

## APPENDIX B

### ASSESSMENT OF EFFECTS





South Mall Campus Master Plan-Level Assessment of Effects

This document provides an initial assessment of effects for the alternatives under consideration for the South Mall Campus Master Plan. The alternatives under consideration are titled Alternative A, B, D, and F (alternatives C and E have been dismissed from further consideration and have not been addressed for their effects on historic properties). Potential adverse effects resulting from the No Action Alternative are also described.

The Smithsonian Institution has defined an Area of Potential Effects (APE), and identified historic properties within that area (illustration at right) that are listed in, or have been determined as being eligible for listing in, the National Register of Historic Places (NRHP).

Criteria of Adverse Effect

Effects assessments are based on the criteria of adverse effect as defined in the implementing regulations of Section 106 of the National Historic Preservation Act (NHPA). The criteria of adverse effect are defined as follows:

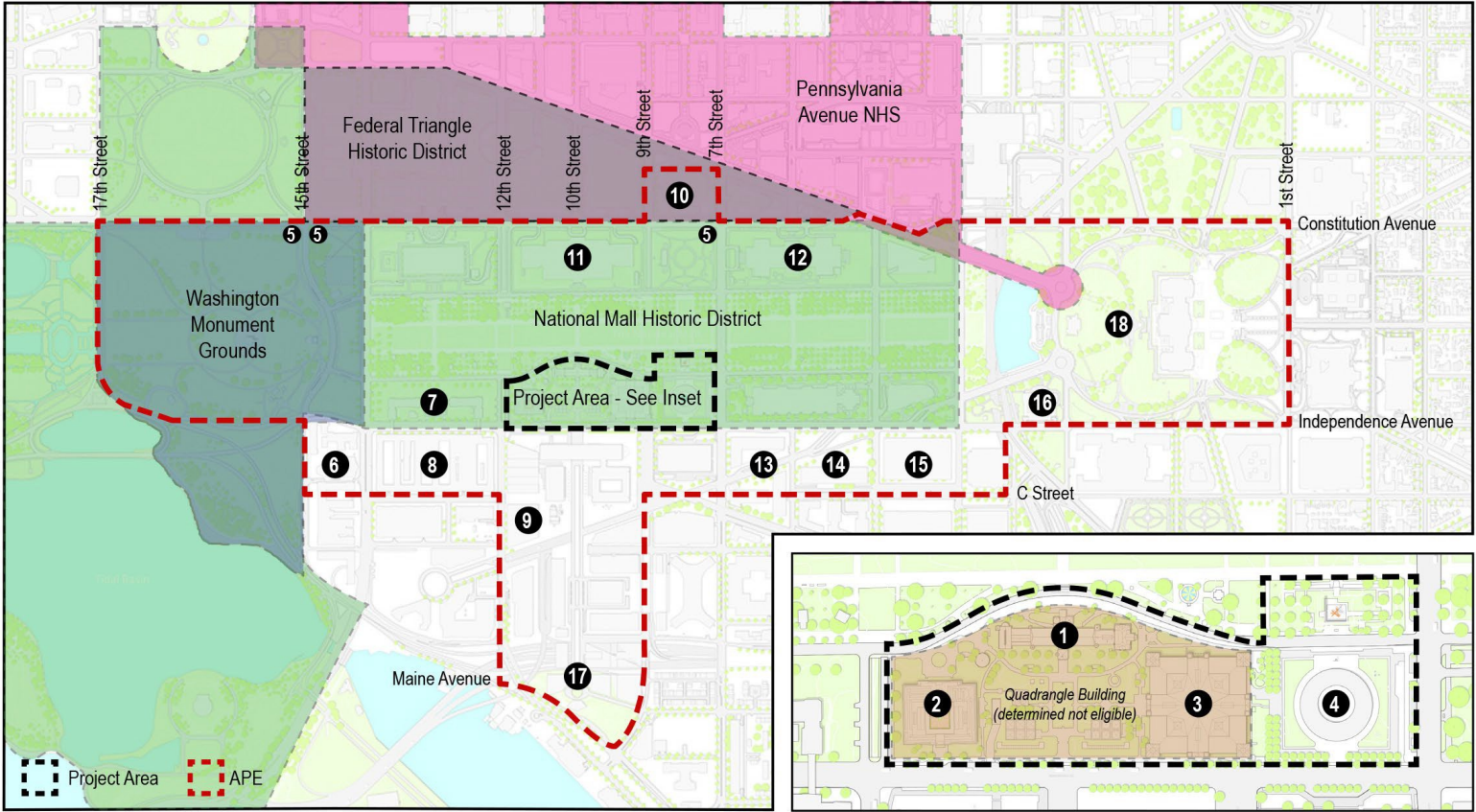
An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.<sup>1</sup>

Examples of adverse effects may include: physical destruction or damage; alterations that are inconsistent with the Secretary’s Standards for the Treatment of Historic Properties, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access; removal of the property from its historic location; change of the character of the property’s use or of contributing physical features within the property’s setting; introduction of visual, atmospheric, or audible elements that diminish the property’s integrity of the property’s significant historic features; neglect or deterioration (except in certain religious or cultural cases); and transfer, lease, or sale of property out of Federal ownership or control without adequate preservation controls.

The following table provides an assessment of the effects of the proposed alternatives on NRHP-eligible or NRHP-listed historic properties and is based upon the Section 106 criteria of adverse effect. The effects analysis has been organized by historic properties and actions under each alternative. Direct effects are addressed first, followed by indirect effects.

In most cases, design details at the master planning level are not sufficiently developed to fully and accurately assess the effect of a specific action. In such cases, the effects will be further addressed at the time of project design in accordance with the Programmatic Agreement. Where known or potential adverse effects have been identified, the Section 106 resolution document will outline treatment strategies to avoid, minimize, or mitigate adverse effects on the historic properties and outline guidelines for addressing unknown effects. Due to the nature of this project as a Master Plan, certain actions have the potential to create adverse effects due to their related or cumulative nature. These related and cumulative effects have been described at the end of this document.

Area of Potential Effects and Identification of Historic Properties



Within Project Area		Within Area of Potential Effects (APE)			
	National Mall Historic District		Washington Monument Grounds	11	National Museum of Natural History
	Smithsonian Institution Quadrangle Historic District		Pennsylvania Avenue NHS	12	National Gallery of Art (West Building)
	Plan of the City of Washington		Federal Triangle Historic District	13	Federal Office Building 10B
1	Smithsonian Institution Building	5	Bulfinch Gatehouses and Gateposts	14	Federal Office Building 6
2	Freer Gallery of Art	6	Auditor's Building Complex	15	Social Security Administration
3	Arts and Industries Building	7	USDA Administration Building	16	United States Botanic Garden
4	Hirshhorn Museum and Sculpture Garden	8	USDA South Building	17	Benjamin Banneker Park
		9	USDA Cotton Annex	18	U.S. Capitol and Grounds
		10	National Archives		

1 36 CFR § 800.5(a)(1).



Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
Freer Gallery of Art DC, NR, Contributing building to Mall HD and Quadrangle HD	<b>Freer Gallery East Accessible Entrance:</b> An existing window on the east side of the Freer Gallery will be lowered to create an accessible entrance from Haupt Garden.	<b>No effect.</b>	Alteration of the east wall will adversely effect the historic window configuration. <b>Adverse effect.</b>	Alteration of the east wall will adversely effect the original window configuration and diminish the property's integrity of design and materials. <b>Adverse effect.</b>	Alteration of the east wall will adversely effect the original window configuration and diminish the property's integrity of design and materials. <b>Adverse effect.</b>	Alteration of the east wall will adversely effect the original window configuration and diminish the property's integrity of design and materials. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Adverse effect has been minimized by designing the new entrance to correspond to the existing facade bay configuration and to remove a minimal amount of historic fabric.</li> <li>Interior lobby will be located in a modified area and will not affect significant interior spaces.</li> </ul>
	<b>New Loading Ramp:</b> A new loading ramp will be constructed on the west lawn of the Freer Gallery to connect with centralized loading facilities.	<b>No effect.</b>	Existing Quad loading dock would be retained. <b>No effect.</b>	Existing Quad loading dock will be removed and replaced with a new ramp adjacent to the west elevation of the Freer Gallery. <b>Potential adverse effect.</b>	Existing Quad loading dock will be removed and replaced with a new ramp adjacent to the west elevation of the Freer Gallery. <b>Potential adverse effect.</b>	Existing Quad loading dock will be removed and replaced with a new ramp adjacent to the west elevation of the Freer Gallery. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Excavation may require structural underpinning to Freer Gallery.</li> <li>Ramp and associated infrastructure has potential to adversely effect the character of the Freer Gallery and diminish its integrity of setting.</li> <li>Effects will be further evaluated at time of project design.</li> </ul>
Smithsonian Institution Building "Castle" DC, NR, NHL, Contributing building to Mall HD and Quadrangle HD	<b>Castle Blast Protection:</b> Castle retrofit will include blast resistance to be coordinated with perimeter security elements.	Without treatment, Castle will be vulnerable to potential blast damage. <b>Potential adverse effect.</b>	Blast protection will include hardening and replacement of non-original components, including windows. Project will be designed to avoid effects on historic fabric, if possible. <b>Potential adverse effect.</b>	Blast protection will include hardening and replacement of non-original components, including windows. Project will be designed to avoid effects on historic fabric, if possible. <b>Potential adverse effect.</b>	Blast protection will include hardening and replacement of non-original components, including windows. Project will be designed to avoid effects on historic fabric, if possible. <b>Potential adverse effect.</b>	Blast protection will include hardening and replacement of non-original components, including windows. Project will be designed to avoid effects on historic fabric, if possible. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Blast protection is consistent with Security Design Criteria for SI Facilities.</li> <li>Blast protection will be coordinated with master plan perimeter security design.</li> </ul>
	<b>Castle Base Isolation:</b> Base isolation will include excavation beneath the Castle and introduction of base isolators beneath the existing foundation.	Without treatment, Castle will continue to deteriorate and be vulnerable to potential damage. <b>Potential adverse effect.</b>	Base isolation would be designed and monitored to ensure protection of Castle. Action has potential to adversely effect character of Castle and diminish its integrity of setting. <b>Potential adverse effect.</b>	Base isolation would be designed and monitored to ensure protection of Castle. Action has potential to adversely effect character of Castle and diminish its integrity of setting. <b>Potential adverse effect.</b>	Base isolation would be designed and monitored to ensure protection of Castle. Action has potential to adversely effect character of Castle and diminish its integrity of setting. <b>Potential adverse effect.</b>	Base isolation would be designed and monitored to ensure protection of Castle. Action has potential to adversely effect character of Castle and diminish its integrity of setting. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Seismic protection is consistent with building code.</li> <li>Base isolation requires a neutral perimeter around base of the Castle. Perimeter buffer will be integrated into the landscape.</li> <li>Consistent with best practices for base isolation, SI will solicit third-party review by qualified engineers to ensure protection of Castle.</li> </ul>
	<b>Castle Seismic Bracing:</b> Structural bracing will be added to supplement the Castle's existing structure.	Without treatment, Castle will continue to deteriorate and be vulnerable to potential damage. <b>Potential adverse effect.</b>	Structural bracing may require the removal or modification of historic fabric, with the potential to diminish the Castle's integrity of design, materials, and workmanship. <b>Potential adverse effect.</b>	Structural bracing may require the removal or modification of historic fabric, with the potential to diminish the Castle's integrity of design, materials, and workmanship. <b>Potential adverse effect.</b>	Structural bracing may require the removal or modification of historic fabric, with the potential to diminish the Castle's integrity of design, materials, and workmanship. <b>Potential adverse effect.</b>	Structural bracing may require the removal or modification of historic fabric, with the potential to diminish the Castle's integrity of design, materials, and workmanship. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Seismic protection is consistent with building code.</li> <li>Structural bracing will focus on the protection of Castle towers and chimneys. Bracing will be limited to building interior and will not be visible from the exterior or significant interior spaces.</li> <li>Consistent with best practices for base isolation, SI will solicit third-party review by qualified engineers to ensure protection of Castle.</li> </ul>

Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
<b>Smithsonian Institution Building "Castle"</b> DC, NR, NHL, Contributing building to Mall HD and Quadrangle HD	<b>Castle Basement Floor Lowering:</b> In connection with seismic retrofit, the basement floor level will be lowered to create additional headroom for the visitor center and other program uses. Mechanical and other infill will be removed to expose the historic masonry vaults, piers, and walls.	<b>No effect.</b>	Project requires additional study to determine the historic integrity of Castle basement and effects to masonry vaults, piers, and walls. Altering the proportions of the basement will likely result in an adverse effect. <b>Adverse effect.</b>	Project requires additional study to determine the historic integrity of Castle basement and effects to masonry vaults, piers, and walls. Altering the proportions of the basement will likely result in an adverse effect. <b>Adverse effect.</b>	Project requires additional study to determine the historic integrity of Castle basement and effects to masonry vaults, piers, and walls. Altering the proportions of the basement will likely result in an adverse effect. <b>Adverse effect.</b>	Project requires additional study to determine the historic integrity of Castle basement and effects to masonry vaults, piers, and walls. Altering the proportions of the basement will likely result in an adverse effect. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Undertaking will remove incompatible infill construction and allow for the restoration of these historic features.</li> <li>Detailing of historic structural elements will be designed to meet the Secretary of the Interior Standards.</li> <li>Approximately one-third of basement level was previously lowered at connection to Quadrangle and in mechanical and food service spaces.</li> </ul>
	<b>Castle Interior Restoration:</b> The ground and upper floors of the Castle will be rehabilitated, with significant interior spaces restored to their period(s) of significance.	Without a coordinated treatment approach, Castle interior and systems will continue to deteriorate. <b>Potential adverse effect.</b>	Restoration is generally expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Restoration is generally expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Restoration is generally expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Restoration is generally expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Undertaking will remove incompatible infill construction and will be designed to meet the Secretary of the Interior Standards.</li> <li>Undertaking will restore primary public interior spaces and will retain historic configuration of east wing and range.</li> </ul>
	<b>Castle Sub-Basement Expansion:</b> A new sub-basement will be excavated beneath the existing basement level. Sub-basement will provide loading, utility, and building support. The footprint of the proposed expansion varies by alternative.	<b>No effect.</b>	No sub-basement is proposed. Existing service connection tunnel to the Quad will remain. <b>No effect.</b>	Sub-basement excavation is limited to the east and west Castle ranges and wings. <b>Potential adverse effect.</b>	Sub-basement excavation will include entire Castle and will require extensive structural bracing. <b>Adverse effect.</b>	Sub-basement excavation is limited to the west range and wing. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Excavation beneath the Castle is necessary for the functionality of the central delivery of goods, services, handling of trash and recycling, and museum exhibit delivery.</li> <li>Expanded sub-basement area will require additional egress through connecting buildings.</li> <li>Excavation will be monitored to ensure safety of building during implementation.</li> </ul>
	<b>Visitor Center Entrance:</b> A new means of entrance and egress from the below-grade Visitor Center is proposed in several alternatives.	<b>No effect.</b>	No new entrance is proposed. Quad pavilions will continue to serve as entrances to below-grade facilities. <b>No effect.</b>	Removal of the Ripley Pavilion would have an adverse effect and may require a new entrance or egress pavilion adjacent to Castle. The size and visibility of the entrance has potential to adversely affect character of Castle and diminish its integrity of setting. <b>Adverse effect.</b>	Below-grade "dip" entrance to Visitor Center will adversely affect character of Castle and diminish its integrity of setting. <b>Adverse effect.</b>	Visitor Center entrance will be provided in below-grade court located to the south of the Castle. The new entry may require removal of historic fabric and the size and visibility of the entrance is likely to adversely affect character of Castle and diminish its integrity of setting. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>In Alternative F, the adverse effect of a visible grade change has been avoided or minimized by reducing the size of the entrance, limiting its visibility from the south, and maintaining the existing flat grade of the Haupt Garden.</li> </ul>

Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
<b>Arts &amp; Industries Building (AIB)</b> DC, NR, NHL, Contributing building to Mall HD and Quadrangle HD	<b>Reopen AIB for Public Circulation:</b> The non-historic east security door will be removed and AIB will be opened to allow interior east-west circulation.	<b>No effect.</b>	No alterations are proposed. <b>No effect.</b>	Returning the east door to use will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	Returning the east door to use will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	Returning the east door to use will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Removing the non-historic security door will allow the extant reproduction door to be visible.</li> <li>While a permanent program and funding are developed, SI will continue to utilize AIB for public exhibitions, educational programming and special events.</li> </ul>
	<b>AIB Interior:</b> Facilitated interim and/or permanent use of the AIB for public exhibitions, educational programming and special events. AIB may house a temporary Visitor's Center during the Castle restoration.	<b>No effect.</b>	Modifications expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Modifications expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Modifications expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	Modifications expected to be beneficial but plans have not yet been sufficiently developed to make a determination of effect. <b>Effects to be determined.</b>	<ul style="list-style-type: none"> <li>Undertaking will be designed to meet the Secretary of the Interior Standards.</li> <li>For any permanent use modifications, the Undertaking will restore primary public interior spaces and will retain the historic open configuration of the interior to the maximum extent feasible.</li> <li>Historic floorplan and vaulted interior spaces are ideal for flexible programming and special events.</li> </ul>
	<b>Remove Surface Parking Lot and Expand Ripley Garden:</b> The non-historic parking lot to the east of AIB will be removed, allowing for the expansion of the adjacent Ripley Garden.	<b>No effect.</b>	No alterations are proposed. <b>No effect.</b>	Removing the parking lot and expanding the existing garden will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	Removing the parking lot and expanding the existing garden will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	Removing the parking lot and expanding the existing garden will not adversely effect the character or integrity of AIB. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>In Alternatives B-F, the expanded garden will maintain the character and setting of the existing Ripley Garden.</li> </ul>
	<b>Central Utility Plant:</b> Unexcavated areas adjacent to the Quad will be excavated to create a central utility plant for the campus. The location and extent of excavation varies by alternative.	<b>No effect.</b>	No excavation or utility/loading connection are proposed. <b>No effect.</b>	Excavation will require structural underpinning to be performed on west side of AIB foundations. At-grade ventilation and access infrastructure associated with utility plant has potential to adversely affect character and setting of AIB. <b>Potential adverse effect.</b>	Excavation will require structural underpinning to be performed on west side of AIB foundations. At-grade ventilation and access infrastructure associated with utility plant has potential to adversely affect character and setting of AIB. <b>Potential adverse effect.</b>	Excavation will require structural underpinning to be performed on west side of AIB foundations. At-grade ventilation and access infrastructure associated with utility plant has potential to adversely affect character and setting of AIB. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Excavation may require structural underpinning to AIB.</li> <li>Excavation will be monitored to ensure safety of AIB during implementation.</li> <li>Potential visual effect resulting from at-grade utility plant infrastructure will be minimized by integrating these features into the landscape and building design.</li> </ul>



Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
<b>Hirshhorn Museum &amp; Sculpture Garden</b> <i>Determined eligible for NR Contributing building to Mall HD</i>	<b>Hirshhorn Plaza Walls:</b> Portions of the Plaza walls will be removed to allow a direct pedestrian connection to AIB and the Ripley Garden.	<b>No effect.</b>	No alterations are proposed. <b>No effect.</b>	Small opening will be inserted on the west Plaza wall. <b>Adverse effect.</b>	Portions of the north, west, and east Plaza walls will be removed. <b>Adverse effect.</b>	Small opening will be inserted on the west Plaza wall. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>Opening improves east-west circulation across the campus by providing a direct pedestrian link between the AIB, Ripley Garden, and Hirshhorn Plaza.</li> <li>Adverse effect in Alternatives B and F has been minimized by limiting the opening to the dimension of the proposed east-west pedestrian link.</li> </ul>
	<b>Hirshhorn Plaza Tunnel:</b> A direct pedestrian connection between the Hirshhorn Plaza and Sculpture Garden beneath Jefferson Drive will be restored or replaced. Degree of intervention varies by alternative.	<b>No effect.</b>	No alterations are proposed. <b>No effect.</b>	Tunnel would be reopened and restored to its original configuration. <b>No adverse effect.</b>	Tunnel will be reopened, expanded, and reconfigured, resulting in a loss of historic fabric. <b>Adverse effect.</b>	Tunnel will be reopened, expanded, and reconfigured, resulting in a loss of historic fabric. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>In Alternatives B-F, the existing education facility will be relocated.</li> <li>The Tunnel is an original feature of the Hirshhorn site. It is currently enclosed and infilled to serve as an education facility.</li> </ul>
	<b>Hirshhorn Building Renovation:</b> Hirshhorn Building and Plaza will be renovated.	Without treatment, building envelope and site will continue to deteriorate. <b>Potential adverse effect.</b>	Renovation will not affect character or integrity of the building or site. <b>No adverse effect.</b>	Renovation will not affect character or integrity of the building or site. <b>No adverse effect.</b>	Renovation will not affect character or integrity of the building or site. <b>No adverse effect.</b>	Renovation will not affect character or integrity of the building or site. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Adverse effects caused by the reconfiguration of the Sculpture Garden in Alternatives D and F are addressed separately.</li> <li>Undertaking will be designed to meet the Secretary of the Interior Standards.</li> <li>Any interim changes to the Plaza or Sculpture Garden will undergo separate review.</li> </ul>
	<b>Hirshhorn Sculpture Garden Walls:</b> Perimeter Sculpture Garden walls will be restored.	<b>No effect.</b>	Walls will be repaired in kind. <b>No adverse effect.</b>	Walls will be repaired in kind. <b>No adverse effect.</b>	Walls will be repaired in kind. <b>No adverse effect.</b>	Walls will be repaired in kind. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Repairs to walls are necessary to prevent further deterioration of their condition and appearance.</li> </ul>
	<b>New Galleries Beneath Sculpture Garden:</b> In Alternatives D and F, the interior walls of the Sculpture Garden will be reconfigured to allow for high-ceilinged galleries below.	<b>No effect.</b>	Modest interim modifications without changes to grade may be considered. <b>Potential adverse effect.</b>	Modest interim modifications without changes to grade may be considered. <b>Potential adverse effect.</b>	Existing Sculpture Garden elements will be removed and replaced with a new Sculpture Garden and galleries below. <b>Adverse effect.</b>	Existing Sculpture Garden elements will be removed and replaced with a new Sculpture Garden and galleries below. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>The new Sculpture Garden proposed in Alternatives D and F will remain below the prevailing grade of the Mall.</li> <li>The majority of the existing perimeter walls will be retained.</li> <li>Any interim changes to the Sculpture Garden will undergo separate review.</li> </ul>
<b>Quadrangle Building</b> <i>Contributing building to:</i> <b>National Mall</b> <i>HD DC, NR</i>	<b>Remove Loading Ramp/ Expand Garden:</b> The existing loading ramp will be removed and the Haupt Garden will be expanded into this area.	<b>No effect.</b>	Existing loading ramp will remain. <b>No effect.</b>	Loading ramp will be removed and garden will be expanded into this area. <b>No adverse effect.</b>	Loading ramp will be removed and garden will be expanded into this area. <b>No adverse effect.</b>	Loading ramp will be removed and garden will be expanded into this area. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Removal of the loading dock in Alternatives B-F will not adversely affect the contributing Quad building.</li> </ul>

Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
<b>Quadrangle Building</b> Contributing building to:  <b>National Mall</b> HD DC, NR	<b>Ripley Pavilion:</b> The Ripley Pavilion will be removed to allow construction of a consolidated loading facility.	<b>No effect.</b>	Ripley Pavilion will remain. <b>No effect.</b>	Removal of the Ripley Pavilion will adversely affect the contributing Quad building. <b>Adverse Effect.</b>	Removal of the Ripley Pavilion will adversely affect the contributing Quad building. <b>Adverse Effect.</b>	Removal of the Ripley Pavilion will adversely affect the contributing Quad building. <b>Adverse Effect.</b>	<ul style="list-style-type: none"> <li>Removal of the Ripley Pavilion in Alternatives B-F will restore views between the Quad and Mall and south of the Castle to the Washington Monument.</li> <li>A new exit will be constructed to the south of the Castle to meet egress requirements.</li> </ul>
	<b>Replace Quadrangle Roof Membrane:</b> Quadrangle roof membrane will be replaced.	Without treatment, Quad roof membrane will continue to deteriorate, posing danger to building and collections. <b>Potential adverse effect.</b>	Replacement of the roof membrane will not adversely effect the contributing Quad building. <b>No adverse effect.</b>	Replacement of the roof membrane will not adversely effect the contributing Quad building. <b>No adverse effect.</b>	Replacement of the roof membrane will not adversely effect the contributing Quad building. <b>No adverse effect.</b>	Replacement of the roof membrane will not adversely effect the contributing Quad building. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>Replacement of roof membrane is necessary to protect Quadrangle and its collections.</li> <li>The reconstruction of the Haupt Garden is addressed separately, and has a greater potential to adversely affect this resource.</li> </ul>
	<b>Reconfigure Haupt Garden:</b> In coordination with roof membrane replacement, the Haupt Garden will be reconfigured to accommodate new Quad museum and Visitor Center access. Degree of intervention varies by alternative.	<b>No effect.</b>	Haupt Garden features will be replaced in kind following roof membrane replacement. <b>No adverse effect.</b>	Haupt Garden features will be replaced in kind following roof membrane replacement. <b>No adverse effect.</b>	Haupt Garden will be substantially reconfigured. Removal of Haupt Garden features will adversely affect character and integrity of the contributing Quad building. <b>Adverse effect.</b>	Haupt Garden will be reconfigured, although certain elements will be replaced in kind. Removal of Haupt Garden features will adversely affect character and integrity of the contributing Quad building. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>Adverse effect has been minimized in Alternative F by retaining the existing grade and garden-like quality of the Haupt Garden and by retaining certain garden features.</li> </ul>
	<b>Central Utility Plant:</b> Unexcavated areas adjacent to the Quad will be excavated to create a central utility plant for the campus. The location and extent of excavation varies by alternative.	<b>No effect.</b>	No excavation or central utility plan is proposed. <b>No effect.</b>	In Alternative B, the plant will be located in the unexcavated area between the Quad and AIB. At-grade ventilation and access infrastructure associated with utility plant has potential to adversely affect character of Quadrangle and Haupt Garden. <b>Potential adverse effect.</b>	In Alternative D, the plant will be located in the sub-basement beneath the Castle. At-grade ventilation and access infrastructure associated with utility plant will adversely affect the character of the Quadrangle, Castle, and Haupt Garden. <b>Adverse effect.</b>	In Alternative F, the plant will be located in the unexcavated area between the Quad and AIB. At-grade ventilation and access infrastructure associated with utility plant has potential to adversely affect character of Quadrangle and Haupt Garden. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Excavation will require structural underpinning.</li> <li>Potential visual effect resulting from at-grade utility plant infrastructure will be minimized by integrating these features into the landscape and building design.</li> </ul>

Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Direct Effects - Within Project Area							
<b>Quadrangle Building</b> Contributing building to:  <b>National Mall</b> HD DC, NR	<b>Quad Museum Pavilions:</b> The pavilions will be reconfigured or replaced with new pavilions. Degree of intervention varies by alternative.	<b>No effect.</b>	No reconfiguration of the museum pavilions is proposed. <b>No effect.</b>	Museum entrances will be reoriented to existing glass infilled openings in the north walls of the museum pavilions. No historic fabric to be removed. <b>No adverse effect.</b>	Museum pavilions will be removed and replaced with new pavilions further to the north. Removal of pavilions will adversely affect the contributing Quad building and alters setting of the Castle and other historic buildings. <b>Adverse effect.</b>	Museum pavilions will be removed and replaced with new pavilions further to the north. Removal of pavilions will adversely affect the contributing Quad building and alters setting of the Castle and other historic buildings. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>In Alternative B, only the removal of glazing infill is required to accommodate new entrances.</li> <li>In Alternatives D and F, relocation of the museum pavilions will allow for greater visibility from the Mall and significant improvement to the quality of the below-grade museum and circulation space.</li> <li>The existing above-grade egress and skylight structures will also be reconfigured in Alternatives D and F.</li> <li>Effects of the contemporary character of the new museum pavilions will be evaluated at time of design.</li> </ul>
	<b>Quad Skylights:</b> In Alternatives D and F, existing skylights will be removed and new skylights will be integrated into the Haupt Garden design to provide interior daylighting for the Quad museums and Visitor Center.	<b>No effect.</b>	No skylight alterations are proposed. <b>No effect.</b>	No skylight alterations are proposed. <b>No effect.</b>	Removal of contributing skylight features and installation of larger skylights will adversely affect the contributing Quad building and alters setting of the Castle and other historic buildings. <b>Adverse effect.</b>	Removal of contributing skylight features and installation of larger skylights will adversely affect the contributing Quad building and alters setting of the Castle and other historic buildings. <b>Adverse effect.</b>	<ul style="list-style-type: none"> <li>In Alternatives D and F, adverse effects will be minimized by integrating these features into the landscape and building design.</li> </ul>
<b>National Mall</b> HD DC, NR	<b>Perimeter Security:</b> Perimeter security elements will be installed around the South Mall Campus.	<b>No effect.</b>	Perimeter security has the potential to adversely affect the character of the Mall, including the relationship of buildings to the surrounding landscapes. <b>Potential adverse effect.</b>	Perimeter security has the potential to adversely affect the character of the Mall, including the relationship of buildings to the surrounding landscapes. <b>Potential adverse effect.</b>	Perimeter security has the potential to adversely affect the character of the Mall, including the relationship of buildings to the surrounding landscapes. <b>Potential adverse effect.</b>	Perimeter security has the potential to adversely affect the character of the Mall, including the relationship of buildings to the surrounding landscapes. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Undertaking is common to all action alternatives.</li> <li>NCPC granted preliminary approval for a Mall-wide building perimeter security for SI museums in 2004. In the Master Plan, adverse effects were avoided by removing alterations to Jefferson Drive and Independence Avenue from all alternatives.</li> <li>Perimeter security elements will be integrated into hardened landscape features to the greatest degree possible.</li> </ul>
<b>Plan of the City of Washington (L'Enfant Plan)</b> DC, NR	<b>All Plan Components:</b> The Master Plan proposes no major alterations to contributing streets and avenues within the project area.	<b>No effect.</b>	<b>No adverse effect.</b>	<b>No adverse effect.</b>	<b>No adverse effect.</b>	<b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Independence Avenue, Twelfth Street, Seventh Street, and Jefferson Drive are contributing elements to the Plan of the City of Washington.</li> <li>Adverse effects were avoided by removing alterations to Jefferson Drive and Independence Avenue from all Alternatives.</li> </ul>
<b>Potential Archaeological Resources</b>	<b>Plan Excavation:</b> Excavation is proposed for new loading, sub-basement, and utility plant facilities. Degree of intervention varies by alternative.	<b>No effect.</b>	No excavation is proposed. <b>No effect.</b>	Areas of excavation have the potential to impact previously undiscovered archaeological resources. <b>Effect to be determined.</b>	Areas of excavation have the potential to impact previously undiscovered archaeological resources. <b>Effect to be determined.</b>	Areas of excavation have the potential to impact previously undiscovered archaeological resources. <b>Effect to be determined.</b>	<ul style="list-style-type: none"> <li>The site has been extensively disturbed and has minimal potential for archaeological resources.</li> <li>Programmatic Agreement will include stipulations for previously undiscovered archaeological resources.</li> </ul>



Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Indirect Effects - Within Area of Potential Effects							
Plan of the City of Washington (L'Enfant Plan) DC, NR	<b>Grade Changes Across Project Area:</b> Existing grades in the Hirshhorn Sculpture Garden and Haupt Garden will be modified to varying degrees across the alternatives.	<b>No effect.</b>	No major above-grade changes are proposed. <b>No adverse effect.</b>	No major above-grade changes are proposed. <b>No adverse effect.</b>	New Quad museum pavilions, sunken Visitor Center entrance, and modified Sculpture Garden will not affect contributing views. <b>No adverse effect.</b>	New Quad museum pavilions and modified Sculpture Garden will not affect contributing views. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>The new Sculpture Garden proposed in Alternatives D and F will remain below grade of Mall.</li> </ul>
National Mall HD DC, NR	<b>Hirshhorn Sculpture Garden Alterations:</b> In Alternatives D-F, portions of the Hirshhorn Sculpture Garden will be raised to create high-ceilinged galleries below.	<b>No effect.</b>	No substantial alterations to the Sculpture Garden are proposed. <b>No adverse effect.</b>	No substantial alterations to the Sculpture Garden are proposed. <b>No adverse effect.</b>	Modifying the Sculpture Garden has the potential to affect the east-west Mall viewshed. <b>Potential adverse effect.</b>	Modifying the Sculpture Garden has the potential to affect the east-west Mall viewshed. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"> <li>Contributing views were identified in the amended National Mall National Register Nomination.</li> <li>The new Sculpture Garden proposed in Alternatives D and F will remain below grade of Mall to minimize the potential adverse effect.</li> <li>Effects will be further evaluated at time of project design, to assess the visibility of the proposed changes.</li> </ul>
National Mall HD DC, NR	<b>Remove Loading Ramp/ Expand Garden:</b> The existing loading ramp will be removed and a new ramp installed adjacent to the Freer Gallery.	<b>No effect.</b>	Existing Quad loading dock would be retained. <b>No effect.</b>	The new loading dock ramp will be only minimally visible from the Mall. <b>No adverse effect.</b>	The new loading dock ramp will be only minimally visible from the Mall. <b>No adverse effect.</b>	The new loading dock ramp will be only minimally visible from the Mall. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Beyond the potential direct effects to the contributing Freer Gallery described above, there will be no adverse effects on the Mall HD.</li> <li>The new loading ramp has no potential to alter the principal, east-west Mall viewshed.</li> </ul>
	<b>Quad Museum Pavilions:</b> The pavilions will be reconfigured or replaced with new pavilions. Degree of intervention varies by alternative.	<b>No effect.</b>	No reconfiguration of the museum pavilions is proposed. <b>No effect.</b>	Only a minor reconfiguration of the museum pavilions is proposed. <b>No adverse effect.</b>	Replacement of these pavilions will not negatively affect contributing historic views within the Mall. <b>No adverse effect.</b>	Replacement of these pavilions will not negatively affect contributing historic views within the Mall. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>Contributing views were identified in the amended National Mall National Register Nomination.</li> </ul>
Washington Monument and Grounds HD DC, NR	<b>Grade Changes Across Project Area:</b> Existing grades in the Hirshhorn Sculpture Garden and Haupt Garden will be modified to varying degrees across the alternatives.	<b>No effect.</b>	No major above-grade changes are proposed. <b>No adverse effect.</b>	Alternative B proposes limited above-ground changes. <b>No adverse effect.</b>	Alternative D proposes grade changes in the Haupt Garden and a higher elevation for the Sculpture Garden. Changes will be minimally visible from the Monument Grounds. <b>No adverse effect.</b>	Alternative F proposes a higher elevation for the Sculpture Garden. Changes will be minimally visible from the Monument Grounds. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>In all action alternatives, the removal of the Ripley Pavilion will restore the viewshed between the Monument and South Yard.</li> <li>In all action alternatives, the loading ramp adjacent to the Freer Gallery will be minimally visible from the Monument Grounds.</li> </ul>
Federal Triangle HD DC, DOE  Pennsylvania Avenue NHS DC, NR	<b>All Plan Components</b>	<b>No effect.</b>	No major above-grade changes are proposed. <b>No adverse effect.</b>	Projects proposed under all alternatives will be minimally visible and have no potential to adversely affect surrounding historic resources. <b>No adverse effect.</b>	Projects proposed under all alternatives will be minimally visible and have no potential to adversely affect surrounding historic resources. <b>No adverse effect.</b>	Projects proposed under all alternatives will be minimally visible and have no potential to adversely affect surrounding historic resources. <b>No adverse effect.</b>	<ul style="list-style-type: none"> <li>A small portion of the APE overlaps with these historic districts, drawn to incorporate the Ninth Street viewshed.</li> </ul>

Resource	Feature/Action	NO ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE D	ALTERNATIVE F	Comments/Additional Information
Indirect Effects - Within Area of Potential Effects							
Individually Designated Historic Properties <i>See APE for complete list</i>	All Plan Components	No effect.	Projects proposed will be minimally visible and have no potential to adversely affect surrounding historic resources. <b>No adverse effect.</b>	Visibility of the proposed alterations under will be determined at the time of the project. <b>Potential adverse effect.</b>	Visibility of the proposed alterations under will be determined at the time of the project. <b>Potential adverse effect.</b>	Visibility of the proposed alterations under will be determined at the time of the project. <b>Potential adverse effect.</b>	<ul style="list-style-type: none"><li>Effects will be further evaluated at time of project design, to assess the visibility of the proposed changes from these locations. There is a limited potential for adverse effects to result.</li></ul>





## Cumulative and Related Effects

NHPA Section 106 implementing regulations require agencies to consider the cumulative effects on their undertakings on historic properties. When assessed individually, some of the above-described actions may have a limited potential to adversely affect historic properties. However, when assessed as connected or interrelated projects, these cumulative effects have the potential to rise to the level of adverse under Section 106. Furthermore, many of these actions, such as restoring the public interior spaces of the Castle, are intended to counter past and reasonably foreseeable future actions and/or events. This narrative includes a discussion of those past and future actions.

In most cases, these cumulative effects are common to all action alternatives. Therefore, they have been organized by historic property, rather than by alternative. This assessment has identified no cumulative effects to properties outside the project area; therefore, they have been excluded from this narrative.

### ***Freer Gallery of Art***

No cumulative adverse effects have been identified on the Freer Gallery.

### ***Smithsonian Institution Building “Castle”***

Under all action alternatives, the degree of change proposed for the Castle has the potential to generate cumulative adverse effects on this property.

Throughout the twentieth century, alterations to the Castle have resulted in a diminished degree of integrity to its significant interior spaces. Circa 1940, several bays on the east and west sides of the Lower Main Hall (Great Hall) were infilled with partition walls, reducing the original length of that space by approximately one-third. The enclosed areas behind these partitions were subsequently modified in 1987 to accommodate restrooms, offices, and a café.

In the Upper Main Hall, the installation of the Woodrow Wilson Center circa 1968 subdivided this room both horizontally and vertically, creating an additional floor and a warren of offices and corridors in the formerly open space. On the basement floor, infill construction—including extensive mechanical equipment, ducts, and pipes—completed throughout the late nineteenth to late twentieth centuries has obscured the historic masonry piers and vaults. Cumulatively, these alterations have diminished the Castle’s integrity of design, feeling, workmanship, and materials, and feeling, resulting in an adverse effect.

In 2011, an earthquake originating in Mineral, Virginia resulted in damage to buildings throughout Washington, including on the Castle’s chimneys and towers, demonstrating the building’s susceptibility to potential future damage. Furthermore, the lack of adequate perimeter security and blast protection for the Castle creates a risk for future potential damage.

The South Mall Campus Master Plan seeks to address the deficiencies in the Castle’s historic character and structural integrity through a coordinated expansion, rehabilitation, and structural and blast upgrade. All action alternatives propose extensive excavation to create a below-grade Visitor Center beneath and adjacent to the Castle basement and to allow for the installation of a base isolation system. The sub-basement expansion will accommodate visitor amenities in addition to mechanical equipment and centralized loading. The relocation of these systems and program elements will allow mechanical equipment and infill construction to be removed from the historic spaces above, allowing for the restoration of the Lower and Upper Main Halls. The basement floor will be lowered throughout, partitions and equipment removed, and the masonry vaults and piers restored.

In all action alternatives, the degree of change proposed for the Castle—including interior restoration and rehabilitation, blast protection, base isolation, seismic bracing, basement expansion, and sub-basement excavation—has the potential to generate cumulative adverse effects on this property, and by association on the National Mall Historic District (to which the Castle is a contributing property). The addition of a Visitor Center ingress or egress and new museum pavilions to the south of the Castle also have the potential to diminish the Castle’s integrity of setting. However, these cumulative adverse effects could be viewed as balanced by the beneficial effects of the Castle interior restoration and structural upgrade, which ensures long-term preservation of the building. The proposed changes also avoid more impactful alterations to the Castle, including a potential above-grade exterior addition.

To minimize or avoid cumulative adverse effects at the time of project implementation, the Castle treatment must be carefully designed and implemented to meet or exceed historic preservation standards for the treatment of historic properties. Implementation of the Castle restoration under the Master Plan will allow SI to better utilize this National Historic Landmark and reallocate interior spaces to public use.

### ***Arts and Industries Building***

No cumulative adverse effects have been identified on AIB.

### ***Hirshhorn Museum and Sculpture Garden***

Under Alternatives D and F, the greater degree of change proposed for the Hirshhorn Museum and Sculpture Garden has the potential to generate cumulative adverse effects on this property. Two major landscape projects in the twentieth century altered the character of the Hirshhorn Plaza and Sculpture Garden. In the Sculpture Garden, a landscape rehabilitation project completed between 1977 and 1981 improved the accessibility and environmental hospitableness of the landscape. Between 1989 and 1993, Smithsonian rehabilitated the Plaza to replace the paving, cover over the original Tunnel entrance, and introduce mostly new plant material. Because both of these projects fell outside the period of significance for this property, the Determination of Eligibility for the Hirshhorn Museum and Sculpture Garden found them to be non-contributing, yet compatible, additions to

the property. Therefore, any alterations to these specific elements do not represent an adverse effect unless they also alter the significant contributing features of the Sculpture Garden.

The additional changes proposed to contributing features of the site—including the removal or alteration of portions of the Plaza walls, alteration of the elevation of the Sculpture Garden to create gallery space below, and reopening and alteration of the Tunnel—have the potential to create cumulative adverse effects on this property, and by association on the National Mall Historic District (to which the Hirshhorn is a contributing property). The adverse effects could be viewed as balanced by the cumulative beneficial effects of restoring the Sculpture Garden perimeter walls and rehabilitating the Hirshhorn Museum building. These effects can be further avoided or minimized by designing and implementing these projects to meet historic preservation standards for the treatment of historic properties.

### ***Quadrangle***

The Quadrangle is a contributing building to the National Mall Historic District. Under Alternatives D and F, the greater degree of change proposed for above-grade Quadrangle Building features and the Haupt Garden has the potential to generate cumulative adverse effects on this property. These related actions include the replacement of the Quadrangle roof membrane, relocation of the existing loading dock, removal of the Ripley Pavilion, removal and replacement of the museum pavilions, replacement of the skylights and egress stair enclosures, potential construction of a new Visitor Center entrance near the Castle, and reconfiguration of the Haupt Garden and its associated features—will create a cumulative adverse effect on this property, and by association on the National Mall Historic District.

Alternative F, which maintains the flat grade of the existing Haupt Garden, represents a lesser cumulative effect than Alternative D, which alters the grade by introducing the Visitor Center “dip” entrance to the garden. In both alternatives, the effects of interior illumination from the museum pavilions and skylights has the potential to contribute to the cumulative adverse effect by altering the character and setting of the Mall and contributing buildings in this location.



***National Mall Historic District***

Under all action alternatives, the greater degree of change proposed for the Haupt Garden, Quadrangle, and Castle has the potential to generate cumulative adverse effects on the historic district, namely the character and setting of the National Mall in this location.

Specifically, this applies to the greater degree of change proposed to contributing buildings within the National Mall and South Mall Campus under Alternatives D and F. These effects will be further assessed at the time of project design. Cumulative effects to individual properties that contribute to the historic district have been described above.

***Plan of the City of Washington***

No cumulative adverse effects have been identified on the Plan of the City of Washington.