APPENDIX D

VIEWSHED ANALYSIS

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A viewshed is the total visible area from a particular fixed vantage point. A viewshed analysis was undertaken by OLIN to analyze the different alternatives and their respective wall heights and alignments in context at the 17th Street project area. The viewshed analysis consisted of a multi-step process.

First, OLIN surveyed the existing views and viewsheds in the project area and determined which views would be most effective at conveying the visual impacts associated with the range of alternatives. Digital photographs taken between May and October 2008 served as backgrounds upon which computer generated massing diagrams representing the various alternatives in Phase 1 and Phase 2 were electronically superimposed. The goal was to provide an easily accessible answer to the question of how each alternative would affect the view of the site from all the most significant and/or familiar vantage points.

The volume of each alternative transposed over the existing photograph simulates the area of impact and the degree to which adjacent historic resources would be obscured. The viewshed analysis was performed on all options for viewsheds A and C (below). Additional viewsheds (B, D and E) were analyzed for some options on a case-by-case basis.

- View A: From the north side of the intersection of 17th Street and Constitution Avenue looking south.
- View B: From 17th Street, approximately 330' south of Constitution Avenue looking north.
- View C: From 17th Street, approximately 445' south of Constitution Avenue looking north.
- View D: From 17th Street, approximately 725' south of Constitution Avenue looking north.
- View E: From the southwest corner of 17th Street and Constitution Avenue looking towards the Washington Monument

These views were deemed to be the most significant and represent either a historically important vantage point, as established in the L'Enfant plan, or a well known viewshed. Figure D4.1 shows the map of views analyzed in this viewshed analysis and references six existing conditions photographs (Fig. D4.2-4.6).

Figure D.1 – Viewshed Analysis Map

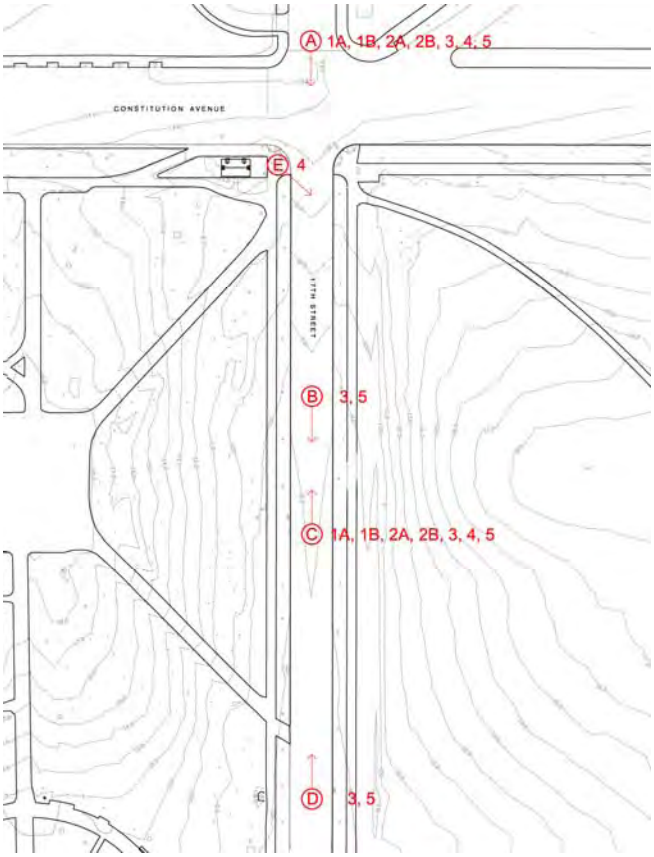

Figure D.2 – View A Existing Conditions

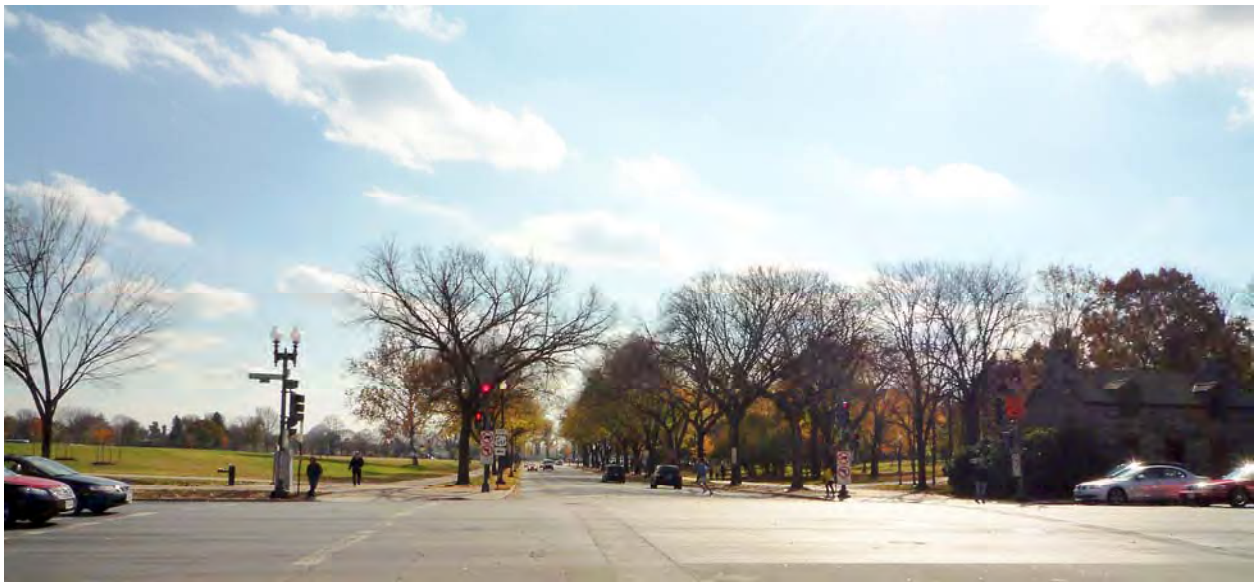

Figure D.3 – View B Existing Conditions

Figure D.4 – View C Existing Conditions

Figure D.5 – View D Existing Conditions

Figure D.6 – View East Existing

Figure D.7 – Alternative 1A-Phase 1 View A

Figure D.8 – Alternative 1A – Phase 1 View C

Figure D.9 – Alternative 1A – Phase 1 View A

Figure D.10 – Alternative 1A – Phase 2 View C

Figure D.11 – Alternative 1B – Phase 1 View A

Figure D.12 – Alternative 1B – Phase 1 View C

Figure D.13 – Alternative 1B – Phase 2 View A

Figure D.14 – Alternative 1B – Phase 2 View C

Figure D.15 – Alternative 2A – Phase 1 View C

Figure D.16 – Alternative 2A – Phase 1 View A

Figure D.17 – Alternative 2A – Phase 2 View C

Figure D.18 – Alternative 2B – Phase 2 View A

Figure D.19 – Alternative 2B – Phase 1 View C

Figure D.20 – Alternative 2B – Phase 1 View A

Figure D.21 – Alternative 2B – Phase 2 View C

Figure D.22 – Alternative 2– Phase 2 View A

Figure D.23 – Alternative 3 – Phase 1 View A

Figure D.24– Alternative 3 – Phase 1 View B

Figure D.25– Alternative 3 – Phase 1 View C

Figure D.26– Alternative 3 – Phase 1 View D

Figure D.27– Alternative 3 – Phase 2 View A

Figure D.28– Alternative 3 – Phase 2 View B

Figure D.29– Alternative 3 – Phase 2 View C

Figure D.30– Alternative 3 – Phase 1 View D

Figure D.31– Alternative 4 – Phase 1 View A

Figure D.32– Alternative 4 – Phase 1 View C

Figure D.33– Alternative 4 – Phase 1 View E

Figure D.34– Alternative 4 – Phase 2 View A

Figure D.35– Alternative 4 – Phase 2 View C

Figure D.36– Alternative 4 – Phase 2 View E

Figure D.37– Alternative 5 – Phase 1 View A

Figure D.38– Alternative 5 – Phase 1 View B

Figure D.39– Alternative 5 – Phase 1 View C

Figure D.40– Alternative 5 – Phase 1 View D

Figure D.41– Alternative 5 – Phase 2 View A

Figure D.42 – Alternative 5 – Phase 2 View B

Figure D.43 – Alternative 5 – Phase 2 View C

Figure D.44 – Alternative 5 – Phase 2 View D

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APPENDIX E

CULTURAL RESOURCES MAPS

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Figure E.1 - Potomac Park Levee Area of Potential Effect (APE)

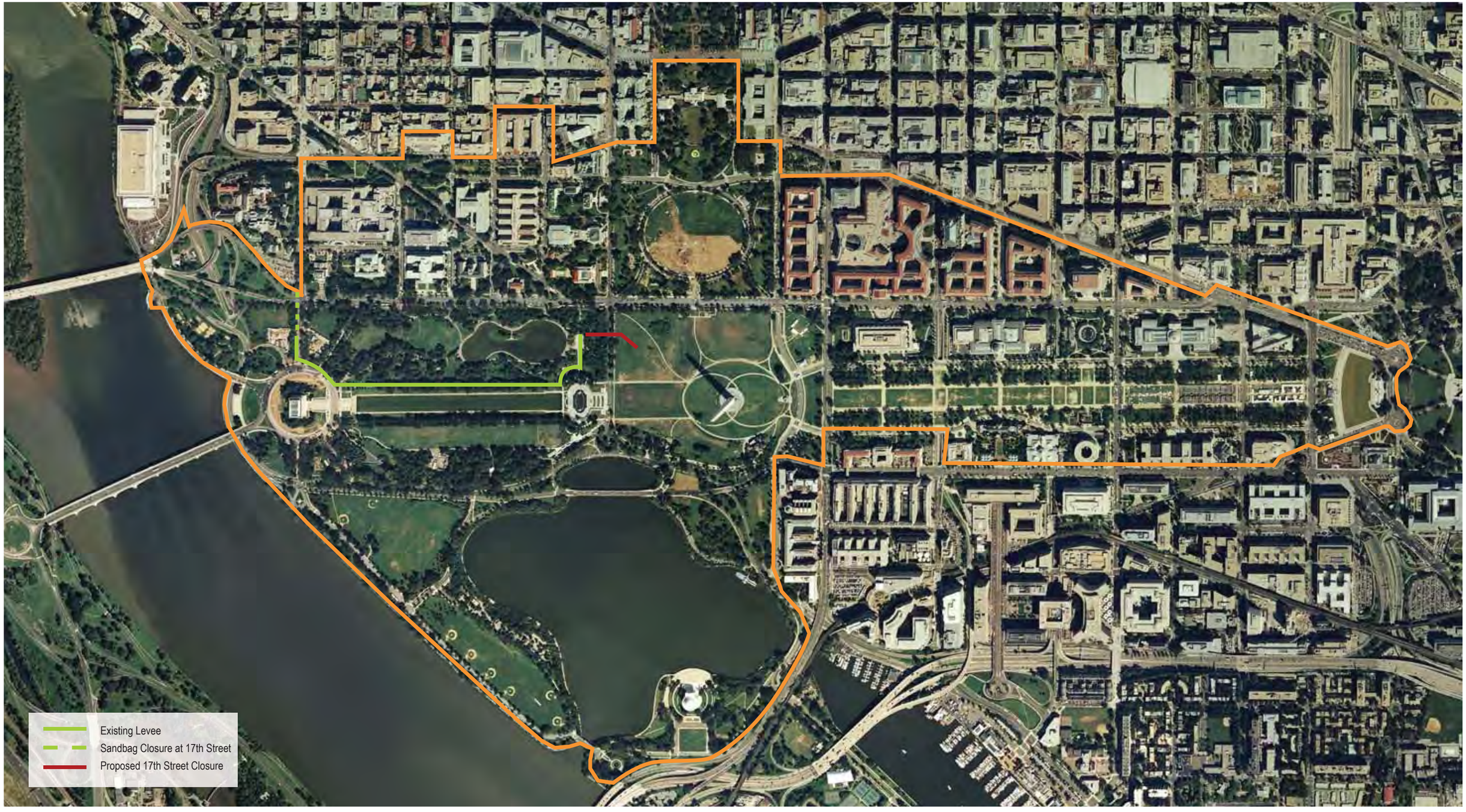
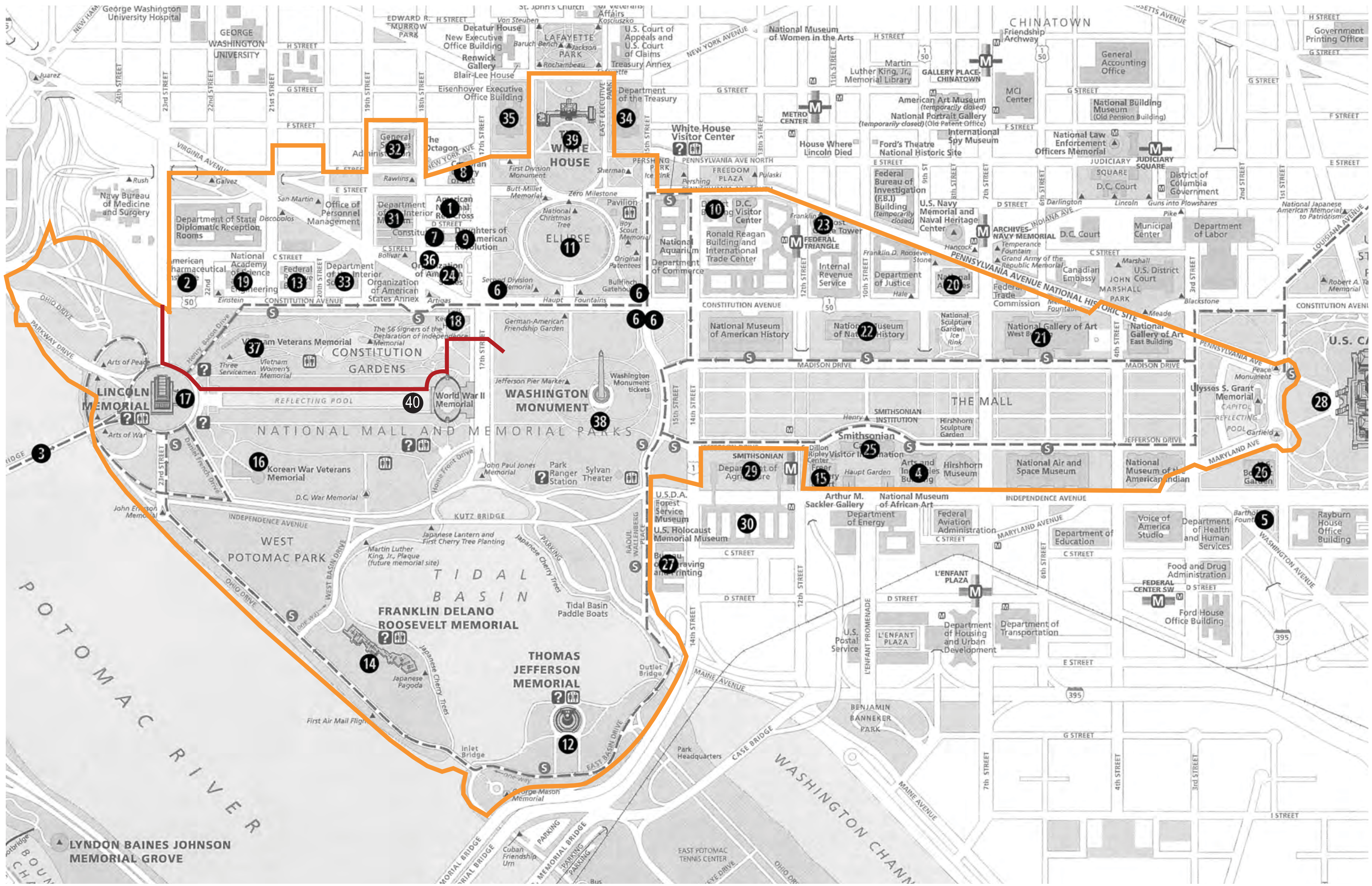
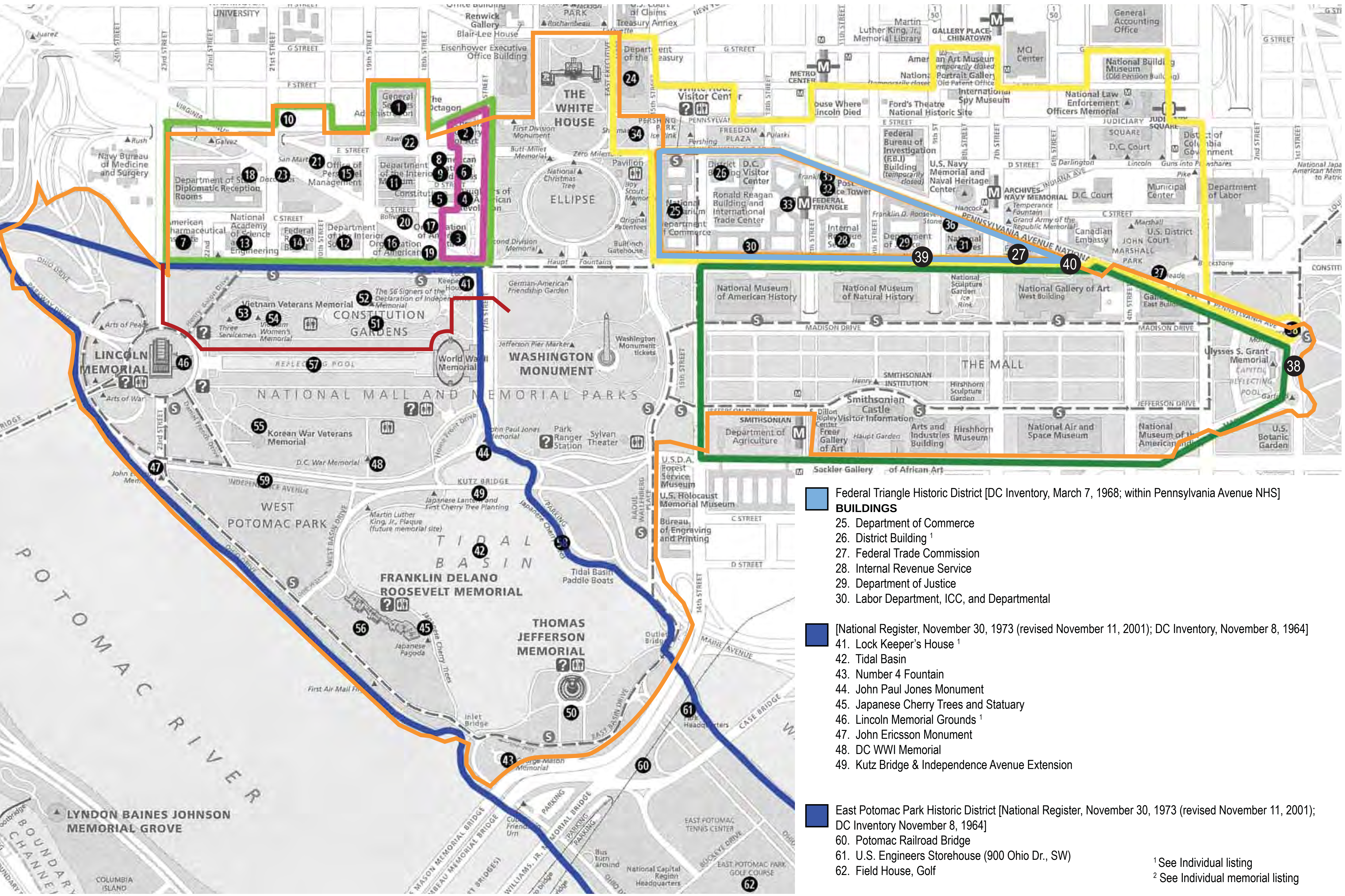


Figure E.2 - Individually Listed Historic Properties within the APE



[NHL] National Historic Landmark	
[NR] National Register of Historic Places	
[DC] District of Columbia Inventory of Historic Places	
1 American National Red Cross	[NHL, NR, DC]
2 American Pharmaceutical Institute	[NR, DC]
3 Arlington Memorial Bridge	[NR, DC]
4 Arts and Industries Building	[NHL, NR, DC]
5 Bartholdi Fountain	[NR Exempt, DC]
6 Bulf nch Gatehouse and Gateposts	[NR, DC]
7 Constitution Hall (Daughters of the American Revolution)	[NHL, NR, DC]
8 Corcoran Gallery of Art	[NHL, NR, DC]
9 DAR Memorial Continental Hall	[NHL, NR, DC]
10 District of Columbia District Building	[NR, DC]
11 The Ellipse	[NR]
12 Jefferson Memorial Bridge	[NR, DC]
13 Federal Reserve Board Building	[DC]
14 Franklin Delano Roosevelt Memorial	[NR]
15 Freer Gallery of Art	[NR, DC]
16 Korean War Veterans Memorial	[NR]
17 Lincoln Memorial	[NR, DC]
18 Lock Keeper's House	[NR, DC]
19 National Academy of Science and Engineering	[NR, DC]
20 National Archives	[NR, DC]
21 National Gallery of Art West Building	[DC]
22 National Museum of Natural History	[DC]
23 Old Post Off ce Building	[NR, DC]
24 Pan American Union (Organization of American States)	[NR, DC]
25 Smithsonian Institution Building (Castle)	[NHL, NR, DC]
26 U.S. Botanic Gardens	[DC]
27 U.S. Bureau of Engraving and Printing	[DC]
28 U.S. Capitol and Grounds	[NHL, NR Exempt, DC]
29 U.S. Department of Agriculture (Administration Building)	[NR, DC]
30 U.S. Department of Agriculture South Building	[NR Eligible]
31 U.S. Department of the Interior (New Interior Building)	[NR, DC]
32 U.S. Department of the Interior Off ces	[NR]
33 U.S. Department of the Interior South Building	[NR Eligible]
34 U.S. Department of the Treasury Building	[NHL]
35 U.S. State, War, and Navy Building	[NHL, NR, DC]
36 Van Ness House Stables	[DC]
37 Vietnam Veterans Memorial	[NR]
38 Washington Monument and Grounds	[NR, DC]
39 White House	[NHL, NR Exempt, DC]
40 WWII Memorial	
41 The Mall	[NR,DC]

Figure E.3 - Historic Districts and Contributing Properties within the APE



The National Mall Historic District [National Register, October 15, 1966; DC Landmark, November 8, 1964]

Northwest Rectangle Historic District [Determined Eligible for the National Register]

BUILDINGS

1.Old Department of the Interior Building (GSA)
2.Corcoran Gallery of Art
3.Pan American Union (Organization of American States)
4.DAR Memorial Continental Hall
5.DAR Constitution Hall
6.American National Red Cross
7.American Institute of Pharmacist
8.American National Red Cross Administration Building
9.American National Red Cross Off ce
10.American Red Cross D.C. Chapter House
11.Department of the Interior Building
12.Department of the Interior South Building
13.National Academy of Sciences
14.Federal Reserve Board Building
15.Off ce of Personnel Management
16.Pan American Union Annex
17.Van Ness House Stable
18.War Department

STATUARY

19.Jose Artigas Statue
20.Simon Bolivar Statue
21.General Jose de San Martin Statue
22.Major General John A. Railins Statue
23.Reproduction of Discus Thrower

Seventeenth Street Historic District [DC Inventory, March 7, 1968]

2. Corcoran Gallery of Art [1]
3. Pan American Union [1]
4.DAR Memorial Continental Hall [1]
6. American National Red Cross

Pennsylvania Avenue National Historic Site [NHS, October 15, 1966; DC Inventory, June 19, 1973] *

BUILDINGS

24.Department of Treasury
25.Department of Commerce, Federal Triangle
26.District Building, Federal Triangle
27.Federal Trade Commission, Federal Triangle
28.Internal Revenue Service Building, Federal Triangle
29.Department of Justice, Federal Triangle
30.Labor Department, Interstate Commerce and Departmental Auditorium, Federal Triangle
31.National Archives, Federal Triangle
32.Old Post Off ce Building, Federal Triangle
33.U.S. Post Off ce Building, Federal Triangle

STATUARY/MEMORIALS/MONUMENTS

34.Sherman Statue, Sherman Park
35. Benjamin Franklin Statue, SE corner Pennsylvania & 12th
36.Franklin Delano Roosevelt Memorial, Market Square Park
37.General George C. Meade Memorial, Meade Plaza
38.Peace Monument, Pennsylvania Avenue & 1st Street
39.Captain Nathan Hale Statue, Department of Justice

FOUNTAINS

40.Andrew W. Mellon Memorial Fountain, Mellon Park

Federal Triangle Historic District [DC Inventory, March 7, 1968; within Pennsylvania Avenue NHS]

BUILDINGS

25. Department of Commerce
26. District Building [1]
27. Federal Trade Commission
28. Internal Revenue Service
29. Department of Justice
30. Labor Department, ICC, and Departmental

[National Register, November 30, 1973 (revised November 11, 2001); DC Inventory, November 8, 1964]

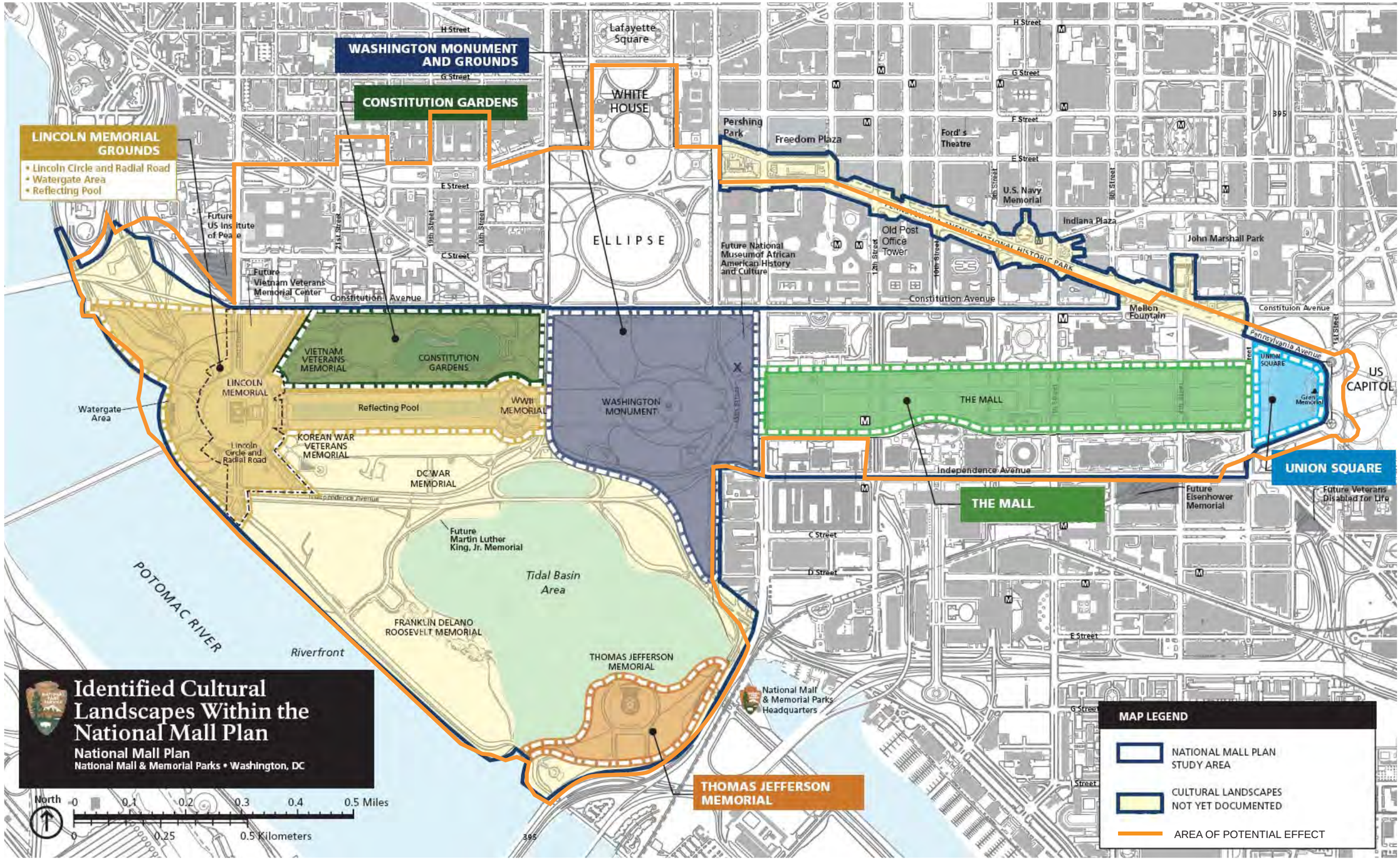
41. Lock Keeper's House [1]
42. Tidal Basin
43. Number 4 Fountain
44. John Paul Jones Monument
45. Japanese Cherry Trees and Statuary
46. Lincoln Memorial Grounds [1]
47. John Ericsson Monument
48. DC WWI Memorial
49. Kutz Bridge & Independence Avenue Extension

East Potomac Park Historic District [National Register, November 30, 1973 (revised November 11, 2001); DC Inventory November 8, 1964]

60. Potomac Railroad Bridge
61. U.S. Engineers Storehouse (900 Ohio Dr., SW)
62. Field House, Golf

[1] See Individual listing
[2] See Individual memorial listing

Figure E.4 - Cultural Landscapes within the APE



APPENDIX F

TOP OF PROTECTION SUMMARY

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As described in Chapter 1, the FEMA required (Phase 1) and congressionally authorized (Phase 2) solutions have elevations that vary based on existing grades in the project area. These grade variations yield different requirements for the elevations (heights) of the flood protection systems at 23rd Street, 17th Street, and along the Reflecting Pool levee. In Phase 1, an elevation of 16.7 NAVD for the top of the flood protection system will meet and exceed FEMA requirements. For Phase 2, the approximate level of protection requirement will be 18.7 NAVD; a more specific break down of elevations is found in table F.1.

Table F.1 - Top of Protection Summary

Location	FEMA 100YR Top Of Protection	100 YR T.O.P. for USACE Approval*	700,000 cfs - Top of Protection (Original Estimate)	100 yr Water Surface Elevation (WSEL)	500 yr WSEL	Design Event WSEL	500 YR Top of Protection includes 2' Freeboard** with min. 90% CNP***	Approximate Existing Grades
P St. at Ft. McNair	14.0	14.0	15.5	11.0	14.6	15.2	16.6	15.2'
Washington Monument Tie Out	16.0	16.7	18.3	12.4	16.7	17.5	18.7	11 to 20+\-
17th St. at Constitution Ave.	16.0	16.7	18.3	12.4	16.7	17.5	18.7	13.0
17th St. at 200' South of Constitution Ave.	16.0	16.7	18.3	12.4	16.7	17.5	18.7	10.0
East End of Reflection Pool	16.0	16.7	18.3	12.4	16.7	17.5	18.7	17.0
Low Spot Along Existing Levee	16+/-	16.7	18.5+/-	N/A	N/A	N/A	18.7+	16.7
West End of Reflecting Pool	16.5	17.0	19.0	13.1	17.1	17.8	19.1	18.2
Along 23rd St.	16.5	17.0	19.8	13.5	17.8	18.6	19.8+/-	16.2 to 23+/-
23rd St and Constitution Ave.	16.5	17.0	19.8	13.5	17.8	18.6	19.8	16.2

NOTES:

All elevations in feet NAVD 88 Datum

* Closures and/or new construction can be no lower than the lowest area along the existing line of protection to remain.

** No clear guidance from USACE or FEMA on freeboard requirements for 500 yr levees.

*** (CNP) Conditional Non-exceedance Probability.

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APPENDIX G

STATEMENT OF FINDINGS FOR FLOODPLAINS

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FLOODPLAIN STATEMENT OF FINDINGS

For the National Mall and Memorial Parks,
Potomac Park Levee Improvements

Washington, DC

January, 2009

Recommended: _____

Superintendent NAMA Date

Concurred: _____

Water Resources Division Date

Approved: _____

National Capital Region Office Date

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Introduction

The existing Potomac Park levee structure extends from the vicinity of 23rd Street, parallel to the Lincoln Memorial Reflecting Pool in Constitution Gardens, and ends on the Washington Monument Grounds (Monument Grounds) east of 17th Street. Currently, during a flood event, the NPS must provide temporary closures at 23rd Street (using sandbags) and at 17th Street. The temporary closure at 17th Street consists of using a combination of sandbags, Jersey barriers, and soil (i.e., an earthen dike) to create a temporary barrier across the street to block the flow of water into downtown Washington, D.C. This system has not been favored by the USACE, due to the large scope of this type of emergency closure, coupled by unknown weather conditions and logistic requirements. Based on new policies since Hurricane Katrina, the USACE deemed the 17th Street closure unreliable and consequently gave the levee an unacceptable inspection rating. For this reason, the Federal Emergency Management Agency's (FEMA) most recently proposed 100-year floodplain map for this area reflects a 100-year flood event as if the currently designed 17th Street closure did not exist. This new mapping puts a portion of downtown Washington, D.C. and the monumental core within the 100-year flood insurance rate zone, which would require additional flood insurance and/or costly upgrades to comply with building standards for those facilities that now fall within the new 100-year floodplain. In addition, a number of projects that are currently in development would need to be revised and could be delayed in order to comply with these building codes.

FEMA has agreed to delay the final issuance of the new floodplain mapping to allow the District and the NPS to design and implement a solution that would, at a minimum, reliably stop the 100-year flood at 17th Street south of Constitution Avenue. This solution would remove the necessity for FEMA to map this area within the 100-year floodplain. However, unless a solution is implemented and accredited by FEMA by November 2009, FEMA will issue the proposed floodplain maps and the affected area will be subject to new constraints and more stringent requirements for development. In 1936, Congress authorized the USACE to design and construct a flood protection project to contain a flow of 700,000 cubic feet per second (cfs) (700,000 cfs exceeds the anticipated flow of a 100-year flood event.). At this time, the USACE has not received funds to construct a permanent levee that would meet this level of protection. Nevertheless, since the original levee is a congressionally authorized project, it is necessary that any modifications are consistent with the original authorization. Therefore, the 100-year solution will be designed in a way that ensures that the congressionally authorized level of protection can ultimately be achieved once funding is appropriated.

During the development of the alternatives, it became apparent that considerable costs and time of construction, and therefore time of disturbance to the National Mall and visitors, could be avoided if the levee at 17th Street was constructed to the higher level of protection initially, if funding would be available. However, since funding is not certain, the alternatives in this EA are presented in a phased approach:

- Phase 1 solutions satisfy the FEMA requirements for reliably stopping the 100-year flood at 17th Street, although it is recognized that they may be built to the congressionally authorized level of protection if funding becomes available at the time of construction and the design lends itself to this.

- A phase 2 address design solutions to satisfy the congressionally authorized level of protection at 23rd Street, the Reflecting Pool, and 17th Street and includes measures to enhance the visual character of the levee and the surrounding landscape.

Justification for the Use of Floodplain

Portions of the project area are located within designated high hazard floodplains. Although the NPS is under executive order and policy to reduce or eliminate development in floodplains, this is not possible in the project area because the required improvements to existing levee system are located within the 100-year floodplain. The proposed levee improvements constitute maintenance actions necessary for the preservation of current floodplain function. Therefore, although the project must occur within the floodplain, the extent of development, placement of structures, and types of structures would be selected to minimize impacts.

Site-Specific Flood Risk

The project area within West Potomac Park lies at a low elevation and is relatively flat. The areas to the north and east of the existing 17th Street levee closure, including much of 23rd Street, are currently designated as Zone C, representing minimal flood potential and outside of the 100-year floodplain. The area immediately south of the closure is designated as Zone B—between the limits of the 100-year flood and 500-year flood—while the area further south, in the vicinity of the Independence Avenue/17th Street intersection, is designated as Zone A12, within the 100-year flood zone. The Reflecting Pool levee also lies within this designation. As witnessed during past storm events, any buildings or other facilities located in this floodplain has the potential to be impacted by flood waters, high winds, and storm surge.

Flood Mitigation Plans

All Alternatives:

The proposed project itself constitutes a strategy for the reduction of flood risk. All new structures and improvements would be constructed for the purpose of fortifying existing floodwalls and flood protection measures. During site preparation and construction, efforts to preserve existing vegetation within the floodplain will be undertaken as standard procedure. Vegetation necessarily removed for the construction of the 17th Street floodwall and improvements at 23rd Street would be replaced in-kind within the flood zone.

Summary

Because the proposed project constitutes a strategy for the reduction of flood risk, improvements to the current levee system must be carried out within the 100-year floodplain. Specifically, the proposed levee improvements at the 17th Street and Reflecting Pool Levees are within or adjacent to the 100-year floodplain. Since the proposed improvements must be undertaken at the location of the existing levees, there are no other siting alternatives that could be reasonably considered for this project. The location of proposed structures within the flood zone, albeit for the purpose of flood protection, would result in risks from the possibility of flooding and storm surge damage to these structures. Efforts to preserve existing vegetation within the floodplain will be undertaken as standard procedure during site preparation and construction. Moreover, with the increased reliability of the improved levee system there would be beneficial effects in flood protection within portions of downtown Washington, D.C. and the monumental core. Therefore, floodplain values would be protected to the maximum extent possible and potential flood hazards would be minimized.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS D-85/ January 2009