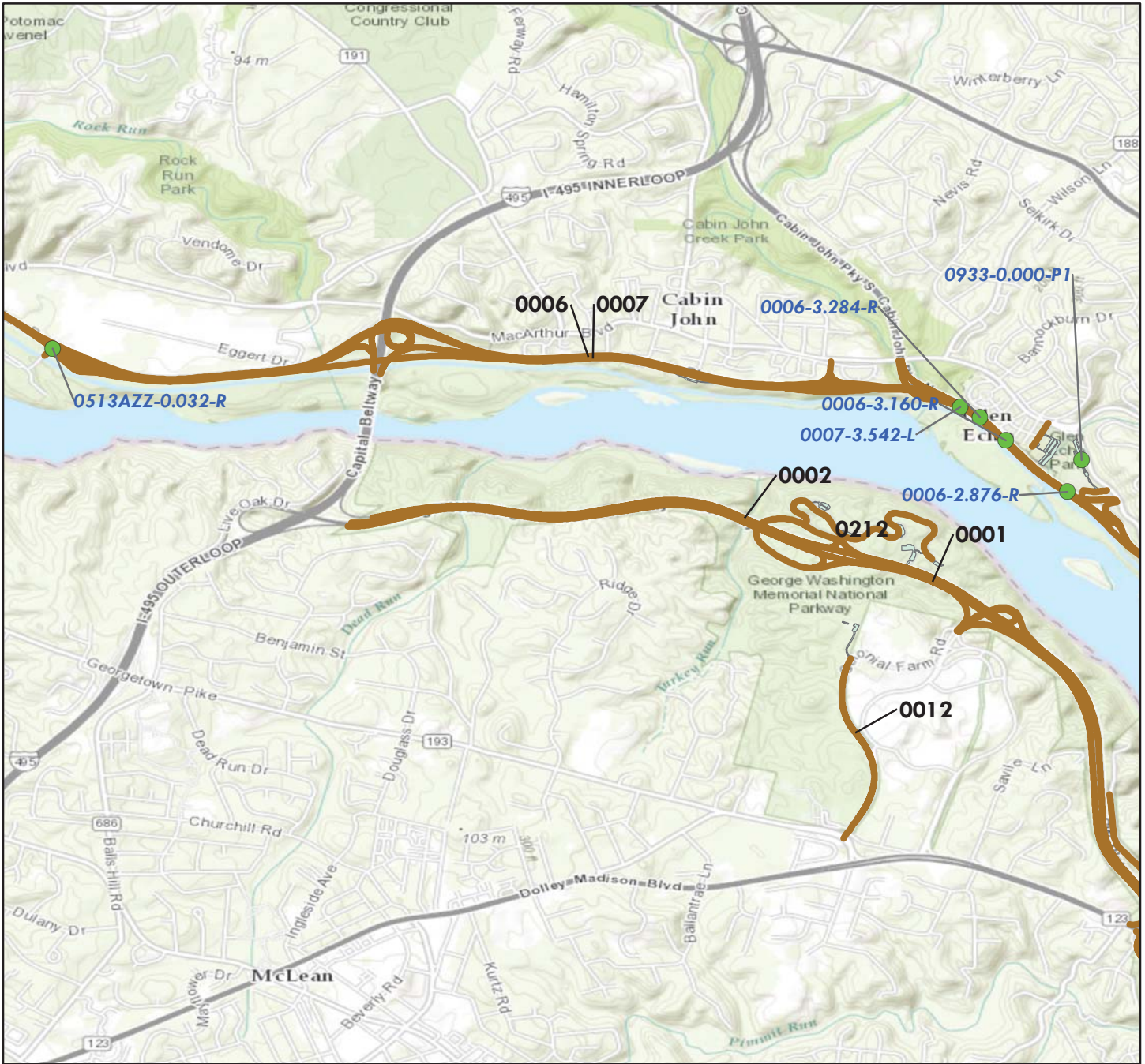
 RIP Collected Routes



George Washington Memorial Parkway

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

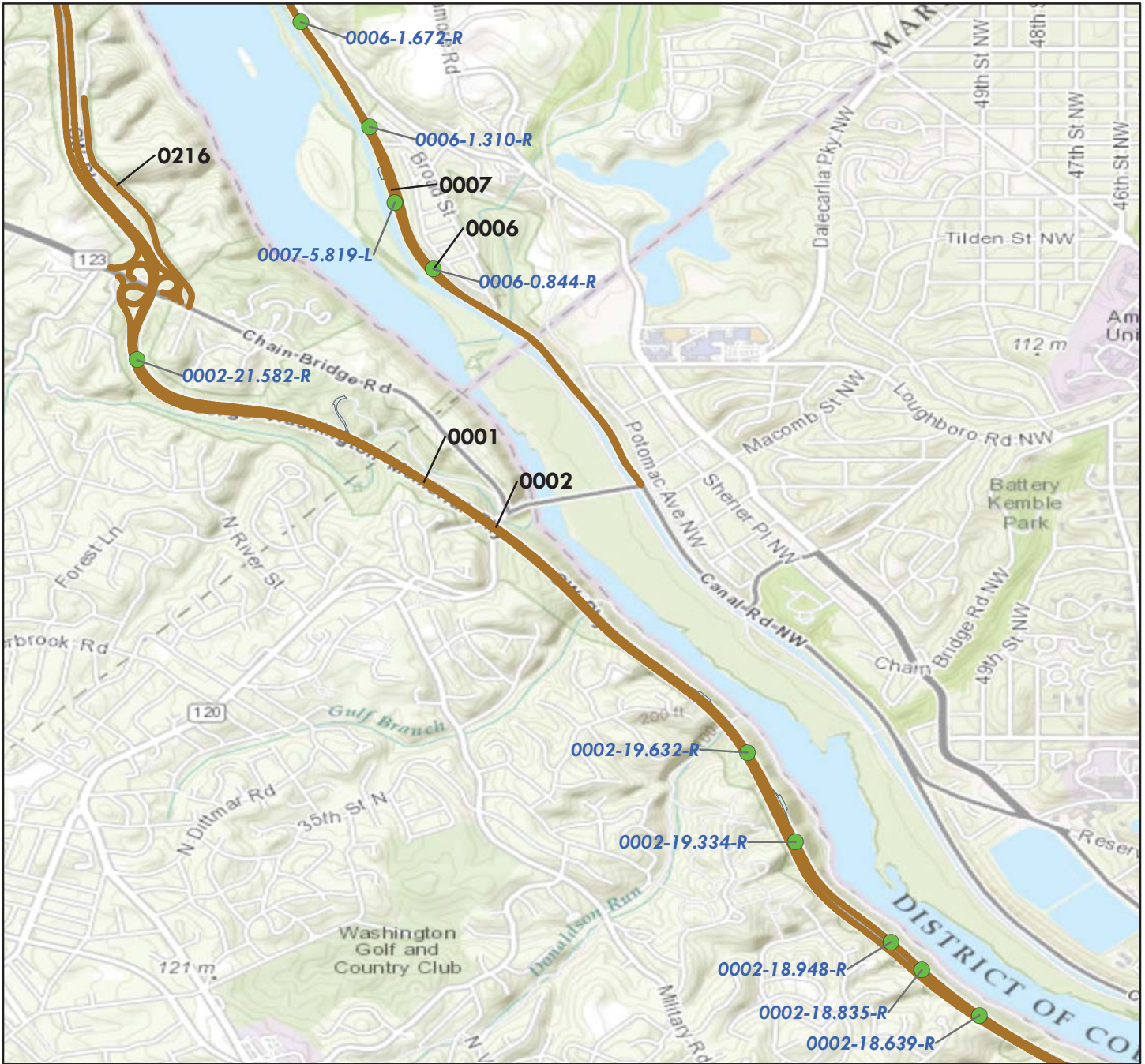
— RIP Collected Routes



George Washington Memorial Parkway

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

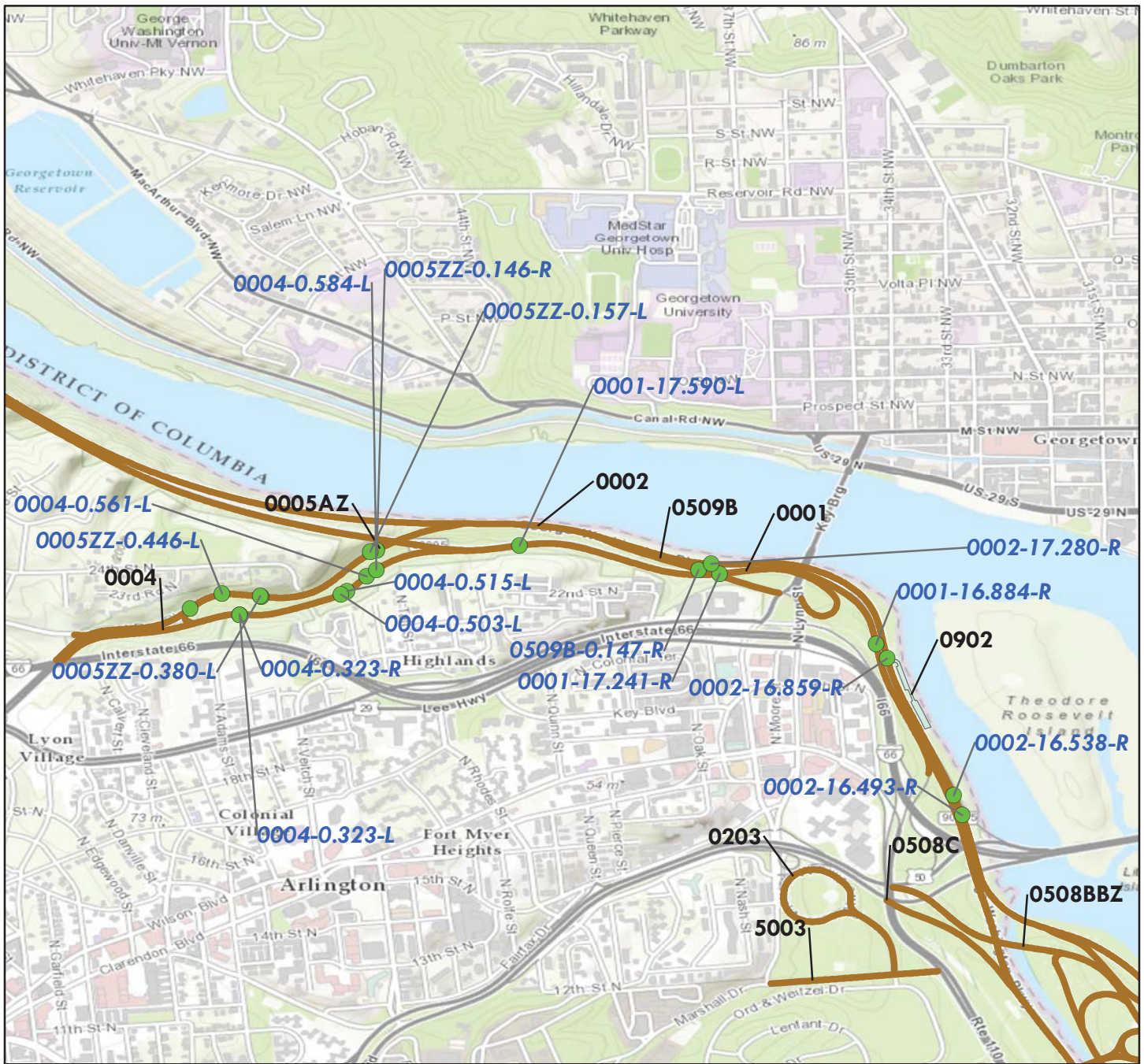
— RIP Collected Routes



George Washington Memorial Parkway

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

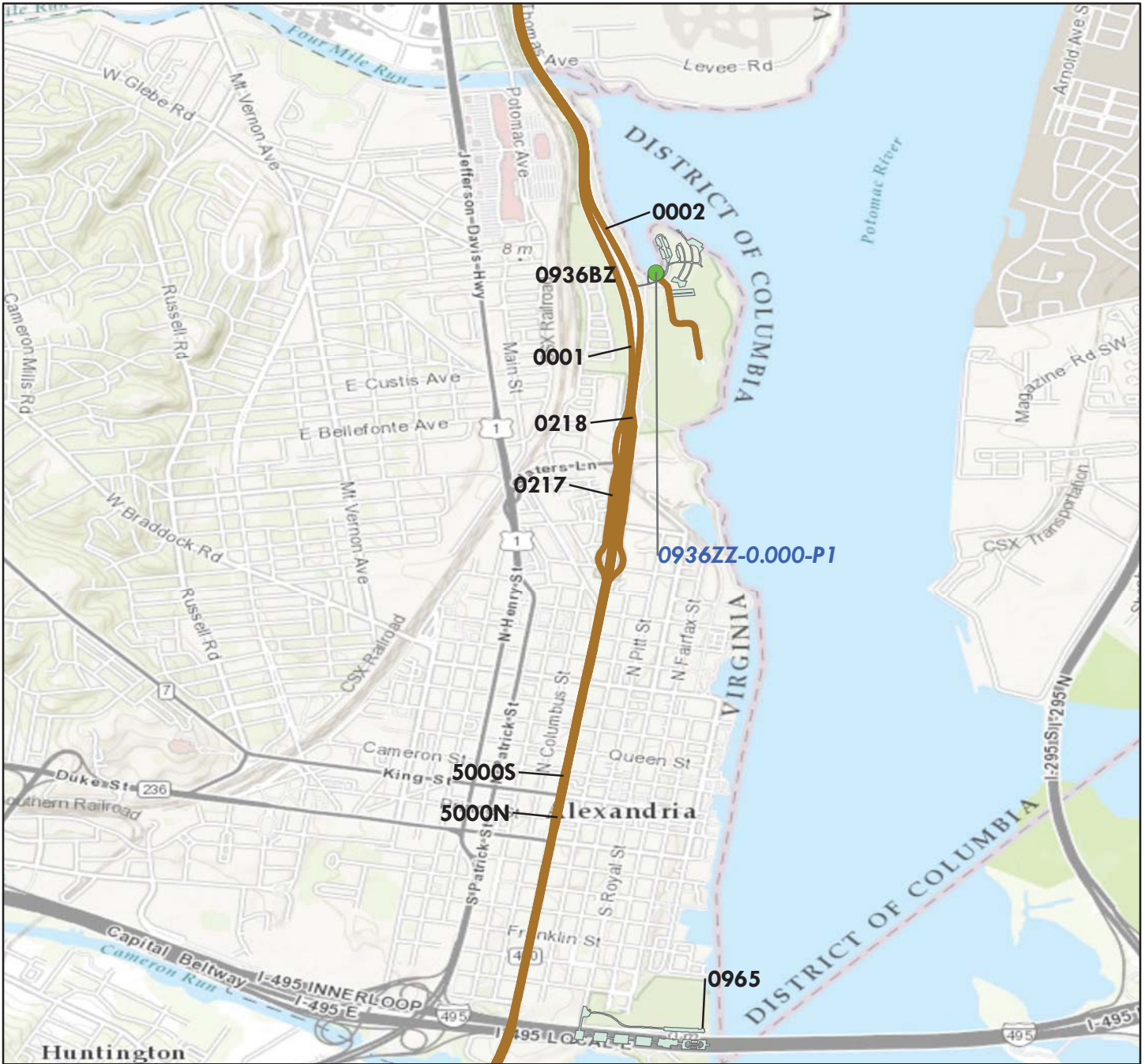
Miles



George Washington Memorial Parkway

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



George Washington Memorial Parkway

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



Tier 1 Park Retaining Wall Overview



George Washington Memorial Parkway



Federal Lands Highway
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Parkwide Summary: George Washington Memorial Parkway

Initial retaining wall inspections were conducted at George Washington Memorial Parkway in 2007, and encompassed all known retaining wall structures associated with Park roadways - including structure's retaining cuts and fills, as well as qualifying headwalls at culverts. For the purposes of the assessment, walls must be a minimum of 4 feet in maximum height of retained earth and greater than 6 feet in maximum height for culvert headwalls. This does not include the height of parapet or guardwall above a retaining wall.

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, 52 walls were inventoried on the routes listed below.

Table 1: Number of Walls by Route

Route Number	Route Name	No. of Walls
0001	GWMP - SOUTHBOUND	3
0002	GWMP - NORTHBOUND	10
0003ZZ	MOUNT VERNON PARKWAY	14
0004	SPOUT RUN PARKWAY EASTBOUND	6
0005ZZ	SPOUT RUN PARKWAY WESTBOUND AND RAMPS	6
0006	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY	6
0007	EB (INBOUND) CLARA BARTON MEMORIAL PARKWAY	2
0509B	ROSSLYN CIRCLE RAMP TO NB GWMP	1
0513AZZ	EB CLARA BARTON PARKWAY RAMPS AND SPUR AT CARDEROCK AND NAVAL RESEARCH CENTER	1
0917	MOUNT VERNON PARKING EAST LOT	1
0933	GLEN ECHO SERVICE AREA	1
0936ZZ	WASHINGTON MARINA PARKING AREAS	1

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

Table 2: Number of Walls by Wall Function

Wall Function	No. of Walls
CW - Cut Wall	16
FW - Fill Wall	17
HW - Head Wall	19

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	5
CL, Cantilever - Concrete	3
GB, Gravity - Concrete Block/Brick	1
GC, Gravity - Mass Concrete	3
GG, Gravity - Gabion	1
GM, Gravity - Mortared Stone	38
GV, Other - Geocell with Concrete/Veg Face	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	26
Monitor	\$0	0
Maintenance	\$5,940	6
Repair Elements	\$208,642	14
Replace Elements	\$86,269	3
Replace Wall	\$275,090	3
Totals	\$575,941	52

*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	26
\$1 - \$25,000	20
\$25,001 - \$50,000	3
\$50,001 - \$100,000	0
\$100,001 - \$250,000	3
\$250,001 - \$500,000	0
\$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	52

*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 George Washington Memorial Parkway. 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 George Washington Memorial Parkway 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⁾
GWMP-0005ZZ-0.446-L	MODERATE	44	REPLACE WALL	\$117,500
GWMP-0936ZZ-0.000-P1	LOW	48	REPLACE WALL	\$151,200

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



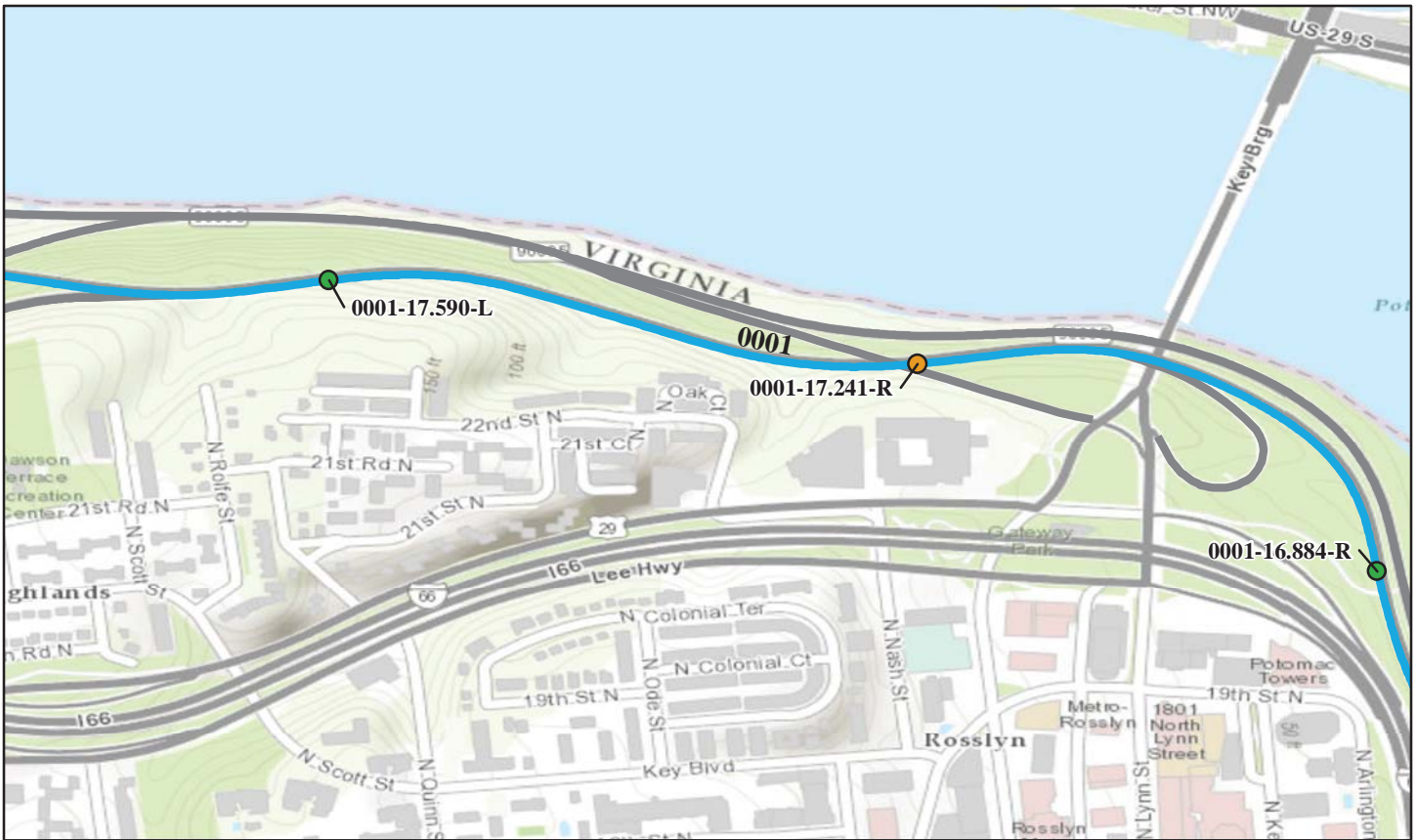
George Washington Memorial Parkway



Federal Lands Highway
Road Inventory Program

George Washington Memorial Parkway

ROUTE 0001: GWMP - 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)

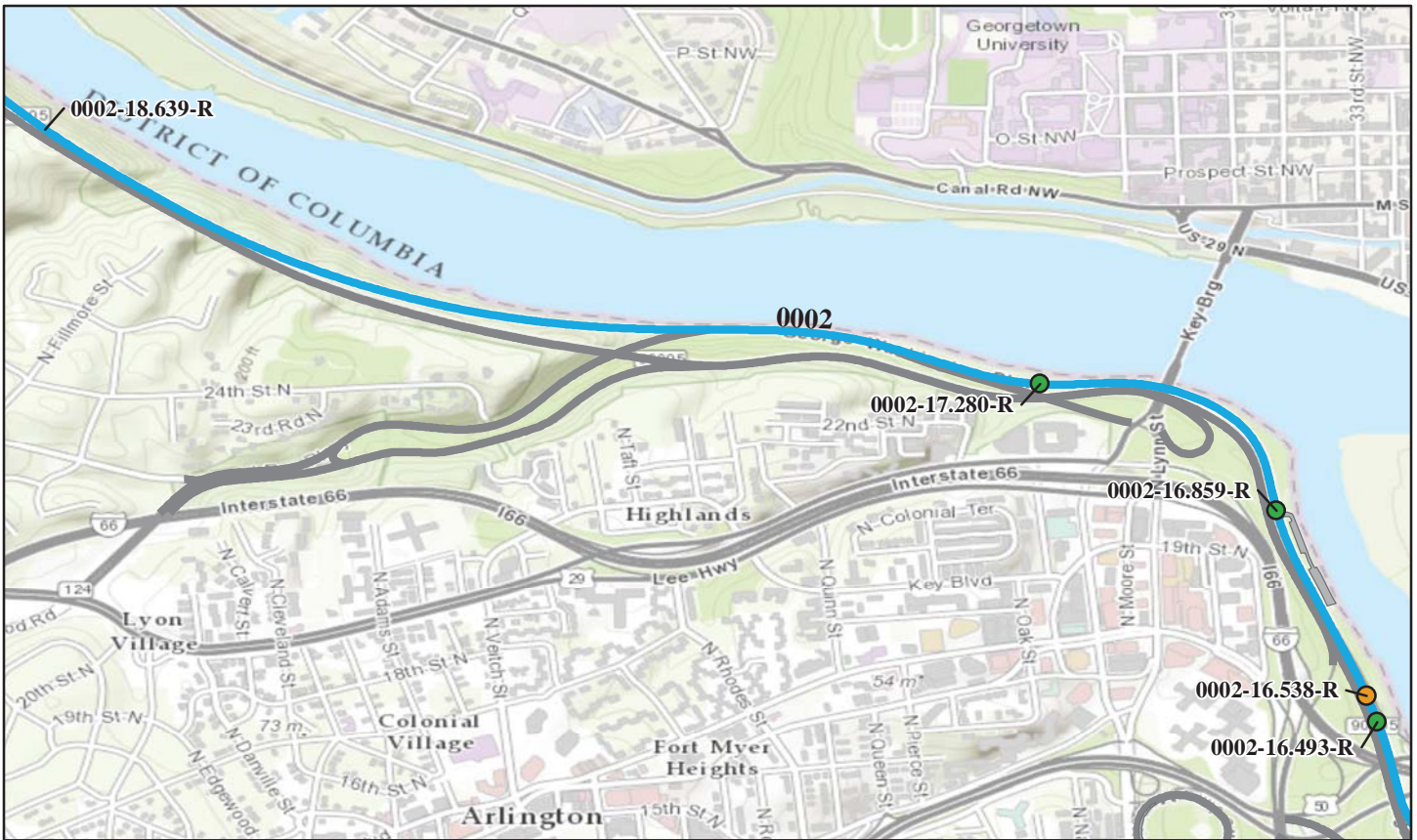
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0001-16.884-R 7/11/2007	9,600	1,295	Gravity - Mortared Stone	Cut Wall	77	\$0.00
GWMP-0001-17.241-R 8/9/2007	1,700	130	Cantilever - Concrete	Cut Wall	64	\$8,700.00
GWMP-0001-17.590-L 7/16/2007	2,320	515	Gravity - Mortared Stone	Cut Wall	80	\$0.00

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

George Washington Memorial Parkway

ROUTE 0002: GWMP - 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
GWMP-0002-16.493-R 7/11/2007	3,850	350	Gravity - Mortared Stone	Fill Wall	81	\$0.00
GWMP-0002-16.538-R 7/11/2007	13,800	1,150	Gravity - Mortared Stone	Fill Wall	68	\$0.00
GWMP-0002-16.859-R 7/11/2007	7,650	1,700	Gravity - Mortared Stone	Fill Wall	73	\$25,200.00
GWMP-0002-17.280-R 7/11/2007	11,935	1,705	Gravity - Mortared Stone	Fill Wall	77	\$0.00
GWMP-0002-18.639-R 12/19/2006	720	72	Crib - Concrete	Fill Wall	50	\$0.00

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

George Washington Memorial Parkway

ROUTE 0002: GWMP - 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)

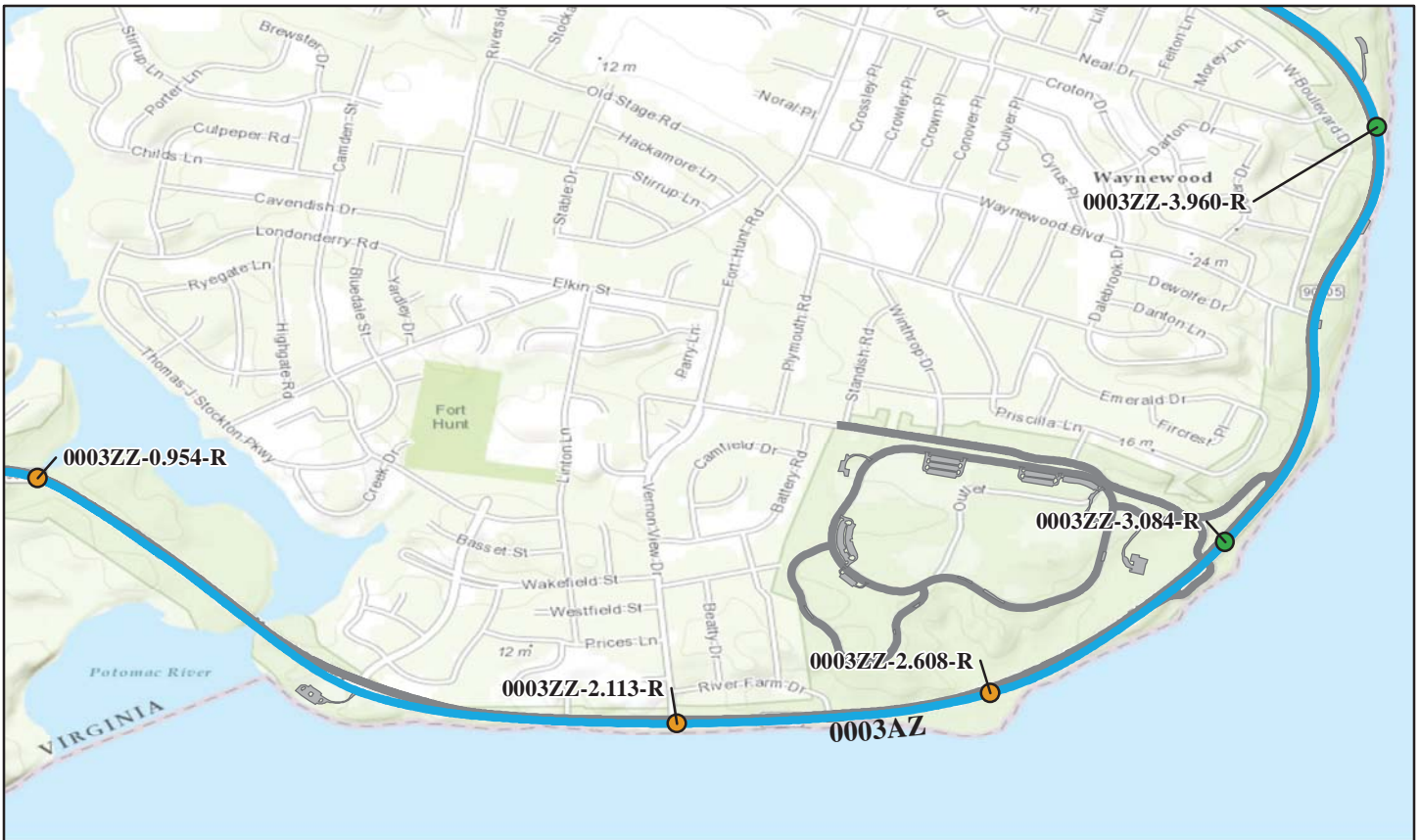
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0002-18.835-R 12/19/2007	968	88	Crib - Concrete	Fill Wall	76	\$0.00
GWMP-0002-18.948-R 12/19/2007	384	48	Crib - Concrete	Fill Wall	64	\$0.00
GWMP-0002-19.334-R 12/19/2007	960	96	Crib - Concrete	Fill Wall	53	\$0.00
GWMP-0002-19.632-R 12/19/2007	320	64	Crib - Concrete	Fill Wall	52	\$0.00
GWMP-0002-21.582-R 7/12/2007	72	19	Gravity - Mass Concrete	Head Wall	70	\$0.00

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY



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)

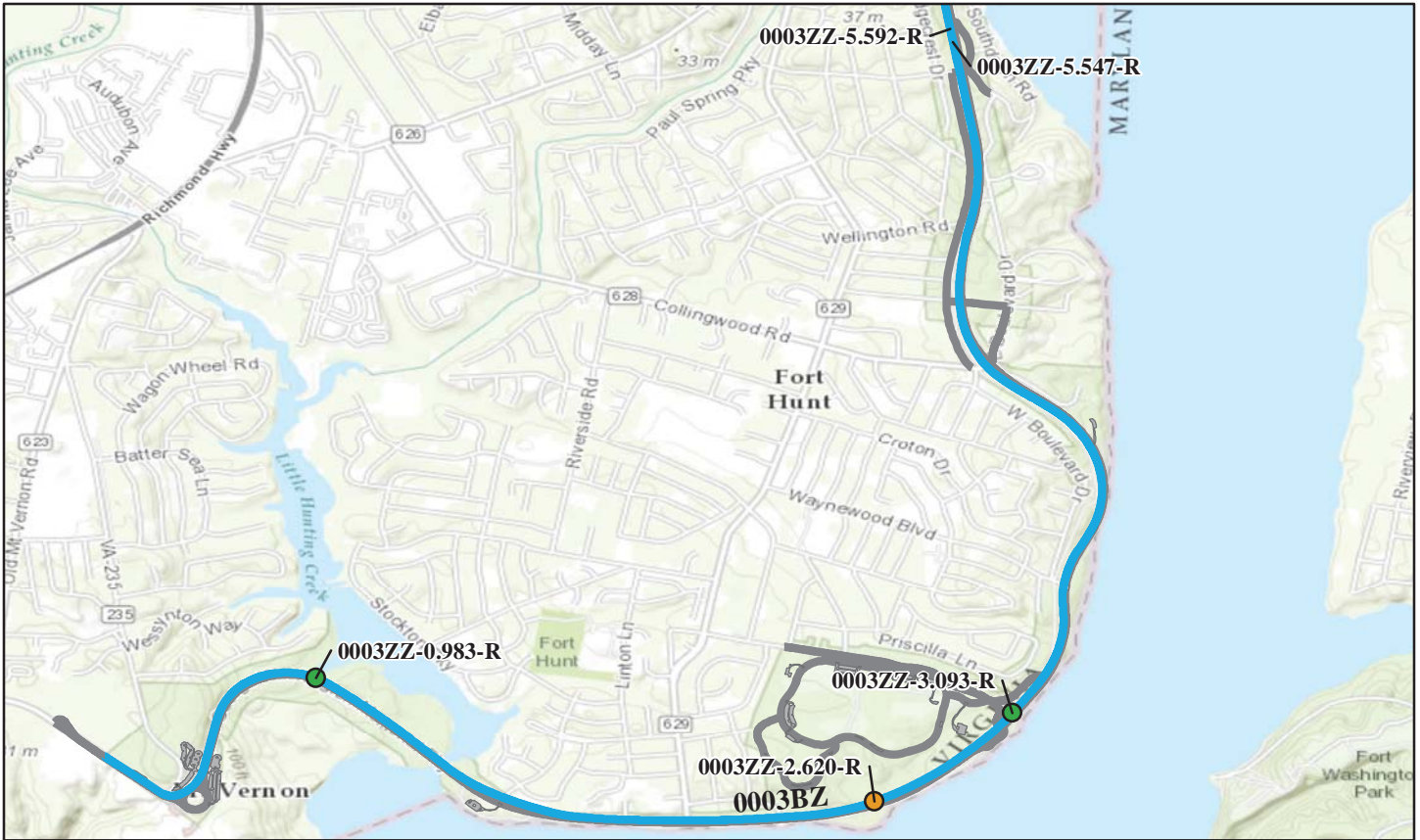
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0003ZZ-0.954-R 7/10/2007	113	25	Gravity - Mortared Stone	Head Wall	68	\$2,360.00
GWMP-0003ZZ-2.113-R 7/10/2007	90	18	Gravity - Mortared Stone	Head Wall	65	\$2,455.00
GWMP-0003ZZ-2.608-R 7/10/2007	150	27	Gravity - Mortared Stone	Head Wall	67	\$1,500.00
GWMP-0003ZZ-3.084-R 7/10/2007	180	32	Gravity - Mortared Stone	Head Wall	70	\$0.00
GWMP-0003ZZ-3.960-R 7/10/2007	200	30	Gravity - Mortared Stone	Head Wall	71	\$880.00

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY



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)

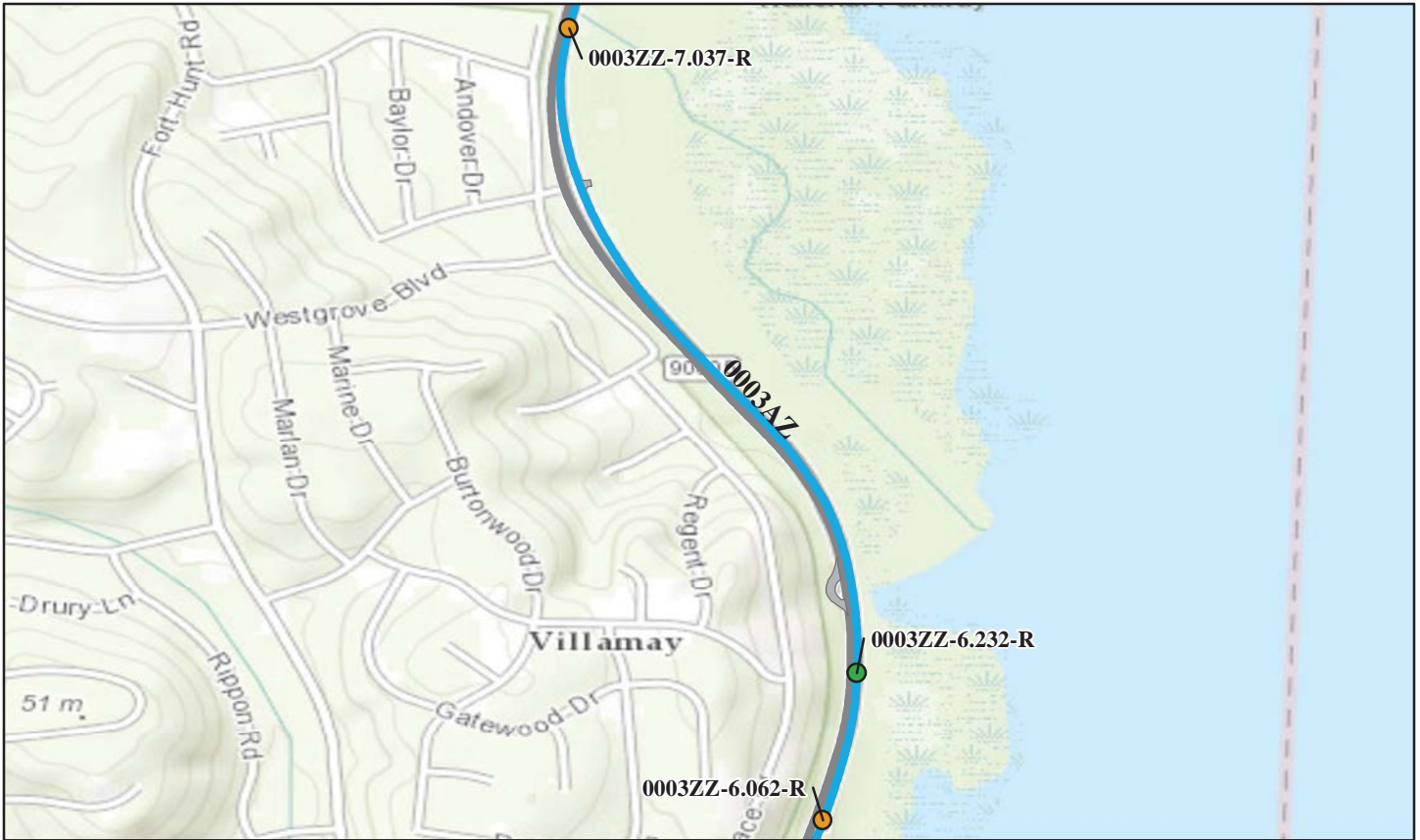
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0003ZZ-0.983-R 7/10/2007	113	25	Gravity - Mortared Stone	Head Wall	70	\$110.00
GWMP-0003ZZ-2.620-R 7/10/2007	125	27	Gravity - Mortared Stone	Head Wall	65	\$750.00
GWMP-0003ZZ-3.093-R 7/10/2007	100	29	Gravity - Mortared Stone	Head Wall	72	\$0.00
GWMP-0003ZZ-5.547-R 7/10/2007	500	93	Gravity - Mortared Stone	Cut Wall	54	\$22,527.00
GWMP-0003ZZ-5.592-R 7/10/2007	850	170	Gravity - Mortared Stone	Cut Wall	57	\$33,654.00

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY



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
GWMP-0003ZZ-6.062-R 7/10/2007	40	11	Gravity - Mortared Stone	Head Wall	66	\$450.00
GWMP-0003ZZ-6.232-R 7/10/2007	80	21	Gravity - Mortared Stone	Fill Wall	70	\$0.00
GWMP-0003ZZ-7.037-R 7/10/2007	150	26	Gravity - Mortared Stone	Head Wall	68	\$450.00

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY



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)

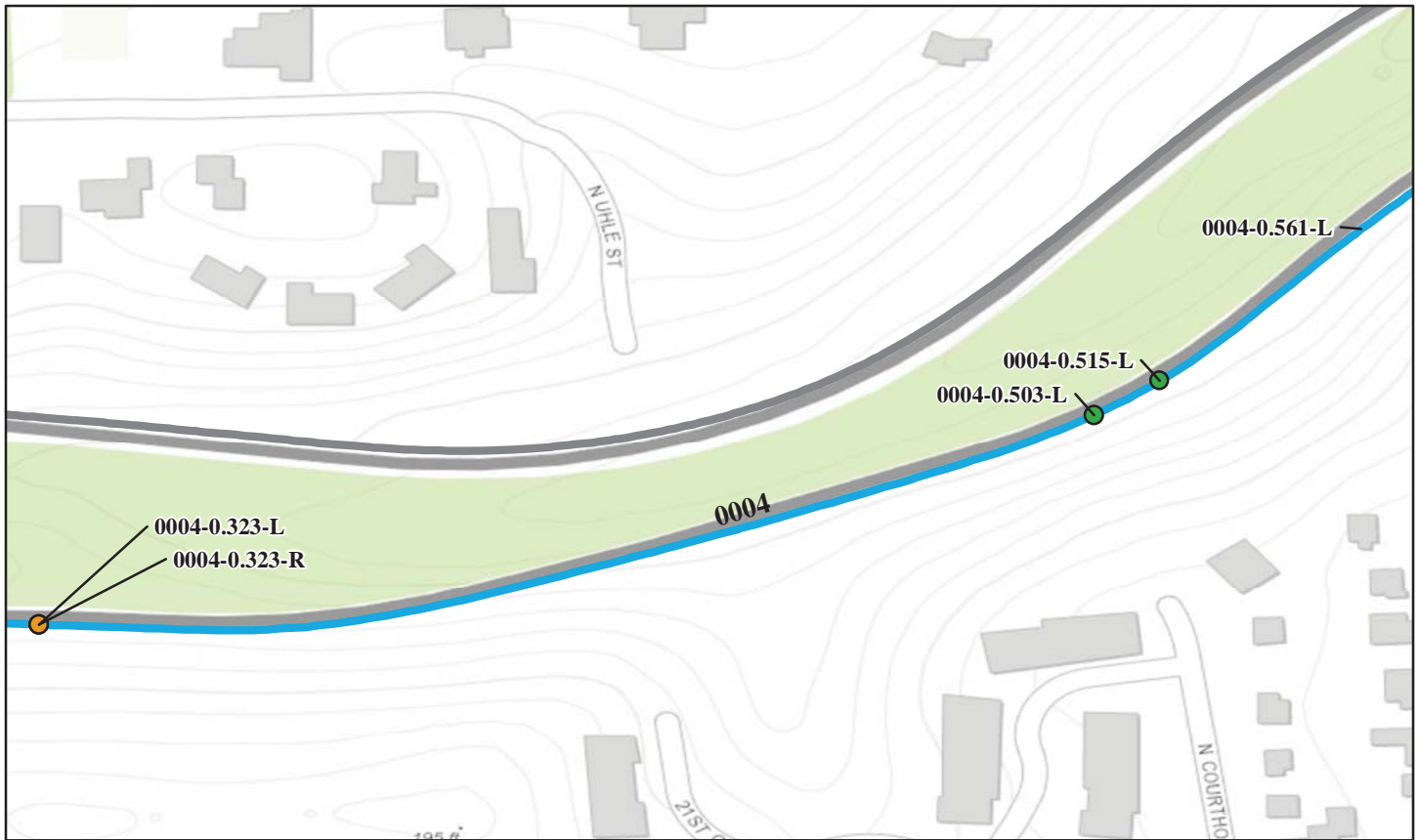
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0003ZZ-7.054-R 7/10/2007	140	25	Gravity - Mortared Stone	Head Wall	70	\$0.00

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

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND



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)

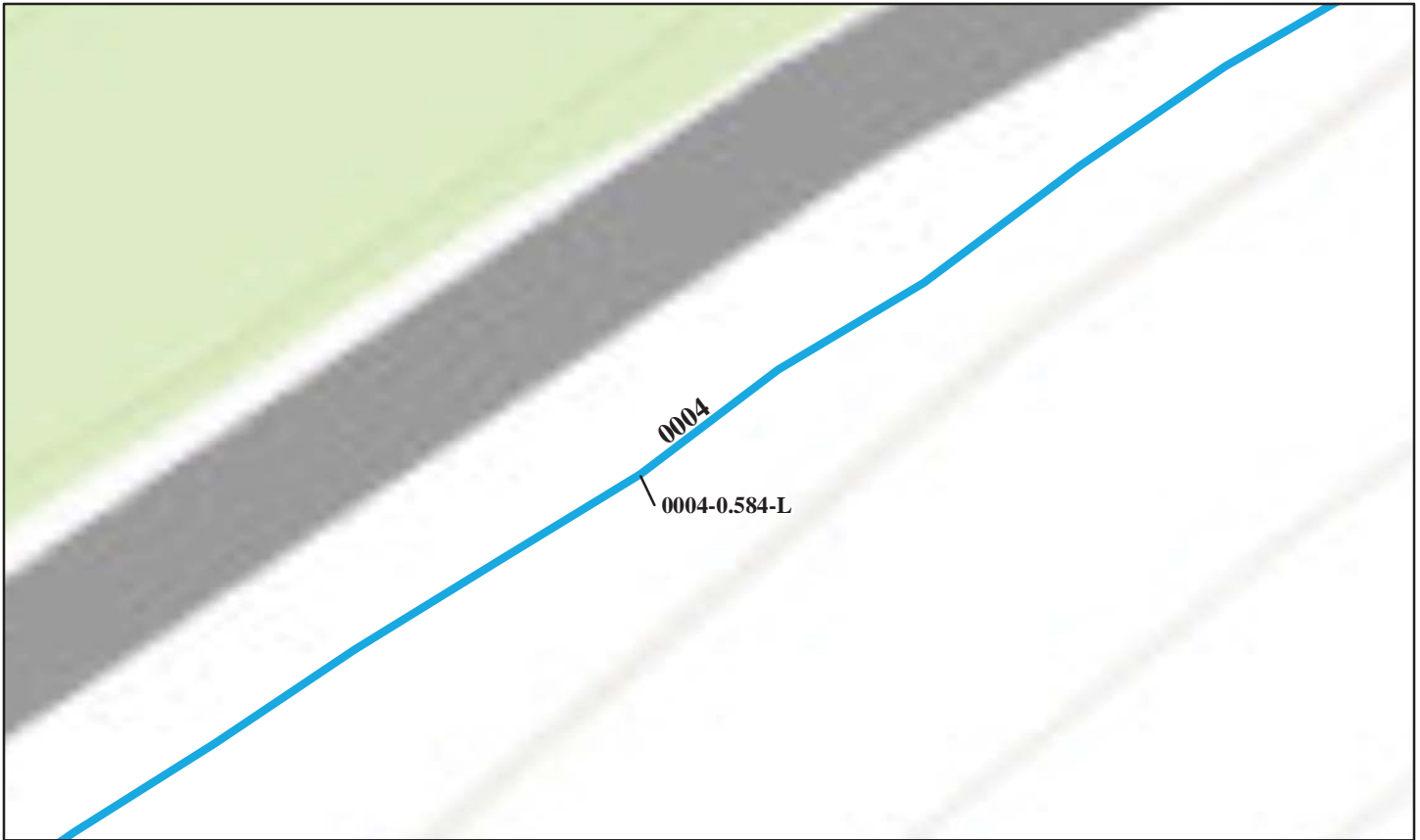
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0004-0.323-L 7/16/2007	440	55	Gravity - Mortared Stone	Head Wall	68	\$0.00
GWMP-0004-0.323-R 7/16/2007	600	75	Gravity - Mortared Stone	Head Wall	66	\$0.00
GWMP-0004-0.503-L 7/16/2007	120	20	Gravity - Mortared Stone	Fill Wall	74	\$740.00
GWMP-0004-0.515-L 7/16/2007	55	15	Gravity - Mortared Stone	Head Wall	75	\$0.00
GWMP-0004-0.561-L 7/16/2007	68	17	Gravity - Mortared Stone	Head Wall	59	\$8,252.00

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

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND



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)

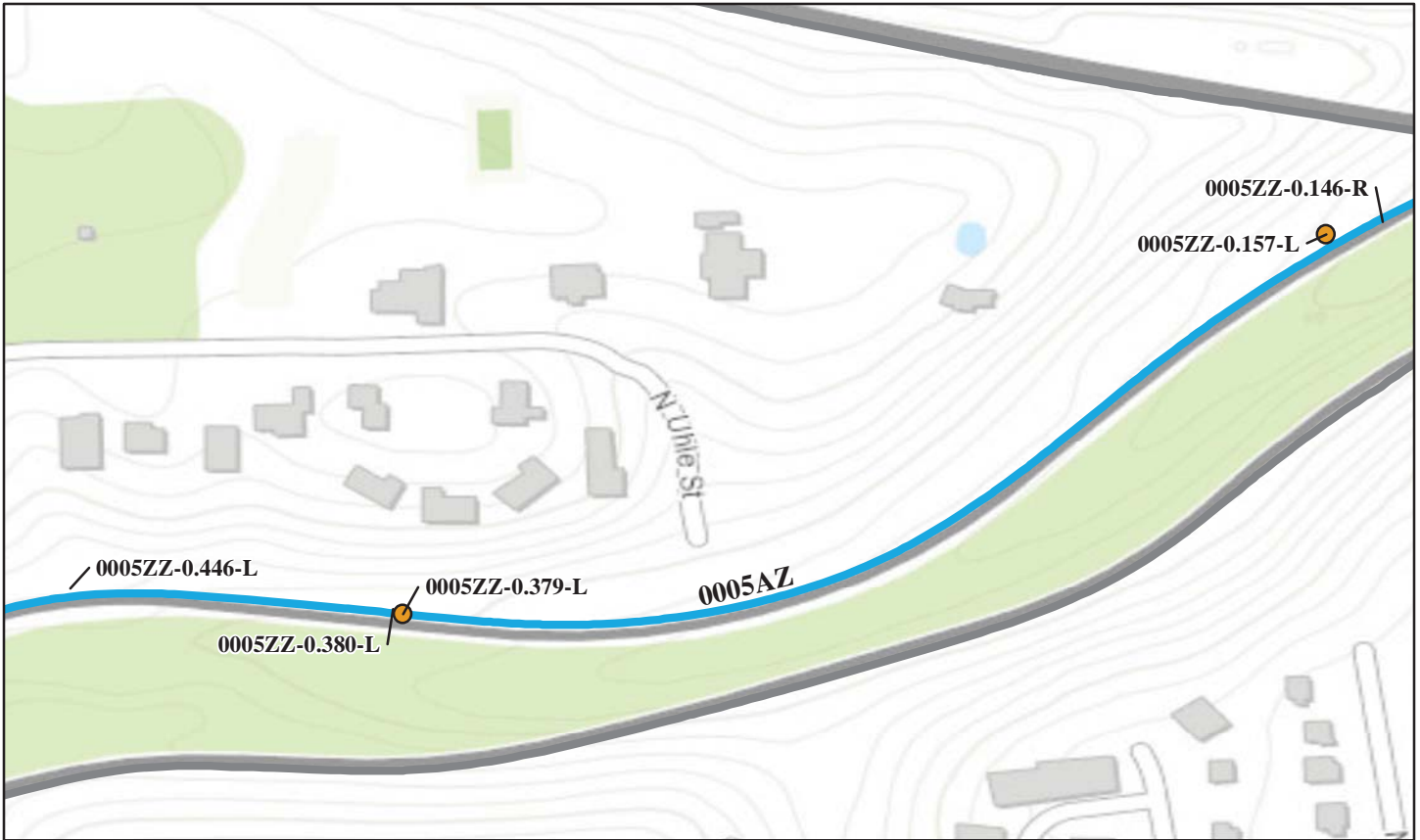
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0004-0.584-L 7/16/2007	65	13	Gravity - Mass Concrete	Fill Wall	58	\$0.00

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

George Washington Memorial Parkway

ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND 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)

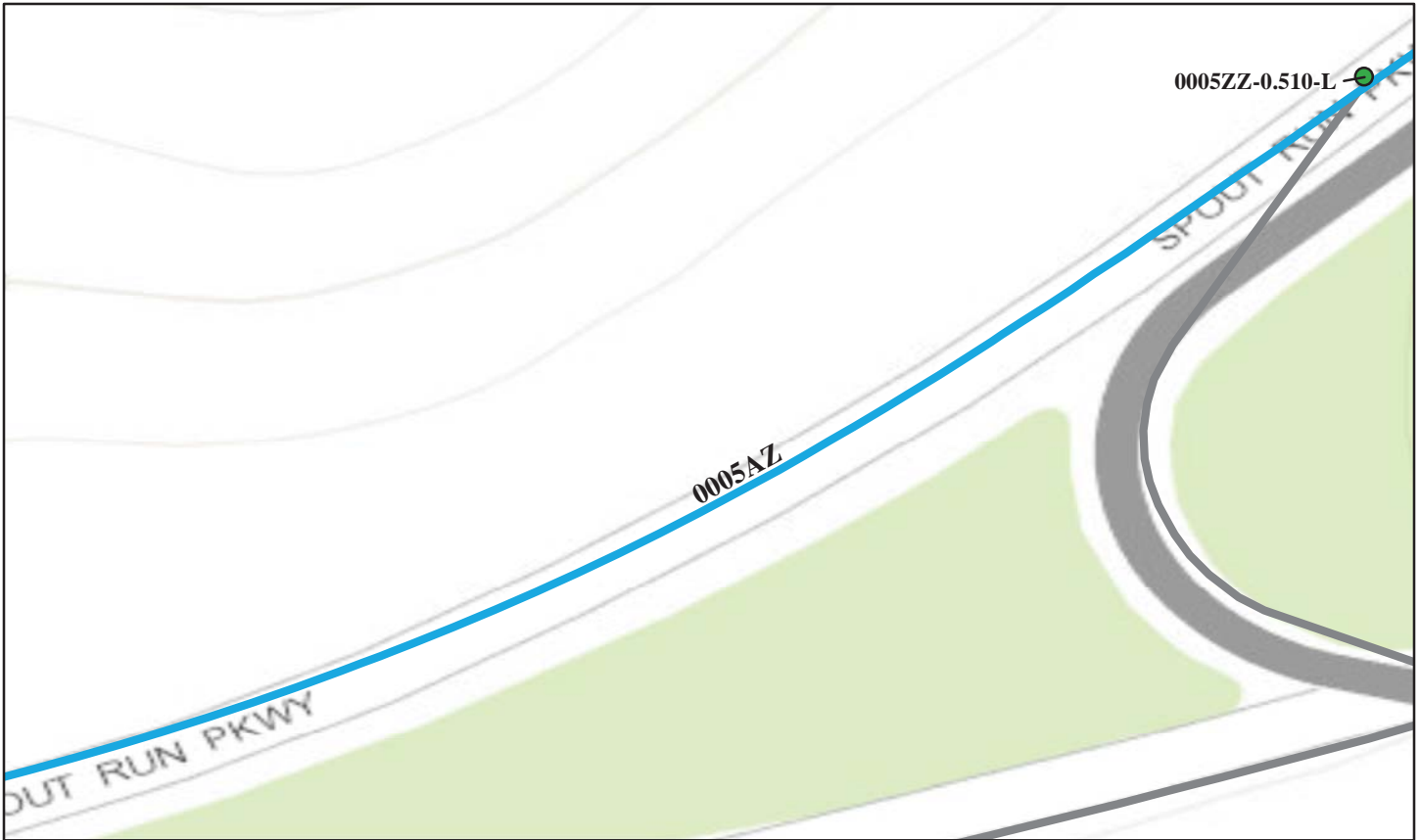
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0005ZZ-0.146-R 7/16/2007	2,500	125	Gravity - Mortared Stone	Head Wall	59	\$0.00
GWMP-0005ZZ-0.157-L 7/16/2007	525	90	Gravity - Mortared Stone	Head Wall	66	\$0.00
GWMP-0005ZZ-0.379-L 7/16/2007	1,800	145	Other - Geocell with Concrete/Veg Face	Fill Wall	65	\$11,827.00
GWMP-0005ZZ-0.380-L 7/16/2007	40	10	Gravity - Mortared Stone	Head Wall	54	\$6,390.00
GWMP-0005ZZ-0.446-L 7/16/2007	350	35	Gravity - Gabion	Fill Wall	44	\$117,500.00

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

George Washington Memorial Parkway

ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND 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

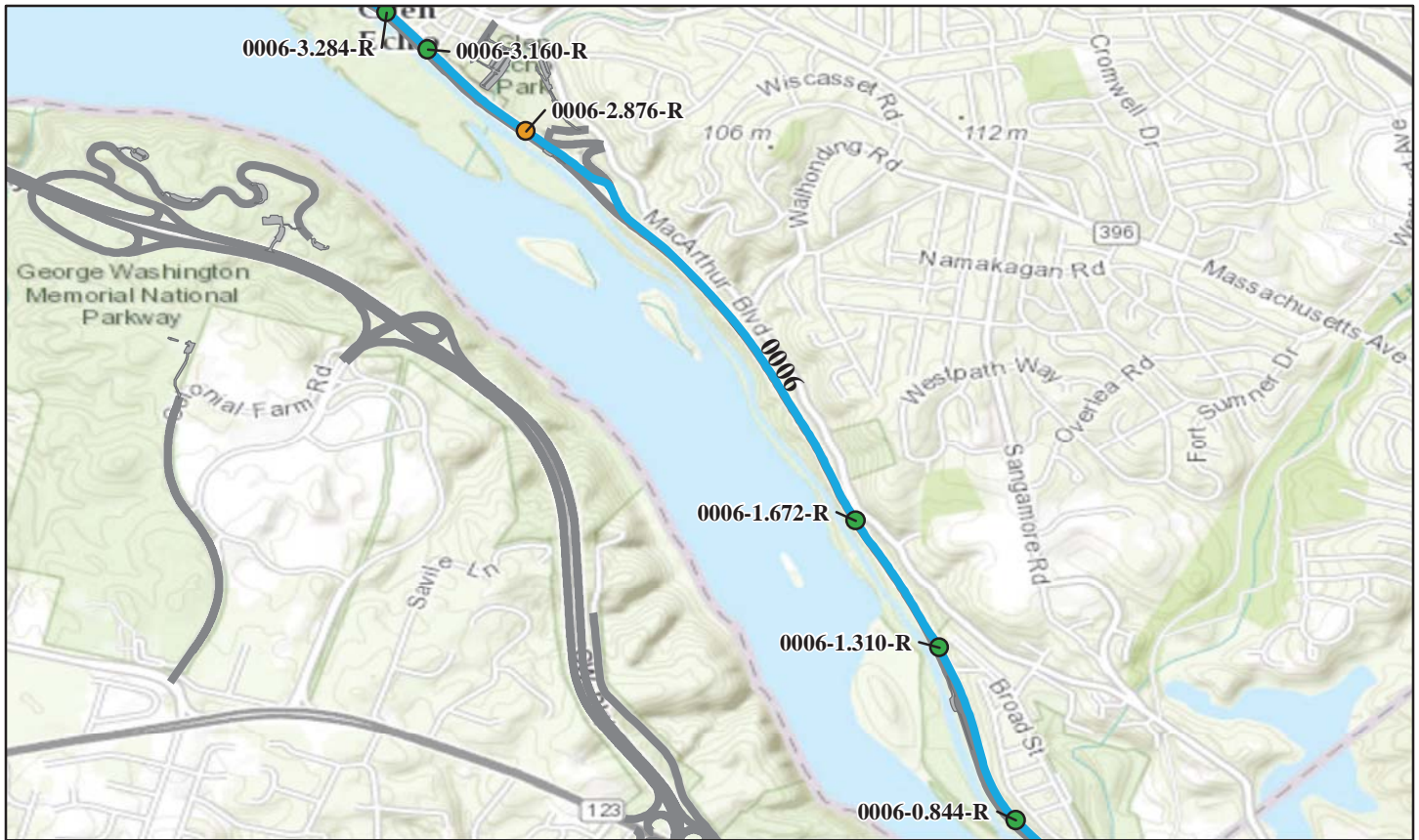
Critical / Poor (0 - 49)	Fair (50 - 69)	Good to Excellent (70 - 100)	No Data
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Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0005ZZ-0.510-L 7/16/2007	2,070	345	Gravity - Mortared Stone	Fill Wall	79	\$0.00

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

George Washington Memorial Parkway

ROUTE 0006: WB (OUTBOUND) CLARA Barton Memorial Parkway



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
GWMP-0006-0.844-R 7/17/2007	15,300	1,175	Gravity - Mortared Stone	Cut Wall	74	\$1,650.00
GWMP-0006-1.310-R 7/17/2007	680	85	Gravity - Mortared Stone	Cut Wall	80	\$0.00
GWMP-0006-1.672-R 7/17/2007	8,450	550	Gravity - Mortared Stone	Cut Wall	82	\$1,100.00
GWMP-0006-2.876-R 7/16/2007	1,800	210	Cantilever - Concrete	Cut Wall	63	\$22,176.00
GWMP-0006-3.160-R 7/9/2007	4,896	408	Gravity - Mortared Stone	Cut Wall	84	\$1,100.00

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

George Washington Memorial Parkway

ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY



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)

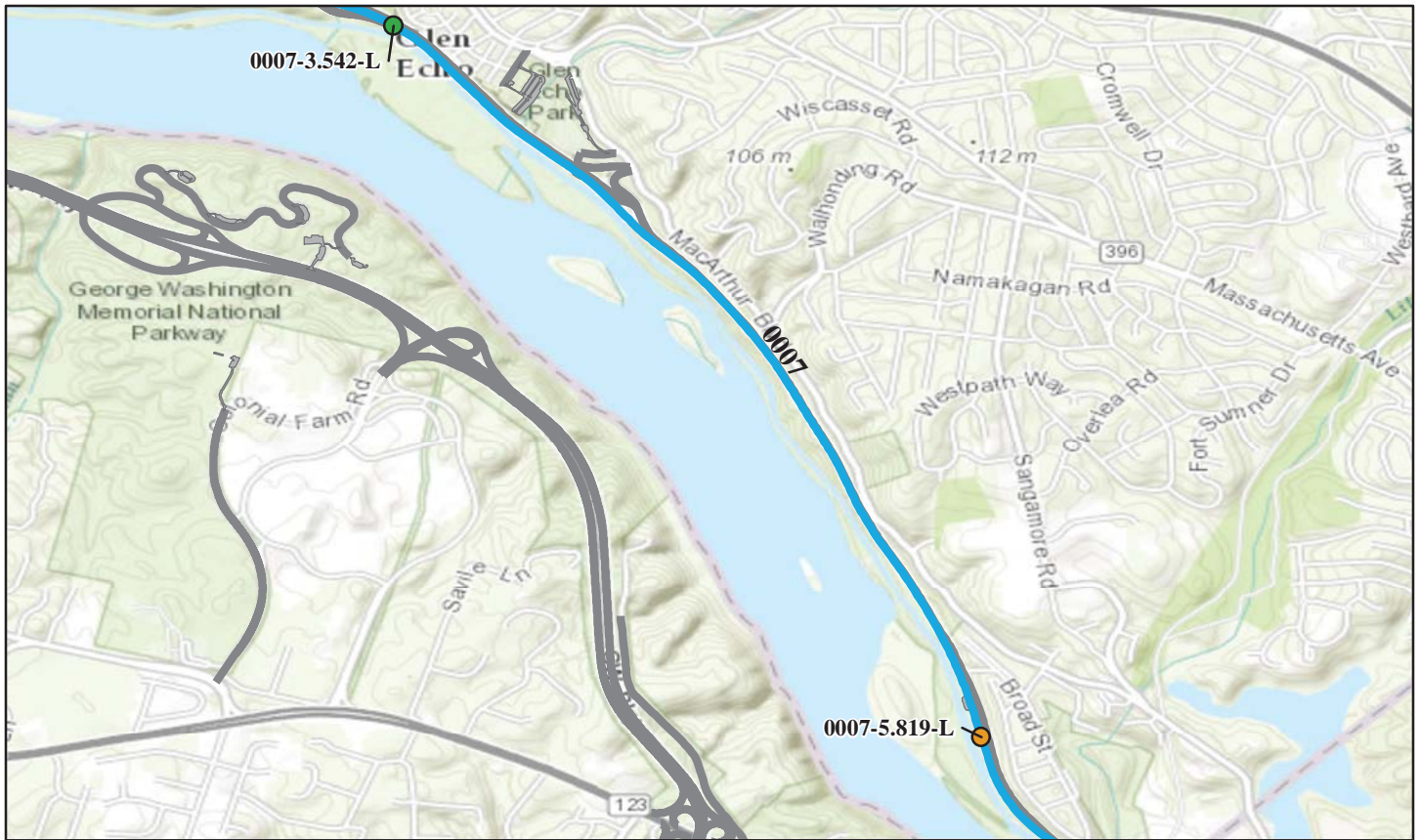
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0006-3.284-R 7/9/2007	3,240	405	Gravity - Mortared Stone	Cut Wall	81	\$1,100.00

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

George Washington Memorial Parkway

ROUTE 0007: EB (INBOUND) CLARA Barton Memorial Parkway



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)

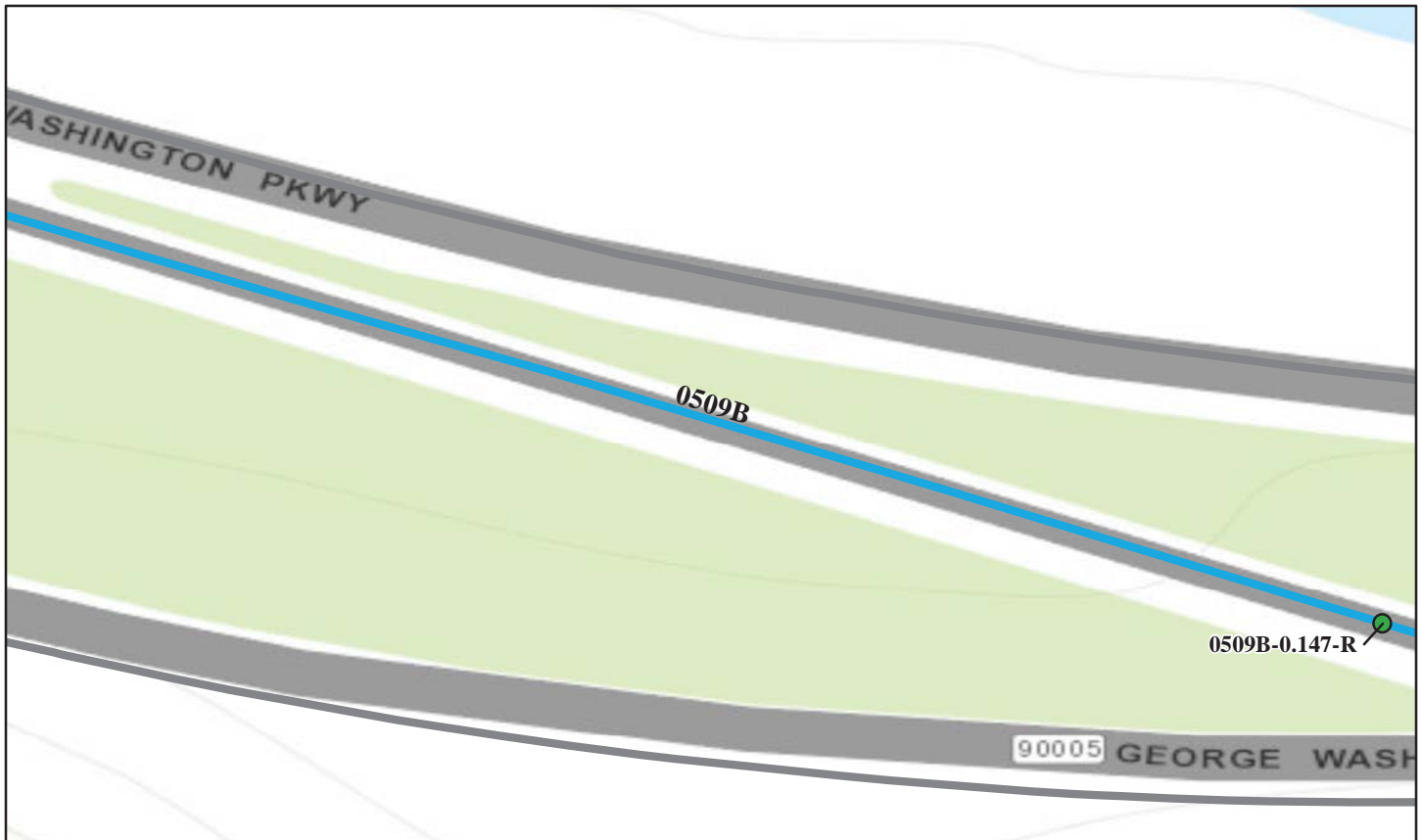
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0007-3.542-L 7/17/2007	-1	3,275	Cantilever - Concrete	Cut Wall	79	\$0.00
GWMP-0007-5.819-L 7/17/2007	16,500	1,262	Gravity - Mortared Stone	Cut Wall	68	\$118,496.00

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

George Washington Memorial Parkway

ROUTE 0509B: ROSSLYN CIRCLE RAMP TO NB GWMP



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)

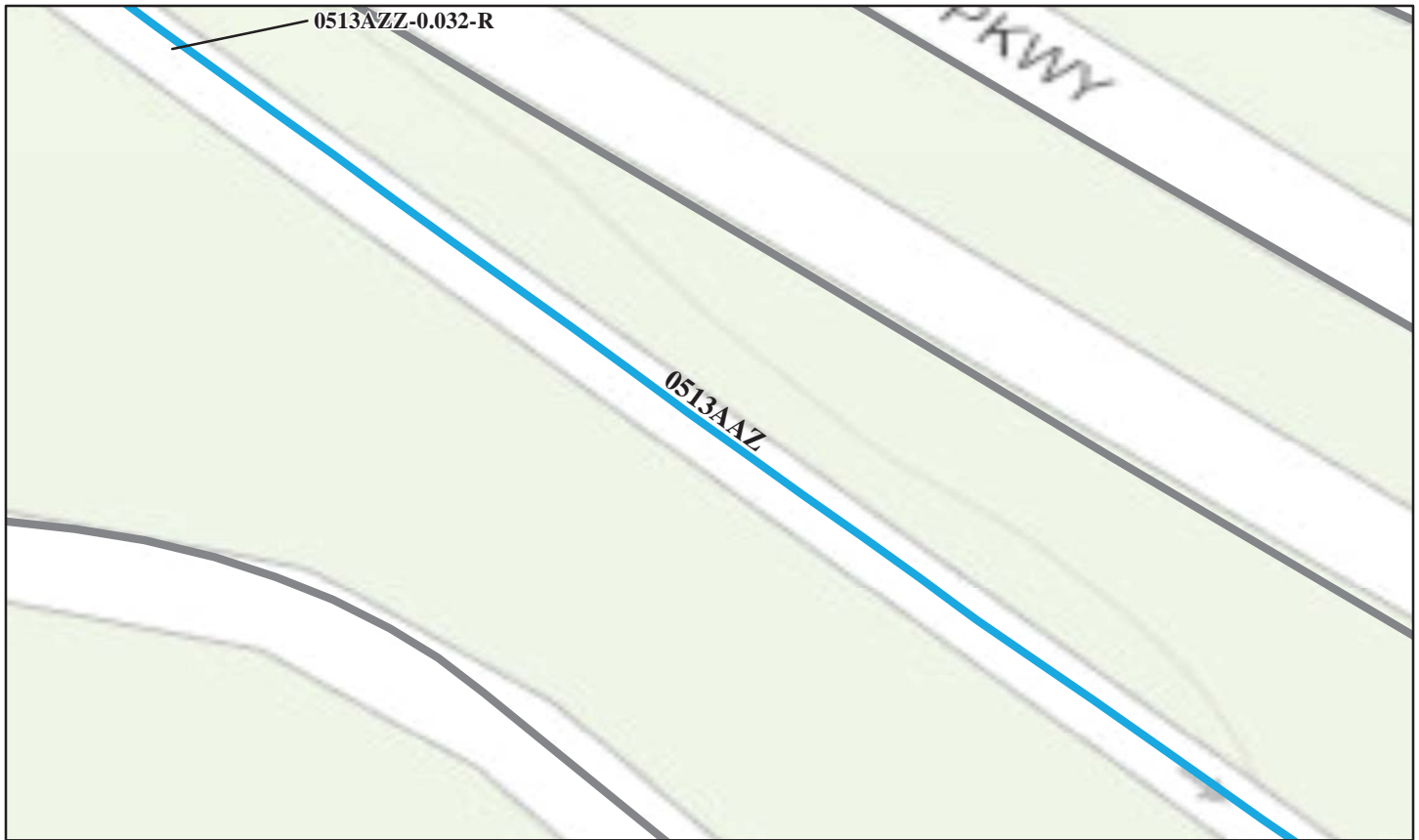
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0509B-0.147-R 7/11/2007	1,400	365	Gravity - Mortared Stone	Fill Wall	79	\$0.00

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

George Washington Memorial Parkway

ROUTE 0513AAZ: EB CLARA BARTON PARKWAY RAMPS AND SPUR AT CARDEROCK AND NAVAL RESEARCH CENTER



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)

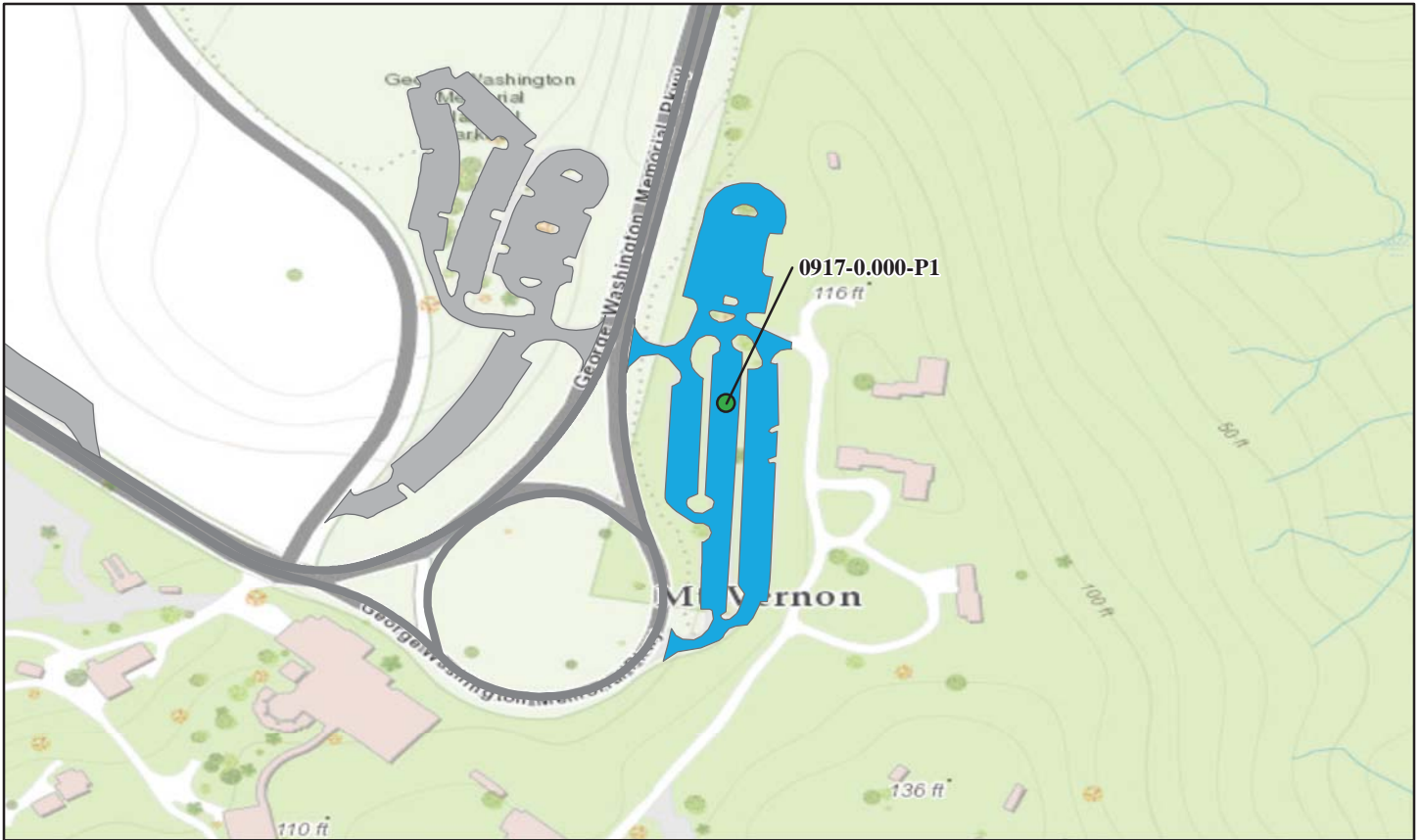
No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0513AAZ-0.032-R 7/9/2007	1,000	193	Gravity - Mortared Stone	Cut Wall	58	\$30,088.00

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

George Washington Memorial Parkway

ROUTE 0917: MOUNT VERNON PARKING EAST LOT



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

Retaining Wall Condition Legend – Wall Condition Rating

Critical / Poor (0 - 49)

Fair (50 - 69)

Good to Excellent (70 - 100)

No Data

Wall ID Inspection Date:	Wall Area (Sq. Ft.)	Wall Length (Ft.)	Wall Type	Wall Function	Overall Rating	Repair Cost
GWMP-0917-0.000-P1 7/10/2007	2940	490	Gravity - Concrete Block/Brick	Cut Wall	72	\$0.00

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

George Washington Memorial Parkway

ROUTE 0933: GLEN ECHO SERVICE 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
GWMP-0933-0.000-P1 7/17/2007	120	31	Gravity - Mortared Stone	Cut Wall	68	\$5,286.00

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

George Washington Memorial Parkway

ROUTE 0936ZZ: WASHINGTON MARINA PARKING AREAS



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
GWMP-0936ZZ-0.000-P1 7/12/2007	360	80	Gravity - Mass Concrete	Fill Wall	48	\$151,200.00

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

Tier 3 Retaining Wall Details



George Washington Memorial Parkway



Federal Lands Highway
Road Inventory Program

Wall ID:	GWMP-0001-16.884-R		
Route Name:	GWMP - SOUTHBOUND		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*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:	Across GWMP from Theodore Roosevelt Island		

Wall Measurements

Wall Length (ft.):	1295	Face Area (sq.):	9600
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	No global distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Sound and durable, slightly discolored	7
STONE MASONRY 8.00	No fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassy, flat	8
VEGETATION 0.50	Minor vegetation over face	8
UPSLOPE 1.00	Flat at top of wall for 2', then 2H:1V up slope, with trees	6
WALL DRAINS 1.00	None visible	7

Repair Recommendations

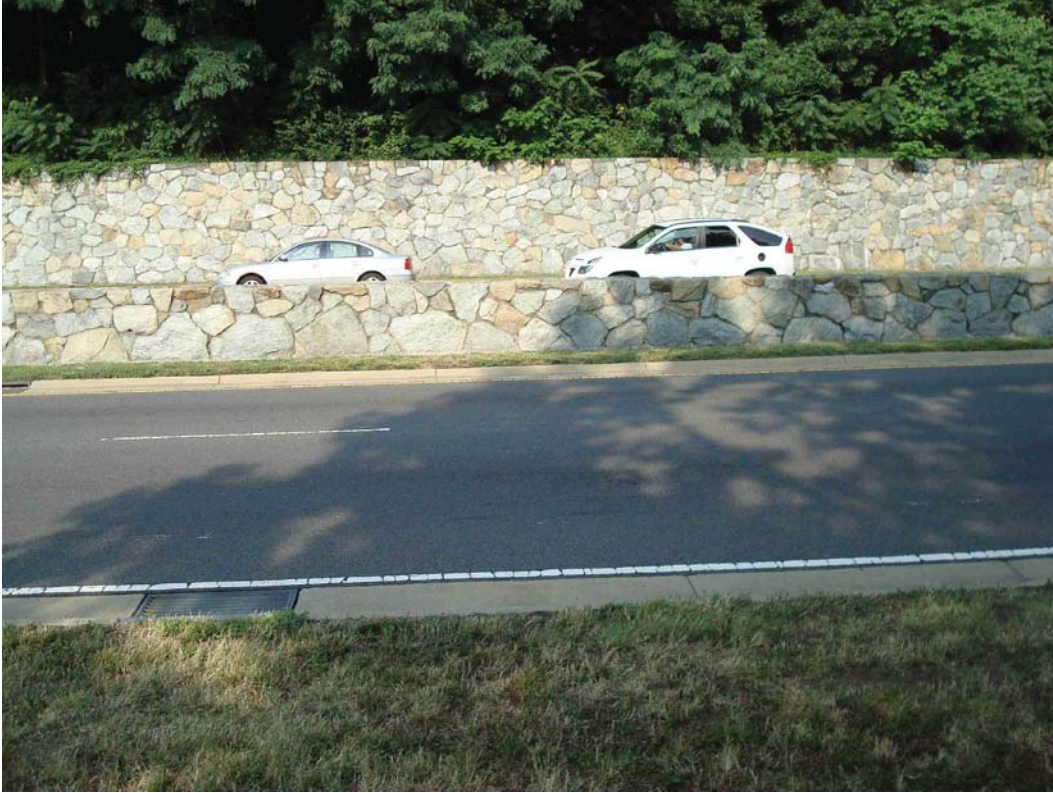
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

George Washington Memorial Parkway

ROUTE 0001: GWMP - SOUTHBOUND

Retaining Wall Condition Photos



GWMP_0001_16.884_R_1.jpg



GWMP_0001_16.884_R_2.jpg

Wall ID:	GWMP-0001-17.241-R		
Route Name:	GWMP - SOUTHBOUND		
Inspection Date:	August 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	64	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall abuts bridge and extends south		

Wall Measurements

Wall Length (ft.):	130	Face Area (sq.):	1700
Average Wall Height (ft.):	13	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	Wall rotated out at control joint, panel out 1.5" at top, has been caulked/sealed. Monitor.	6
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
CONCRETE 8.00	3 continuous vertical cracks with efflorescence, top to bottom, except header. Cracks are closed to 1/8" gap. Spall 3" by 8", rusted reinforcing steel exposed, 3-4 smaller incipient spalls nearby	6
DOWNSLOPE 0.50	Flat, grassy	8
VEGETATION 1.00	Vines growing over wall on low portion, obscuring south end of wall	6
CULVERT 1.00	Drop inlet in front of wall, steel grate	7
LATERAL SLOPE 1.00	Bridge on one side, gradual on other side	7
UPSLOPE 1.00	2H:1V, heavily vegetated	7
WALL DRAINS 1.00	15' spacing, steel/iron pipe, rusted, 4" diameter, 2' to 3' above ground	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Patch concrete/coat reinforced steel - 100 s.f. * \$65/s.f. = \$6,500 Labor - clean weep holes - 40 hrs * \$55/hr = \$2,200
Repair Cost:	\$8,700

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

George Washington Memorial Parkway

ROUTE 0001: GWMP - SOUTHBOUND

Retaining Wall Condition Photos



GWMP_0001_17.241_R_1.jpg



GWMP_0001_17.241_R_2.jpg

Wall ID:	GWMP-0001-17.590-L		
Route Name:	GWMP - SOUTHBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Wall just south of Spout Run. Some areas are borderline guardwall classification		

Wall Measurements

Wall Length (ft.):	515	Face Area (sq.):	2320
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	Stable overall, no evidence of global distress	8
WALL FOUNDATION MATERIAL 8.00	No settlement or erosion	8
MORTAR 8.00	Sound, durable	8
STONE MASONRY 8.00	No fracturing or degradation	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Narrow concrete sidewalk for wall access only	8
WALL DRAINS 0.50	Weep holes approximately 10 ft O-C	8
UPSLOPE 1.00	3H:1V	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.

George Washington Memorial Parkway

ROUTE 0001: GWMP - SOUTHBOUND

Retaining Wall Condition Photos



GWMP_0001_17.590_L_1.jpg



GWMP_0001_17.590_L_2.jpg

Wall ID:	GWMP-0002-16.493-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*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:	Wall for on-ramp Rectangular granite blocks		

Wall Measurements

Wall Length (ft.):	350	Face Area (sq.):	3850
Average Wall Height (ft.):	11	Face Angle (deg.):	90
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Sound and durable, some efflorescence	8
STONE MASONRY 8.00	No fractures or degradation Rectangular granite blocks	9
ROAD/SIDEWALK/SHOULDER 0.50	Grassed	8
LATERAL SLOPE 1.00	Flat on North end, 2H:1V on South end	7
UPSLOPE 1.00	Roadway	7
WALL DRAINS 1.00	None visible	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_16.493_R_1.jpg

Wall ID:	GWMP-0002-16.538-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*Wall Rating:	68	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 guard wall/fill wall Next to Roosevelt Island/bike trail		

Wall Measurements

Wall Length (ft.):	1150	Face Area (sq.):	13800
Average Wall Height (ft.):	12	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Aged, slightly mossy, patched in areas, lots of separation between capstones, 1/16" (hairline), loose stone at East end, facing roadway. 10' long area appears recently repointed. 2 fallen rocks near south end.	5
STONE MASONRY 8.00	No fractures or degradation Control joints	8
DOWNSLOPE 0.50	Gradual	8
LATERAL SLOPE 0.50	Flat	8
UPSLOPE 0.50	Flat, grassy	8
CULVERT 1.00	12' by 12' box-arch culvert 20" concrete culvert approximate midpoint, approximately 140' north of large culvert 2' by 2' box culvert - approximately 60' south of large culvert	7
VEGETATION 1.00	Minor vine growth	7

Repair Recommendations

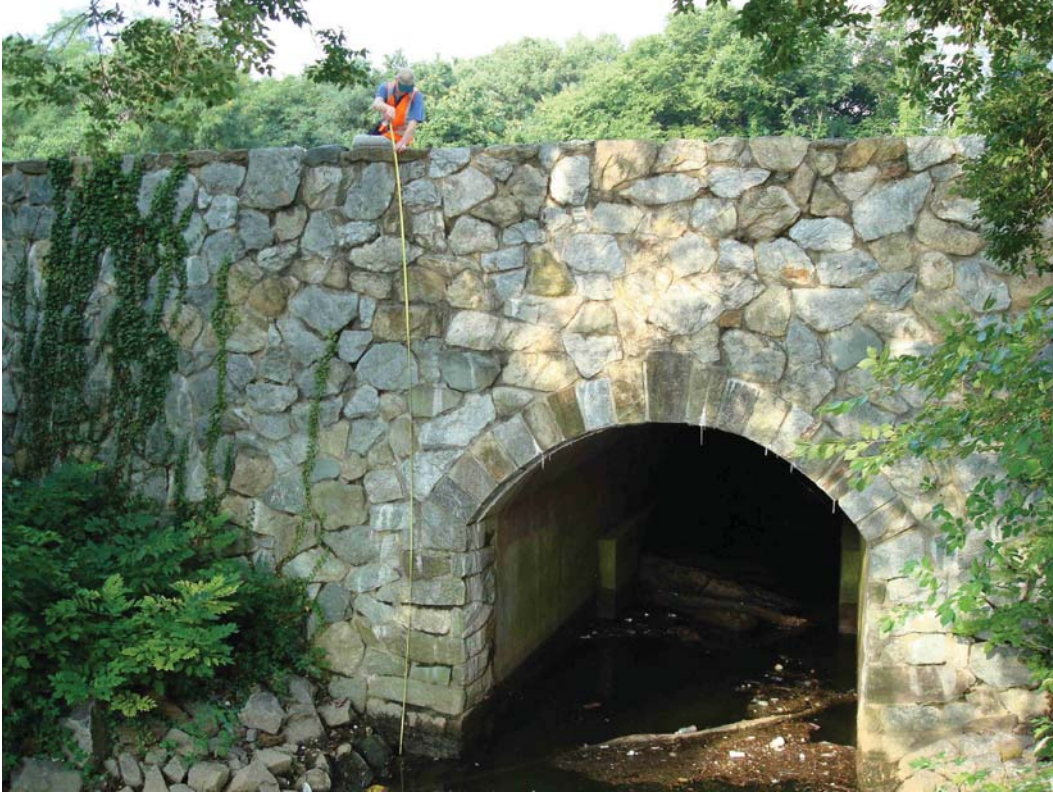
Failure Consequence:	HIGH
Recommendation Narrative:	None
Repair Cost:	\$0

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

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_16.538_R_1.jpg



GWMP_0002_16.538_R_2.jpg

Wall ID:	GWMP-0002-16.859-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*Wall Rating:	73	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:	Transitions to guardwall in places		

Wall Measurements

Wall Length (ft.):	1700	Face Area (sq.):	7650
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	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement/erosion	8
MORTAR 8.00	Repaired and repointed area, occasional (1-2) lost stones. 1/16" - 1/8" separation in mortar at top. Problem may be recessed at top - traps water, freeze/thaw and long face stone held in place mostly by mortar (unbalanced). Likely problem - POOR MORTAR	6
STONE MASONRY 8.00	No fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Flat, grassed	8
WALL DRAINS 0.50	Wall drains, approximately 30' spacing	8
DOWNSLOPE 1.00	Flat for 2' horizontally, then 3H:1V	7
VEGETATION 1.00	Some vines	7

Repair Recommendations

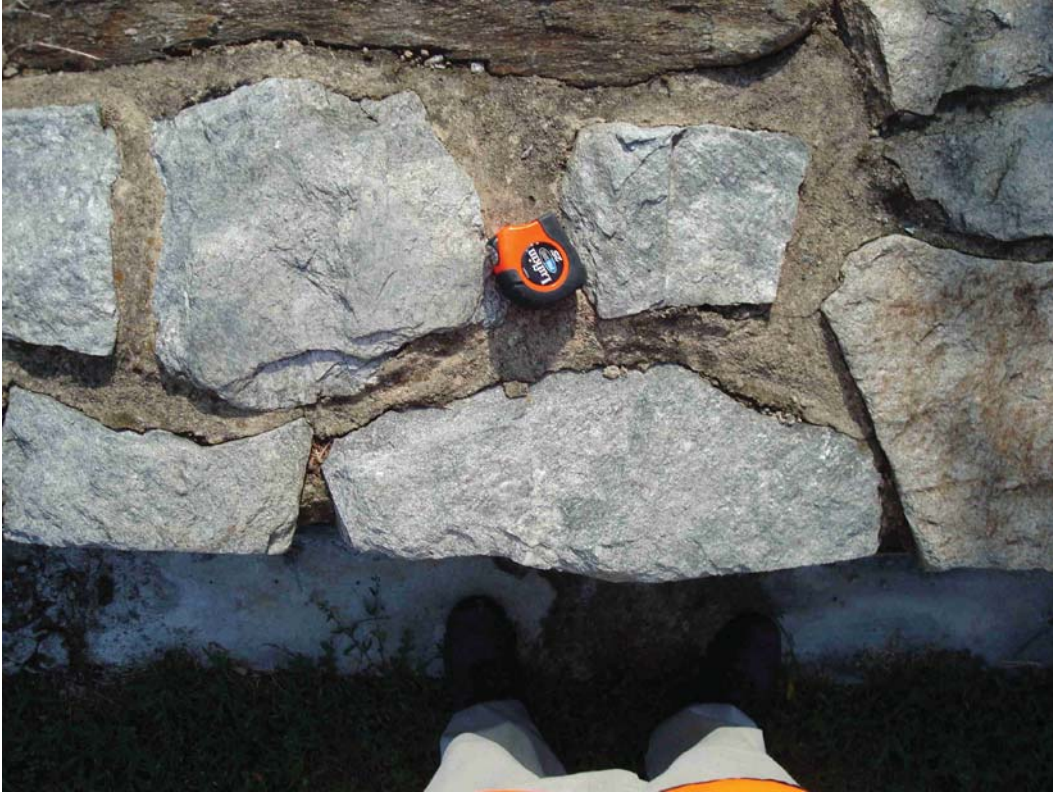
Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint Mortar - 300 s.f. * \$75/s.f. = \$22,500 Mob = 12%EE = \$2,700
Repair Cost:	\$25,200

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

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_16.859_R_1.jpg



GWMP_0002_16.859_R_2.jpg

Wall ID:	GWMP-0002-17.280-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*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:	Combination of guardwall and retaining wall, 7 culverts (not all culvert pictures included - but they are on file at EFLHD)		

Wall Measurements

Wall Length (ft.):	1705	Face Area (sq.):	11935
Average Wall Height (ft.):	7	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	No global distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Overall sound and durable, minor cracks at top surface	7
STONE MASONRY 8.00	No fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Flat/grassy	8
VEGETATION 0.50	Little vegetation over box culvert	8
WALL DRAINS 0.50	Weep holes 40 - 50 ft. spacing	8
CULVERT 1.00	Five culverts: 1) 7 ft. diameter concrete box/arch culvert (pic 7), 2) 24" ccp (pic 6), 3) 24" circular concrete pipe (ccp), 4) 20" arch culvert (pic 5), 5) 24" box culvert (pic 4), 6) 24" culvert (pic 3) and 7) 30" box (pic 2)	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_17.280_R_1.jpg



GWMP_0002_17.280_R_2.jpg

Wall ID:	GWMP-0002-18.639-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	December 19, 2006	Approximate Year Built:	1960
*Wall Rating:	50	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete Crib Wall on very steep side slope to Potomac River, rock outcrops in area Referred to as Wall #1 at Station 958+00 for FHWA GWMP GWMP 1A104 See project GWMP 1A104 for wall repair information		

Wall Measurements

Wall Length (ft.):	72	Face Area (sq.):	720
Average Wall Height (ft.):	10	Face Angle (deg.):	79
Maximum Wall Height (ft.):	21	Vertical Offset (ft.):	30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs repair or replacement, repair of bin elements, eroded areas, cut trees and reinforce wall	4
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement below foundation	7
BIN OR CRIB 8.00	Wall bulging, likely caused by tree growth and erosion/infiltration at top. Losing fines through face of wall. No settlement at base.	4
CONCRETE 8.00	Several complete cracks of deadmen, exposed reinforcing steel	5
CULVERT 0.50	18" RCP in good condition	8
DOWNSLOPE 1.00	Erodable beyond the base. Mix of rock, boulders, silty material, severely eroded. Very steep slope/vertical at 15 ft. from toe.	4
VEGETATION 1.00	Lots of vegetation, 1 ft. diameter tree and stump growing through face	4
WALL DRAINS 1.00	Losing fines through face of wall, bulging wall	5
LATERAL SLOPE 1.00	Hole on south end near edge	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_18.639_R_1.jpg



GWMP_0002_18.639_R_2.jpg

Wall ID:	GWMP-0002-18.835-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	December 19, 2007	Approximate Year Built:	1960
*Wall Rating:	76	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete Crib Wall on very steep side slope to Potomac River, rock outcrops in area Referred to as Wall #2 at Station 953+00 for FHWA GWMP 1A104 See project GWMP 1A104 for wall repair information		

Wall Measurements

Wall Length (ft.):	88	Face Area (sq.):	968
Average Wall Height (ft.):	11	Face Angle (deg.):	79
Maximum Wall Height (ft.):	22	Vertical Offset (ft.):	20

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Mostly cosmetic issues	8
WALL FOUNDATION MATERIAL 8.00	Rock/partial soil, no settlement or erosion	8
CONCRETE 8.00	Good condition, some cracking, spalling, typical throughout wall	7
BIN OR CRIB 8.00	Overall Crib in good condition, best condition of the 5 crib walls	8
CULVERT 0.50	4' by 4' box, bottom center of wall	8
WALL DRAINS 0.50	Well drained through face	8
UPSLOPE 1.00	Steep	6
VEGETATION 1.00	Tree growing through face, vines throughout, not affecting performance	6
DOWNSLOPE 1.00	Rocky, steep	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_18.835_R_1.jpg



GWMP_0002_18.835_R_2.jpg

Wall ID:	GWMP-0002-18.948-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	December 19, 2007	Approximate Year Built:	1960
*Wall Rating:	64	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete Crib Wall on very steep side slope to Potomac River, rock outcrops in area Referred to as Wall #3 at Station 942+00 for FHWA GWMP 1A104 See project GWMP 1A104 for wall repair information		

Wall Measurements

Wall Length (ft.):	48	Face Area (sq.):	384
Average Wall Height (ft.):	8	Face Angle (deg.):	79
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	30

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Crib foundation and culvert in good condition, needs concrete repair and vegetation removed. Note downslope severe.	6
WALL FOUNDATION MATERIAL 8.00	Rock foundation, short distance to vertical drop	7
CONCRETE 8.00	Few moderate cracks, 1 major vertical crack in header	6
BIN OR CRIB 8.00	Overall wall function not compromised, isolated elements under stress, small to moderate local bulges near trees	7
CULVERT 0.50	24" RCP through bottom center of wall	8
DOWNSLOPE 1.00	Rock ledge. Vertical drops of 20 to 30 ft. at distances of 5 to 15 ft. from toe of wall	5
VEGETATION 1.00	Trees growing through wall	5
LATERAL SLOPE 1.00	Steep	6
UPSLOPE 1.00	Steep, vegetated	6

Repair Recommendations

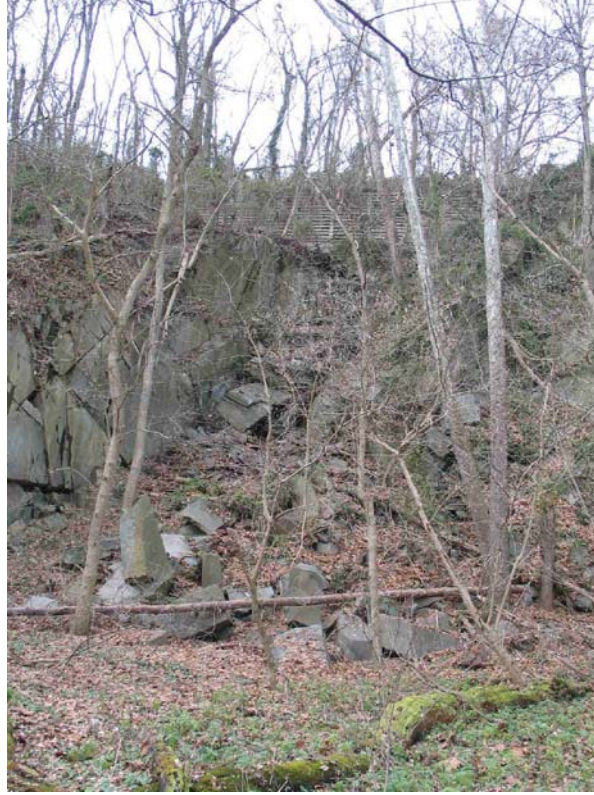
Failure Consequence:	MODERATE
Recommendation Narrative:	None
Repair Cost:	\$0

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

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_18.948_R_1.jpg



GWMP_0002_18.948_R_2.jpg

Wall ID:	GWMP-0002-19.334-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	December 19, 2007	Approximate Year Built:	1960
*Wall Rating:	53	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete Crib Wall on very steep side slope to Potomac River, rock outcrops in area Referred to as Wall #4 at Station 926+50 for FHWA GWMP 1A104 See project GWMP 1A104 for wall repair information		

Wall Measurements

Wall Length (ft.):	96	Face Area (sq.):	960
Average Wall Height (ft.):	10	Face Angle (deg.):	79
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	40

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs repair of individual elements and trees cut, footings fully supported	6
WALL FOUNDATION MATERIAL 8.00	Three footings on south end visible. Three footings on north end visible and undermined/eroded.	5
CONCRETE 8.00	Exposed reinforcing steel, numerous cracks, some large	4
BIN OR CRIB 8.00	Numerous spalls, exposed reinforcing steel, trees growing through face. Overall wall function not compromised	6
CULVERT 0.50	3' by 3' box through bottom center of wall	8
VEGETATION 1.00	Significant tree growth throughout	4
DOWNSLOPE 1.00	Rock, severe slope	5
LATERAL SLOPE 1.00	Relatively mild, less severe than downslope	6
UPSLOPE 1.00	Steep, vegetated	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_19.334_R_1.jpg



GWMP_0002_19.334_R_2.jpg

Wall ID:	GWMP-0002-19.632-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	December 19, 2007	Approximate Year Built:	1960
*Wall Rating:	52	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Crib - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete Crib Wall on very steep side slope to Potomac River, rock outcrops in area Referred to as Wall #5 at Station 912+50 for FHWA GWMP 1A104 See project GWMP 1A104 for wall repair information		

Wall Measurements

Wall Length (ft.):	64	Face Area (sq.):	320
Average Wall Height (ft.):	5	Face Angle (deg.):	79
Maximum Wall Height (ft.):	11	Vertical Offset (ft.):	50

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Headwall problems, undermined footings, culvert separation	5
WALL FOUNDATION MATERIAL 8.00	Footings undermined, culvert pipe separated and rotated	4
CONCRETE 8.00	Few major cracks, several minor cracks, headwall has 18" long major incipient spall	5
BIN OR CRIB 8.00	Headwall major crack, many cracks and some broken elements (spalls).	6
CULVERT 1.00	30" RCP through bottom center of wall, culvert 4' section, front face rotated down, 2.5" separation between pipes, 1.5" vertical gap Headwall 18" long incipient spall	4
VEGETATION 0.50	Vines present, no large trees	8
DOWNSLOPE 1.00	Steep drop	6
WALL DRAINS 1.00	Drains through face, drainage affected by separated culvert	6
LATERAL SLOPE 1.00	Less severe than downslope	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_19.632_R_1.jpg



GWMP_0002_19.632_R_2.jpg

Wall ID:	GWMP-0002-21.582-R		
Route Name:	GWMP - NORTHBOUND		
Inspection Date:	July 12, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Box concrete culvert		

Wall Measurements

Wall Length (ft.):	19	Face Area (sq.):	72
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-20

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
CONCRETE 8.00	Sound and durable	7
DOWNSLOPE 0.50	Gradual slope	8
UPSLOPE 0.50	Gradual slope	8
LATERAL SLOPE 1.00	1H:1V	6
CULVERT 1.00	3'H by 3.2'W	7
WALL DRAINS 1.00	None visible	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.

George Washington Memorial Parkway

ROUTE 0002: GWMP - NORTHBOUND

Retaining Wall Condition Photos



GWMP_0002_21.582_R_1.jpg

Wall ID:	GWMP-0003ZZ-0.954-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*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:	Culvert headwall		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	113
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No evidence of global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Some cracks in mortar	6
STONE MASONRY 8.00	No fractures or degradation	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassed shoulder	8
WALL DRAINS 0.50	None visible	8
CULVERT 1.00	3'H by 6'W, appears OK condition, partially visible	6

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Clear vegetation = 2 hrs * \$55/hr = \$110 Repoint mortar - 30 s.f. * \$75/s.f. = \$2,250
Repair Cost:	\$2,360

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_0.954_R_1.jpg



GWMP_0003ZZ_0.954_R_2.jpg

Wall ID:	GWMP-0003ZZ-0.983-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Between 35 mph sign and 1/2 mile to Mt. Vernon sign		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	113
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No evidence of global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Appears sound and durable, difficult to see with vines	7
STONE MASONRY 8.00	Appears no fractures or degradation, difficult to see with vines	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
VEGETATION 1.00	Growing over face	6
UPSLOPE 1.00	3H:1V	7
WALL DRAINS 1.00	None visible	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Clear vegetation - 2 hrs * \$55/hr = \$110
Repair Cost:	\$110

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_0.983_R_1.jpg

Wall ID:	GWMP-0003ZZ-2.113-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*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:	Headwall, between signs for Lucia Lane and River Farm Drive		

Wall Measurements

Wall Length (ft.):	18	Face Area (sq.):	90
Average Wall Height (ft.):	5	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	No global distress, but needs repair to local distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Some efflorescence, missing/cracked mortar for capstones	6
STONE MASONRY 8.00	Capstone on top left is out of place, otherwise OK	6
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
VEGETATION 1.00	Tree immediately next to right side of wall, potential future distress to wall	5
UPSLOPE 1.00	2H:1V, drains around wall, cause of offset capstone?	6
CULVERT 1.00	2.5' H by 3.5' W Appears to function well	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Clear Tree - 1 tree * \$955/tree = \$955 Repoint/Reset capstone - 20 s.f. * \$75/s.f. = \$1,500
Repair Cost:	\$2,455

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

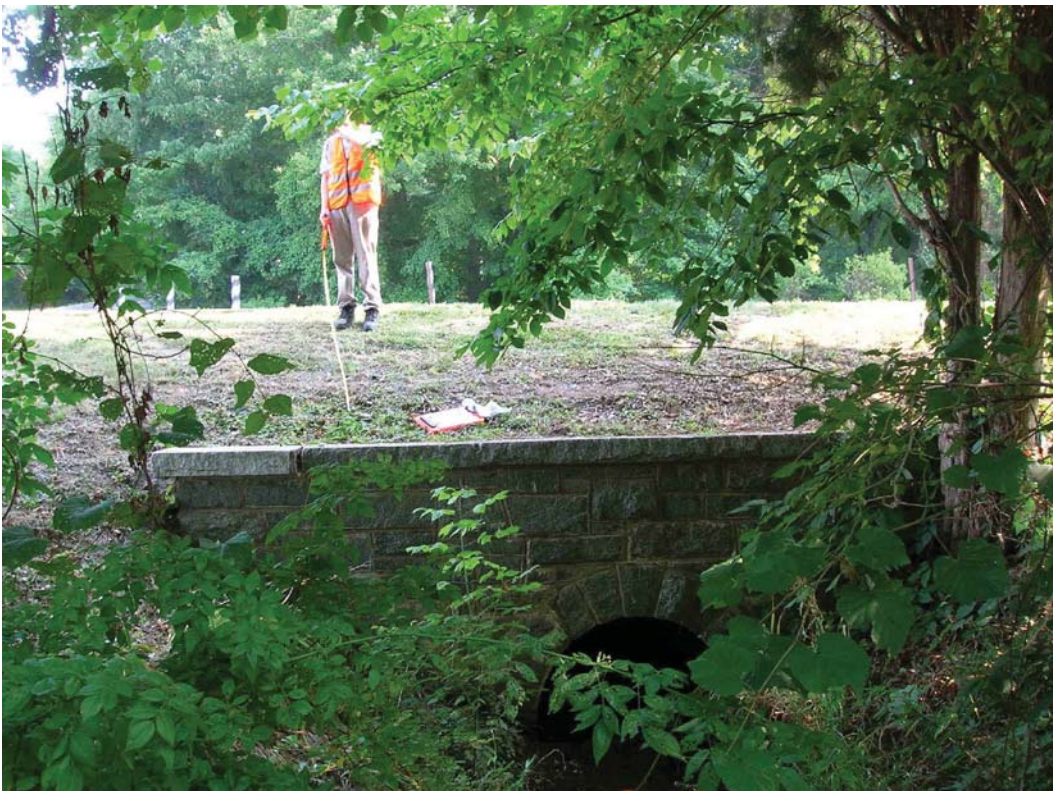
George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_2.113_R_1.jpg



GWMP_0003ZZ_2.113_R_2.jpg

Wall ID:	GWMP-0003ZZ-2.608-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 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:	Headwall, high water at culvert		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	150
Average Wall Height (ft.):	5	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	May be hydraulic/drainage issue - culvert may be too small for site	6
WALL FOUNDATION MATERIAL 8.00	No visible settlement or erosion	7
MORTAR 8.00	Loose mortar (6 l.f.) between capstones, but still in place Slight efflorescence	7
STONE MASONRY 8.00	No fractures or degradation	7
LATERAL SLOPE 0.50	Flat	8
WALL DRAINS 1.00	Eroding around corners, otherwise wall face OK High water could affect performance	5
DOWNSLOPE 1.00	Flat, water, swampy	6
CULVERT 1.00	5.5'W by 3'H High water	7
ROAD/SIDEWALK/SHOULDER 1.00	Grassed, mild slope	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint Mortar - 20 s.f. * \$75/s.f. = \$1,500 May need hydraulics evaluation
Repair Cost:	\$1,500

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_2.608_R_1.jpg

Wall ID:	GWMP-0003ZZ-2.620-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*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:	Headwall, only 3 ft to water, appears over culverts capacity		

Wall Measurements

Wall Length (ft.):	27	Face Area (sq.):	125
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	May be hydraulics/drainage issue - culvert may be too small for site	6
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement	7
MORTAR 8.00	Mortar missing in capstones - approximately 4 linear feet. No stones displaced	6
STONE MASONRY 8.00	No fractures or deterioration	7
LATERAL SLOPE 0.50	Flat	8
WALL DRAINS 1.00	Drain pipe - corrugated black plastic pipe around southern end. Corner of headwall slightly eroded near pipe High water could affect performance	5
DOWNSLOPE 1.00	Flat, wet, swampy area	6
CULVERT 1.00	5.5' W by 3' H High water	7
ROAD/SIDEWALK/SHOULDER 1.00	Gradual slope, grassed	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Repoint - 10 s.f. * \$75/s.f. = \$750 May need hydraulics evaluation
Repair Cost:	\$750

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_2.620_R_1.jpg



GWMP_0003ZZ_2.620_R_2.jpg

Wall ID:	GWMP-0003ZZ-3.084-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Find on visidata by 2 large drop inlets together		

Wall Measurements

Wall Length (ft.):	32	Face Area (sq.):	180
Average Wall Height (ft.):	5	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	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Sound and durable	7
STONE MASONRY 8.00	No fractures or degradation	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Gradual	8
CULVERT 1.00	6'W by 5' H	6
VEGETATION 1.00	Heavy, covers wall face	6
UPSLOPE 1.00	Vegetated, 2.5H: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.

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_3.084_R_1.jpg

Wall ID:	GWMP-0003ZZ-3.093-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	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 headwall		

Wall Measurements

Wall Length (ft.):	29	Face Area (sq.):	100
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Sound and durable	7
STONE MASONRY 8.00	No fractures or degradation	8
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
VEGETATION 1.00	Lots of vegetation over face	6
CULVERT 1.00	6'W by 4'H	7
UPSLOPE 1.00	Vegetated, 2H: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.

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_3.093_R_1.jpg

Wall ID:	GWMP-0003ZZ-3.960-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	71	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, difficult to observe with trees/vines in the way Located near clearing, across road from wood bridge		

Wall Measurements

Wall Length (ft.):	30	Face Area (sq.):	200
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Appears sound and durable	7
STONE MASONRY 8.00	Appears no fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
VEGETATION 1.00	Severe over face of wall, trees, vines nearly totally obscure wall	4
CULVERT 1.00	6'H by 5'W	7
DOWNSLOPE 1.00	Flat, wet and swampy	7
UPSLOPE 1.00	Grassy, 2H:1V	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Clear vegetation - 16 hours * \$55/hr = \$880
Repair Cost:	\$880

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_3.960_R_1.jpg

Wall ID:	GWMP-0003ZZ-5.547-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	1930
*Wall Rating:	54	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	One of two walls near overpass - one of these may be from 1980 or worked on in 1980?		

Wall Measurements

Wall Length (ft.):	93	Face Area (sq.):	500
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	Global distress - wall face cracking	5
WALL FOUNDATION MATERIAL 8.00	No bulges, possible settlement	7
MORTAR 8.00	Severe mortar loss	3
STONE MASONRY 8.00	No/minor fracture/degradation	6
ROAD/SIDEWALK/SHOULDER 1.00	Close to road	6
UPSLOPE 1.00	Flat for 5 ft horizontally, then 2H:1V	6
VEGETATION 1.00	Minor vegetation growing through gaps in mortar	6
LATERAL SLOPE 1.00	Flat	7
WALL DRAINS 1.00	None visible	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clear vegetation - 6 hrs * \$55/hr = \$330. Repoint mortar - 250 s.f. * \$75/s.f = \$18,750. Geomembrane diversion channel at top of wall - 93 ft * 10 ft. /9 * \$10/sq. yd. = \$1,033. Mob = 12%EE = \$2,414
Repair Cost:	\$22,527

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_5.547_R_1.jpg



GWMP_0003ZZ_5.547_R_2.jpg

Wall ID:	GWMP-0003ZZ-5.592-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	1930
*Wall Rating:	57	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	One of two walls near overpass - one of these may be from 1980 or worked on in 1980?		

Wall Measurements

Wall Length (ft.):	170	Face Area (sq.):	850
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	Global distress - wall face cracking	6
WALL FOUNDATION MATERIAL 8.00	No erosion, possible settlement?	6
MORTAR 8.00	Mortar missing or separated in several (5-6) locations. 1 Major crack at approximate middle of wall from top to bottom, 1" wide	4
STONE MASONRY 8.00	No/minor fractures or degradation	7
WALL DRAINS 1.00	None visible, potential drainage problems based on observed cracks	4
UPSLOPE 1.00	1H:1V for 10 ft. horizontally, then vertical wall above (private land)	5
VEGETATION 1.00	2 trees at top of wall, above less severe cracks	5
ROAD/SIDEWALK/SHOULDER 1.00	Flat, close to road	6
LATERAL SLOPE 1.00	Gradual	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Cut trees - 2 * \$955 = \$1,910. Repoint mortar - 350 s.f. * \$75/s.f. = \$26,250. Geomembrane diversion channel at top of wall, 170 ft. * 10 ft./9 8 \$10/sq. yd. = \$1,888. Mob = 12% EE = \$3,605
Repair Cost:	\$33,654

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_5.592_R_1.jpg



GWMP_0003ZZ_5.592_R_2.jpg

Wall ID:	GWMP-0003ZZ-6.062-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 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:	Small culvert headwall, approximately 0.62 miles north of Bridge		

Wall Measurements

Wall Length (ft.):	11	Face Area (sq.):	40
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	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement Eroded base to footing elevation at center just below pipe	6
MORTAR 8.00	Overall sound and durable, one area above pipe (2' long by 1/8" thick) missing	6
STONE MASONRY 8.00	No fractures or degradation	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
CULVERT 1.00	2' diameter circular steel pipe	7
UPSLOPE 1.00	Grassed, 4H:1V	7
WALL DRAINS 1.00	None visible	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint Mortar - 6 s.f. * \$75/s.f. = \$450
Repair Cost:	\$450

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_6.062_R_1.jpg

Wall ID:	GWMP-0003ZZ-6.232-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*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:	Stonework in one area could be filled in culvert pipe?		

Wall Measurements

Wall Length (ft.):	21	Face Area (sq.):	80
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Recessed but not damaged, sound and durable	7
STONE MASONRY 8.00	Irregular shapes/relief, no fractures or degradation	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassed, flat	8
WALL DRAINS 1.00	None visible	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.

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_6.232_R_1.jpg

Wall ID:	GWMP-0003ZZ-7.037-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*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:	Large culvert headwall with polished stone capstones, near marsh area, near wood pedestrian bridge		

Wall Measurements

Wall Length (ft.):	26	Face Area (sq.):	150
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	No evidence of global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Missing mortar at corner between wingwall and headwall Mortar aged, discolored, but mostly durable	6
STONE MASONRY 8.00	No fractures or degradation Polished capstones	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
UPSLOPE 0.50	Flat, grassy	8
CULVERT 1.00	Total size - 7.5' H by 22' W, consists of 2 boxes 5' from top of culvert to water surface	7
WALL DRAINS 1.00	None visible	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Repoint mortar - 6 s.f. * \$75/s.f. = \$450
Repair Cost:	\$450

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

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_7.037_R_1.jpg

Wall ID:	GWMP-0003ZZ-7.054-R		
Route Name:	MOUNT VERNON PARKWAY		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	70	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:	Large culvert headwall, near marsh area, polished capstones 2 wingwalls, each 12 ft long		

Wall Measurements

Wall Length (ft.):	25	Face Area (sq.):	140
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	No evidence of global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	7
MORTAR 8.00	Mortar aged, discolored, but mostly sound	7
STONE MASONRY 8.00	No fractures or degradation Polished capstones	7
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Flat	8
UPSLOPE 0.50	Flat, grassed	8
CULVERT 1.00	Total size - 7.5' H by 22'W, consists of 2 boxes 5' from top of culvert to water	7
WALL DRAINS 1.00	None visible	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.

George Washington Memorial Parkway

ROUTE 0003ZZ: MOUNT VERNON PARKWAY

Retaining Wall Condition Photos



GWMP_0003ZZ_7.054_R_1.jpg

Wall ID:	GWMP-0004-0.323-L		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	68	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 Headwall draining in median of Spout Run, where spout run parkway becomes divided road EFLHD project GWMP 4(1),5(1)		

Wall Measurements

Wall Length (ft.):	55	Face Area (sq.):	440
Average Wall Height (ft.):	8	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	Repair work to be done by EFL under project GWMP 4(1),5(1)	6
WALL FOUNDATION MATERIAL 8.00	2" gap on east side wingwall - likely scour from high water Slab (sewer beneath) cast through culvert at base and beyond, undermined	5
MORTAR 8.00	Efflorescence at culvert arch	8
STONE MASONRY 8.00	No fractures or degradation	8
CULVERT 0.50	8'H x 20'W, no distress inside culvert	8
LATERAL SLOPE 0.50	Flat	8
WALL DRAINS 0.50	Weep holes 8' O-C inside culvert, not along headwall, appears well-drained	8
UPSLOPE 1.00	1H:1V	6
DOWNSLOPE 1.00	Gentle 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.

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos



GWMP_0004_0.323_L_1.jpg



GWMP_0004_0.323_L_2.jpg

Wall ID:	GWMP-0004-0.323-R		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	66	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 inlet side, NW end of Spout Run Parkway EFLHD project GWMP 4(1),5(1)		

Wall Measurements

Wall Length (ft.):	75	Face Area (sq.):	600
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	12	Vertical Offset (ft.):	-4

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall work to be done under project GWMP 4(1), 5(1)	6
WALL FOUNDATION MATERIAL 8.00	1' by 15' section of eroded sandy material beneath east side wingwall	4
MORTAR 8.00	sound, durable	8
STONE MASONRY 8.00	No fracturing or degradation	8
CULVERT 0.50	8'H x 20'W	8
LATERAL SLOPE 0.50	Flat	8
WALL DRAINS 0.50	Weep holes 8' O-C inside culvert	8
DOWNSLOPE 1.00	Gentle Slope	7
ROAD/SIDEWALK/SHOULDER 1.00	2H: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.

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos

Condition photos are not available for GWMP-0004-0.323-R.

Wall ID:	GWMP-0004-0.503-L		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	74	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:	Culvert Headwall, concrete at base and sides, stone masonry at top and middle		

Wall Measurements

Wall Length (ft.):	20	Face Area (sq.):	120
Average Wall Height (ft.):	6	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	Overall good performance, need to repair scour/undermining	7
WALL FOUNDATION MATERIAL 8.00	Rock/soil mixture, undermined 2" high by 4' wide by 9" deep	7
CONCRETE 8.00	Minor spalls in foundation concrete, especially sides	7
MORTAR 8.00	sound and durable	8
STONE MASONRY 8.00	No fractures or degradation	8
DOWNSLOPE 0.50	4H:1V	8
UPSLOPE 0.50	Flat to gradual slope	8
CULVERT 1.00	Reinforced concrete circular pipe, spalls on face, exposed reinforcing steel	7
LATERAL SLOPE 1.00	Flat	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Grout to stabilize foundation - 5 s.f. * \$110/sf = \$550 Mob = 12% EE = \$66 Difficult access = 20%EE = \$123
Repair Cost:	\$740

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

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos



GWMP_0004_0.503_L_1.jpg



GWMP_0004_0.503_L_2.jpg

Wall ID:	GWMP-0004-0.515-L		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*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:	Across from Geocell wall		

Wall Measurements

Wall Length (ft.):	15	Face Area (sq.):	55
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-5

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No settlement or erosion	7
MORTAR 8.00	Sound and durable	8
STONE MASONRY 8.00	No fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
CULVERT 1.00	2' circular concrete pipe	7
DOWNSLOPE 1.00	3H:1V	7
UPSLOPE 1.00	1.5H:1V	7
WALL DRAINS 1.00	No drains visible, appears well drained	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.

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos



GWMP_0004_0.515_L_1.jpg



GWMP_0004_0.515_L_2.jpg

Wall ID:	GWMP-0004-0.561-L		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 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:	Concrete and Stone Masonry, with Riprap Base		

Wall Measurements

Wall Length (ft.):	17	Face Area (sq.):	68
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-8

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Little soil behind left side of wall, needs repair	5
WALL FOUNDATION MATERIAL 8.00	Severe erosion behind wall, does not appear to have settled or rotated due to erosion Scour hole to left of wall, large tree roots holding soil bank up	4
CONCRETE 8.00	Minor air pockets in concrete foundation	6
MORTAR 8.00	Sound and durable	7
STONE MASONRY 8.00	No fractures or degradation	7
LATERAL SLOPE 0.50	Flat	8
DOWNSLOPE 1.00	Flat/streambed	6
CULVERT 1.00	2 ft. diameter reinforced concrete pipe Spalls, exposed reinforcing steel	7
UPSLOPE 1.00	2H:1V	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Concrete behind wall - 2 cy * \$1,470/cy = \$2,940. Mortared Riprap - 8 cy * \$400/cy = \$3,200. Mob = 12%EE = \$737. Difficult access - add 20% = \$1,375
Repair Cost:	\$8,252

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

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos



GWMP_0004_0.561_L_1.jpg



GWMP_0004_0.561_L_2.jpg

Wall ID:	GWMP-0004-0.584-L		
Route Name:	SPOUT RUN PARKWAY EASTBOUND		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	58	Maintenance Action:	No Action

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Reinforced concrete structure - unknown purpose Former abutment for small bridge?		

Wall Measurements

Wall Length (ft.):	13	Face Area (sq.):	65
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	5	Vertical Offset (ft.):	-10

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Unknown purpose of wall, can it be removed?	6
WALL FOUNDATION MATERIAL 8.00	Erodable, scour on left and right sides	4
CONCRETE 8.00	Rough finish, weathered but not deteriorated	7
LATERAL SLOPE 1.00	Scoured out on east side (major) and west side (smaller area). West side held together by tree roots.	4
DOWNSLOPE 1.00	Flat, streambed	7
UPSLOPE 1.00	2H:1V	7
WALL DRAINS 1.00	None	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.

George Washington Memorial Parkway

ROUTE 0004: SPOUT RUN PARKWAY EASTBOUND

Retaining Wall Condition Photos



GWMP_0004_0.584_L_1.jpg



GWMP_0004_0.584_L_2.jpg

Wall ID:	GWMP-0005ZZ-0.146-R		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	59	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 for large culvert near eastern entrance to Spout Run Parkway Current EFLHD project GWMP 4(1),5(1)		

Wall Measurements

Wall Length (ft.):	125	Face Area (sq.):	2500
Average Wall Height (ft.):	20	Face Angle (deg.):	90
Maximum Wall Height (ft.):	25	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Rotation of wall suggests minor hydrostatic pressure issue - monitor Scour to be repaired under GWMP 4(1),5(1)	5
WALL FOUNDATION MATERIAL 8.00	Large scour area Wall segment rotated out 1/2" at top of wall at control joint	4
MORTAR 8.00	Sound, durable	7
STONE MASONRY 8.00	No deterioration of masonry	7
ROAD/SIDEWALK/SHOULDER 0.50	Flat, grassy	8
VEGETATION 0.50	Light vegetation	8
WALL DRAINS 0.50	Inside culvert	8
CULVERT 1.00	20'H by 30'W Good condition except for scour - see Wall Foundation comments	7
DOWNSLOPE 1.00	Mild, but scour a problem	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.

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.146_R_1.jpg



GWMP_0005ZZ_0.146_R_2.jpg

Wall ID:	GWMP-0005ZZ-0.157-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	66	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:	Large Culvert near end of Spout Run stream, located beneath high bridge Current EFLHD project GWMP 4(1),5(1)		

Wall Measurements

Wall Length (ft.):	90	Face Area (sq.):	525
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No other signs of global distress, however, scour undermining a threat to future stability Work on scour to be done under GWMP 4(1),5(1)	6
WALL FOUNDATION MATERIAL 8.00	Severe scour inside culvert - see photo GWMP-0005B-0.157-L-3 - from project GWMP 4(1),5(1)	4
MORTAR 8.00	Sound, durable	8
STONE MASONRY 8.00	No fracturing or degradation	8
LATERAL SLOPE 0.50	Gentle slope	8
ROAD/SIDEWALK/SHOULDER 0.50	Flat, grassy	8
DOWNSLOPE 1.00	Gradual, streambed, high scour potential	6
CULVERT 1.00	15'H by 27"W, concrete arch	7
WALL DRAINS 1.00	Inside Culvert	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.

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.157_L_1.jpg



GWMP_0005ZZ_0.157_L_2.jpg

Wall ID:	GWMP-0005ZZ-0.379-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	2004
*Wall Rating:	65	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Other - Geocell with Concrete/
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Geocell wall designed by EFLHD, soil in geocells, concrete on face at base, soil/vegetation on upper face GWMP 5(2)		

Wall Measurements

Wall Length (ft.):	145	Face Area (sq.):	1800
Average Wall Height (ft.):	12	Face Angle (deg.):	65
Maximum Wall Height (ft.):	15	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Undermining of foundation due to scour from high water. Need hydraulics input and repair or global stability threatened	6
WALL FOUNDATION MATERIAL 8.00	Undermining of concrete slab/footing in stream, from metal culvert for a length of 30 feet to the west. 1' vertical by 1'-2' deep	4
BIN OR CRIB 8.00	Cellular wall is in good condition, no evidence of cracks/breaks Newly constructed wall	9
CULVERT 0.50	30" corrugated metal pipe, not distress	8
LATERAL SLOPE 0.50	Gently sloping	8
VEGETATION 0.50	Vegetation on top face by design	9
WALL DRAINS 0.50	10' O-C at approximately 5' above footing	9
DOWNSLOPE 1.00	Flat streambed, extreme scour after 3 years	5
ROAD/SIDEWALK/SHOULDER 1.00	Flat shoulder	7

Repair Recommendations

Failure Consequence:	HIGH
Recommendation Narrative:	Grout to stabilize foundation - 40 ft * 2 ft * \$110/s.f. = \$8,800 Mobilization - 12% EE = \$1,056 Difficult access - 20% = \$1,971
Repair Cost:	\$11,827

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

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.379_L_1.jpg



GWMP_0005ZZ_0.379_L_2.jpg

Wall ID:	GWMP-0005ZZ-0.380-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	54	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:	Headwall abutting west end of geocell wall (built in 2004)		

Wall Measurements

Wall Length (ft.):	10	Face Area (sq.):	40
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-12

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall needs to be replaced	4
WALL FOUNDATION MATERIAL 8.00	Head wall pushed forward and down, rotated	5
STONE MASONRY 8.00	Missing most of the cap pieces, otherwise stone in good condition	5
MORTAR 8.00	Sound and durable, aged and discolored	7
CULVERT 1.00	20" diameter circular concrete pipe. Interior has dropped 2", 1" horizontal gap at the bottom of pipe	4
LATERAL SLOPE 0.50	Flat	8
UPSLOPE 1.00	1H:1V	6
VEGETATION 1.00	Moderate vegetation above wall	6
DOWNSLOPE 1.00	Flat/gentle/stream, but susceptible to scour	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Remove/reset Stone Masonry - 2 cy * \$3,195/cy = \$6,390
Repair Cost:	\$6,390

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

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.380_L_1.jpg



GWMP_0005ZZ_0.380_L_2.jpg

Wall ID:	GWMP-0005ZZ-0.446-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	1980
*Wall Rating:	44	Maintenance Action:	Replace Wall
Wall Description			
Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Gabion
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Gabion wall similar to what was replaced previously at mile 0.381 (replaced with geocell wall)		
Wall Measurements			
Wall Length (ft.):	35	Face Area (sq.):	350
Average Wall Height (ft.):	10	Face Angle (deg.):	79
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	-2
Assessed Elements			
Element (Weighting Factor)	Narrative		Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs replacement - local gabion basket failures beginning to affect global stability		3
WALL FOUNDATION MATERIAL 8.00	Lean concrete footing/working pad, undermined/scoured 6" to 1' vertical, 1' - 2' deep, for most or all of length of wall		3
WIRE/GEOSYNTHETIC FACING 8.00	4 tiers, bottom tier rusted out in 8 of 13 baskets, rocks fallen out of those cells. Based on EFLHD knowledge of project, wall only 1 gabion basket deep - not adequate retaining structure in this condition		3
MORTAR 8.00	Frequent loose mortar for uppermost stones (not capstones). Several loose stones - significant repointing needed entire length of wall at top tier of stones to prevent further loss of stones and deterioration of wall below the top surface.		4
STONE MASONRY 8.00	Stone in good condition, not deteriorated. One stone imminent to fall into EB roadway, this and two other stones removed. This rated under "Mortar" because stone in good condition, mortar is the problem.		8
DOWNSLOPE 0.50	Flat		8
UPSLOPE 0.50	Flat		8
WALL DRAINS 0.50	Self-draining		8
LATERAL SLOPE 1.00	Gentle, but eroded on east end from scour at high water		6

Wall ID:	GWMP-0005ZZ-0.446-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	1980
*Wall Rating:	44	Maintenance Action:	Replace Wall

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Remove gabion wall - 350 s.f. * \$50/s.f. = \$17,500 Geocell/concrete wall - 400 s.f. * \$250/s.f. = \$100,000
Repair Cost:	\$117,500

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

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.446_L_1.jpg



GWMP_0005ZZ_0.446_L_2.jpg

Wall ID:	GWMP-0005ZZ-0.510-L		
Route Name:	SPOUT RUN PARKWAY WESTBOUND AND RAMPS		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*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:	Stone Mortar wall, difficult to access from below (vegetation) and above (limited shoulder on curvy section of road)		

Wall Measurements

Wall Length (ft.):	345	Face Area (sq.):	2070
Average Wall Height (ft.):	6	Face Angle (deg.):	90
Maximum Wall Height (ft.):	9	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global distresses or evidence of repair	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Sound, durable, aged and discolored	8
STONE MASONRY 8.00	No fractures or degradation	8
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassed, flat	8
DOWNSLOPE 1.00	3H:1V	7
WALL DRAINS 1.00	No drains visible, appears well-drained	7

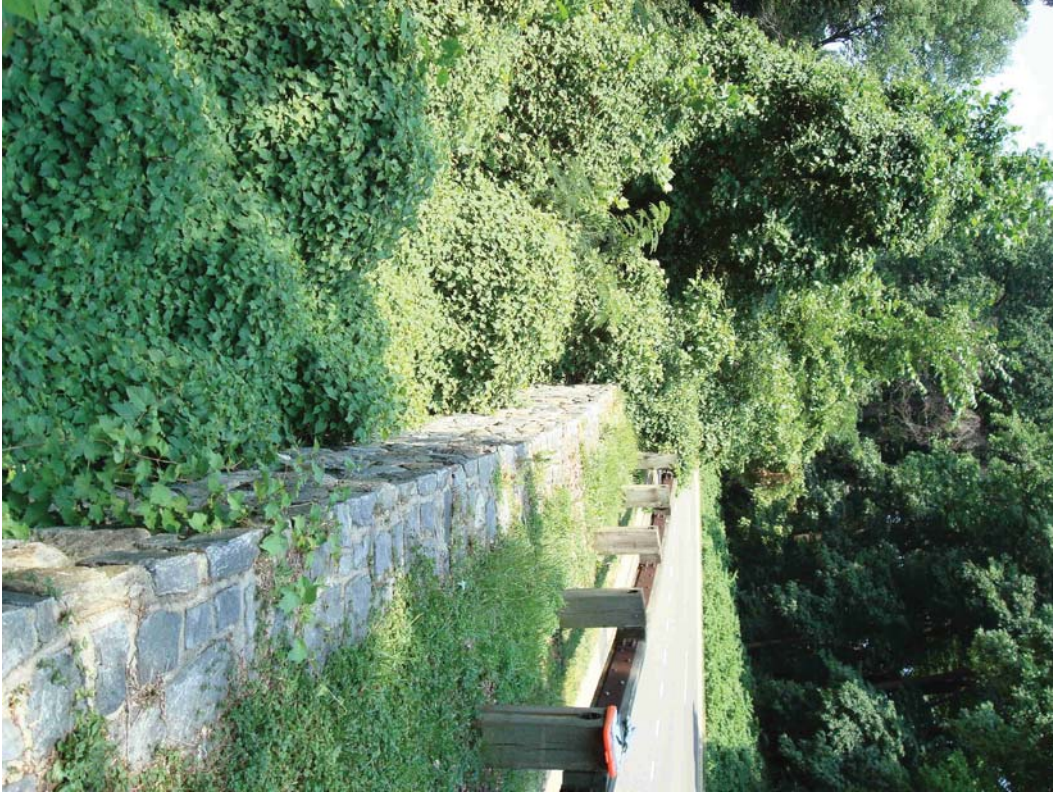
Repair Recommendations

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

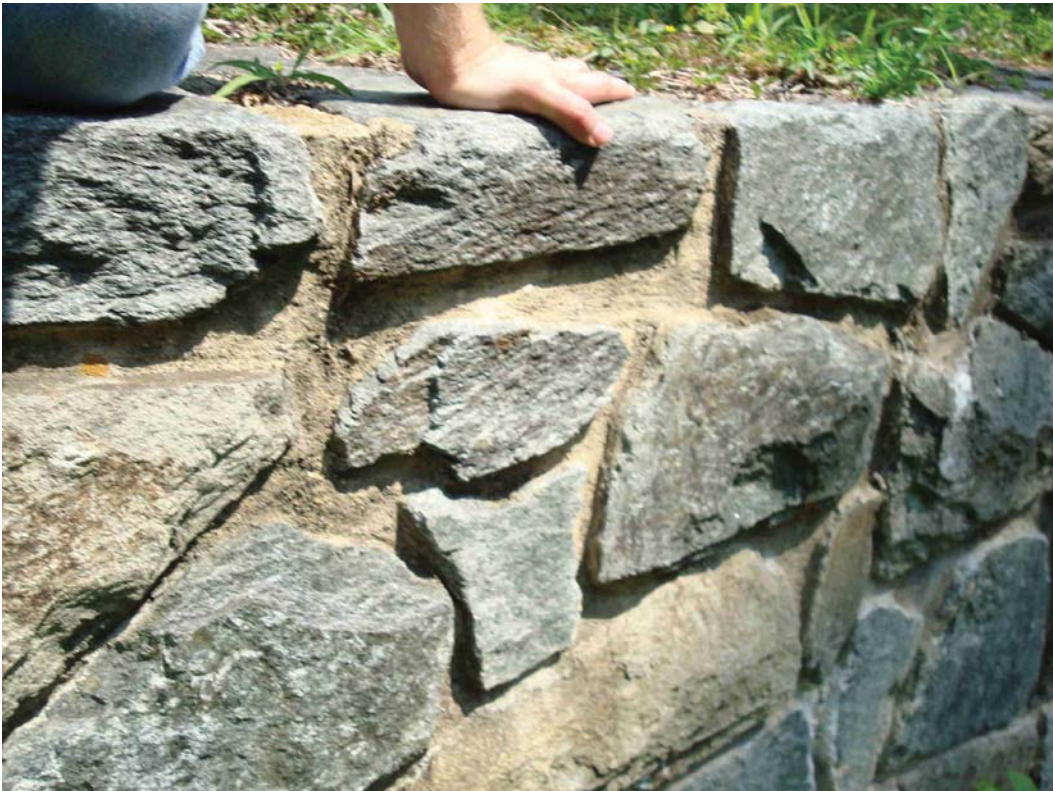
2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

George Washington Memorial Parkway
ROUTE 0005ZZ: SPOUT RUN PARKWAY WESTBOUND AND RAMPS

Retaining Wall Condition Photos



GWMP_0005ZZ_0.510_L_1.jpg



GWMP_0005ZZ_0.510_L_2.jpg

Wall ID:	GWMP-0006-0.844-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 17, 2007	Approximate Year Built:	Unknown
*Wall Rating:	74	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large, long stone masonry wall - park called Wall A for this and EB wall		

Wall Measurements

Wall Length (ft.):	1175	Face Area (sq.):	15300
Average Wall Height (ft.):	13	Face Angle (deg.):	90
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, minor separation of mortar, needs weep holes cleaned out	7
WALL FOUNDATION MATERIAL 8.00	No settlement or erosion of foundation materials	8
MORTAR 8.00	Limited minor separation from stone	7
STONE MASONRY 8.00	Very good condition, no spalls	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassed shoulder	8
WALL DRAINS 1.00	Weep holes approximately 10 ft. on center. Some reportedly covered/filled with leaves/grass from mowing.	6
LATERAL SLOPE 1.00	Gradual	7
UPSLOPE 1.00	Recent tree cutting performed at top of wall. Slope is approximately 2H:1V, homes at top of slope, chain link fence is 15 ft. up slope from top of wall.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean out weep holes - 30 hours * \$55/hr
Repair Cost:	\$1,650

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

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0006_0.844_R_1.jpg



GWMP_0006_0.844_R_2.jpg

Wall ID:	GWMP-0006-1.310-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 17, 2007	Approximate Year Built:	Unknown
*Wall Rating:	80	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recent gravity mortared wall, labeled Wall B by GWMP West of Lock 6, C&O Canal		

Wall Measurements

Wall Length (ft.):	85	Face Area (sq.):	680
Average Wall Height (ft.):	8	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	Overall good performance	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Slight efflorescence, darkened, good condition	8
STONE MASONRY 8.00	Sound and durable	8
DOWNSLOPE 0.50	Flat	8
LATERAL SLOPE 0.50	Gradual	8
WALL DRAINS 0.50	Drains 10' on center	8
UPSLOPE 1.00	Flat 10', then 2H:1V, Private wood log retaining wall at East end above wall, 28' horizontally from wall face	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.

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0006_1.310_R_1.jpg



GWMP_0006_1.310_R_2.jpg

Wall ID:	GWMP-0006-1.672-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 17, 2007	Approximate Year Built:	Unknown
*Wall Rating:	82	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recent gravity mortared wall, labeled Wall C by GWMP		

Wall Measurements

Wall Length (ft.):	550	Face Area (sq.):	8450
Average Wall Height (ft.):	15	Face Angle (deg.):	90
Maximum Wall Height (ft.):	20	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Very good condition, needs minor maintenance on weep holes	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Good, mossy in places	8
STONE MASONRY 8.00	Very good, no degradation	9
WALL DRAINS 0.50	Weep holes 10' to 15' on center, some covered with grass/leaves	8
LATERAL SLOPE 1.00	Gradual	7
UPSLOPE 1.00	Flat for 5', then 2H:1V	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean Weep Holes - 20 hours * \$55/hr
Repair Cost:	\$1,100

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

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos

Condition photos are not available for GWMP-0006-1.672-R.

Wall ID:	GWMP-0006-2.876-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 16, 2007	Approximate Year Built:	Unknown
*Wall Rating:	63	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:	Painted	Secondary Wall Type:	Gravity - Gabion
Secondary Surface Treatment:		Architectural Facing:	
General Description:	This wall is part of a structure at Glen Echo Park Service Area at the end of Tulane Road. Included on CB West because of proximity to CB and Glen Echo has no RIP route number for this area. Cantilever/house found./gabion.		

Wall Measurements

Wall Length (ft.):	210	Face Area (sq.):	1800
Average Wall Height (ft.):	8	Face Angle (deg.):	90
Maximum Wall Height (ft.):	10	Vertical Offset (ft.):	20

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Overall performing well, but roof drainage is undermining gabion basket. Threatens gabion element function and hazard to traffic below if there was a failure.	5
WALL FOUNDATION MATERIAL 8.00	Undermining/erosion of gabions at one location. Lack of treatment threatens element function. Likely caused by roof drainage directly to foundation soils.	4
CONCRETE 8.00	Yellow-painted retaining wall connected to building foundation. Concrete durable, no sign of spalling.	8
WIRE/GEOSYNTHETIC FACING 8.00	Gabion baskets in good condition, no degradation, but foundation undermining a section of wall (see Wall Foundation Material)	8
DOWNSLOPE 1.00	Flat 10 ft. horizontally, then 1H:1V for 20 ft. horizontally - severe slope to Clara Barton Parkway WB	6
CULVERT 1.00	12" black corrugated pipe through base of wall	7
LATERAL SLOPE 1.00	Flat to gradual	7
UPSLOPE 1.00	Flat/parking lot	7
WALL DRAINS 1.00	12" black pipe/culvert through wall - wall drain or culvert? Gabions are self-draining.	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Gabion underpinning/stabilization, maintain a minimum 2 ft. of cover below ground nearest ground surface - 150 s.f. * \$110/s.f. = \$16,500. Mob 12% EE = \$1,980. Difficult access - add 20% - = \$3,696. Consider redirecting drainage to a more protected area.
Repair Cost:	\$22,176

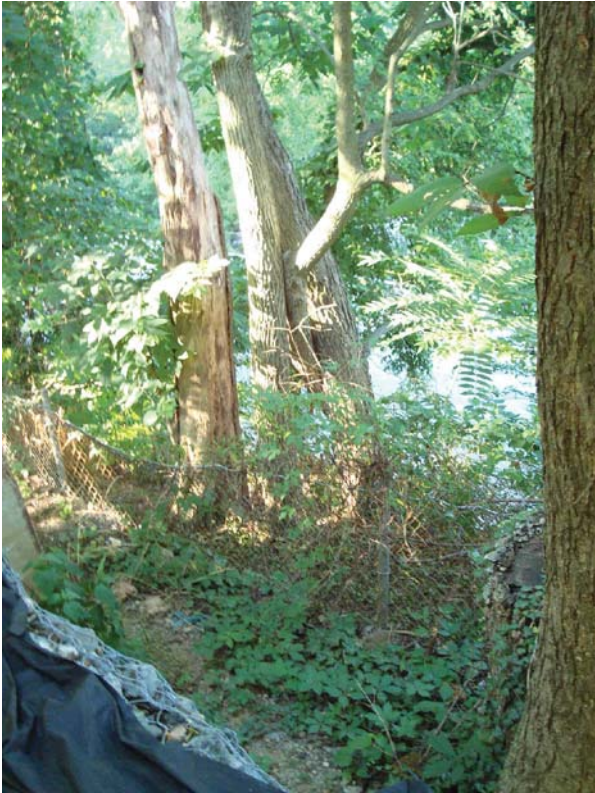
2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0006_2.876_R_1.jpg



GWMP_0006_2.876_R_2.jpg

Wall ID:	GWMP-0006-3.160-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	84	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recent gravity mortared wall, labeled Wall D by GWMP		

Wall Measurements

Wall Length (ft.):	408	Face Area (sq.):	4896
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	Overall good performance, need to clean drains	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	9
MORTAR 8.00	minor efflorescence, minor light moss	8
STONE MASONRY 8.00	Good condition, no degradation	9
LATERAL SLOPE 0.50	Slight slope	8
WALL DRAINS 0.50	Not visible, reportedly filled in/buried	8
DOWNSLOPE 1.00	Divided highway, elevation drop of 15'	7
UPSLOPE 1.00	3H:1V	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean weep holes - 20 hours * \$55/hr
Repair Cost:	\$1,100

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

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0006_3.160_R_1.jpg



GWMP_0006_3.160_R_2.jpg

Wall ID:	GWMP-0006-3.284-R		
Route Name:	WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	81	Maintenance Action:	Maintenance

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Recent gravity mortared wall, labeled Wall E by GWMP		

Wall Measurements

Wall Length (ft.):	405	Face Area (sq.):	3240
Average Wall Height (ft.):	8	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	Overall good condition, weep holes need maintenance	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Light efflorescence, light moss	8
STONE MASONRY 8.00	Very good condition, no deterioration	9
ROAD/SIDEWALK/SHOULDER 0.50	Grassed	8
WALL DRAINS 0.50	No weep holes noticed, likely buried Drop inlet near middle of wall	8
DOWNSLOPE 1.00	Flat but divided elevated median	7
LATERAL SLOPE 1.00	Mild	7
UPSLOPE 1.00	3H:1V	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean weep holes - 20 hrs * \$55/hr
Repair Cost:	\$1,100

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

George Washington Memorial Parkway
ROUTE 0006: WB (OUTBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0006_3.284_R_1.jpg



GWMP_0006_3.284_R_2.jpg

Wall ID:	GWMP-0007-3.542-L		
Route Name:	EB (INBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 17, 2007	Approximate Year Built:	1960
*Wall Rating:	79	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Cantilever - Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Concrete cantilevered wall. Divided highway, partially cantilevered roadway section. Projects GWMP 100 A8 – original and GWMP 100 A24 reconstruction (pavement?)		

Wall Measurements

Wall Length (ft.):	3275	Face Area (sq.):	(1)
Average Wall Height (ft.):	13	Face Angle (deg.):	90
Maximum Wall Height (ft.):	21	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Good condition, difficult access (traffic), no signs of global distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion. Notes from GWMP 100 A8 - "Ground capable of 4 tsf for firm natural material, 2 tsf for fill." Alternate footing design used 1) where directed by engineer, 2) over box culvert @Station 138+25 (Minnehaha Branch) and 3)	8
CONCRETE 8.00	Good Condition, observed while driving slowly in traffic	8
WALL DRAINS 0.50	Only seen at Easternmost section - plans show not in cantilever section, only shown for retaining wall plans: 8" bituminous coated, perforated, corrugated metal pipe underdrain	8
DOWNSLOPE 1.00	Road/shoulder below	7
LATERAL SLOPE 1.00	Gradual	7
UPSLOPE 1.00	Road surface above, flat	7

Repair Recommendations

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

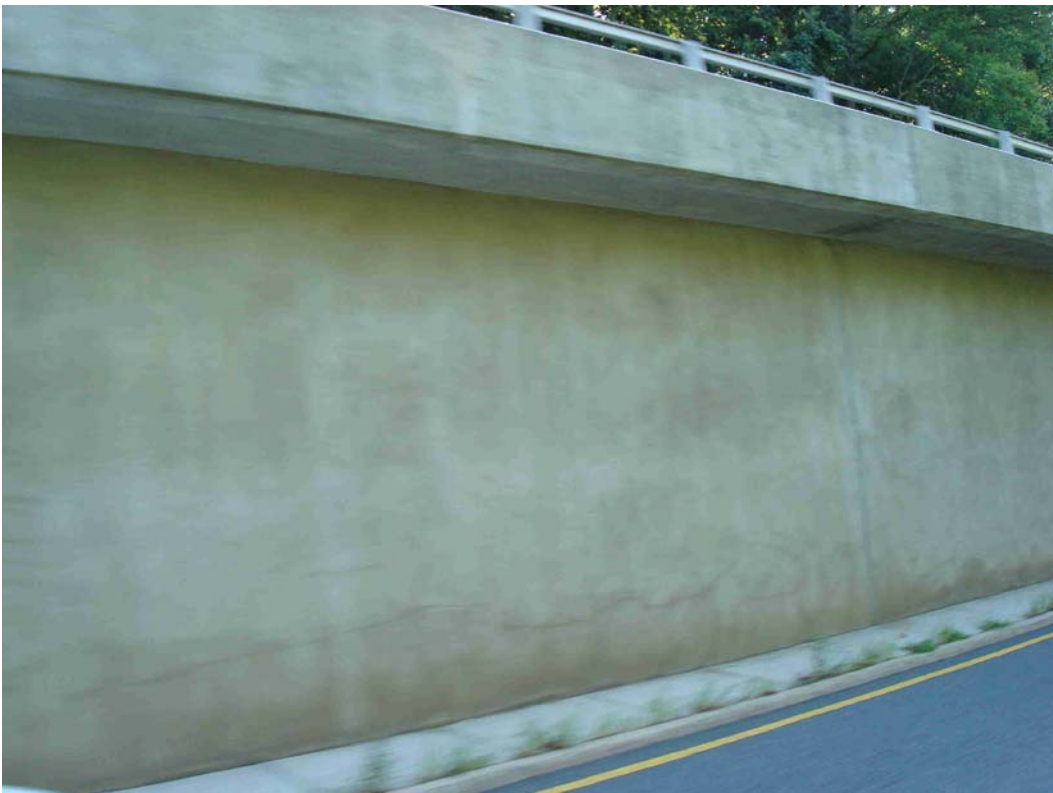
2007 cost estimate (ASTM Class D), preliminary for comparison to other repair costs only.

George Washington Memorial Parkway
ROUTE 0007: EB (INBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0007_3.542_L_1.jpg



GWMP_0007_3.542_L_2.jpg

Wall ID:	GWMP-0007-5.819-L		
Route Name:	EB (INBOUND) CLARA BARTON MEMORIAL PARKWAY		
Inspection Date:	July 17, 2007	Approximate Year Built:	Unknown
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Large, long stone masonry wall - park calls Wall A for this and other wall going westbound		

Wall Measurements

Wall Length (ft.):	1262	Face Area (sq.):	16500
Average Wall Height (ft.):	13	Face Angle (deg.):	90
Maximum Wall Height (ft.):	17	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Needs work for safety/aesthetic reasons, not affecting overall wall stability	7
WALL FOUNDATION MATERIAL 8.00	No settlement or erosion of foundation materials	8
MORTAR 8.00	Frequent loose mortar for uppermost stones (not capstones). Several loose stones - significant repointing needed entire length of wall at top tier of stones to prevent further loss of stones and deterioration of wall below the top surface.	4
STONE MASONRY 8.00	Stone in good condition, not deteriorated. One stone imminent to fall into EB roadway, this and two other stones removed. This rated under "Mortar" because stone in good condition, mortar is the problem.	8
DOWNSLOPE 0.50	Flat - Shoulder for EB traffic	8
LATERAL SLOPE 0.50	Gradual Slope	8
WALL DRAINS 1.00	Weep holes at approximately 10 ft on center. Only a few holes visible, some reportedly filled with grass from mowing/leaves or buried.	6
UPSLOPE 1.00	Flat - Shoulder for WB traffic	7

Repair Recommendations

Failure Consequence:	MODERATE
Recommendation Narrative:	Clean out weep holes - 30 hours * \$55/hr = \$1,650. Remove/reset stone guardwall - assume 20 L.F. * \$475/L.F. = \$9,500. Repoint Mortar - use \$75/s.f. stone masonry repointing, assume half of top surface of wall requires repointing - 1,262 ft. * 2 ft./2 * \$7
Repair Cost:	\$118,496

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

George Washington Memorial Parkway
ROUTE 0007: EB (INBOUND) CLARA BARTON MEMORIAL PARKWAY

Retaining Wall Condition Photos



GWMP_0007_5.819_L_1.jpg



GWMP_0007_5.819_L_2.jpg

Wall ID:	GWMP-0509B-0.147-R		
Route Name:	ROSSLYN CIRCLE RAMP TO NB GWMP		
Inspection Date:	July 11, 2007	Approximate Year Built:	Unknown
*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:	Rectangular granite block wall		

Wall Measurements

Wall Length (ft.):	365	Face Area (sq.):	1400
Average Wall Height (ft.):	3	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	No global distress	8
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MORTAR 8.00	Sound and durable	8
STONE MASONRY 8.00	No fractures or degradation Has control joints	8
WALL DRAINS 0.50	Weep holes 15' OC	8
DOWNSLOPE 1.00	2H:1V	7
LATERAL SLOPE 1.00	Sloped to flat	7
ROAD/SIDEWALK/SHOULDER 1.00	Roadway	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.

George Washington Memorial Parkway

ROUTE 0509B: ROSSLYN CIRCLE RAMP TO NB GWMP

Retaining Wall Condition Photos



GWMP_0509B_0.147_R_1.jpg



GWMP_0509B_0.147_R_2.jpg

Wall ID:	GWMP-0513AZZ-0.032-R		
Route Name:	EB CLARA BARTON PARKWAY RAMPS AND SPUR AT CARDEROCK AND NAVAL RESEARCH CENTER		
Inspection Date:	July 09, 2007	Approximate Year Built:	Unknown
*Wall Rating:	58	Maintenance Action:	Replace Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Not sure if owned by park or other entity		

Wall Measurements

Wall Length (ft.):	193	Face Area (sq.):	1000
Average Wall Height (ft.):	5	Face Angle (deg.):	90
Maximum Wall Height (ft.):	6	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Wall rotated out 6" at top in one section	6
WALL FOUNDATION MATERIAL 8.00	No evidence settlement or erosion	7
STONE MASONRY 8.00	Missing/fallen blocks at 2 locations	4
MORTAR 8.00	Loose mortar throughout, mostly near trees at top of wall	6
ROAD/SIDEWALK/SHOULDER 0.50	Grassed shoulder	8
VEGETATION 1.00	Tree growth causing overturning of wall in one section	4
WALL DRAINS 1.00	None visible	6
LATERAL SLOPE 1.00	Gradual	7
UPSLOPE 1.00	3H:1V	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Excavate behind rotated section, re-align wall segment to vertical, and reset stone veneer at one location. Second location just reset stone veneer. Remove trees wherever affecting wall performance. Cut trees - 3 * \$955 = \$2,865. Replace wall elements
Repair Cost:	\$30,088

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

George Washington Memorial Parkway

ROUTE 0513AZZ: EB CLARA BARTON PARKWAY RAMPS AND SPUR AT CARDEROCK AND NAVAL RESEARCH CENTER

Retaining Wall Condition Photos



GWMP_0513AZZ_0.032_R_1.jpg



GWMP_0513AZZ_0.032_R_2.jpg

Wall ID:	GWMP-0917-0.000-P1		
Route Name:	MOUNT VERNON PARKING EAST LOT		
Inspection Date:	July 10, 2007	Approximate Year Built:	Unknown
*Wall Rating:	72	Maintenance Action:	No Action

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Concrete Block/Brick
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Brick fence/retaining wall Length noted is length within parking area limits, wall continues further into Mt. Vernon estate		

Wall Measurements

Wall Length (ft.):	490	Face Area (sq.):	2940
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	No global distress	7
WALL FOUNDATION MATERIAL 8.00	No evidence of settlement or erosion	8
MANUFACTURED BLOCK/BRICK 8.00	Red bricks, no fractures or degradation	7
MORTAR 8.00	Some cracks in mortar, mossy	7
LATERAL SLOPE 0.50	Flat	8
UPSLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 1.00	Trees	7
VEGETATION 1.00	Ivy/vines	7
WALL DRAINS 1.00	None visible	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.

George Washington Memorial Parkway

ROUTE 0917: MOUNT VERNON PARKING EAST LOT

Retaining Wall Condition Photos



GWMP_0917_0.000_P1_1.jpg



GWMP_0917_0.000_P1_2.jpg

Wall ID:	GWMP-0933-0.000-P1		
Route Name:	GLEN ECHO SERVICE AREA		
Inspection Date:	July 17, 2007	Approximate Year Built:	Unknown
*Wall Rating:	68	Maintenance Action:	Repair Elements

Wall Description

Wall Function:	Cut Wall	Primary Wall Type:	Gravity - Mortared Stone
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Actual location on Tulane Avenue, abuts to corner of Rt. 0933, Glen Echo Service Area, and Tulane Ave. Across from Law & Associates		

Wall Measurements

Wall Length (ft.):	31	Face Area (sq.):	120
Average Wall Height (ft.):	3	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	0

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	No global stability problems	7
WALL FOUNDATION MATERIAL 8.00	No evidence of erosion or settlement	7
MORTAR 8.00	Moderate deterioration	6
STONE MASONRY 8.00	No fracturing, minor weathering	7
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Flat, grassy	8
UPSLOPE 0.50	Flat	8
VEGETATION 1.00	Hanging over top of wall	7
WALL DRAINS 1.00	None visible, appears well-drained	7

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Repoint - 60 s.f. * \$75/s.f. = \$4,500 Trim vegetation - 4 hrs * \$55/hr = \$220 Mobilization = \$556
Repair Cost:	\$5,286

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

George Washington Memorial Parkway

ROUTE 0933: GLEN ECHO SERVICE AREA

Retaining Wall Condition Photos



GWMP_0933_0.000_P1_1.jpg



GWMP_0933_0.000_P1_2.jpg

Wall ID:	GWMP-0936ZZ-0.000-P1		
Route Name:	WASHINGTON MARINA PARKING AREAS		
Inspection Date:	July 12, 2007	Approximate Year Built:	Unknown
*Wall Rating:	48	Maintenance Action:	Replace Wall

Wall Description

Wall Function:	Fill Wall	Primary Wall Type:	Gravity - Mass Concrete
Surface Treatment:		Secondary Wall Type:	
Secondary Surface Treatment:		Architectural Facing:	
General Description:	Bulkhead wall, anchors for boats on top of wall, massive gravity structure		

Wall Measurements

Wall Length (ft.):	80	Face Area (sq.):	360
Average Wall Height (ft.):	4	Face Angle (deg.):	90
Maximum Wall Height (ft.):	4	Vertical Offset (ft.):	-2

Assessed Elements

Element (Weighting Factor)	Narrative	Condition Rating (0 - 10)
PERFORMANCE 8.00	Tidal effects on hydrostatic pressure? Wall still retaining soil, but structure has failed	6
WALL FOUNDATION MATERIAL 8.00	Major settlement, erosion and/or undermining. Cracked in 3 places, 2", 3" and 1" wide cracks. One crack shows differential settlement of 1 ft.	2
CONCRETE 8.00	Aged, good surface condition, cracked from settlement/rotation Wall is 3.5' wide by 4.5' high by 80' long	6
LATERAL SLOPE 0.50	Flat	8
ROAD/SIDEWALK/SHOULDER 0.50	Grassed shoulder	8
WALL DRAINS 1.00	None visible. Failure could be in part caused by hydrostatic pressure.	5
DOWNSLOPE 1.00	Underwater, rocky	6

Repair Recommendations

Failure Consequence:	LOW
Recommendation Narrative:	Replace Wall - 400 s.f. * \$300/s.f. = \$120,000 Remove existing wall - \$15,000 Mob = 12%EE = \$16,200
Repair Cost:	\$151,200

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

George Washington Memorial Parkway
ROUTE 0936ZZ: WASHINGTON MARINA PARKING AREAS

Retaining Wall Condition Photos



GWMP_0936ZZ_0.000_P1_1.jpg



GWMP_0936ZZ_0.000_P1_2.jpg

Appendix A

Summary of WIP Definitions



George Washington Memorial Parkway



**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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