



Arlington House, The Robert E. Lee Memorial Rehabilitation Environmental Assessment

August 2016



**US Department of the Interior
National Park Service
George Washington Memorial Parkway**

**Arlington House Rehabilitation
Environmental Assessment**

August 2016

SUMMARY

Arlington House, The Robert E. Lee Memorial (Arlington House), is located within Arlington National Cemetery in Arlington, Virginia, and is administered by the National Park Service (NPS) under the authority of the George Washington Memorial Parkway (the park). It was formally designated by the federal government on June 29, 1955, through Public Law 84-107 to suitably memorialize General Robert E. Lee. Robert E. Lee lived at Arlington House for 30 years with his wife, Mary Custis Lee, before resigning from the US Army in 1861 on the eve of the Civil War. Today, the memorial consists of the Greek Revival mansion, the north and south slave quarter buildings, the Robert E. Lee museum, the flower garden, the kitchen garden, and the 12-acre mature forest known as Arlington Woods.

The National Park Service proposes to preserve and rehabilitate the historic Arlington House mansion, slave quarters, and surrounding grounds. Treatments to the mansion include: stabilization of the foundation; rehabilitation of the portico and entrance; restoration of exterior finishes and hardware; improvement of the climate management and fire suppression system; installation of new electrical, lighting, and security systems; and rehabilitation of the conservatory. Site work outside of the mansion includes: rehabilitation of the west room of the north slave quarters, rehabilitation of the south slave quarters, rehabilitation of the museum building, relocation of the bookstore, and rehabilitation of the historic grounds to improve circulation and accessibility.

This environmental assessment evaluates three alternatives: a no-action alternative (alternative 1), the proposed action (alternative 2) and another action alternative (alternative 3). The action alternatives, including the proposed action, would have very similar impacts on park resources. The action alternatives would result in both adverse and beneficial impacts on historic structures, the cultural landscape, archeological resources, museum collections, and visitor use and experience. These impacts would be associated with construction activities and changes in visual features of the site.

Note to Reviewers and Respondents:

If you wish to comment on this environmental assessment, you may mail comments within 30 days of release of this document to the name and address below or you may post them electronically at <http://parkplanning.nps.gov/ARHOREhab2016>. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so.

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ACRONYMS AND ABBREVIATIONS

Arlington House	Arlington House, The Robert E. Lee Memorial
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DO	Director's Order
EA	Environmental Assessment
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
the park	George Washington Memorial Parkway
USC	US Code

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PURPOSE AND NEED

INTRODUCTION

Arlington House, The Robert E. Lee Memorial (Arlington House), is located within Arlington National Cemetery in Arlington, Virginia, and is administered by the National Park Service (NPS) under the authority of the George Washington Memorial Parkway (the park). The site became part of the national park system in 1933 and was known as the Custis-Lee Mansion, named for former residents George Washington Parke Custis and Robert E. Lee. It was formally designated by the federal government on June 29, 1955, through Public Law 84-107 to suitably memorialize General Robert E. Lee. Robert E. Lee lived at Arlington House for 30 years with his wife, Mary Custis Lee, before resigning from the US Army in 1861 on the eve of the Civil War. Today, the memorial consists of the Greek Revival mansion, the north and south slave quarter buildings, the Robert E. Lee museum, the flower garden, the kitchen garden, and the 12-acre mature forest known as Arlington Woods. The National Park Service proposes to preserve and rehabilitate the historic Arlington House mansion, slave quarters, and surrounding grounds.

This environmental assessment (EA) describes the no-action alternative (alternative 1), the proposed action (alternative 2), and one other action alternative (alternative 3), and analyzes the potential impacts these alternatives would have on the natural, cultural, and human environment. This environmental assessment has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended [42 United States Code (USC) 4332(2) (C)]; the implementing regulations of the Council on Environmental Quality (CEQ) [40 Code of Federal Regulations (CFR) 1500-1508.9]; the Department of the Interior NEPA regulations (43 CFR Part 46); and NPS Director's Order (DO) 12: *Conservation Planning, Environmental Impact Analysis and Decision-making* (DO-12) (NPS 2011) and the accompanying DO-12 Handbook (NPS 2015).

Compliance with section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR Part 800) is being completed separately from and concurrently with the NEPA process, and is not included in this environmental assessment. Applicable cultural resource information, including potential impacts associated with the proposed alternatives, is documented in this environmental assessment, but does not constitute section 106 compliance.

PURPOSE OF AND NEED FOR ACTION

PURPOSE

The purpose of this project is to expand upon preservation and rehabilitation efforts to the Arlington House mansion and its surrounding grounds in order to protect and maintain the historic integrity of the site, while expanding and improving visitor orientation, wayfinding, and interpretation, and improving universal access throughout the mansion and grounds. It would also move the bookstore out of the north slave quarters; and upgrade the climate, fire, and security systems. This project is an expansion of the preservation and rehabilitation project that was undertaken in 2009-2011, which is described in the *Rehabilitation of Arlington House, Outbuildings & Grounds Environmental Assessment* (NPS 2006b).

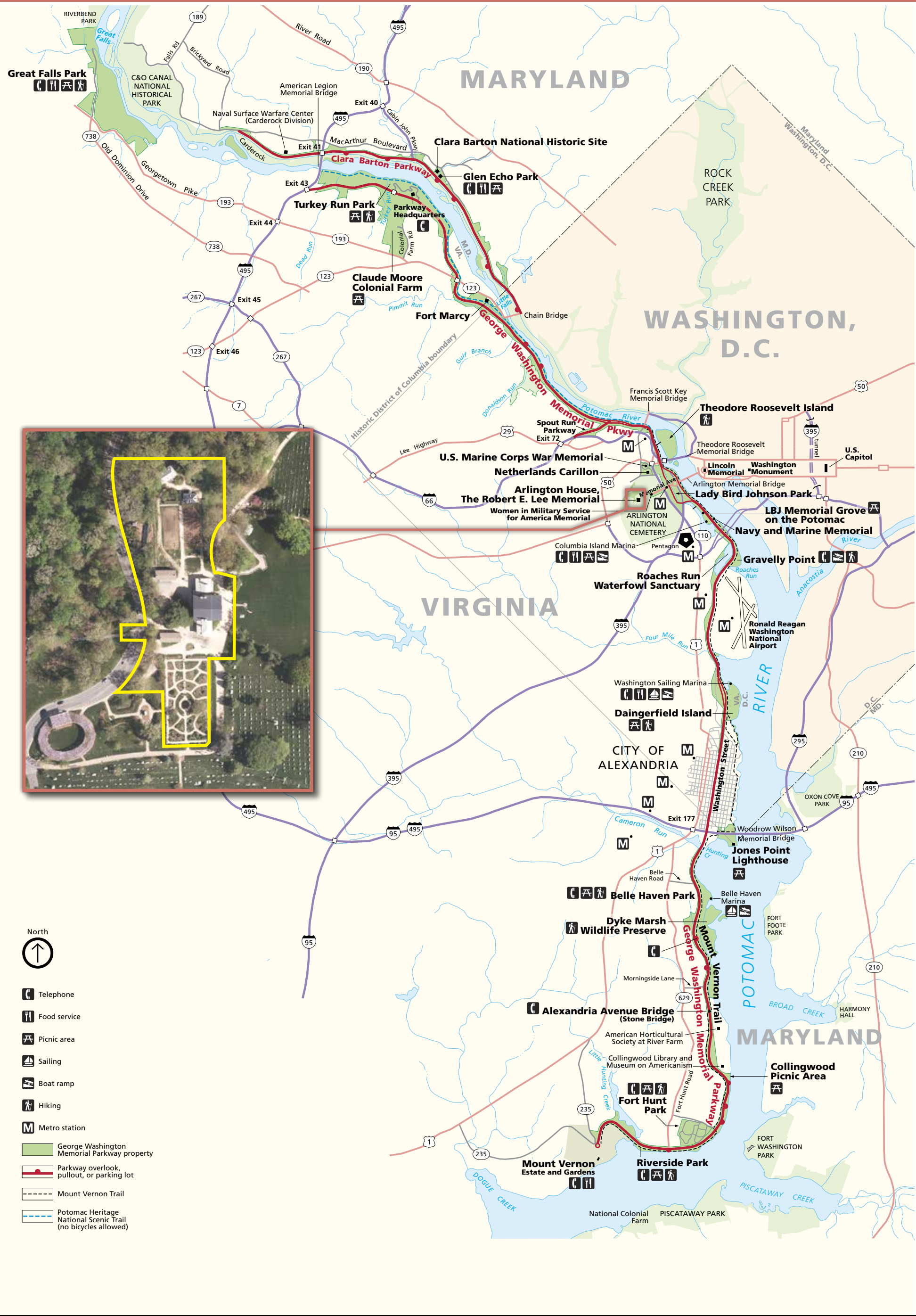
NEED

Action is needed to continue the preservation and rehabilitation efforts because of several issues related to the physical condition and visitor experience of the site, which include the following:

- § The mansion's exterior and foundation are weathered and deteriorating in some areas, including the front portico.
- § Paint, finishes, and hardware in some areas of the mansion interior are deteriorating or are in poor condition.
- § Universal access throughout the grounds is currently lacking due to existing grading and surface treatments. Additionally, universal access into the mansion interior is limited to the use of a metal ramp up to the front portico followed by a wood ramp through the non-historic vestibule through the front door.
- § Areas of the grounds experience some soil erosion and ponding of water after rain events.
- § The south slave quarters' exterior stucco, wood trim, and interior rooms are in poor condition.
- § The site's bookstore is located within the west room of the north slave quarters. The bookstore prevents the room from being rehabilitated to period appearance and into an interpretive space for visitors.
- § Site arrival, orientation, and flow is unsystematic and requires better organization.
- § Wayfinding and interpretive information is insufficient.
- § The existing climate management, security, fire suppression, and electrical systems are in need of upgrades.
- § The Arlington Woods to the west of the site is not currently interpreted clearly to reflect its significance.

PROJECT LOCATION AND DESCRIPTION

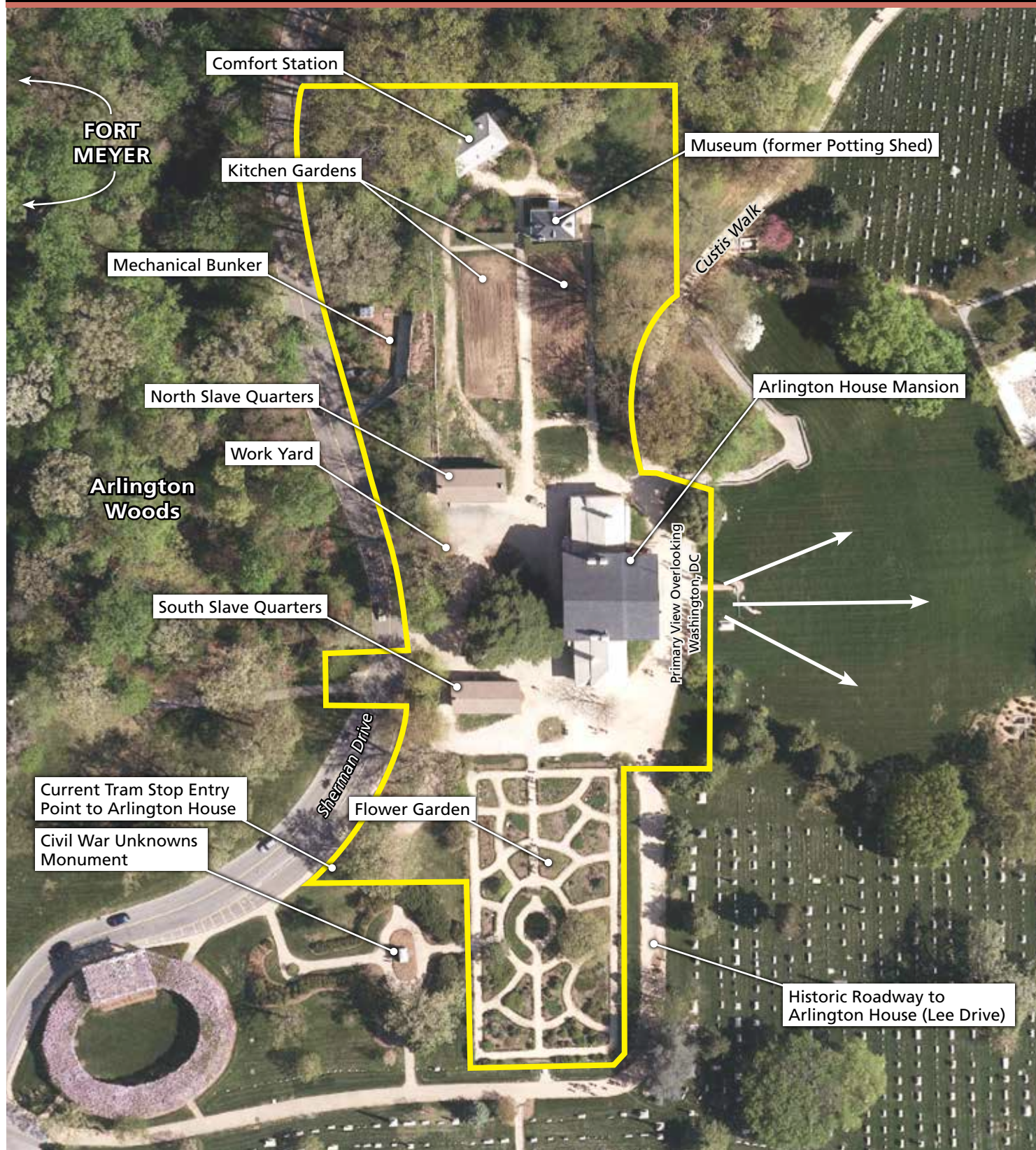
The George Washington Memorial Parkway occupies more than 7,300 acres of land in Virginia, Maryland, and the District of Columbia, and extends 38.3 miles along the Potomac River (figure 1). As shown on figure 2, the project area includes approximately 4 acres of the remaining Arlington House estate within George Washington Memorial Parkway, bordered on the north, south, and east by Arlington National Cemetery and on the north and west by Arlington Woods, a roughly 12-acre mixed hardwood forest on the Arlington House property. The project area encompasses the Arlington House mansion, north and south slave quarters, flower garden, kitchen garden, museum (former potting shed), and comfort station.



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FIGURE 1
Project Vicinity Map

Source: NPS GIS Data



Project Boundary

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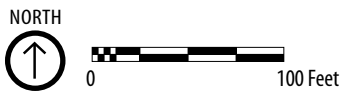


FIGURE 2
Project Area

PROJECT BACKGROUND

PURPOSE AND SIGNIFICANCE OF ARLINGTON HOUSE, THE ROBERT E. LEE MEMORIAL

George Washington Parke Custis, the step-grandson of George Washington, inherited the 1,110-acre tract of land that would become Arlington House from the estate of his deceased natural father, John Parke Custis. John Parke Custis was the only son of Martha Dandridge Custis Washington's first marriage to survive to adulthood and have children. Arlington House was constructed in three phases between 1802 and 1818 by Custis. Custis built the estate as a family home, but also as a memorial to George Washington and a place to exhibit his collection of family heirlooms associated with the first president, known as the "Washington Treasury." In 1831, Mary Anna Randolph Custis, the daughter of George Washington Parke Custis, married Robert E. Lee, and Arlington House became the family's primary residency for 30 years until Lee's resignation from the US Army in 1861. Lee assumed command of Virginia's military forces in the Civil War and the Arlington House property was seized by the US Army and was used as a headquarters throughout the Civil War. In May 1864, the US Army started burying soldiers along the northern border of the Arlington estate and by June of that year, the creation of the national cemetery was approved. The War Department transferred Arlington House to the National Park Service in 1933, and Congress designated the site as a memorial to Robert E. Lee in 1955 (Public Law 84-107, 69 Stat. 190) with the purpose of honoring "Robert E. Lee by recognizing his life, family, and accomplishments through the preservation, restoration, and interpretation of the historic home, furnishings, outbuildings, and grounds" (NPS 2014a).

Today, the historic grounds of the property encompass Arlington House mansion, the north and south slave quarters, the former potting shed (museum building), the flower garden, and the kitchen garden. The former potting shed, built in the 1880s by the US Army as a part of a larger greenhouse complex, is within the northern extent of the kitchen garden, and currently is used as a museum. The complete museum collections comprise more than 41,000 artifacts, including original artifacts associated with George and Martha Washington and one of the largest collections associated with Robert E. Lee in the United States. The mature forest behind Arlington House, known as Arlington Woods, has remained uncut since before George Washington Parke Custis established the estate in 1802, providing a living link and backdrop to this historic landscape. The period of significance for Arlington House is 1802-1935, comprising the Custis and Lee residencies, occupation by the US Army during the Civil War, the establishment of the national cemetery, and the first professional restoration of the house and grounds (NPS 2014b). Two buildings constructed during the 2009-2011 rehabilitation campaign are located within the project area, but are not considered contributing resources to the site's significance. These are a comfort station located north of the kitchen garden near the northern property boundary and a mechanical bunker located just west of the kitchen garden next to Sherman Drive.

PREVIOUS AND RELATED PLANNING STUDIES

Previous and related planning studies have been completed for the park and Arlington House, The Robert E. Lee Memorial. These plans were reviewed to provide additional information and guidance for the alternatives. These documents are summarized below.

Arlington House, The Robert E. Lee Memorial Cultural Landscape Report, History, Vol. I (NPS 2001). The cultural landscape report for Arlington House traces the development of the site's

landscape and details the physical changes that occurred throughout its occupancy. The document provides information on the historic topography, circulation, vegetation, views, vistas, and scale of the cultural landscape, including how it changed through construction of the mansion in the early 19th century, the Custis and Lee residencies, the US Army occupation during the Civil War, the development of the surrounding cemetery, and eventually through rehabilitation and restoration campaigns by the War Department and National Park Service in the 20th century. The information in this report informed some of the landscape rehabilitation actions, particularly the historic planting palette, proposed in this environmental assessment.

Rehabilitation of Arlington House, Outbuildings & Grounds Environmental Assessment (NPS 2006). The 2006 environmental assessment provided NEPA compliance for the rehabilitation of Arlington House, including the mansion, slave quarters, grounds, and kitchen garden. The 2006 environmental assessment included the restoration of historic finishes, rehabilitation of the mansion and slave quarters interiors for visitor interpretation, rehabilitation of the kitchen garden, the construction of a mechanical bunker and accessible comfort station, and the installation of modern climate control and fire suppression systems. This 2016 environmental assessment continues and builds upon the preservation and rehabilitation of the mansion, slave quarters, and grounds that was called for in the 2006 environmental assessment. Preservation and rehabilitation activities that were completed are considered in this 2016 environmental assessment as cumulative actions. A few items that were proposed under the 2006 environmental assessment were not completed during the resulting 2009-2011 rehabilitation campaign and are included within the scope of the currently proposed rehabilitation. These actions are the stabilization of the foundation, rehabilitation and preservation of the south slave quarters, and rehabilitation of the kitchen garden with historical plantings including fruit trees. Because the proposed improvements may be slightly more specific than previously discussed, their impacts are disclosed in this 2016 environmental assessment.

Arlington House, The Robert E. Lee Memorial South Dependency Historic Structures Report (NPS 2009a). The historic structures report for the south slave quarters reports the information, analysis, and conclusion resulting from investigation of the historic structure. The document also proposed an appropriate restoration program to enable the National Park Service to better interpret the building, its occupants, and its functions during the period of significance. This historic structure report provided background information on the project area and the south slave quarters, which informed some of the rehabilitation efforts proposed in this environmental assessment.

Foundation Document for George Washington Memorial Parkway (NPS 2014a). The foundation document for the park provides basic guidance for planning and management decisions. It also identifies the purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes for the Arlington House site. The foundation document informed many elements of this environmental assessment, including the purpose and need, planning issues, alternatives, and impact analysis methodologies.

PLANNING ISSUES RETAINED FOR DETAILED ANALYSIS

During the internal and public scoping process an internal scoping meeting, public scoping meeting, and open public comment period were held to gather information to guide the planning process. See chapter 4, “Consultation and Coordination” for additional details. During this time, specific considerations and concerns were identified as critical to this project. Along with the purpose and need for the proposed action, these issues guided the development of alternatives and contributed to

the selection of impact topics, as identified within each issue description. Impact topics, simply defined, are the resources that could be affected by the actions proposed under the alternatives in this environmental assessment.

Arlington House and grounds are prominent historic resources important to American history. Preserving the historic integrity of Arlington House and its dependencies is a top priority for all rehabilitation and preservation work. Rehabilitation and preservation efforts could result in changes to the historic integrity and character. Any work to the exterior, interior, or grounds must be done with respect to the historic fabric and character. Additionally, many features of the grounds contribute to the historic setting and integrity and include the following: the layout of the buildings, the location of the flower and kitchen gardens, the vicinity of Arlington Woods, the views within the site itself, and the vista east overlooking Washington, DC. The proposed action would include regrading of the work yard and gardens, replacement of period appropriate non-invasive plantings, addition of a new bookstore, and installation of wayfinding and orientation signs. All of these actions have the potential to impact the project area's historic setting, views, and vistas. Relevant laws, policies, and plans including the National Historic Preservation Act of 1966, Executive Order 115693, "Protection and Enhancement of the Cultural Environment," Director's Order 28: *Cultural Resource Management Guidelines*, and the *Secretary of the Interior's Standards for the Treatment of Historic Properties* will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed in detail under "Historic Structures," "Cultural Landscape," "Archeological Resources," and "Visitor Use and Experience" within the "Affected Environment and Environmental Consequences" chapter of the environmental assessment.

Arlington Woods is an important natural resource and known sensitive archeological site. The mature forest, Arlington Woods, located to the west of Arlington House has remained uncut since before George Washington Parke Custis established the estate in 1802, and several trees in the forest are approximately 250 years old. This is an important natural resource that should be preserved, and the proposed interpretive wayside exhibit in the area should avoid impacts to the resource where possible. Additionally, archeological surveys completed for the 1999 *Proposed Transfer of Land (Section 29 at Arlington House, The Robert E. Lee Memorial) from George Washington Memorial Parkway to Arlington National Cemetery Environmental Assessment* identified the forest as a sensitive archeological site, with both prehistoric and historic artifacts discovered. Relevant laws, policies, and plans including NPS *Management Policies 2006*, Endangered Species Act of 1973, National Historic Preservation Act of 1966 and Executive Order 115693, "Protection and Enhancement of the Cultural Environment" will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed in detail under "Archeological Resources" and "Cultural Landscape" within the "Affected Environment and Environmental Consequences" chapter of the environmental assessment.

The project area is located within a national military cemetery. The project area is surrounded by Arlington National Cemetery, a military cemetery of national significance. Because of this location, any actions undertaken in the project area could have direct and indirect impacts on visitors to and funerals taking place in the cemetery. All actions should be sensitive to the reverent atmosphere surrounding the project area and ensure there are no adverse impacts on cemetery visitors, funerals, or the nearby grave sites, some of which are situated at the boundary of the Arlington House property. Relevant laws, policies, and plans including the National Historic Preservation Act of 1966 and Executive Order 115693, "Protection and Enhancement of the Cultural Environment" will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed in detail under "Cultural Landscape" and "Visitor Use and Experience" within the "Affected Environment and Environmental Consequences" chapter of the environmental assessment.

Universal accessibility is currently limited. There is currently only one universally accessible entrance to/exit from the mansion, which is via a temporary ramp at the front entrance. The limited universal access throughout the site is an issue for visitors with limited mobility and those using wheelchairs. Regrading in and around the work yard is needed for improved universal accessibility on the grounds. It is important to make the project area more accessible while maintaining the historic character of the resources. Relevant laws, policies, and plans including the Americans with Disabilities and Architectural Barriers Act Guidelines, as well as local disability rights laws will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed in detail under “Historic Structures,” “Cultural Landscape,” and “Visitor Use and Experience” within the “Affected Environment and Environmental Consequences” chapter of the environmental assessment.

Overall wayfinding, orientation, and interpretation throughout the site is lacking. Visitors currently enter the project area from several entry points, none of which offer a sense of arrival, formal orientation, or wayfinding to guide circulation. The National Park Service has the opportunity to improve the visitor experience by improving orientation, wayfinding, and interpretive waysides throughout the grounds in a way that conveys historic context and significance in an organized manner. Relevant laws, policies, and plans including NPS *Management Policies 2006* will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed under “Cultural Landscape,” “Archeology,” and “Visitor Use and Experience” within the “Affected Environment and Environmental Consequences” chapter of the environmental assessment.

Museum artifacts will have to be protected and removed from the mansion and slave quarters during rehabilitation efforts. The Arlington House museum collections comprise over 41,000 artifacts, including original artifacts associated with George and Martha Washington and one of the largest collections associated with Robert E. Lee in the United States. The proposed rehabilitation of Arlington House, its outbuildings, and grounds would necessitate the removal, transportation, and safe storage of some of the park’s museum collection that are currently housed in the mansion, slave quarters, and museum building which could put the artifacts at risk of damage. Relevant laws, policies, and plans including NPS *Management Policies 2006* and Director’s Order 24: *Museum Collections Management* will inform the discussion of this issue. This task will require trained staff and contractors to handle and move the collections. Potential impacts of the alternatives will be analyzed under “Museum Collections” within the “Affected Environment and Environmental Consequences” chapter of the environmental assessment.

Rehabilitation efforts would require parts of the project area to be temporarily closed to visitors. Because activities proposed would close down portions of Arlington House mansion and slave quarters, visitor access would be limited temporarily. These temporary closures could impact the visitor experience for those who cannot visit certain areas of the site. Additionally, visitors may not be able to view certain museum objects during the time they are removed for construction activities. Relevant laws, policies, and plans including NPS *Management Policies 2006* will inform the discussion of this issue. Potential impacts of the alternatives will be analyzed under “Visitor Use and Experience” within the “Affected Environment and Environmental Consequences” chapter of the environmental assessment.

PLANNING ISSUES DISMISSED FROM FURTHER ANALYSIS

The following presents an overview of impact topics that were considered but ultimately dismissed from further analysis in this environmental assessment. An impact topic was initially considered but dismissed from further analysis if it was determined that the resource is not present in the study area or because any potential impacts would be less than minor, typically temporary, and localized. The regulatory and non-regulatory context and baseline conditions relevant to each impact topic also were analyzed in the process of determining if a topic should be retained or dismissed from further analysis. The impact topics that have been considered but dismissed from further analysis are discussed below along with the reasons for dismissal.

SOILS

Soils were considered as an impact topic during project scoping due to the proposed regrading of the grounds and gardens. However, the project area has seen several regrading campaigns over its life, and as such, the soils have been heavily disturbed. Additionally, the changes in grade are analyzed more appropriately under the impact topic of cultural landscape. The issue of concern is how the changes in grade would relate to and possibly change the historic appearance of and circulation through the site. Therefore, the impact topic of soils was considered, but dismissed from further analysis.

VEGETATION

The impact topic of vegetation was initially considered during project scoping because changes in vegetation throughout the project area were proposed. This included the addition of historically-appropriate plantings, fruit trees, and canopy trees, as well as some vegetation clearing for the addition of the bookstore. However, vegetation would consist of clearing grass, shrubs, and small trees in very limited areas, none of which represent unique vegetation or serve a critical role in the local ecosystem. Removal of canopy trees would be avoided, if possible. The addition of vegetation throughout the landscape would not include invasive species and would be based on recommendations of the cultural landscape report. The proposed changes in vegetation are analyzed under the impact topic of cultural landscape because the issue of concern is how the vegetation removal and new plantings would relate to and possibly change the historic appearance, views, and vistas. Therefore, the impact topic of vegetation was considered, but dismissed from further analysis.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental impacts of their programs and policies on minorities and low income populations and communities. According to the Environmental Protection Agency, environmental justice is the "...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."

The goal of “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse impacts and identify alternatives that may mitigate these impacts. Environmental justice was considered but dismissed from further analysis for the following reasons:

- § The park staff and planning team solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- § Implementation of the proposed action would not result in any identifiable adverse human health impacts. Therefore, there would be no direct or indirect adverse impacts on any minority or low-income population.
- § The impacts associated with implementation of the proposed action would not disproportionately affect any minority or low-income population or community.
- § Implementation of the proposed action would not result in any identified impacts that would be specific to any minority or low-income community.

INDIAN TRUST RESOURCES

Secretarial Order 3175 requires that any anticipated impacts on Indian Trust resources from a proposed project or action by US Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to Native American tribes. There are no known Indian Trust resources in the project area, and the lands comprising the park are not held in trust by the secretary of the interior for the benefit of Indians due to their status as Indians. Therefore, the impact topic of Indian Trust resources was considered, but dismissed from further analysis.

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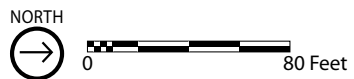
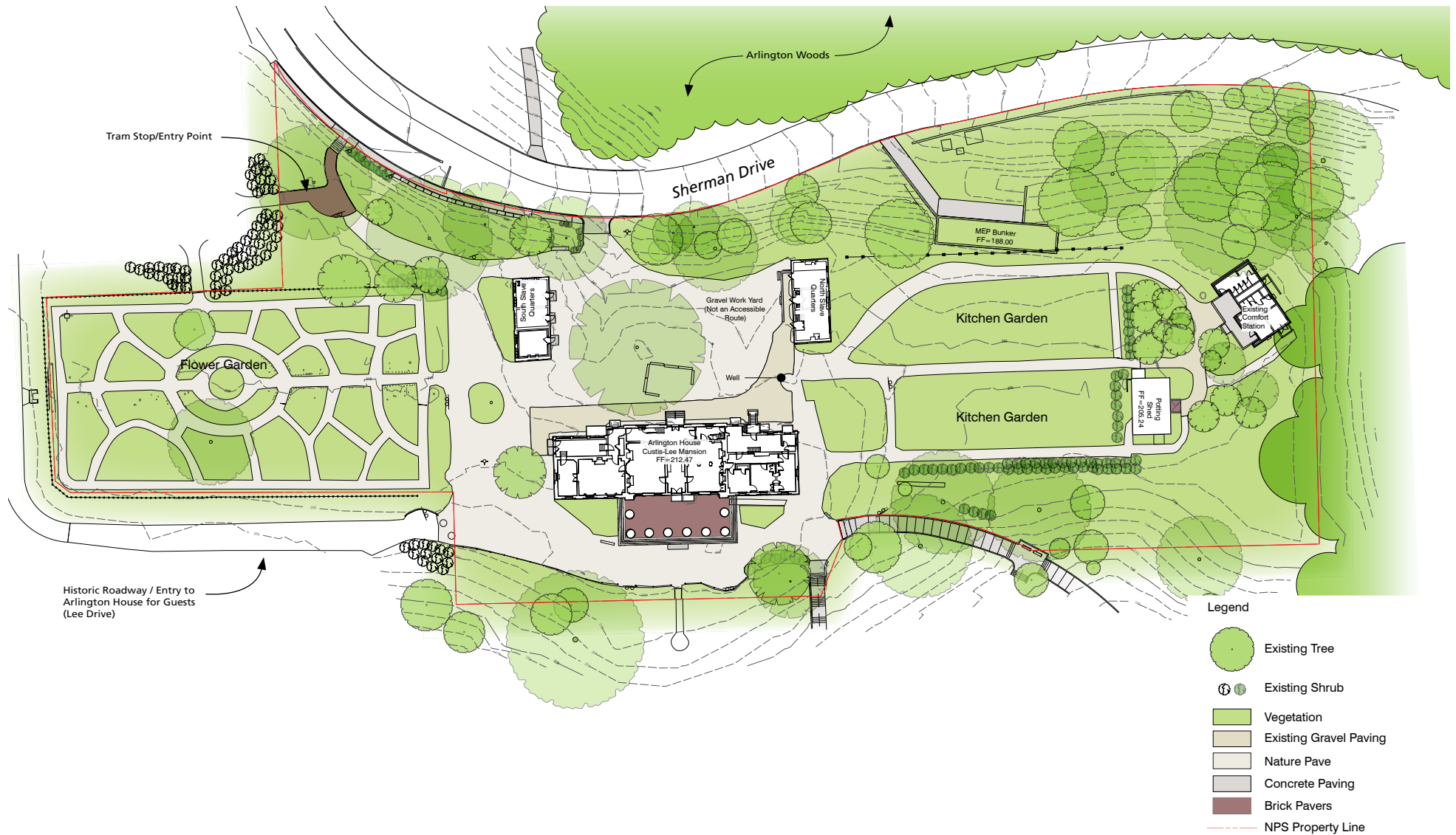
ALTERNATIVES

This environmental assessment documents the analysis of environmental consequences of three alternatives, including the no-action alternative. The no-action alternative serves as the baseline by which to compare all other alternatives. The elements of these alternatives are described in detail in this chapter. Impacts associated with the actions proposed under each alternative are outlined in the “Affected Environment and Environmental Consequences” chapter of this environmental assessment.

ALTERNATIVE 1: NO ACTION

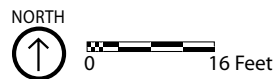
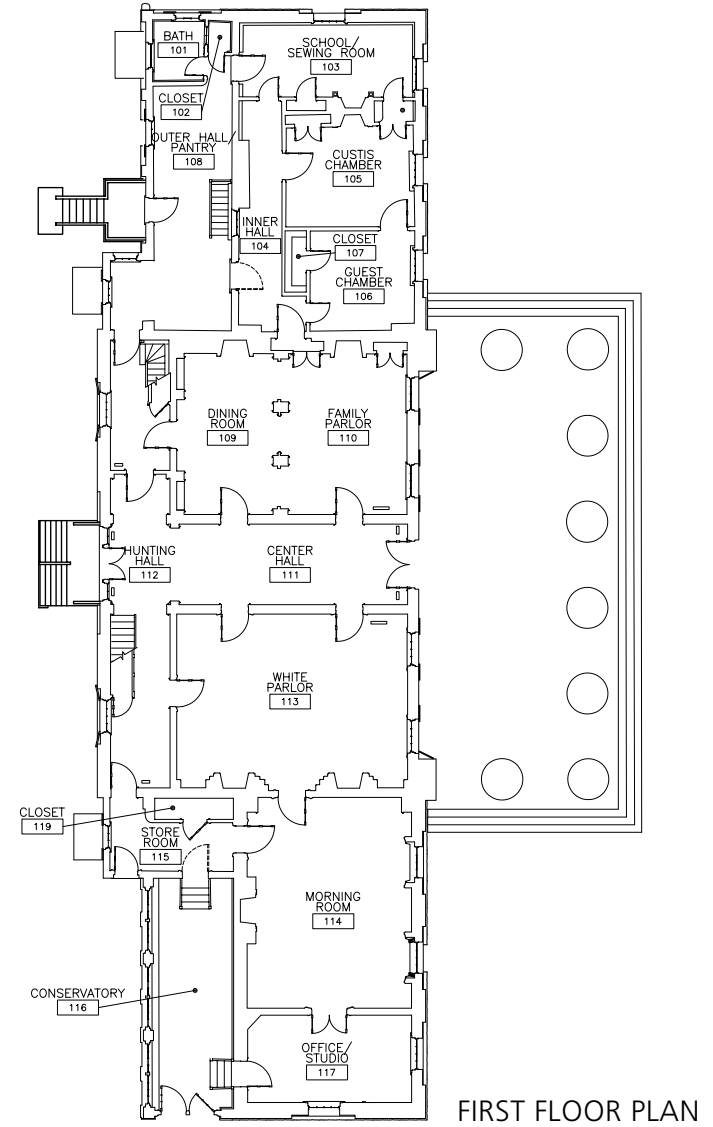
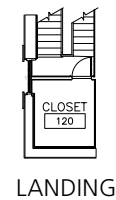
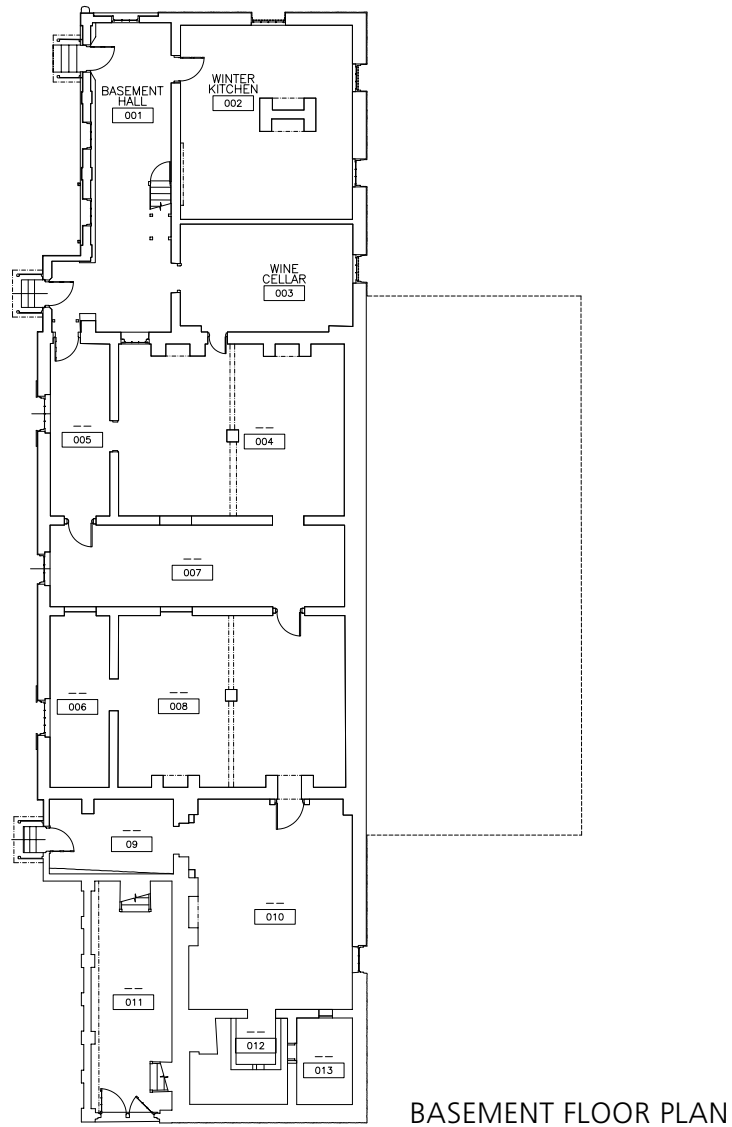
Under the no-action alternative, current management practices of the project area would continue and the National Park Service would continue to maintain the structures and grounds as needed, in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties*. The layout of the site would remain in its current configuration, as shown on figure 3. Existing floor plans of the mansion and slave quarters are provided on figures 4-6 for reference.

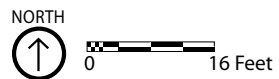
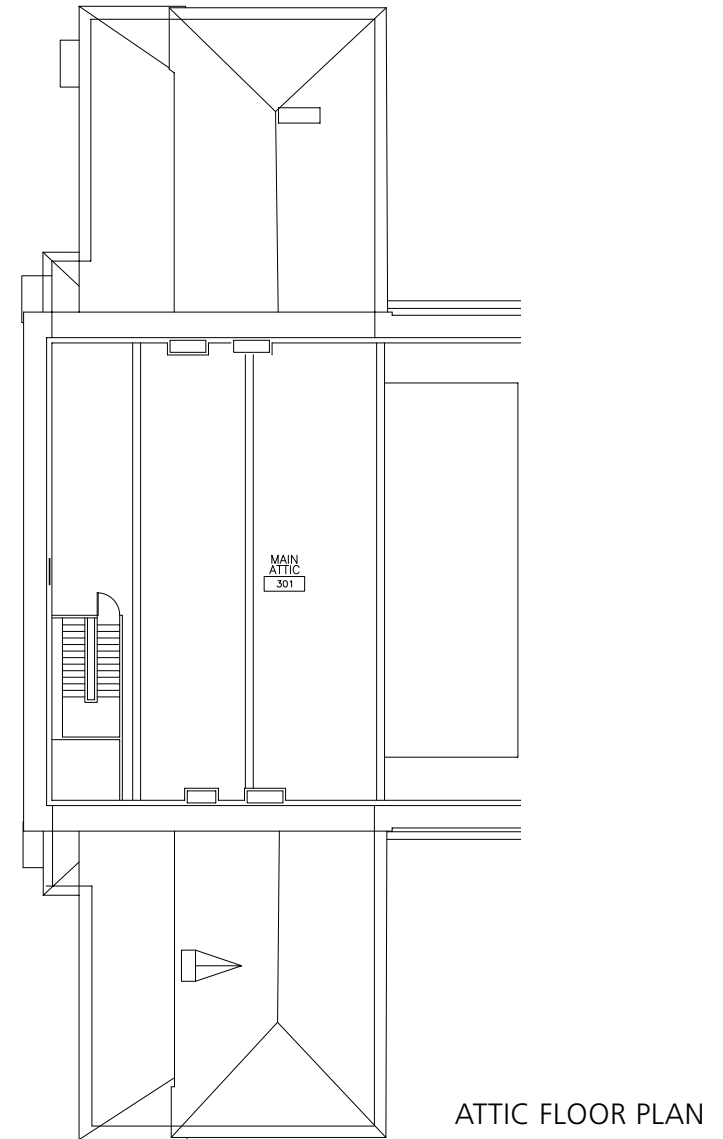
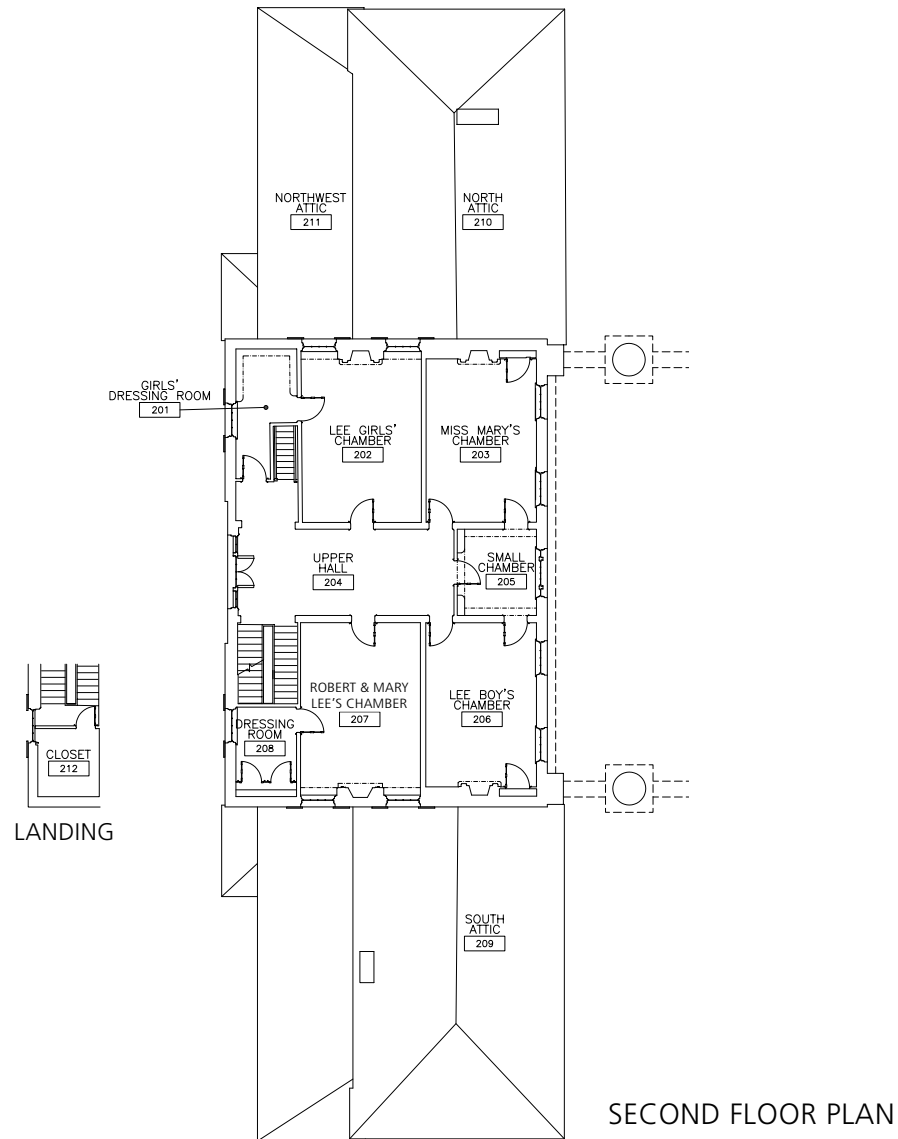
Under the no-action alternative, visitors would continue to access the site from various entry points and continue to circulate through the site with little orientation and wayfinding. Emergency and maintenance vehicle access from Sherman Drive into the site would be maintained through the existing entrance into the work yard. Universal access to the mansion would continue to be limited to the temporary ramps up to the portico and through the vestibule at the front door of the building. The grounds would continue to be at existing grades and consisting of the existing gravel surfaces, limiting universal accessibility throughout the entire site. Drainage would continue to be insufficient, and some ponding of storm water would continue to occur. The exterior foundation, paint, and finishes of the mansion and slave quarters would remain in their weathered and worn state. The interior floors, plaster, and paint of the mansion would remain in their worn and sometimes deteriorated conditions. The south slave quarters would be maintained in its existing condition, which does not accurately reflect its appearance during its period of significance. The site’s bookstore would remain in the north slave quarters, limiting the National Park Service’s ability to interpret that space for visitors. The existing climate control system, fire suppression system, and utilities would continue to have operational deficiencies such as pressure loss in the fire suppression system and unfounded alarms triggered by the security system. Despite the constraints associated with inadequate systems, under the no-action alternative, the National Park Service would continue to strive to protect resources to the extent possible under existing policy requirements and guidelines.



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FIGURE 3
Existing Site Plan



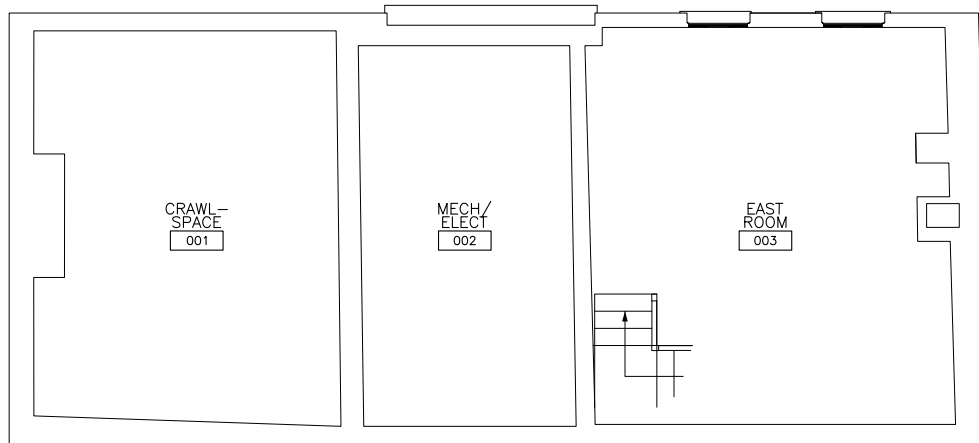


Arlington House, The Robert E. Lee Memorial Rehabilitation
Environmental Assessment

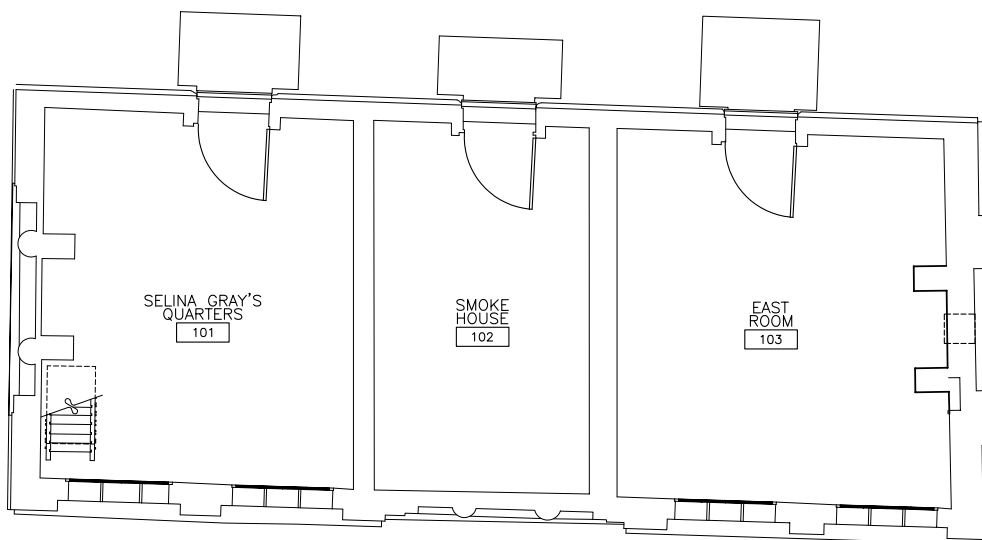
FIGURE 5
Mansion Floor Plan: Second Floor and Attic



NORTH SLAVE QUARTERS
FIRST FLOOR PLAN



NORTH SLAVE QUARTERS
LOWER LEVEL FLOOR PLAN



SOUTH SLAVE QUARTERS
FIRST FLOOR PLAN

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

Several actions would take place under all action alternatives, including improved circulation and universal accessibility throughout the grounds, rehabilitated non-invasive plantings in the gardens and grounds, restoration of the mansion's exterior and interior finishes, and rehabilitation of certain rooms in the north and south slave quarters for interpretation. These elements, as described below, would be common to all action alternatives. However, because the details of these elements were developed in conjunction with the proposed action (alternative 2) they are shown in the figures under alternative 2. Please note that the figures reflect ongoing design development and may show more detail than is described in the text. Specifics such as location, materials, color, and size of design elements are subject to change during further refinement.

GROUND AND CIRCULATION

Under all action alternatives, improvements to pedestrian routes throughout the project area would be undertaken for universal accessibility. At the work yard, a universally accessible path would be created around the perimeter that connects the north and south slave quarters and the mansion. This path would be at least 15 feet wide, at no more than 2 percent grade, and hardened with a porous material. The central area of the work yard would remain mostly at its current grade, with the existing gravel retained. Some minor filling would occur to control erosion and a vegetated edge would be installed on the western edge of the work yard above the slope to Sherman Drive. The paths through the kitchen garden to the existing museum and comfort station would be regraded to approximately 1 percent grade for proper drainage and accessibility and would be treated with a hardened surface. The path around the garden perimeter would be approximately 4 feet wide, and the path through the center would be approximately 6 feet wide. At the east, north, and south side of the mansion, the existing paths would be treated with a hardened surface. Along the eastern boundary of the project area, a new chain and post fence would replace the existing fence above the eastern slope. Some fire hydrants located around the site would need to be relocated due to the proposed improvements. For example, the fire hydrant that currently sits on the pathway between the flower garden and mansion would be relocated out of the path, closer to the flower garden. Specific locations would be determined during a later design phase.

Other improvements to the project area's grounds would include improved interpretation and wayfinding. While various visitor entry points would remain, new entrance signs would guide visitors to a focused orientation point between the south slave quarters, the flower garden, and the south wing of the mansion. This would include a map and interpretive information to provide visitors background and historic context of the site. Two interpretive tables and one tactile map would be located in the rear yard to the north of the flower garden area. New wayside exhibits would be installed throughout the project area, including near the south slave quarters, near the well next to the north slave quarters, near the south wing of the mansion, and along the path that passes Arlington Woods. The new exhibit near Arlington Woods would replace the existing wayside exhibit and include a paved area of approximately 100 to 150 square feet with benches and interpretive signs. A very small amount of fill would be required to regrade the lawn to the edge of the pavement. This fill would be brought in from offsite and the grass would be revegetated after disturbance. A crosswalk across Sherman Drive and a curb cut in the sidewalk would be created for pedestrian safety and universal accessibility to the path. Where applicable, the National Park Service would coordinate with Arlington National Cemetery to implement these improvements.

The planting and garden areas within the project area would be rehabilitated to include the addition of new plantings that are compatible with the historic planting palette, based on information provided in the 2001 cultural landscape report (NPS 2001). Specifically, the kitchen garden would be rehabilitated with historical plantings in the beds and a row of fruit trees along either side of the center path through the garden where fruit trees once existed. This row of fruit trees was originally analyzed as part of the 2006 rehabilitation environmental assessment but was not implemented. A wood fence with rail that matches the existing fence would be added along the south side of the kitchen garden, connecting to the existing fence on the west side and meeting the row of hedges on the east side. This wooden fence would reflect the 1861 appearance of the kitchen garden, which was once surrounded by a post and rail fence (NPS 2001a). A few new hedges of the same type as the existing hedges would be planted where the rows are incomplete along the north side of the kitchen garden. A gate would allow visitor passage into the garden. At the flower garden, steel edging would be installed along the paths and a railing picket fence would replace the existing fence around the east, south, and north sides of the garden. Several canopy and flowering trees would be planted along the buffer from Sherman Drive and in the lawn panels between the flower garden, the south slave quarters, and the south side of the mansion. The locations of these trees would be based on approximate tree locations shown on the historic site plans presented in the cultural landscape report (NPS 2001). No invasive species would be planted, and native species would be used over exotic species when available and appropriate. Please refer to the figures under alternative 2 for proposed locations of these elements.

Drainage of the project area would be improved through several actions, including regrading of the kitchen garden, as mentioned above. These improvements would also include curbing along the western edge of the project area between the north slave quarters and the existing work yard access drive where water would be redirected into the existing drainage features along Sherman Drive. Along the proposed hardened, pervious surface paths, underdrains for stormwater management may be required, pending soil testing. If required, all underdrains would be tied into the existing drainage system and would be located under the proposed paths except where the final connections to the existing system are required. Existing drainage structure grates and manhole cover rims would be raised or lowered as needed to meet the proposed grades. All stormwater management improvements would be subject to archeological clearance.

MANSION

Exterior

On the exterior of the mansion, preservation and rehabilitation efforts would be focused on the historic materials and fabric. The location and quantity of all window shutters, exterior wood doors, exterior windows, and their related hardware would be cataloged. All shutters, doors, windows, and hardware would then be removed, restored, repaired, refinished, and reinstalled in their prior locations after restoration work is complete. Replica components such as doors, shutters, hardware, and wood frames would be created and installed in locations where they are missing. Perimeter weather stripping would be installed at doors and windows as needed. The existing stucco on the east, north, and south elevations would be patched, scored, and refinished to match the existing faux marble finish. The existing stucco finish on the chimneys would be patched, primed, and repainted.

On the western exterior, which faces the work yard and slave quarters, the existing stucco finish would be patched, scored, primed, and painted. Wood panels below the windows would be restored and refinished as necessary. The wood siding and crown molding of the pediment would be stripped

of loose paint, primed, and repainted. Replicas of period stairs, wood landings, and hand rails would be constructed in three locations on the west side of the mansion, where they historically existed: at the north entry into the outer hall/pantry, at the center entry into the hunting hall, and at the south entry into the store room.

On the eastern exterior, which overlooks Washington, DC and includes the front portico, the existing faux marble finish on the columns, capitals, and entablature would be restored. The wood siding and crown molding of the pediment would be stripped of loose paint, primed, and repainted.

Interior

In the mansion's interior, preservation and rehabilitation efforts would be focused on the historic materials and fabric. All painted surfaces would be repaired, patched, touched up, and repainted as needed to match the existing paint. All damaged plaster would be patched, repaired, and refinished as needed. All windows would be repaired and refinished and weather stripping would be installed as needed. All interior doors would be restored and refinished. All fireboxes would be cleaned and repointed as necessary and all fireplace mantels would be restored. Transparent, non-reflective glass barriers would be installed within exhibited rooms on the first and second floors to protect the historic objects while providing visitors with ample space to enter, view, and turn around to exit. Specific locations and design of these barriers would be determined during a later design phase and would be fully reversible.

In the basement of the mansion, the existing exterior wood doors would be restored and refinished. Perimeter weather stripping would be installed where needed. In the basement hall, the rotted door jamb would be replaced in-kind. The foundation of the mansion would be stabilized as needed through reconstruction of selected areas of failing brick and improved waterproofing of the foundation wall. This would include replacing deteriorated bricks with reclaimed bricks that match the properties of the historical bricks as closely as possible and replacing areas of modern cement-based mortar that was used in past preservation work with a more historically compatible mortar. In the central basement room, additional shoring would be added to support the deteriorated and notched floor joists above.

On the first floor of the mansion, damaged plaster in both the northeast corner of the morning room and the northeast corner of the school/sewing room would be repaired, refinished, and repainted to match the adjacent walls. Clear protective covers would be installed over the historic graffiti and finishes that have been previously uncovered on several walls throughout the first floor. The historic signature on a glass pane on the southern window of the white parlor would be protected. In the north wing, the existing moving wall display that reveals elements from the original structure before it was expanded would be removed and replaced with a panel of non-reflective glass that would hang from the ceiling. New lighting would be installed to illuminate the original features behind the glass.

On the second floor, the existing wood panel doors into the Lee girls' chamber would be restored and refinished. Damaged plaster above the window in the upper hall and in Robert and Mary Lee's dressing room would be repaired, refinished, and repainted to match the adjacent walls. The existing wood panel doors and sidelights in the upper hall would be restored and refinished and weather stripping would be installed. The wood fireplace mantel in Robert and Mary Lee's chamber would be restored and refinished.

NORTH SLAVE QUARTERS

Exterior

On the north slave quarters' northern elevation, the wood sill under the engaged columns would be removed and reinstalled with a shim that would provide a slope away from the stucco finish. The sill would be sealed to the adjacent stucco finish.

Interior

On the first floor, all interior damaged plaster would be patched and repaired, then painted to match the existing walls. In the west room, all items related to the bookstore would be removed as would all non-historic wall and ceiling finishes. The floor would remain at the existing level, but approximately one-third of the floor on the western side would be a non-reflective glass floor to allow visitors to view the historic kitchen features that exist in the original lower level of this room. Non-reflective glass display cases would be used for exhibits, though the location, design, and displayed objects would be determined during a later design phase.

In the center room, the ladder providing access to the crawlspace beneath the room would be secured for safety and a steel grate would be installed in the crawlspace over the opening to the existing mechanical chase. New lighting would be installed to replace the existing in a location that is more easily serviced.

SOUTH SLAVE QUARTERS

Exterior

On the exterior of the south slave quarters, all non-original stucco would be removed and a new stucco that matches the existing historic material would be added. The chimney that was removed during past rehabilitation activities on the east side of the building would be reconstructed in its original location based on historic documentation. All exterior doors would be replaced with replica wood stile and rail doors, similar to those on the north slave quarters. All exterior wood features such as trim, engaged columns, capitals, cornices, and sills would be repaired and refinished on the west, east, and north elevations. Any missing or damaged wood that cannot be repaired would be replaced in kind. The frescos on the north elevation above each of the three doors would be stabilized to prevent further deterioration or restored.

Interior

On the interior of the south slave quarters, plaster walls and ceilings would be repaired and refinished as needed. In the west room, the fireplace, fire box, and hearth would be repointed as necessary. This room would be restored to its condition during the period of significance, including the replacement of the brick floor with a more appropriate dirt floor. A non-reflective glass barrier would be installed to allow visitors limited access into the room while protecting the historic furnishings. In the east room, the fireplace and chimney that were removed during past rehabilitation would be reconstructed in their original location based on historic documentation. The stud wall on the east wall would be removed and the original plaster wall would be restored. The brick flooring in this room would be repaired to be flush and level. The existing electrical panelboard in the attic

would be removed and a new panel would be installed in a location more easily accessed by maintenance staff, to be determined at a later design phase.

MECHANICAL SYSTEMS

All existing climate management and fire suppression systems in the project area, including those that were installed in the 2009-2011 campaign, would be improved and upgraded under all action alternatives. All electrical and lighting systems would be upgraded in the mansion and slave quarters. The fire alarm system would be upgraded and all systems would tie directly into the existing system panel in the mechanical bunker and a site-wide annunciator would be added at a central, NPS-approved location that would report all signals to NPS maintenance staff. Additionally, white faceplates would be used instead of standard red faceplates for fire alarm notification devices in historic and public places. The security system in the mansion would be upgraded to include sensors on all windows and doors and motion sensors throughout the interior. This system would also include video surveillance cameras at primary entrances, perimeter doors, and highly valuable areas. A new security system would be installed in the museum building, including an intrusion detection system installed along the perimeter. Systems in the south slave quarters would all be tied into the mechanical bunker systems through existing ductwork located approximately 10 feet from the foundation. All new systems infrastructure would be installed in such a manner as to minimize new intrusions in the historic fabric, and to be as concealed as possible. Existing sensors and concealed wiring pathways would be used to the extent possible. If new pathways are required, efforts would be made to minimize intrusions and damage to the historic materials and character.

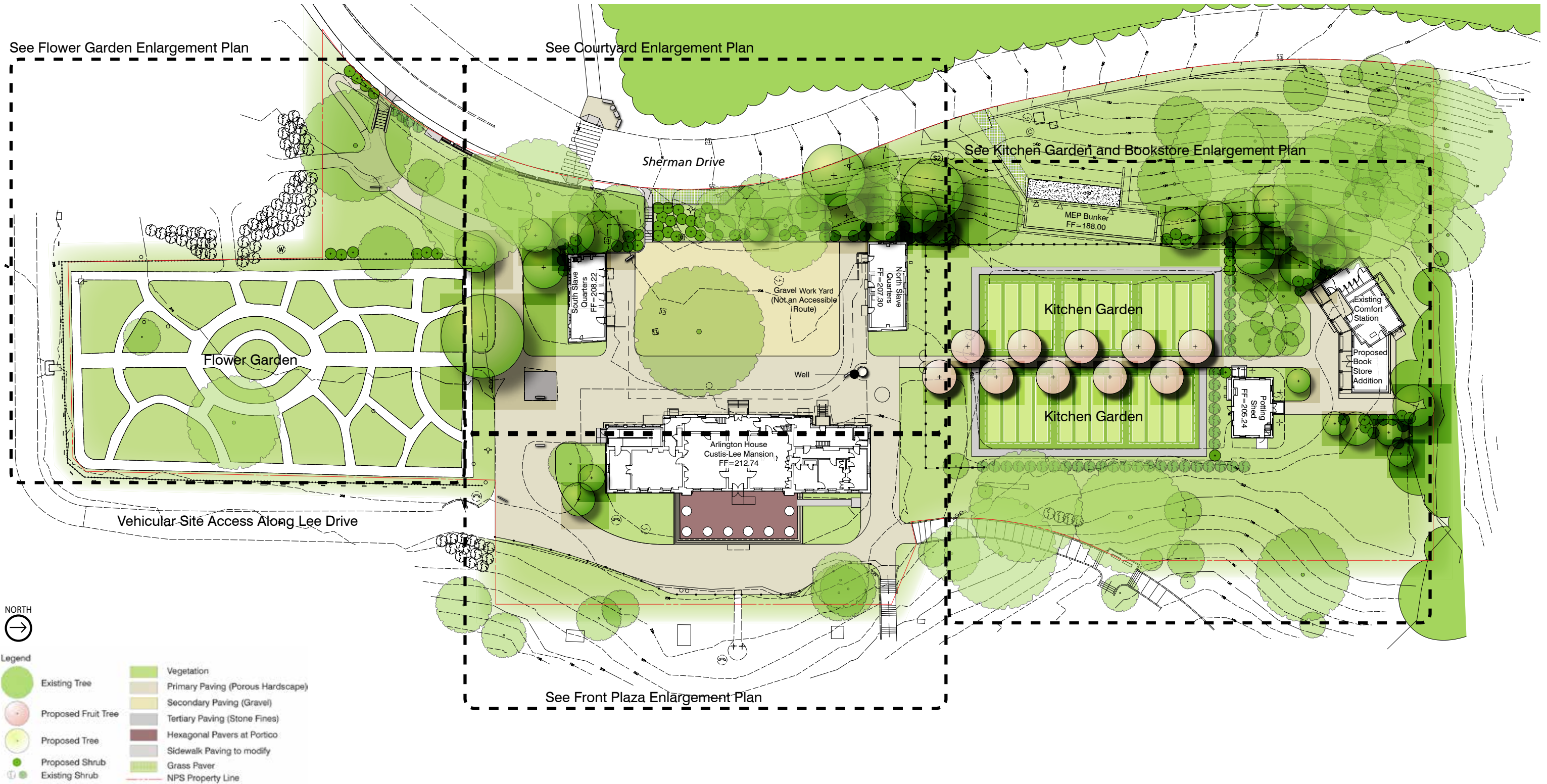
ALTERNATIVE 2: NPS PREFERRED

In addition to the proposed actions discussed under “Elements Common to All Action Alternatives,” the following actions would also be included under alternative 2, which is identified as the proposed action and NPS preferred alternative. See figure 7 for an overall site plan of the actions proposed under this alternative, including the elements common to all action alternatives described above.

TRAM STOP AND VEHICLE ACCESS

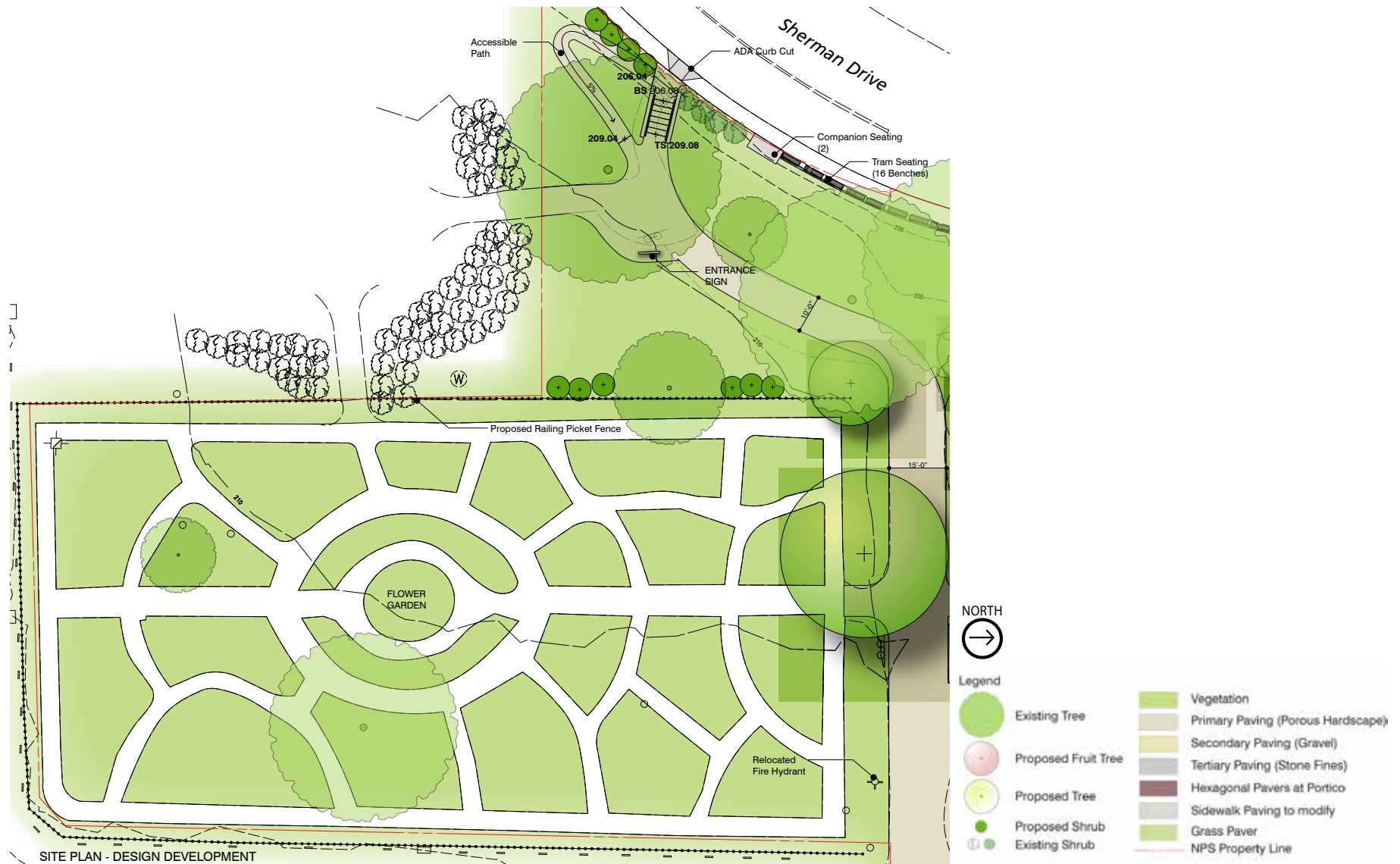
Under alternative 2, the existing tram stop would be maintained in the same location with modifications for accessibility. A curb cut would be created to allow universal access onto the sidewalk at the existing stop. Stairs and a universally accessible path at 5 percent grade would be constructed and would lead to a small gathering area which would meet the path to the Civil War Unknowns Monument and the existing path into the Arlington House site. An entrance sign would be located at this gathering area and would provide orientation and wayfinding to guide visitors into the project area. The existing path to the project site would be finished with a hardened surface approximately 10 feet wide. A row of shrubs would be planted between the accessible path and Sherman Drive to match the existing shrubs. Where applicable, the National Park Service would coordinate with Arlington National Cemetery to implement these improvements. See figure 8 for the configuration of these elements within the site plan.

The existing emergency and maintenance vehicle access from Sherman Drive into the work yard would be closed. New non-invasive, native shrubs, ground cover, and trees would be added in that



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FIGURE 7
Alternative 2: Site Plan



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FIGURE 8
Alternative 2: Flower Garden and Tram Stop Enlargement

location to maintain a visual connection from the work yard to Arlington Woods and Sherman Drive. A set of stairs would be added from the work yard to the existing sidewalk along the road, and would maintain a physical connection. A roll curb with grass pavers would be added along the road in this location to provide a pull-off for two maintenance vehicles to park as needed. See figure 9 for the configuration of these elements within the site plan. Emergency vehicle access into the site would be maintained but relocated to the historic roadway, known as Lee Drive, from Sherman Drive south of the Civil War Unknowns Monument, travelling past the flower garden on the south and east. This roadway historically served as the circulation route for arrival at Arlington House. Because this historic roadway is on Arlington National Cemetery property, the National Park Service has coordinated with Arlington National Cemetery and the Arlington County fire department to ensure access via this route would be available and feasible.

FRONT PORTICO MANSION ACCESS

Under alternative 2, changes to the universal access accommodations at the front portico would be undertaken, as shown on figure 10. The existing ramps, stoop, and vestibule would be removed. An architectural ramp with handrails would replace the existing ramp on the north side of the portico, set away from the mansion façade, providing access from the grounds up to the portico. At the front door, a new stoop would be constructed at level with the mansion's first floor and a small ramp with handrails would be constructed on the north side of that stoop for access from the portico. A non-reflective glass door would replace the existing vestibule. See figure 11 for the site plan enlargement showing the mansion portico.

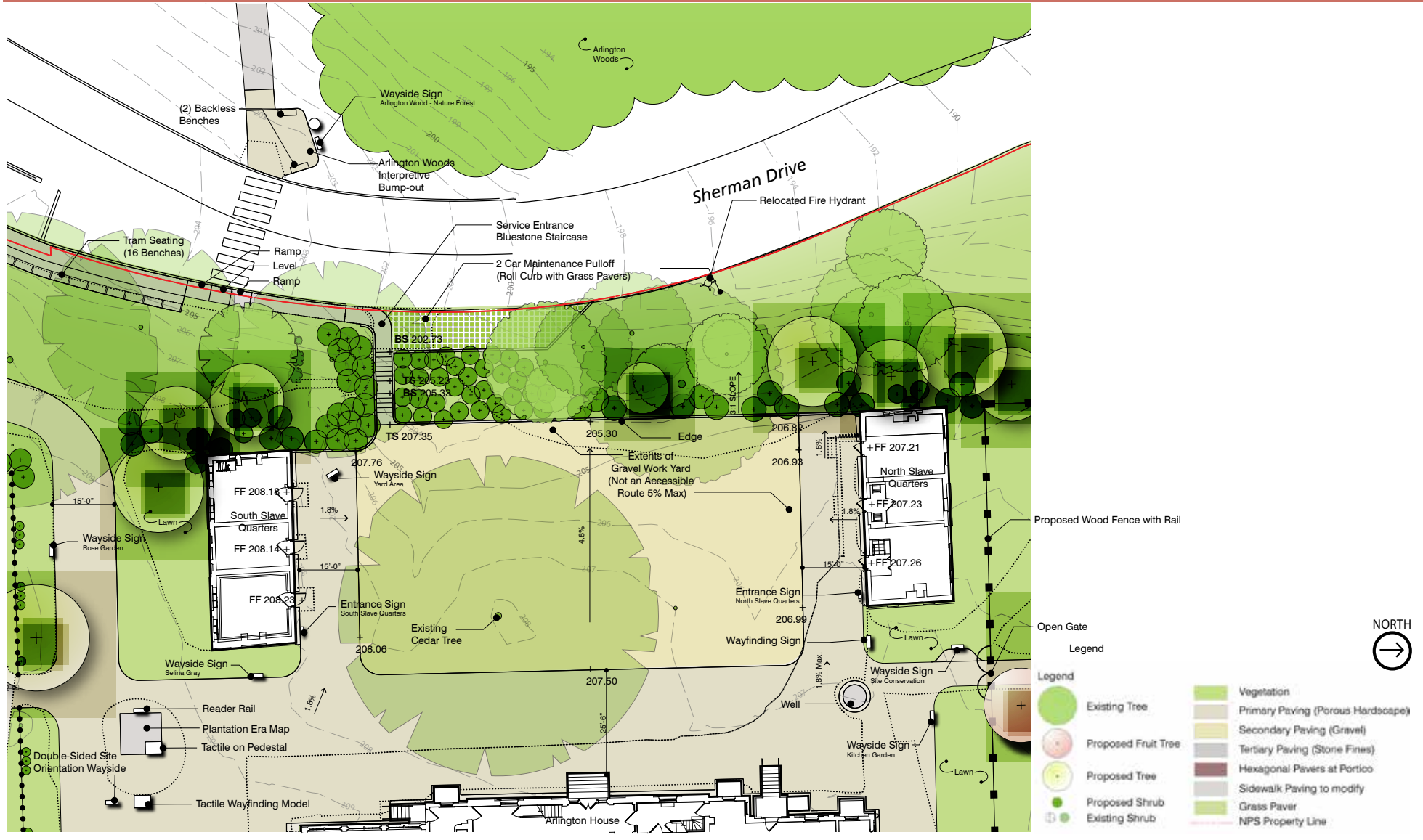
REAR MANSION ACCESS

Under alternative 2, universal access to the rear of the mansion would be through the conservatory on the southwest corner of the building, and would serve as a new tour entry point (figure 12). The walkway to the exterior door on the south side would be treated with a hardened surface for universal accessibility directly into the conservatory. The exterior door would either be modified with new accessible hardware or would be removed and replicated with accessible features. Any original features that would be replicated would be removed and stored for possible inclusion in the museum collections. Perimeter weather stripping would be replaced and the wood transom above the door would be restored and refinished. On the interior of the conservatory, both sets of existing, non-historic stairs would be removed to allow installation of an accessible ramp that would be fully reversible. This ramp would be constructed approximately 6 feet, 4 inches from the exterior door and would lead to a landing at the north end of the room below level with the storeroom door. A transparent barrier would prevent visitors from crossing between the rooms through this door, but would allow visibility between the rooms. The ramp would then continue south to the office/studio door where a landing at level with the first floor would allow universal access into the mansion. See figure 11 for the site plan enlargement showing the conservatory.

BOOKSTORE

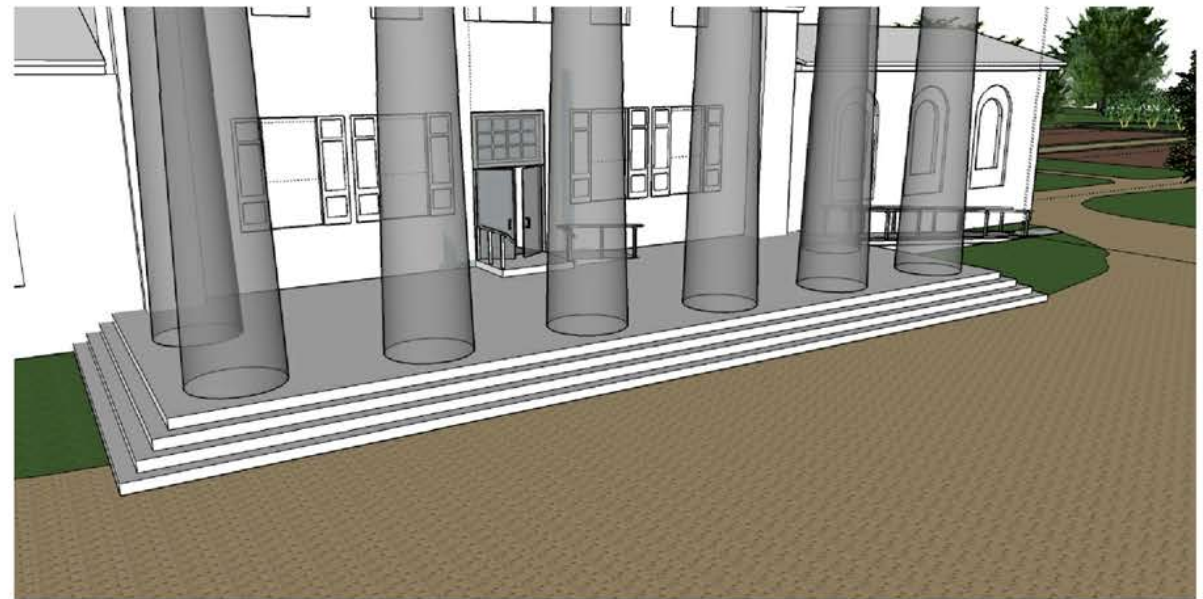
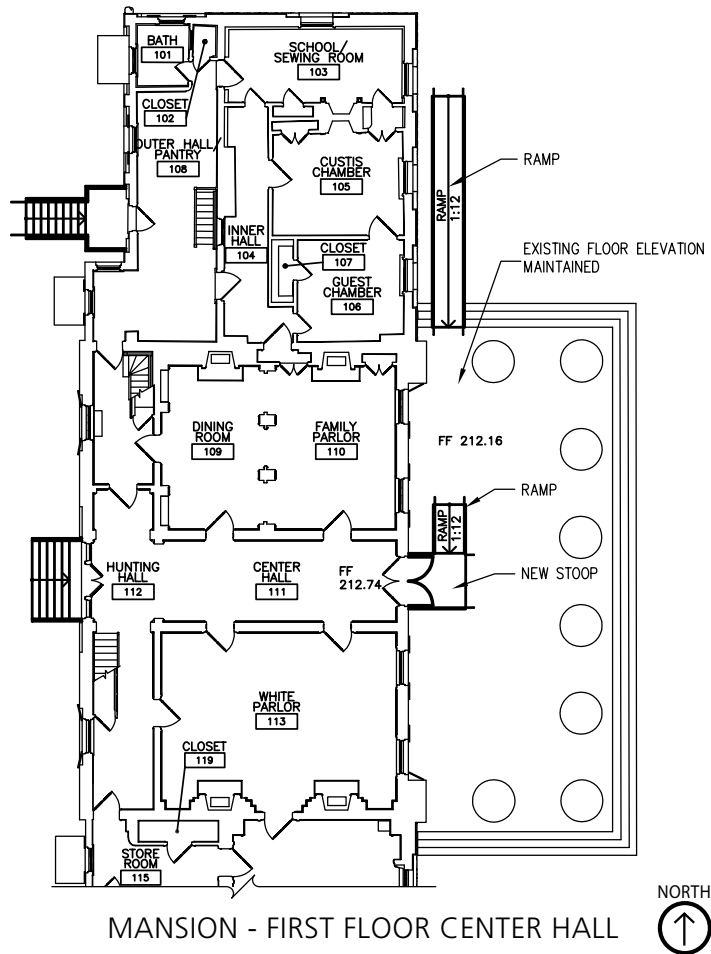
Option A

Under alternative 2, bookstore option A, the bookstore would be relocated from the north slave quarters into a one-story addition constructed on the northeast corner of the existing comfort station. The bookstore addition would be approximately 547 square feet, including storage space. It

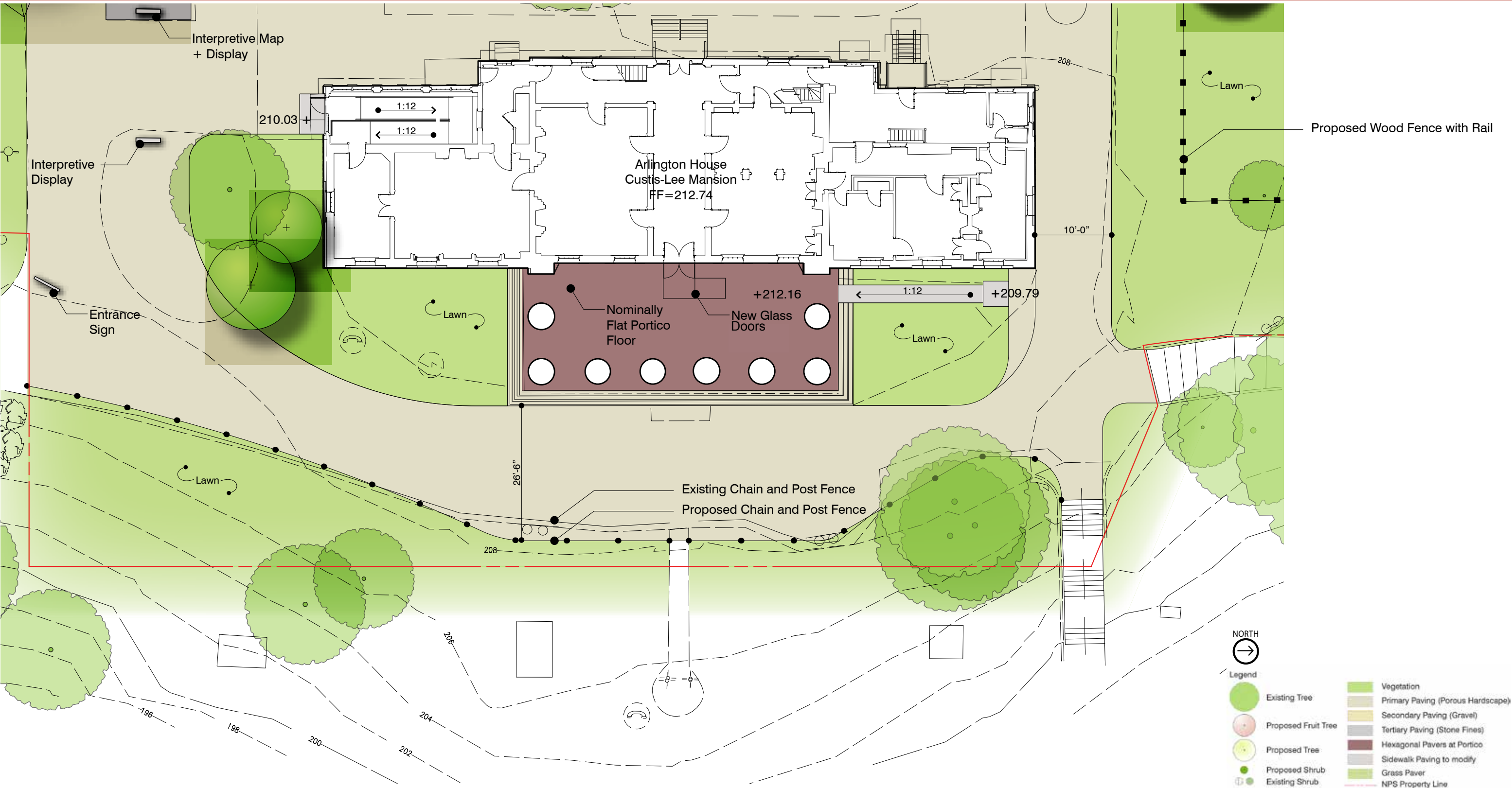


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FIGURE 9
Alternative 2: Work Yard Enlargement



EAST ELEVATION



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FIGURE 11
Alternative 2: Front Plaza Enlargement



Please note that the rendering of the exterior door (at the right of this image) is generic and is not intended to represent the use of any particular material(s).

would be built on an axis offset from the existing building, which would be at the same axis as the historic buildings on the site. Additional trees would be planted on the north, east, and south sides of the building to visually screen them from the rest of the site. Construction for the bookstore addition would require the removal of a few trees, potentially including a couple mature trees and several other smaller trees and shrubs. See figure 13 for the site plan enlargement and figure 14 for the rendering of the bookstore option A.

Option B

Under alternative 2, bookstore option B, the bookstore would be of a similar location and size as option A, but it would be built at the same angle as the existing building, which would be offset from the axis of the historic buildings on the site (figure 15). Construction of this bookstore may require the removal of a couple more trees and shrubs than under option A due to the alignment. Though figure 14 shows bookstore option A within the site plan, bookstore option B would be in approximately the same location, and all other elements would be the same as on the site plan.

MUSEUM BUILDING (POTTING SHED)

In the museum building--the former potting shed just north of the kitchen garden--the exterior doors would be replaced with replica wood and glass doors that are universally accessible. In the interior, the second floor would be removed to create a double-height space on the ground floor to be used for new and enhanced exhibit space. Vertical supports along the interior walls and horizontal bracing would be installed to structurally support the building once the floor is removed. More specific treatments would be determined during a later design phase. All existing windows, jambs, trim, doors, and frames would be repaired and restored as needed. All interior painted surfaces would be stripped of loose paint, primed, and repainted.

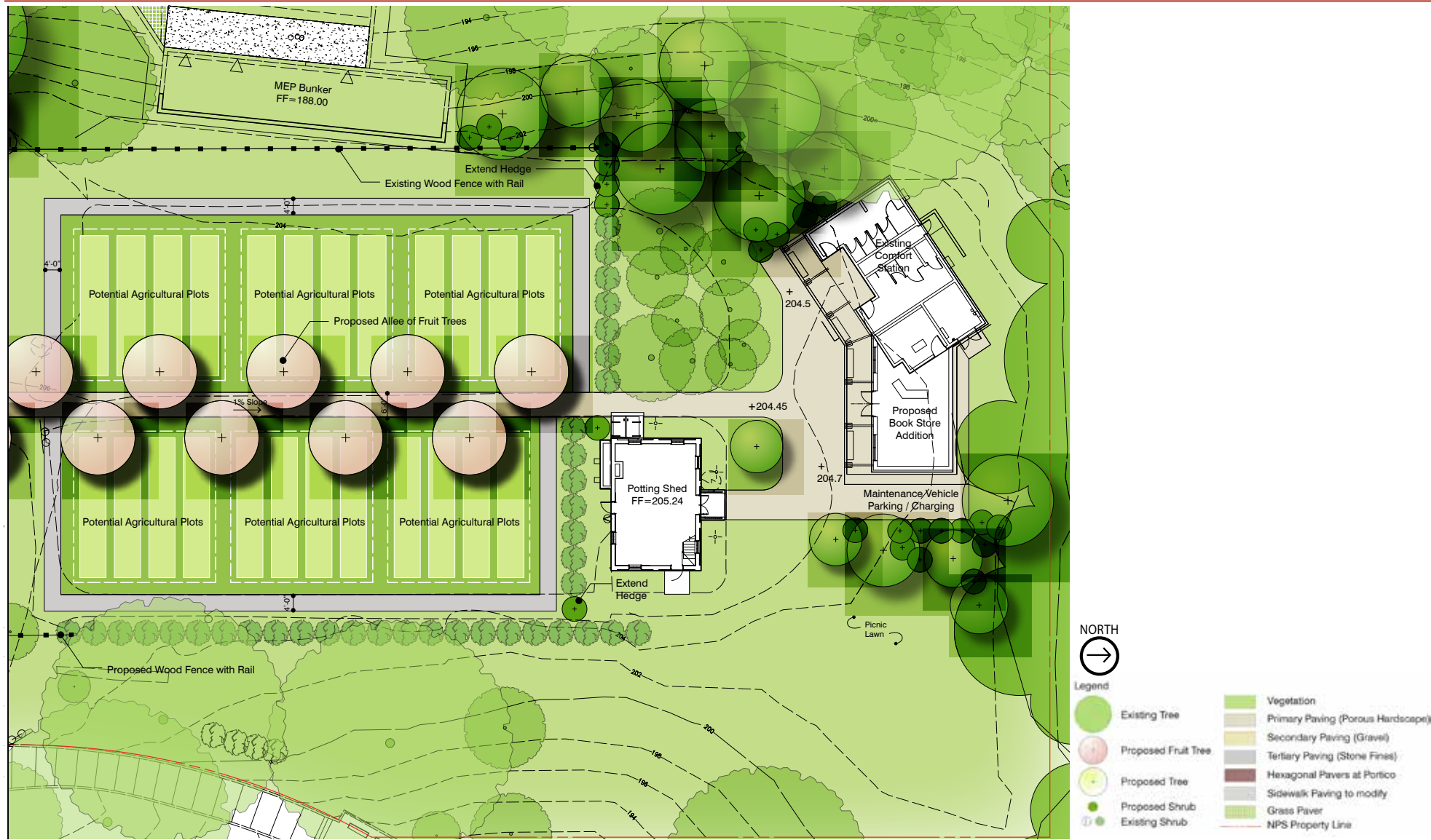
ALTERNATIVE 3

In addition to the proposed actions discussed under "Elements Common to All Action Alternatives," the following actions would also be included under alternative 3.

TRAM STOP AND VEHICLE ACCESS

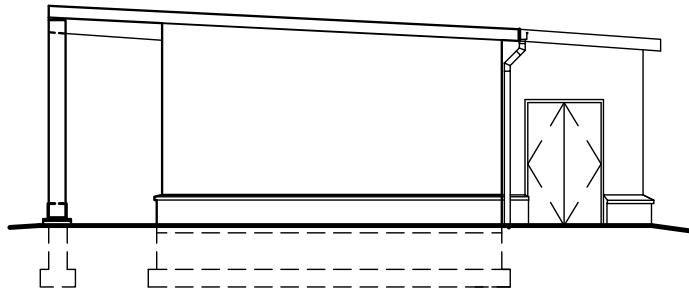
Option A

Under alternative 3, tram stop option A, the Sherman Drive tram stop and visitor entrance into the project area would be relocated to the existing emergency and maintenance vehicle entrance into the work yard, as shown on figure 16. At this location, stairs and a universally accessible two-leg ramp would be constructed to allow visitor entry into the work yard between the north and south slave quarters. A canopy tree and vegetation such as grass would be added around the proposed stairs and ramp to replace the existing gravel entrance. Orientation, wayfinding, and interpretation information would be added near the entrance to guide visitors into the site. Emergency and maintenance vehicle access would be maintained, but relocated to historic Lee Drive, as described under alternative 2.

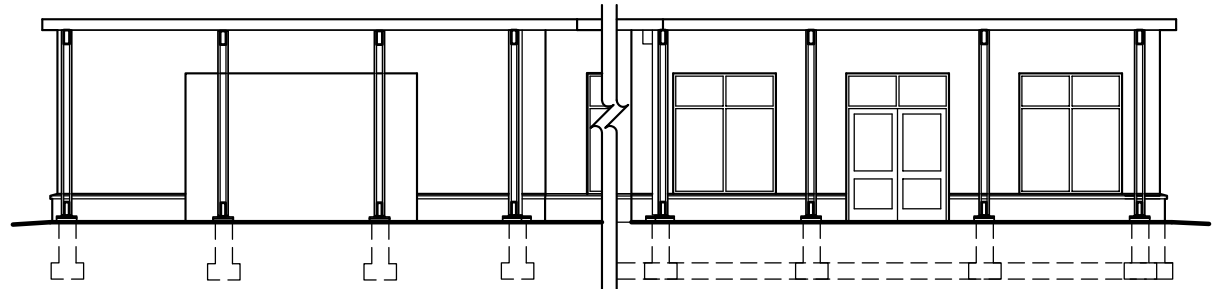


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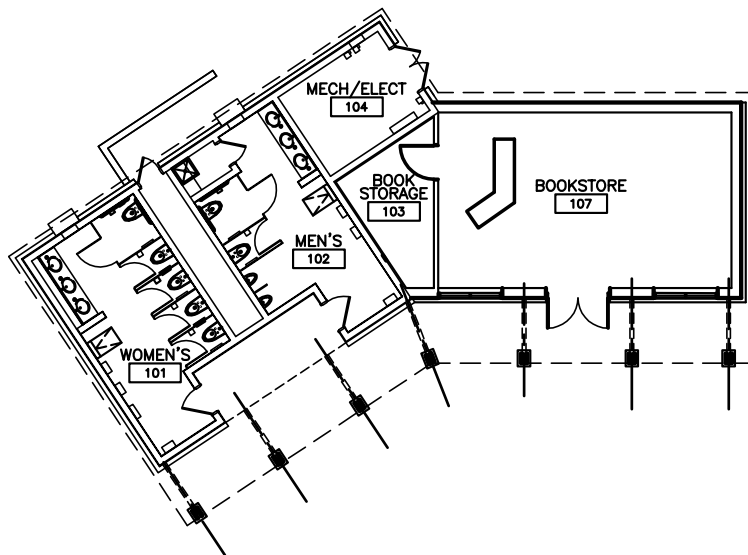
FIGURE 13
Alternative 2: Kitchen Garden and Bookstore Enlargement



EAST ELEVATION



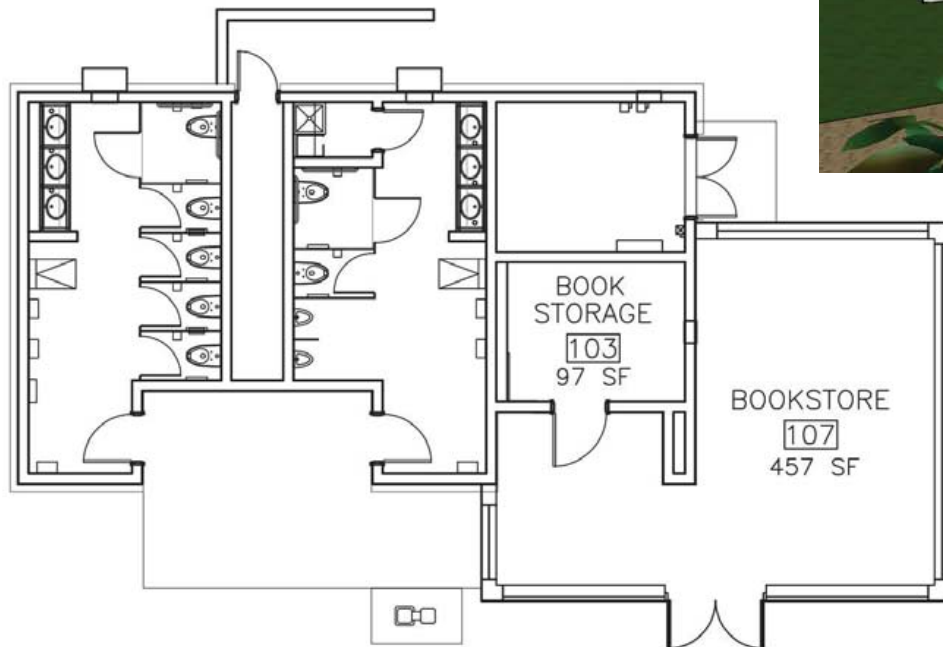
SOUTH ELEVATION



EAST ELEVATION



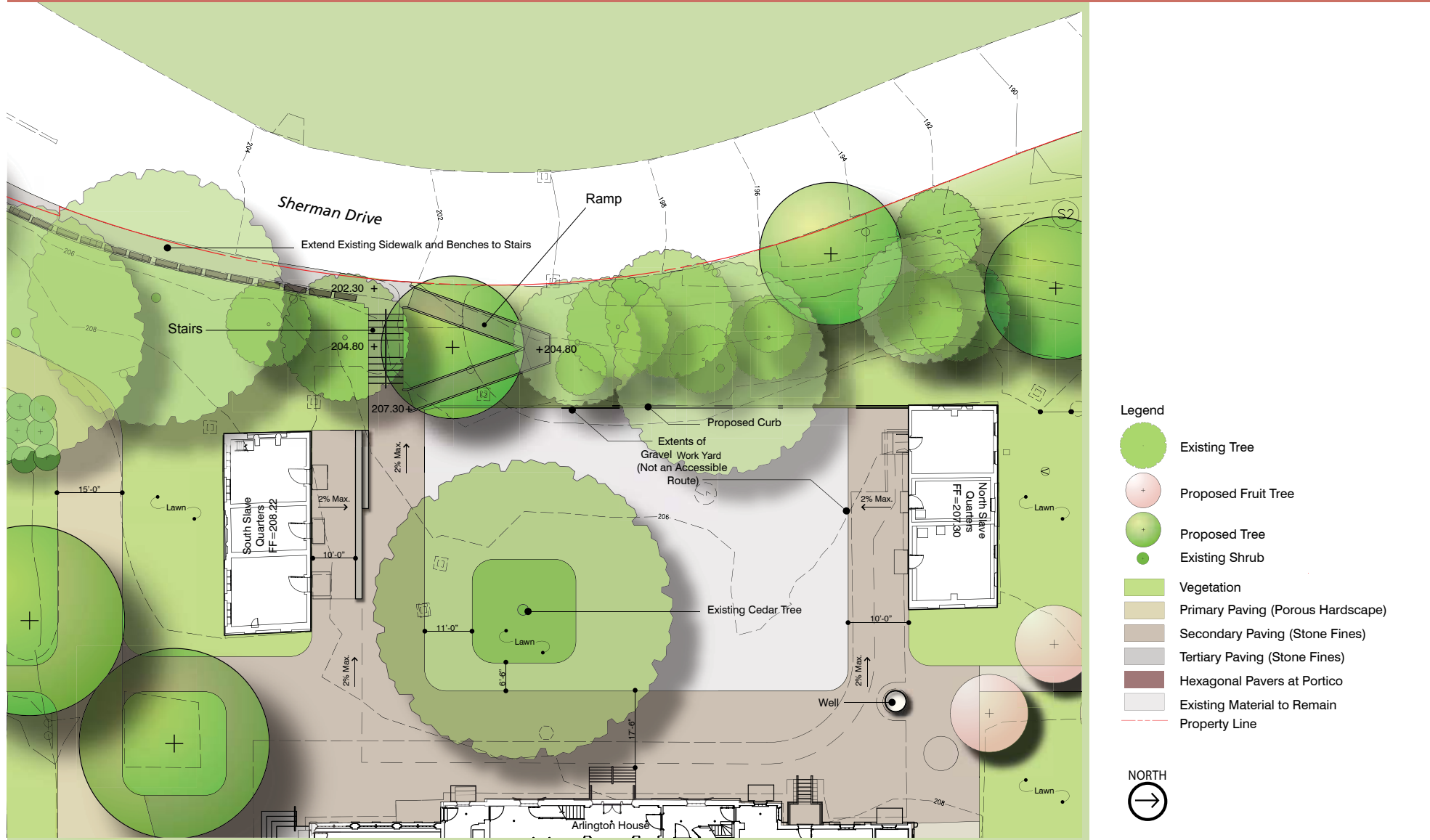
SOUTH ELEVATION



COMFORT STATION - BOOKSTORE ADDITION



SOUTH ELEVATION



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FIGURE 16
Alternative 3: Tram Stop Option A

Option B

Under alternative 3 tram stop option B, the tram stop would be relocated north of the existing stop and south of the existing emergency and maintenance vehicle access point, as shown on figure 17. Stairs and a ramp would be constructed at the drop-off location for accessibility up to the grade of the yard. Retaining walls would be added on either side of the ramp. A path would be constructed and treated with a hardened surface from the new entrance point to the existing path between the south slave quarters and flower garden. Orientation and wayfinding signs would be installed at this entrance point to guide visitors into the site. The emergency and maintenance vehicle access point would be maintained in its existing location.

FRONT PORTICO MANSION ACCESS

Under alternative 3, changes to the universal access accommodations at the front portico would be undertaken, as shown in figure 18. A new surface would be installed that would raise the portico floor to be level with the front door and first floor. This surface would be the size of the portico floor inside the perimeter of the columns and would create a new step up from the existing portico floor. A two-leg sloped sidewalk with handrail would be constructed on the north side of the portico for universal accessibility, in the approximate location of the existing ramp, which would be removed. To create the sloped sidewalk, the grade would have to be built up with fill, which would be brought onto the site from another location. A retaining wall would be added between the slope and the mansion. A vestibule made of non-reflective glass would replace the existing vestibule.

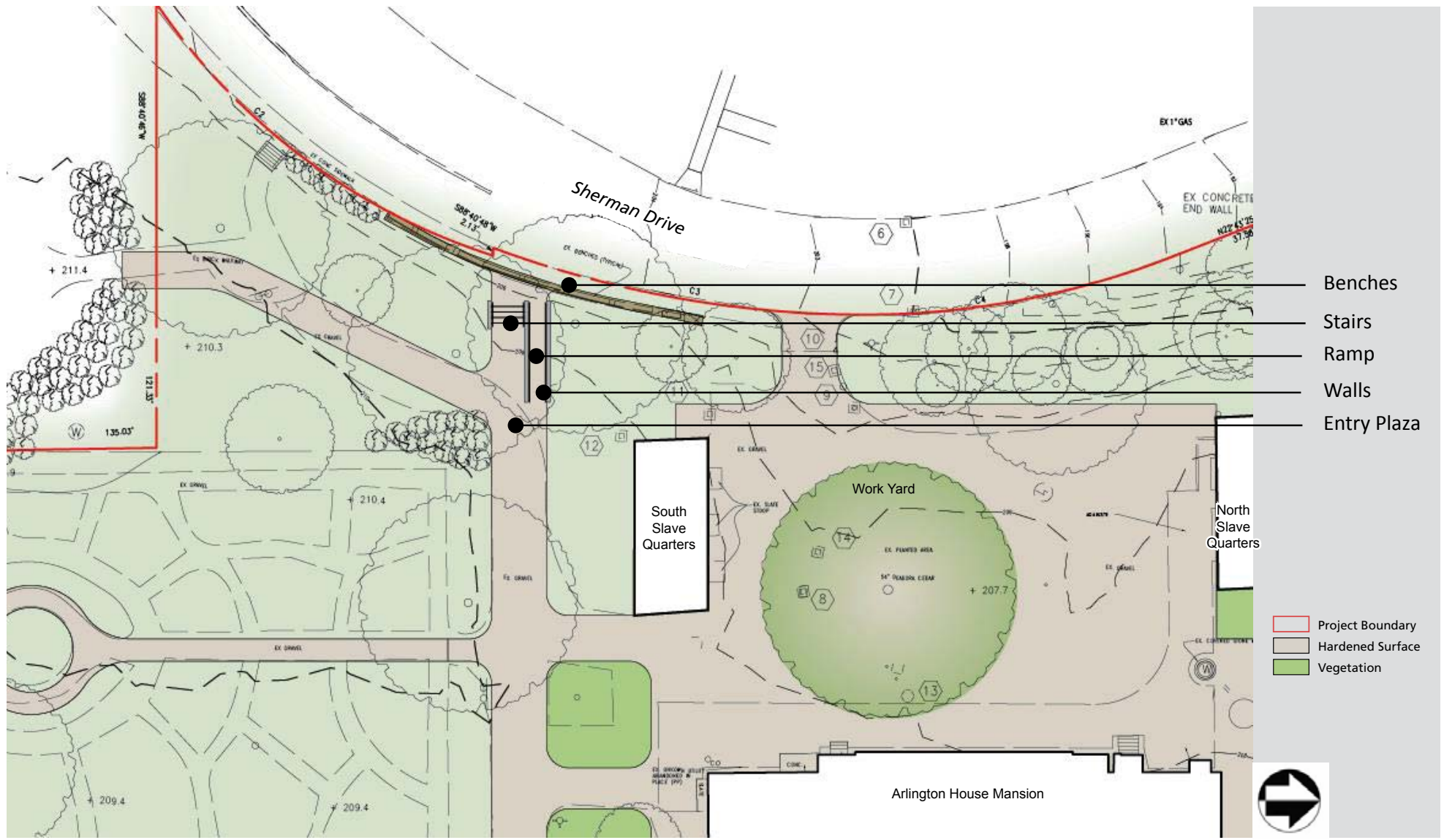
REAR MANSION ACCESS

Option A

Under alternative 3, rear access option A, universal access to the west side of the mansion would be through the conservatory on the southwest corner of the building, and would serve as a new tour entry point (figure 19). An architectural ramp would be located along the west side of the conservatory and lead to a landing at the conservatory door on the south side. A set of stairs would be constructed leading up to the same landing. The landing would be at the same level as the first floor of the mansion and the conservatory door would be reconfigured to accommodate this change in head height. On the interior of the conservatory, a reversible raised platform would be created to provide a floor that is level with the first floor of the mansion, at approximately 2 feet, 8 inches. Visitors would enter the mansion through the store room door at the north end of the conservatory.

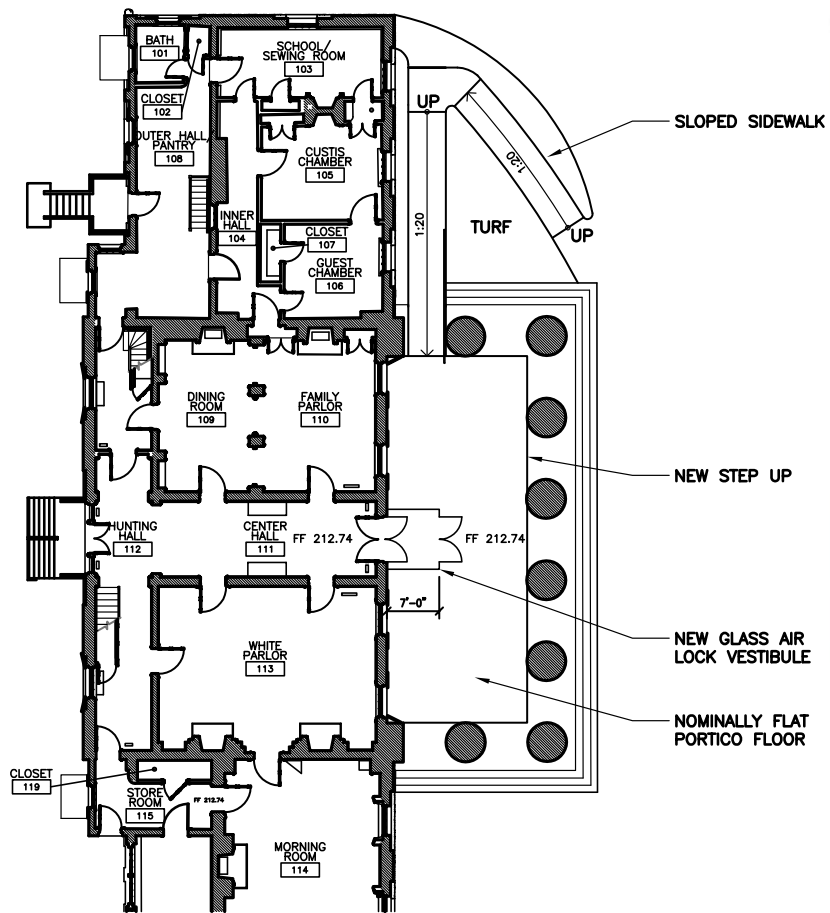
Option B

Under alternative 3, rear access option B, universal access to the rear of the mansion would be through the store room at the southwest end of the mansion, next to the conservatory, and would serve as a new tour entry point (figure 20). An architectural ramp would be constructed in a similar location as option 3A, but would lead north to a landing and stairs at the store room door. This landing would be level with the first floor of the mansion and the exterior door would be modified for accessibility. No change would be made to the interior of the conservatory, but a paved pad at the exterior door would be constructed to provide level, universal access into the conservatory.

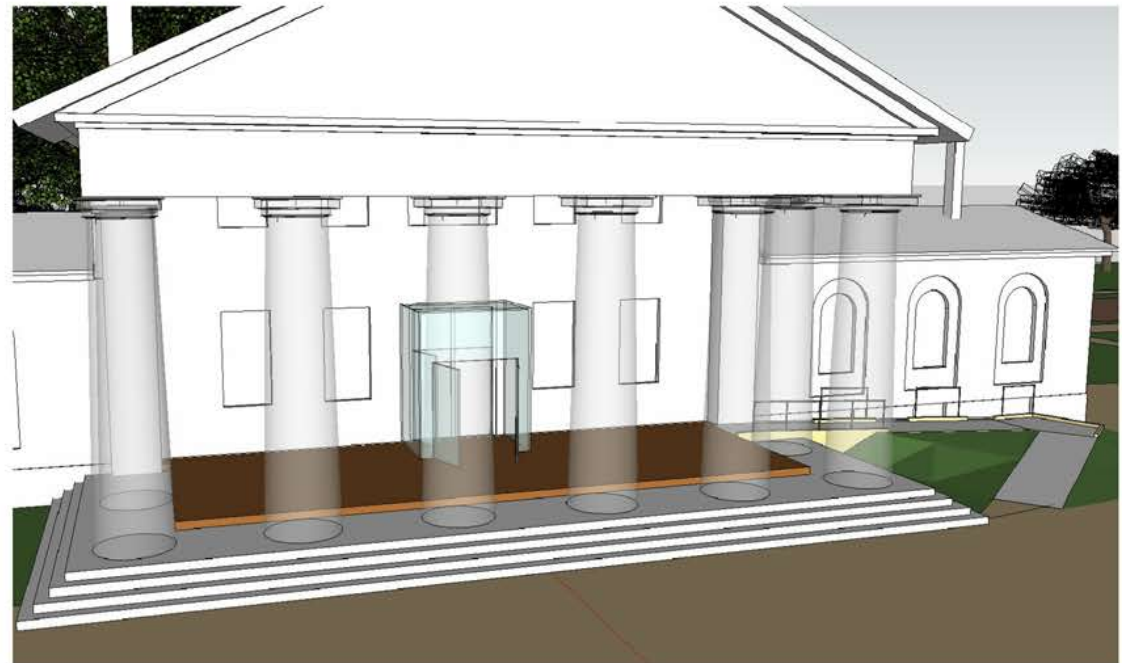


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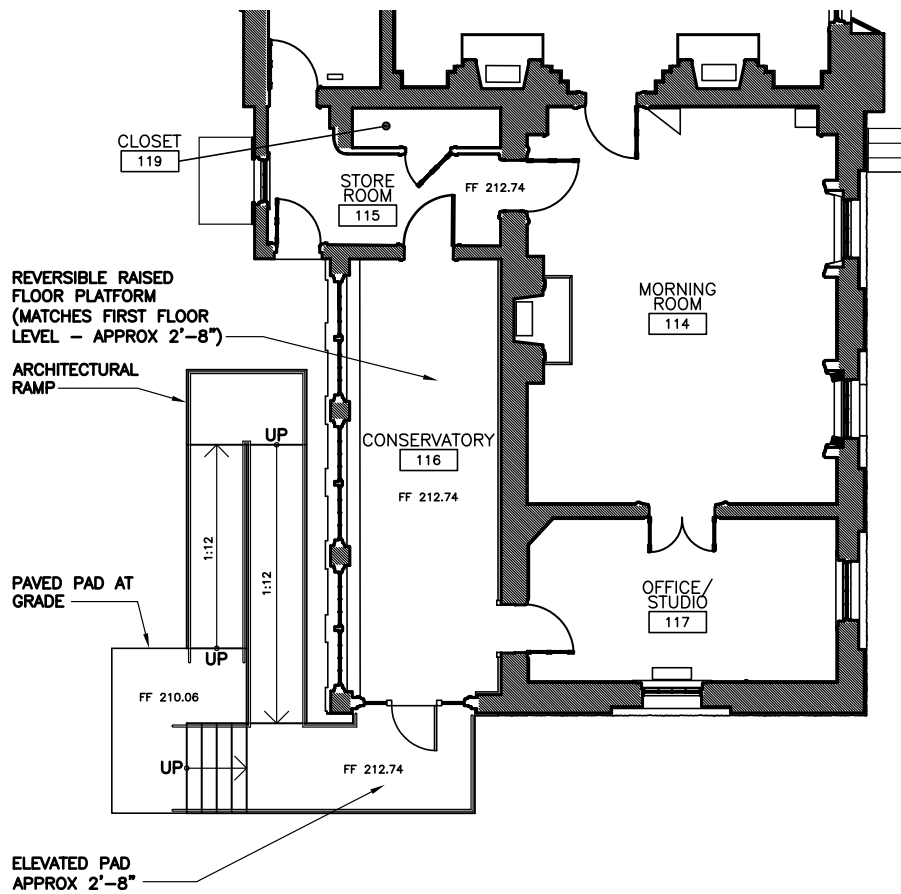
FIGURE 17
Alternative 3: Tram Stop Option B



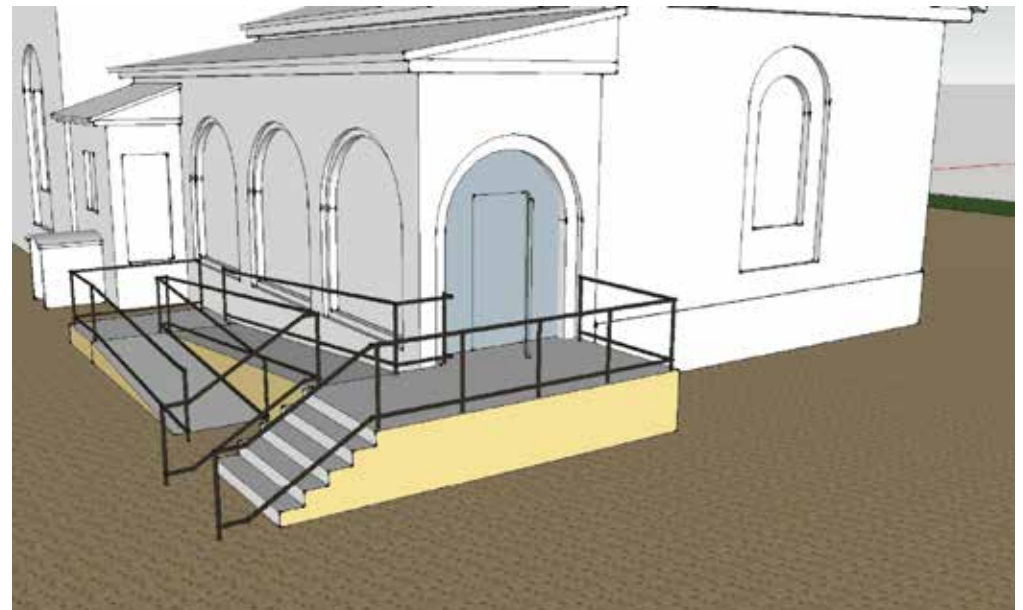
MANSION - FIRST FLOOR NORTH HALL

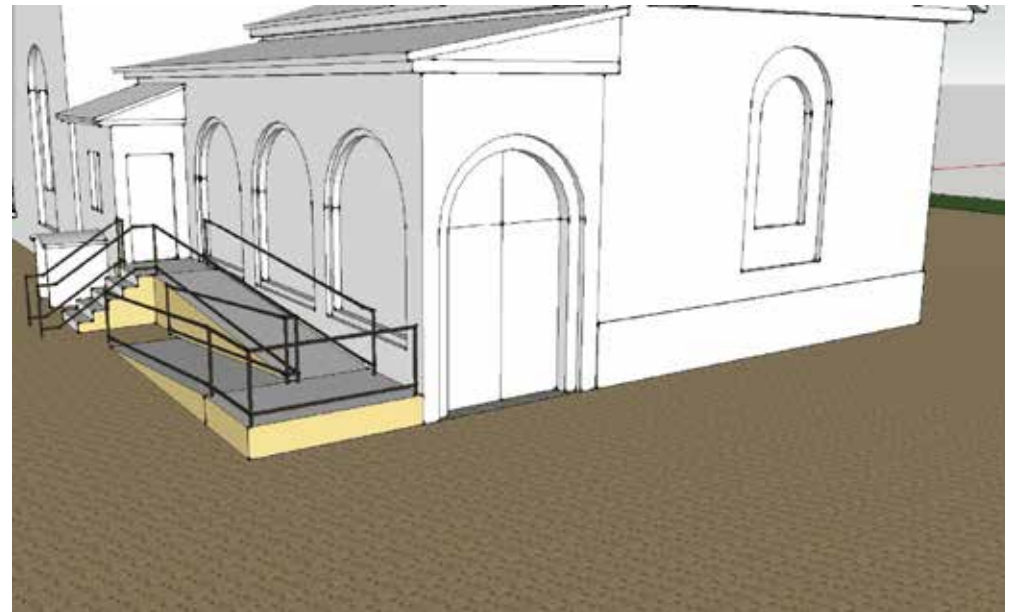
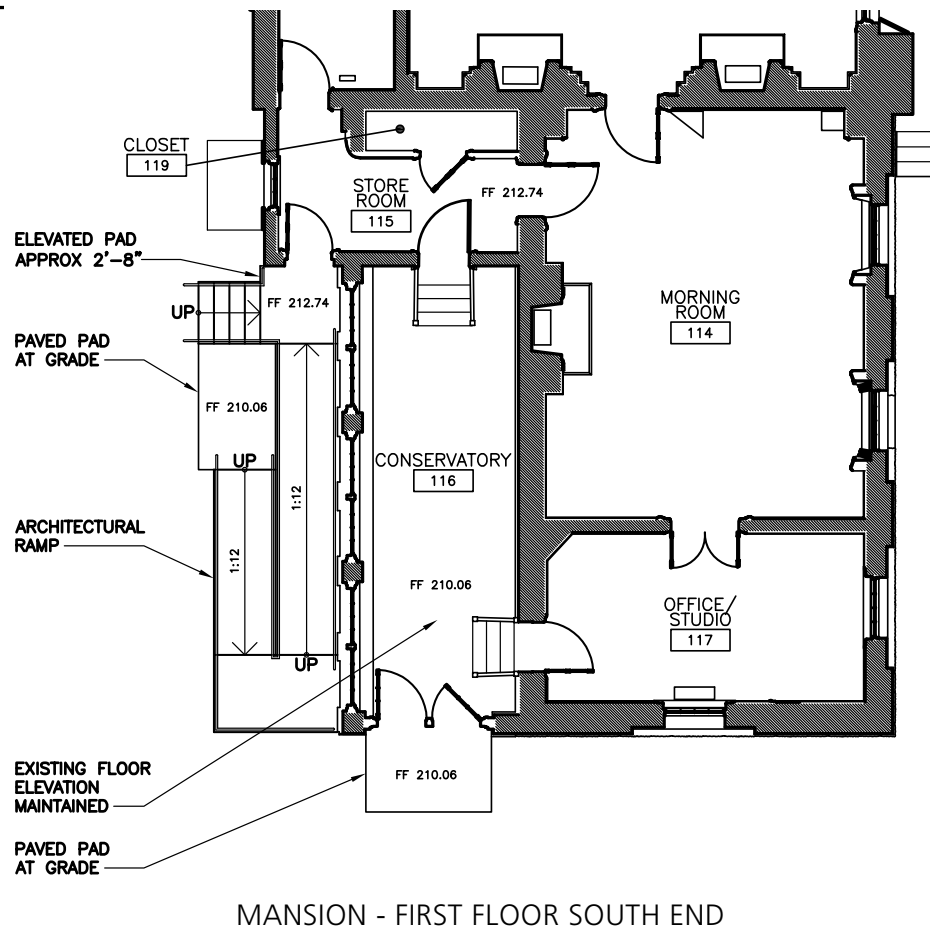


EAST ELEVATION



MANSION - FIRST FLOOR SOUTH END



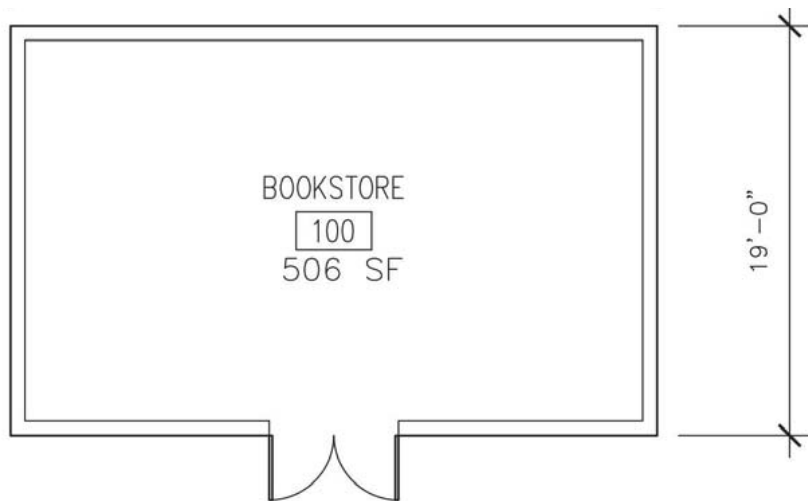


BOOKSTORE

Under alternative 3, the bookstore would be relocated from the north slave quarters into a one-story, stand-alone building, as shown in figure 21. This building would be located next to the existing comfort station on the east and would be of a complementary scale and design. The bookstore would be approximately 506 square feet. Construction for the stand-alone bookstore would require the removal of a few trees, including several mature trees and several other smaller trees and shrubs, and possibly a few more trees than under alternative 2.

MUSEUM (POTTING SHED)

In the museum building, the exterior doors would be replaced with replica wood and glass doors that are universally accessible, as under alternative 2. The interior of building would remain two floors, but the first floor would be rehabilitated for new and enhanced exhibit space. More specific treatments would be determined during a later design phase. As under alternative 2, all existing windows, jambs, trim, doors, and frames would be repaired and restored as needed. All interior painted surfaces would be stripped of loose paint, primed, and repainted.



SOUTH AND EAST ELEVATIONS

COMPARISON OF THE ALTERNATIVES

Table 1 below provides a brief summary and comparison of the key components of the action alternatives.

TABLE 1. COMPARISON OF THE ALTERNATIVES

	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2	Alternative 3
Grounds and Circulation	<p>Various visitor entry points, with limited orientation and interpretive signage.</p> <p>Universal accessibility is limited.</p> <p>Gardens are unchanged.</p> <p>Some ponding of storm water.</p>	<p>Focused visitor orientation point. New orientation, interpretation, and wayfinding signage and exhibits.</p> <p>Additional universally accessible paths created.</p> <p>The kitchen garden would be rehabilitated with historical, native, non-invasive plantings.</p> <p>Drainage would be improved.</p>	Same as Common to All Action Alternatives.	Same as Common to All Action Alternatives.
Tram Stop/Visitor Entry	The tram stop with stairs would remain in its existing location south of the south slave quarters and west of the flower garden.	N/A	Existing location would be maintained and modified for accessibility.	<p>Option A: Relocated to the existing emergency vehicle access point into the work yard, modified for accessibility.</p> <p>Option B: Relocated north of the existing stop between the flower garden and south slave quarters, where a new path, stairs, and ramp would be constructed.</p>
Emergency Access	Access via Sherman Drive through the entrance into the work yard.	N/A	Access would be relocated to the historic Lee Drive roadway travelling south and east of the flower garden.	<p>Option A: Same as alternative 2.</p> <p>Option B: Same as Alternative 1: No Action.</p>

TABLE 1. COMPARISON OF THE ALTERNATIVES (CONT.)

	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2	Alternative 3
Front Portico Accessibility	Access would continue to be via a metal ramp up to the portico, and then through a wooden vestibule with another small ramp into the mansion.	N/A	Ramp with handrails would replace the existing ramp on the north side of the portico. A new stoop, small ramp, and non-reflective glass door would replace existing wood vestibule and ramp.	A sloped sidewalk with handrail would replace the existing ramp on the north side of the portico. Portico floor would be raised to the level of the mansion's first floor. A non-reflective glass vestibule would replace the existing vestibule.
Rear Mansion Accessibility	There would be no universal access at the rear of the mansion.	N/A	<p>A path with a hardened surface would lead to the exterior door allowing universal access to the interior. The existing door would be modified or replicated with accessible features.</p> <p>On the interior, a two-leg ramp within the conservatory would allow access into the mansion through the office/studio.</p>	<p>Option A: Ramp, landing, and stairs at the conservatory, on level with mansion first floor. The conservatory door would be modified for this height. On the interior, a raised platform would connect to the store room door.</p> <p>Option B: Ramp, landing, and stairs at the store room, on level with mansion first floor. No change to the conservatory interior.</p>
Mansion	<p>Exterior: Foundation, paint, and finishes would remain in their weathered state. Some water infiltration would continue.</p> <p>Interior: No improvements to the condition of features or finishes and they would remain in their worn and sometimes deteriorated condition. Some historic finishes would remain unprotected.</p>	<p>Exterior: All historic material, features, and finishes restored and weather stripping installed. Replica wood stairs added on the west side in their historic locations.</p> <p>Interior: All historic material, features, and finishes repaired, restored, and refinished. Transparent visitor barriers and protective covers installed within exhibited rooms and over exposed finishes and graffiti.</p>	Same as Common to All Action Alternatives.	Same as Common to All Action Alternatives.

TABLE 1. COMPARISON OF THE ALTERNATIVES (CONT.)

	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2	Alternative 3
North Slave Quarters	<p>Exterior: Some water infiltration would continue.</p> <p>Interior: The north slave quarters would remain in its existing condition with the bookstore occupying the west room.</p>	<p>Exterior: On the exterior north side, the wood sill would be reinstalled on a slope and sealed to stop water infiltration.</p> <p>Interior: All damaged plaster would be repaired and refinished. All items related to the bookstore would be removed from the west room. A glass floor would be installed to expose historic elements in the lower level. Crawlspace access would be improved for safety.</p>	Same as Common to All Action Alternatives.	Same as Common to All Action Alternatives.
South Slave Quarters	<p>Exterior: The south slave quarters would remain in its existing condition, with modern materials mixed with historic fabric, and missing original features.</p> <p>Interior: The rooms would continue to differ from their historic appearance during the building's occupancy by enslaved laborers.</p>	<p>Exterior: All non-original stucco would be replaced with historically-compatible material. Frescos would be conserved or restored. Missing chimney on the east end would be recreated. All doors would be replaced with historic replica doors. All wood features would be restored or replaced in kind.</p> <p>Interior: Plaster would be refinished as needed. The west room would be restored to period of significance. The missing fireplace and chimney in the east room would be recreated. The electrical panelboard in the attic would be removed and replaced to meet code.</p>	Same as Common to All Action Alternatives.	Same as Common to All Action Alternatives.

TABLE 1. COMPARISON OF THE ALTERNATIVES (CONT.)

	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2	Alternative 3
Bookstore	The bookstore would remain in the west room of the north slave quarters.	The bookstore would be moved from its current location in the north slave quarters to a new building on the north end of the project area, near the existing comfort station. However, the design and specific location would vary between alternatives.	Option A: Relocated into a one-story, 547-square-foot addition to the northeast corner of the comfort station. Would be on an axis offset from the existing building, at the same axis as the historic buildings on site. Removal of a couple of trees and several shrubs would be required. Option B: The bookstore would be of a similar location and size as option A, but it would be built on the same axis as the existing building, offset from the axis of the historic buildings on site. Removal of a few trees and several shrubs would be required.	The bookstore would be relocated into a one-story, stand-alone building next to the existing comfort station. It would be of a complementary scale and design, and approximately 506 square feet. Removal of a few more trees and shrubs than under alternative 2 would be required.
Museum	The museum building would remain as a two-floor structure with existing museum collections exhibits on the first floor and storage on the second floor.	Replica, universally accessible exterior doors would replace the existing. On the interior, all interior painted surfaces would be refinished. All interior doors and windows would be restored as needed.	Same as Common to All Action Alternatives. The second floor would be removed to create a double-height interior space for new and enhanced exhibits.	Same as Common to All Action Alternatives. The interior would remain two floors, but the first floor would be rehabilitated for new and enhanced exhibits.
Mechanical Systems	The existing climate control, fire suppression systems, security systems, and utility lines would remain.	All electrical, fire alarm, fire suppression, security, and climate control systems would be upgraded in the mansion and slave quarters. All systems would be tied into the mechanical bunker and notifications would go to a central location. Security sensors and video surveillance cameras would be installed.	Same as Common to All Action Alternatives.	Same as Common to All Action Alternatives.

TABLE 1. COMPARISON OF THE ALTERNATIVES (CONT.)

	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2	Alternative 3
Meets Purpose and Need?	No, the mansion, slave quarters, and grounds would not be rehabilitated and the deteriorated or missing historic features would not be restored. Visitor arrival, orientation, and interpretive information would remain insufficient, as would universal accessibility throughout the site. Climate control and security systems would not be upgraded.	Yes, the mansion, slave quarters, and surrounding grounds would be rehabilitated, visitor wayfinding and interpretation would be expanded, and mechanical systems would be upgraded. Specific methods for improving universal accessibility throughout the site, relocating the bookstore, and rehabilitating the museum are addressed under alternatives 2 and 3.	Yes, the mansion, slave quarters, and surrounding grounds would be preserved and rehabilitated. Deteriorated or missing historic features would be restored or recreated and historic character would be maintained and restored. Visitor arrival, orientation, and interpretive information would be improved, as would universal accessibility throughout the site. Mechanical systems, including climate control and security systems would be upgraded.	Yes, as under alternative 2.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2 below summarizes the impacts of each alternative on the impact topics analyzed in this environmental assessment. These impacts are described in greater detail under their respective headings in the “Affected Environment and Environmental Consequences” chapter.

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative 1: No Action	Alternative 2	Alternative 3
Historic Structures¹	<p>Exterior and interior wood, plaster, stucco, and paint would continue to deteriorate due to weathering, water infiltration, improper climate maintenance, and heavy use. However, the historic structures within the project area would continue to be maintained as funding allows under the current management practices and in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i>, which would result in a beneficial impact on historic structures through preservation and protection of the character-defining features.</p> <p>The bookstore would continue to visually detract from the historic interior and character of the north slave quarters.</p>	<p>Rehabilitation and preservation would maintain and restore historic materials and features. Removal of non-historic features, particularly the bookstore, would restore historic character. Installation of weather stripping and repainting the exteriors would protect historic materials from deterioration.</p> <p>Improvements to the climate control, security, and fire systems would increase protection from damage to or loss of historic materials.</p> <p>Introduction of modern materials including ramps, visitor barriers, and systems monitoring panels would visually detract from the historic character. However, they would be designed to be minimally conspicuous and historically-compatible. The ramps at the portico would be in the same location as the existing ramps and would be of a less detracting design.</p> <p>The modification of the conservatory interior would result in changes to the visual character. However, these modifications would be reversible and not result in any permanent adverse impacts.</p> <p>Modifications to the exterior door and interior floorplan of the museum building would visually alter the historic building. The removal of the second floor would permanently change the interior configuration into a one-story space. However, the interior has been previously altered and little historic material remains.</p>	<p>Actions related to rehabilitation and preservation of the mansion and slave quarters, improvements to mechanical, security, and fire protection system, and introduction of modern materials would have the same impacts as under alternative 2. The following summarizes the differences in impacts.</p> <p>Modifications at the front portico would result in changes to the character-defining feature due to the change in floor height and the introduction of modern materials. However, the non-reflective glass vestibule would allow the historic character to be visible behind the glass.</p> <p>At the conservatory, option A would have adverse impacts on the exterior due to the introduction of modern materials. Under option A, the conservatory's interior character would be changed by the raised platform and reconfiguration of the exterior entrance.</p> <p>Conservatory access option B would have similar adverse impacts on the exterior as option A due to the introduction of modern materials, but would have no impacts on the conservatory interior.</p> <p>Modifications to the exterior door and interior first floor of the museum building would visually alter the historic building. The interior space would be retained as a two-floor configuration. The interior has been previously altered and little historic material remains.</p>

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONT.)

Impact Topic	Alternative 1: No Action	Alternative 2	Alternative 3
Cultural Landscape¹	<p>The landscape features would remain in their existing conditions, and exterior finishes would continue to deteriorate, slightly changing the appearance of the historic buildings within the cultural landscape.</p> <p>Missing original features such as the exterior stairs on the west side of the mansion, the eastern chimney of the south slave quarters, as well as the existing modern materials would continue to limit the accuracy of the site's historic appearance.</p> <p>Routine and emergency maintenance of the historic buildings and landscape would continue under current NPS management practices to preserve the resources as time and funding allow.</p>	<p>The rehabilitation of the gardens and grounds through historic plantings and restoration of building exteriors would improve the landscape by creating a more accurate historic appearance.</p> <p>Regrading would change the topography slightly but would be relatively small and located where the grading has been previously changed.</p> <p>The introduction of modern materials for the tram stop, ramps, stairs, paving, signage, and interpretive exhibits would introduce new elements into the landscape. These new elements would change the visual character and views from and within the site. These impacts would be mitigated through the use of compatible materials and design.</p> <p>Closure of the vehicle access into the work yard would change the historic circulation west past Arlington Woods. The proposed portico ramps, stoop, and front door that would replace the existing would be of smaller footprints and more compatible with the historic character of the landscape.</p> <p>The bookstore option A would introduce a modern structure into the landscape where a building did not historically exist. However, the bookstore would be an addition to the existing comfort station in a location that is not visually-intrusive to the rest of the project area.</p> <p>Bookstore option B would have the same impacts as option A.</p> <p>All actions related to construction would require temporary visual and noise disruptions due to the presence of construction equipment and materials.</p>	<p>The impacts would be the same as under alternative 2, with the following differences.</p> <p>The tram stop option A would introduce modern stairs and a ramp into the landscape, though the location was historically used for access into the work yard. The tram stop would change the historic circulation route west past Arlington Woods.</p> <p>The tram stop Option B would have slightly increased adverse impacts over option A because it would be relocated where an entrance does not currently exist.</p> <p>Modifications at the portico would have increased adverse impacts over alternative 2 because the raised floor would change the visual character of the portico by adding a new step. The vestibule and ramp would be more visually-intrusive and result in greater changes to the character-defining façade than those under alternative 2.</p> <p>Conservatory access option A would introduce modern stairs and ramp into the landscape and alter the historic appearance of the exterior.</p> <p>Conservatory access option B would result in similar impacts to option A on the west side of the mansion, but would have no impacts on the conservatory's historic entrance.</p> <p>The bookstore would have similar, but greater, adverse impacts on the cultural landscape than alternative 2 because it would introduce a new building with a larger footprint into the historic landscape.</p> <p>All actions related to construction would require temporary visual and noise disruptions due to the presence of construction equipment and materials.</p>

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONT.)

Impact Topic	Alternative 1: No Action	Alternative 2	Alternative 3
Archeological Resources¹	There would be no impacts on archeological resources because there would be no ground disturbance on the site.	Ground disturbance associated with construction activities has the potential to impact archeological resources. However, archeological surveys show that the project area has been previously regraded and disturbed several times over the past two centuries of occupancy and use as a memorial site. Additional archeological surveys and investigations would be completed as needed prior to actions requiring digging to mitigate any adverse impacts.	The impacts on archeological resources would be similar to those under alternative 2, but there would be a slightly increased potential for adverse impacts due to the larger footprints of the proposed ramps and the proposed stand-alone bookstore. The tram stop option B would also have a slightly increased potential for adverse impacts over alternative 2 because it would require ground disturbance in an area not currently disturbed or used for access.
Museum Collections	Continuation of current procedures for the preservation and conservation of museum collections would result in their preservation as much as time and funding allows. The climate management, fire suppression, and security systems would continue to malfunction, resulting in an ongoing risk of damage or loss due to high or low temperature and humidity, fire, and theft.	Upgraded climate control, fire, and security systems would increase the overall protection from damage or loss due to high or low temperature and humidity, fire, and theft. The relocation of museum collections during interior construction activities, including the handling, transportation, and storage required would put these objects at an increased risk of damage or loss. However, leaving the collection in place during construction also puts the objects at an increased risk of damage or theft. The relocation and storage would be done by trained staff members and contractors, and would follow existing collections management policies, mitigating adverse impacts on museum collections.	Same as under alternative 2.

TABLE 2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES (CONT.)

Impact Topic	Alternative 1: No Action	Alternative 2	Alternative 3
Visitor Use and Experience	<p>The existing adverse impacts on visitor use and experience would continue under alternative 1. Because there would continue to be a number of entry points into the project area and an overall lack of orientation, visitors would continue to have no true sense of arrival when visiting the site. Visitors using wheelchairs or with difficulty using stairs and uneven surfaces would continue to have limited access throughout the project area due to the existing site grading and the existing barriers and changes in floor level within the mansion interior.</p>	<p>Universal access would be improved through accessible paths, additional ramps, an accessible tram stop, and a larger bookstore.</p> <p>Improved opportunities for visitor understanding of the site's context and significance would result from the restoration of historic features, addition of non-invasive historic plantings, improved orientation, and improved interpretive exhibits.</p> <p>The addition of canopy trees within the project area would provide an increased amount of shade for visitors.</p> <p>Modern elements introduced into the project area such as ramps, signs, and interpretive exhibits would change the visual character and would detract from the visitors' aesthetic experience of the historic setting.</p> <p>New and enhanced exhibits in the museum building would provide increased opportunities for visitor understanding of the site's history.</p> <p>The presence and noise of construction equipment and landscape disturbance would detract from the visitor experience of the site's historic setting, resulting in a short-term adverse impact. Additionally, some areas would be closed to visitors during construction, which would result in an adverse impact if visitors are unable to view or experience a particular aspect of the site.</p>	<p>Same as under alternative 2 with the following differences:</p> <p>Tram stop option A would be located closer to the central area of the site over alternative 2, resulting in a beneficial impact on visitor entrance into the site. Tram stop option B would have the benefit of a closer location, though not as close as option A.</p> <p>Modifications at the mansion portico would result in the same benefits to universal accessibility as alternative 2, but would be slightly greater because the raised floor would allow visitors with limited mobility to approach the front door from any direction, rather than requiring another ramp to access the mansion interior.</p> <p>For accessibility to the rear of the mansion under option A, the fully raised conservatory floor would allow visitors room to move about freely. However, visitors would not be able to experience the historic aesthetic of the original floor level. The visual changes of the exterior accessibility ramp and door modification would result in adverse impacts on the visitor experience of the historic aesthetic. Option B would result in similar adverse impacts as under option A, except there would be no impacts on the conservatory door or interior.</p> <p>New and enhanced exhibits in the museum building would provide increased opportunities for visitor understanding of the site's history, though the space would be smaller than under alternative 2.</p>

¹An assessment of effect under NHPA section 106 is being completed concurrently with, but separately from, this NEPA document and the impacts summarized in this table do not constitute compliance with or an assessment of effects under section 106.

MITIGATION MEASURES OF THE ACTION ALTERNATIVES

To minimize environmental impacts related to the action alternatives, the National Park Service would implement mitigation measures whenever feasible. Although the exact mitigation measures to be implemented would depend upon the final design and approval of plans by relevant agencies, the National Park Service (and their contractors) would take the following measures:

- § Instruct contractor employees on the sensitivity of the general environment and monitor their activities by NPS staff. Corridors for construction vehicle movement would be established and defined on the ground. Staging of construction equipment would be restricted to identified previously disturbed areas to avoid impacts on natural and cultural resources.
- § Use the minimum size equipment needed to complete the actions laid out in the alternatives. Hand digging and other minimally intrusive methods may be specified to minimize damage to cultural or natural resources.
- § Implement standard noise abatement measures during construction. Standard noise abatement measures could include the following elements: a schedule that minimizes impacts on adjacent noise-sensitive uses, the use of the best available noise control techniques wherever feasible, the use of hydraulically or electrically powered impact tools when feasible, and location of temporary noise sources as far from sensitive uses as possible.
- § Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies.
- § Implement measures to prevent invasive plants from returning to sites where they have been removed, such as ensuring that construction-related equipment arrives at the site free of mud or seed-bearing materials, and certifying that all seeds and straw material are weed-free.
- § Rehabilitate areas that are temporarily disturbed during construction with native grasses and other native species as per NPS standards and consistent with the cultural landscape report.
- § Follow the *Secretary of the Interior's Standards for the Treatment of Historic Properties* for all preservation and rehabilitation efforts to historic structures, to the extent practicable for the majority of project elements.
- § An Unanticipated Discovery Plan would be developed to mitigate potential adverse impacts in the event that archeological resources are encountered during the actions proposed in the alternatives. If during construction previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if significant resources could not be preserved *in situ*, an appropriate mitigation strategy (e.g. the excavation, recordation, and mapping of cultural remains prior to disturbance, to ensure that important archeological data that otherwise would be lost is recovered and documented) would be developed in consultation with the state historic preservation office and, as appropriate, associated American Indian tribes.
- § Tree removal, clearing, and construction activities would not take place during the roosting and pupping season of the northern long-eared bat (June 1-July 31) to avoid disturbance to potential maternity roosts in the area. During future project phases, if it is determined that clearing or construction is needed during these seasons, the National Park Service would coordinate with the US Fish and Wildlife Service to ensure no impacts would occur.

NPS PREFERRED ALTERNATIVE

The preferred alternative is the alternative the National Park Service believes “would best accomplish the purposes of the proposed action and while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors” (43 CFR 46.420 [d]). The National Park Service identified alternative 2 as the preferred alternative because it would provide an improved visitor experience and universal accessibility throughout the site while preserving the historic resources and historic setting more effectively than alternatives 1 and 3. Alternative 1 would not meet the project’s purpose and need because while the site would continue to be actively maintained, its rehabilitation and restoration potential would not be fully realized. Under alternative 1, no rehabilitation efforts would be undertaken to preserve historic integrity, improve visitor experience through accessibility and interpretation, or relocate the bookstore to rehabilitate the north slave quarters for interpretation. Though alternative 3 would meet the purpose and need of the project, the actions would result in a greater degree of adverse impacts on historic structures and cultural landscape when compared to alternative 2 due to modern materials that would be of larger footprints and require more physical changes to the historic structures of the project area.

The preferred alternative has been refined through coordination with the Virginia State Historic Preservation Office, the National Capital Planning Commission, and the Commission of Fine Arts. The National Park Service will continue to consult and coordinate with these agencies and others, as appropriate, as design continues.

3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the current environmental conditions in and surrounding the project as they relate to each impact topic listed below. These conditions serve as a baseline for understanding the resources that could be impacted by implementing the project. This chapter then analyzes the beneficial and adverse impacts that would result from implementing any of the alternatives considered in this environmental assessment. This chapter also includes direct, indirect, and cumulative impacts, as well as the methods used in these analyses. A summary of the environmental consequences for each alternative is provided in table 2, which can be found in chapter 2, “Alternatives.”

GENERAL METHODOLOGY FOR ANALYZING IMPACTS

In accordance with the CEQ regulations for implementation of the National Environmental Policy Act, direct, indirect, and cumulative impacts are described under each impact topic (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each impact topic. For all resource topics, the area evaluated for impacts is the area delineated as the project area, as shown in figure 2.

An assessment of effect under NHPA section 106 is being completed concurrently with, but separately from, this NEPA document and the impacts discussed in this chapter do not constitute compliance with or an assessment of effects under section 106.

Though this document uses the term “impact” to conform to standard NEPA analysis terminology, the terms “impact” and “effect” are used interchangeably in CEQ regulations and therefore they are used interchangeably in this general methodology discussion.

DURATION OF IMPACT

The duration of an impact defines how long the impact may last following implementation of an action. Wherever possible, the analysis quantifies the actual length of the expected impact. Otherwise, impacts are defined as either short-term or long-term and are not generally both. The following terms are used for all impact topics to allow for easy summarization.

Short-term: Impacts that last a relatively brief time following an action and/or are temporary in nature. Short-term impacts typically are less than 1 year in duration.

Long-term: Impacts that last a relatively long time following an action and/or may be permanent. Long-term impacts typically are 1 year or longer in duration.

TYPE OF IMPACT

Impacts are discussed by type, as follows:

Direct: Impacts that would occur as a result of the proposed action at the same time and place of implementation (40 CFR 1508.8).

Indirect: Impacts that would occur as a result of the proposed action but later in time or farther in distance from the action (40 CFR 1508.8).

Adverse: Impacts that would cause an unfavorable result to the resource when compared to the existing conditions.

Beneficial: Impacts that would result in a positive change to the resource when compared to the existing conditions.

It should be noted that this analysis does not constitute a finding of effects as defined by NHPA section 106. An adverse impact in a NEPA analysis does not necessarily equate to an adverse effect under section 106. An assessment of effect is being completed concurrently with, but separate from, this document and will assess the potential for adverse effects under the National Historic Preservation Act.

ASSESSING IMPACTS USING COUNCIL ON ENVIRONMENTAL QUALITY CRITERIA

The impacts of the alternatives are assessed using the Council on Environmental Quality definition of “significance” (1508.27), which requires consideration of both context and intensity:

- (a) **Context** – This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity – This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

- (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect would be beneficial.
- (2) The degree to which the proposed action affects public health or safety.
- (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetland, wild and scenic rivers, or ecologically critical areas.
- (4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- (5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- (6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- (7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- (8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
- (9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
- (10) Whether the action threatens a violation of federal, commonwealth, or local law or requirements imposed for the protection of the environment.

For each impact topic analyzed, an assessment of the potential significance of the impacts according to context and intensity is provided in the “Conclusion” section that follows the discussion of the impacts under each alternative. Resource-specific context is presented in the “Methodologies” section under each resource topic and applies across all alternatives. Intensity of the impacts is presented using the relevant factors from the list in (b) above. Intensity factors that do not apply to a given resource topic and/or alternative are not discussed.

CUMULATIVE IMPACTS ANALYSIS METHODOLOGY

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). As stated in the CEQ handbook, *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997), cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on impacts that are truly meaningful. Cumulative impacts are considered for all alternatives, including the no-action alternative.

Cumulative impacts were determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable actions that would also result in beneficial or adverse impacts. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the projects. These actions were identified through the internal and external project scoping processes and are summarized below. In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

Imperceptible: The incremental effect contributed by the alternative to the overall cumulative impact is such a small increment that it is impossible or extremely difficult to discern.

Noticeable: The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impact.

Appreciable: The incremental effect contributed by the alternative constitutes a large portion of the overall cumulative impact.

Past, Present, and Reasonably Foreseeable Actions

Previous rehabilitation and preservation efforts to the mansion, outbuildings, and grounds. In 2006, the *Rehabilitation of Arlington House, Outbuildings & Grounds Environmental Assessment* was completed to propose needed rehabilitation work for the project area. Many of the proposed efforts were undertaken from 2009-2011 and included extensive work to the mansion’s interior and north slave quarters to restore finishes to a more historically compatible design and to stabilize deteriorating materials. The non-historic 1921 comfort station was removed from its location adjacent to the north slave quarters and a new, universally accessible comfort station was constructed on the north end of the project area. The project also included extensive rehabilitation of mechanical, electrical, and fire protection systems, replacement of site utilities, and construction of a remote bunker to house building systems. These improvements have had impacts on historic structures, cultural landscape, archeological resources, and visitor use and experience.

Arlington National Cemetery Real Property Master Plan. The *Programmatic Environmental Assessment for the Arlington National Cemetery Real Property Master Plan* (2014) establishes the foundation for future development and reflects the cemetery’s primary goal of extending its burial capacity in a manner that respects its unique heritage, identity, and mission. The master plan proposed general areas for future improvements, which includes the arrival areas and overall visitor amenities. These could include an improved welcome center, a new transportation center, and

improved wayfinding signage. Because Arlington House is located within Arlington National Cemetery, this project has the potential to impact visitor use and experience.

Arlington National Cemetery Millennium Project. The Arlington National Cemetery Millennium Project is an in-progress expansion of Arlington National Cemetery to increase burial space northwest of the Arlington House property. This area was formerly part of Arlington Woods and was transferred from the National Park Service to Arlington National Cemetery in 2002. A very small portion of the project includes stream restoration activity on NPS-administered property along the northwest edge of the current Arlington Woods boundary. The Millennium Project includes changes to the topography and vegetation, improvements to stormwater management, and the construction of various facilities. For stream restoration, the main stream channel will be restored and integrated into the overall project as a natural landscape amenity and the existing degraded stream channels will be restored. This project has the potential to impact visitor use and experience.

Local Transportation Infrastructure Improvements. Improvements to local transportation infrastructure are in the planning process for the Arlington Memorial Bridge and the Memorial Circle area of the George Washington Memorial Parkway. The National Park Service will be undertaking the repair and rehabilitation of the Arlington Memorial Bridge, which spans the Potomac River between the National Mall and Arlington National Cemetery. The proposed project includes the rehabilitation and replacement of deteriorating structural elements and other minor nonstructural bridge improvements. The Memorial Circle Transportation Plan is an in-progress project that seeks to reduce conflicts between trail, walkway, and roadway users and to increase overall visitor safety within the heavily used Memorial Circle area. These projects have the potential to impact the cultural landscape.

HISTORIC STRUCTURES

AFFECTED ENVIRONMENT

Arlington House, The Robert E. Lee Memorial is listed in the National Register of Historic Places (National Register) as a historic district and contributing structures within the project area include the mansion, north and south slave quarters, and museum building (potting shed). The comfort station and mechanical bunker are not contributing resources and are not considered historic structures. The alternatives have the potential to impact the historic integrity of the mansion, slave quarters, and museum building through rehabilitation and preservation work and any resulting changes.

Mansion

The mansion is a Greek Revival structure composed of a large two-story central section flanked by two one-story wings. The long axis of the house runs north-south and the front façade faces Washington, DC to the east across the Potomac River. The house was constructed of locally made bricks with the exterior finished in stucco, scribed to simulate ashlar stonework. The most prominent feature of the house is the 16-foot by 52-foot portico across the central section, formed by eight large stuccoed and marbleized brick Doric columns supporting a massive pediment.

The exterior foundation and interior basement walls are constructed of multi-wythe brick masonry, which at some locations show deterioration characteristics of having been under-fired during

manufacture, such as crumbling and delamination. The majority of the deterioration is limited to the outer 1/8 to 1/2-inch of the brick faces, but small areas of bricks with a loss of up to 50 percent or more of the brick thickness occur in the two small southeast rooms in the basement. Water damage is evident in the basement and there are signs of active water infiltration just inside exterior doors in the basement hall. Modern brickwork is evident at several locations dating to previous preservation work undertaken in 1931 and some dating to as recently as the last five years. Additionally, in the central basement room, wood shoring currently supports deteriorated floor joists, which may be in need of additional support. Two additional joists adjacent to the shored joists have large full depth notches cut into their vertical faces and require additional shoring and support.

The front portico of the mansion is surfaced with hexagonal brick pavers, about half original to the mansion's construction and the rest dating to 1930. The brick pavers are currently deteriorated and worn, leaving an uneven walking surface and tripping hazards. A temporary metal ramp serves as the only universal access onto the portico and a plywood ramp leads into the mansion. Currently, all visitors enter the mansion through a temporary wood vestibule with divided light glazing built in front of the historic wood front doors. It is currently in poor condition and in need of replacement. The exterior finish on the foundation, as well as the east, north, and south elevations is painted stucco designed to resemble marble. These surfaces were last recoated in the early 2000s and the current condition ranges from good to poor. The rest of the exterior paint is loose and peeling and the entire house is in need of repainting. The mansion's shutters are in fair to poor condition, except where they are under the cover of the portico's deep overhang, and several windows are missing their shutters entirely. All hardware on the mansion's exterior is in need of cleaning, refinishing, and in some cases, replacement of missing components. Two sets of wood stairs on the rear of the house were demolished during previous rehabilitation efforts and were never replaced. A third set of stairs on the north wing exists but is in poor condition.

The conservatory is located on the west side of the south wing of the mansion at ground level, which is about four feet lower than the level of the adjacent rooms. It is accessed by a set of stairs to the main floor of the mansion, though there is an existing exterior door on the south wall at floor level. Currently, it is in fair condition overall, though the exterior windows and doors are in poor condition. The knee wall beneath the windows on the west wall shows evidence of moisture intrusion and damaged plaster. The interior brick floors are uneven and pose a tripping hazard.

The interior finishes, paint, and hardware are in various conditions throughout the mansion. In the basement and first floor there are several areas where the paint is flaking and in poor condition, while the majority of the paint on the second floor is in good condition. There are several areas throughout the house where the plaster is damaged due to wall hangers used for decorative features. Heavy foot traffic through the main floor center hall has led to wear of the floor boards and several are in poor condition. There are 12 fireplaces in the mansion and all show signs of deterioration, though specific conditions vary and include deteriorated bricks and mortar, uneven stone hearths, build-up of soot and ash, and damaged mantels.

Slave Quarters

The north and south slave quarters are identical one-story buildings located just west of the mansion. The buildings are 40 feet on the north and south elevations by 20 feet on the east and west elevations. They are both of masonry construction, covered by stucco, and are one room deep and three rooms wide. The front façades of each building face each other with a central work yard between. Each building has three doors on the front, each opening into a non-connecting room. The rear elevation

has four decorative arches built into the exterior wall, two on each of the east and west bays, with narrow three-light windows spanning the width of the arch. In the central bay, two pilasters and two engaged columns decorate the exterior to mimic the columns of the mansion's portico. A similar archway is built onto the east sides of both buildings and the similar engaged columns and pilasters decorate each of the west sides. Both buildings have pitched roofs covered in flat tiles. The north slave quarters has two chimneys, one on the east end and one on the west end, while the south slave quarters only has one chimney on the west end.

North Slave Quarters. The north slave quarters underwent rehabilitation during the project area's 2009–2011 rehabilitation campaign. The building currently houses the site's bookstore in the west room, which is one space at ground level—a result of past rehabilitation that changed it from its historic bi-level configuration. The east room is currently in its historic bi-level configuration and exhibited as a period room. There are areas within the interior rooms where the paint and plaster is peeling and in need of repair. The central room is in its historical configuration as one space at ground level with a crawlspace below. The crawl space now functions as access for utilities connected to the mechanical bunker, reached by an unsecured ladder. The lighting fixture in the crawlspace is currently located above ductwork and is difficult to service.

South Slave Quarters. The south slave quarters was not included in the 2009–2011 rehabilitation project and has not had significant restoration or rehabilitation work done in many years. Currently, the three rooms are used for exhibit space, though they do not fully reflect the original configuration or finish of the building. The interiors of the east and west rooms—originally living quarters—do not have the original ceiling heights or finishes. The interior brick floors of these rooms and stud wall in the east room are not from the period of significance. The fireplace and chimney that once were in the east room are no longer in place. The plaster walls in the center room are in need of repair and repainting in some areas. On the exterior, the stucco finish is deteriorating and has non-historic stucco material mixed in with the historic material. Exterior paint is deteriorating and peeling, as are the frescoes above each of the three doors. In the attic, the existing electrical panelboard does not meet code in its location due to the lack of headroom.

Museum Building (Former Potting Shed)

The museum building was built by the US Army in 1888 as a potting shed and part of a larger greenhouse complex on the northeastern edge of the kitchen garden. The building was used in conjunction with an attached greenhouse to cultivate plants for the cemetery, though the greenhouse was removed in 1934. The building is a late-Victorian brick, two-story, rectangular building approximately 22 by 25 feet. It has a hipped roof with slate shingles and brick buttresses on all except the south elevation. The main entrance into the building is on the center of the north elevation and is a double-leaf wood paneled door with a segmental arched lintel and arched roof portico. Decorative features of the museum building include a brick, modillion-like cornice and four louvered and gabled roof dormers, one per side. Copper gutters and downspouts extend the perimeter of the building. The building was rehabilitated into a museum in the early 1950s. While the exterior of the building maintains much of its historic features with the exception of the mid-20th century pedestrian entrance at the east elevation, the interior of the building has been substantially modified from its original state and much of the interior historic materials and features have been lost (NPS 2014b). Currently, the museum building contains exhibited collections from the Custis and Lee families on the first floor, as well as office and storage space on the second floor.

Mechanical Systems

A mechanical bunker on the northwest side of the project area serves the mechanical systems of the mansion, north slave quarters, and museum. The systems in the south slave quarters are not served by this bunker. The current climate management system for the mansion is no longer working at the optimal level and the preferred temperatures and humidity for a historic house museum and its collections are not being consistently met. The existing fire alarm systems in the mansion and slave quarters include manual pull stations as well as smoke and heat detectors. These systems have been observed to have issues by both park staff and a survey completed in 2015 in preparation for this rehabilitation project. An automatic fire suppression system exists in the mansion and north slave quarters, though it currently has problems with maintaining pressure in the pump. There is currently no fire suppression system installed in the museum building because it is less than 5,000 square feet and thus exempt from the NPS requirement. The security systems on site have antiquated intrusion detection systems consisting of arm/disarm keypads and field devices including door position switches, pressure mats, and directional motion sensors. Some sensors have been disconnected due to the frequent occurrence of unfounded alarms. There is currently no video surveillance system in place.

METHODOLOGY AND ASSUMPTIONS

Potential impacts on historic structures are evaluated based on changes to character-defining features of the resources, which are the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places. This approach is derived from both the *Secretary of the Interior's Standards for Rehabilitation of Historic Buildings* as well as the regulations of the Advisory Council on Historic Preservation implementing the provisions of the National Historic Preservation Act. However, it should be noted that this document assesses impacts under the National Environmental Policy Act. An NHPA section 106 assessment of effect is being completed concurrently with, but separately from, this document. The current conditions of historic structures, as presented under the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine the impacts on historic structures.

The resource-specific context for the evaluation of impacts on historic structures includes the following:

- § Arlington House, The Robert E. Lee Memorial is listed in the National Register of Historic Places and is eligible based on criterion A for its association with Robert E. Lee and events in the US Civil War and based on criterion C as an outstanding example of early Greek Revival architecture. Contributing structures to the site include the mansion, slave quarters, and the former potting shed that is now used and known as the museum building.
- § Both the north and south slave quarters are considered contributing features to the significance of Arlington House in its National Register nomination form. These structures provide a unique window into the lives of the enslaved laborers that lived and worked at the Arlington House estate.
- § While there has been change to the historic character of these buildings through reuse and rehabilitation over the past 200 years, the buildings themselves maintain much of their historic integrity overall, including many historic finishes and materials.
- § The historic character and integrity of historic structures and small-scale features in the project area could be diminished by relocation, destruction, major design changes,

introduction of new structures or circulation, and the use of historically-incompatible materials and methods in repair and maintenance.

IMPACTS OF ALTERNATIVE 1: NO-ACTION

Impact Analysis

Under alternative 1, adverse impacts on historic structures would continue to occur due to the continued deterioration of certain finishes and features. On the exterior of the buildings, wood, plaster, stucco, paint, metal, and other finishes would continue to deteriorate due to weathering and moisture infiltration in certain areas. On the interior, wood floors and their finishes would continue to be worn down in high traffic areas such as the central hall due to foot traffic. Interior plaster and paint that is currently damaged or failing would continue to deteriorate. However, the buildings would continue to be maintained as time and funding allows under the current NPS management practices and in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, which would mitigate some of the adverse impacts.

Because no repair of the mansion's foundation would be undertaken under alternative 1, areas of water infiltration and underfired bricks in the basement would continue to deteriorate the historic materials. However, the size of the most deteriorated areas is small in relation to the overall foundation and limited to two rooms in the basement, therefore the overall foundation would remain stable.

Modern materials that exist within the historic fabric of the historic structures would continue to detract from the historic character of the buildings. These materials include the existing vestibule and ramps at the portico and the modern stucco repairs on the exterior of the south slave quarters. These adverse impacts would continue under alternative 1.

Under this alternative, the climate management system would continue to operate outside of ideal levels, which would continue to put the historic fabric of the structures at risk of damage due to high or low temperatures and humidity. Temperatures that are too high can cause gradual disintegration of organic materials, while temperatures that are too low can cause desiccation that can lead to fracture of paints, adhesives, and other materials. Fluctuating temperatures can cause materials to expand and contract rapidly, resulting in fractures and delamination of brittle solid materials. Humidity is directly related to temperature. High humidity can cause mold to form, cause rust and corrosion to metals, and cause swelling of some materials. Low humidity may lead to dehydration or desiccation of organic materials such as wood. Fluctuating levels of humidity causes shrinking and swelling of organic materials that can lead to crushing or fracturing, delamination, and loosening of joints. These long-term impacts of inconsistent temperature and humidity would affect wood, plaster, paint, metals, and other materials within the historic structures.

Under alternative 1, the bookstore would remain in the north slave quarters, which would continue to visually detract from the historic interior and significance of the building. The north slave quarters would continue to experience moisture infiltration on the northern exterior at the sill below the engaged columns due to an improper slope and failing seal, which would continue to result in an adverse impact on the historic structure.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on historic structures include previous restoration and rehabilitation efforts for the mansion and slave quarters. Collectively, these actions have resulted in beneficial and adverse impacts on historic structures. For instance, the efforts undertaken to rehabilitate the historic materials of the mansion and north slave quarters in the 2009-2011 rehabilitation campaign resulted in beneficial impacts because some of the historic character and integrity was restored through restoration and preservation of finishes and features. The improvements made to the climate management system and addition of a fire suppression system resulted in beneficial impacts because they offer increased protection from damage or loss due to temperature fluctuation and fire. Additionally, this campaign removed the 1921 comfort station from behind the north slave quarters and constructed a new comfort station on the northern boundary of the project area, which resulted in beneficial impacts on the north slave quarters by removing a modern structure from its direct vicinity and, therefore, restoring historic integrity of its setting. However, this campaign did introduce modern materials and structures into the project area, which resulted in adverse impacts on the historic setting of the structures. The impacts of alternative 1, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on historic structures. Alternative 1 would contribute an imperceptible increment to the cumulative impact on historic structures.

Conclusion

Under alternative 1, because no rehabilitation effort would be undertaken, certain finishes and features of the historic structures would continue to deteriorate due to weathering, water infiltration, improper climate maintenance, and heavy use, which would result in a long-term adverse impact on historic structures if character-defining finishes and features are lost. However, the historic structures within the project area would continue to be maintained as funding allows under the current management practices and in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, which would result in the continued beneficial impact on historic structures through preservation and protection of the character-defining features. The historic materials and character would remain and the site as a whole would maintain its eligibility for listing in the National Register. Though the slave quarters would continue to not be fully restored or interpreted to their period of significance, the existing exhibits provide visitors an opportunity to understand the lives of the enslaved laborers who lived and worked on the estate. There would be no changes to the site's design, no introduction of modern structures into the landscape, or destruction of historic materials under alternative 1. Therefore, the impacts on historic structures under alternative 1 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 2

Impact Analysis

Mansion. Rehabilitation and restoration efforts to the mansion under alternative 2, including work on doors, windows, walls, floors, and ceilings would result in a beneficial impact because they would maintain and restore historic materials and features. Areas that are damaged would be repaired and restored to their appearance during the site's period of significance. Restoring and refinishing the exterior shutters, stucco, and faux marble finish would result in a beneficial impact on the mansion because it would restore the exterior to its historic appearance. The installation of new weather stripping at doors and windows as needed would result in a beneficial impact because it would

protect the historic fabric from water damage. In addition, removing failing paint and repainting the exteriors would protect the underlying historic materials, such as wood and plaster, from deterioration. The non-historic weather stripping would result in adverse impacts on the historic structure through the introduction of modern materials onto the historic fabric. However, the modern elements would be compatible with the historic structure in color, size, and materials, and would be designed in a way as to not detract from the overall historic character of the structure and to be fully reversible.

The installation of non-reflective glass visitor barriers throughout the mansion would be placed in a manner to minimize impacts to historic fabric. Though the specific locations are not yet determined, in some cases these barriers would be located in place of existing barriers, where the historic materials may have been previously altered for anchoring. Any penetrations into historic floors or walls for nails, screws, or other materials to attach the barriers would be as small as possible and located in a way that would minimize damage to the historic materials. Adverse impacts of these barriers would also result from the introduction of modern materials into the historic structure, which would detract from the historic aesthetics. However, the use of non-reflective glass would minimize the visual impacts because historic features and objects would be visible through the glass. Additionally, these visitor barriers would result in a beneficial impact on the historic structure by preventing access to certain areas, thus protecting fragile historic materials.

The installation of the hanging non-reflective glass panel in the north wing to replace the sliding wall that protects the historic materials of the early structure would result in a beneficial impact on the historic structure because it would preserve the original materials while allowing visitors to view the early features. The installation of the panel and lighting would result in adverse impacts on the historic structure because it would require penetrations in the ceiling to affix the panel and lighting, though those penetrations would be as small as possible to minimize impacts. Adverse impacts would also result from the introduction of modern materials into the historic structure, which would detract from the historic aesthetics. However, the use of non-reflective glass would minimize the visual impacts because the historic materials would be visible behind the glass. The light fixtures would be designed and placed in such a way to be complementary to the historic materials and to minimize the degree to which they detract from the historic structure.

The construction and addition of replicas of the original wood landings, stairs, and hand railings on the west side of the mansion at the outer hall/pantry, the hunting hall, and the store room would result in a beneficial impact on the historic structure because they would restore the historic entry points into the mansion.

Updated and new climate management, fire suppression, electrical, and security systems would result in adverse impacts on the historic structures because they introduce modern elements such as cameras, monitors, and control panels into the historic structures. These actions may require penetrations through the walls or fasteners attached to the walls, which would result in an adverse impact on the historic structure if historic materials are damaged. However, the new systems would be designed and installed in a manner to be as concealed as possible. The sensors, monitors, cameras, and panels would be placed in locations that do not visually disrupt the character-defining features of the structures and any penetrations or attachments to the walls would be as small as possible. Existing concealed sensors and wiring pathways would be used wherever possible to minimize new intrusions. Additionally, the white faceplates of the fire alarm notification devices would visually detract less from the historic character than do the existing red faceplates, resulting in a beneficial impact. Overall, these improved systems would result in a beneficial impact on the historic structures

because the climate management system would protect the historic materials by maintaining a desired temperature and humidity level.

The modifications to the portico area of the east façade for universal accessibility into the mansion's front door would result in adverse impacts on the historic structure due to the introduction of modern materials on the historic fabric of the iconic portico. However, the ramps, stoop, and door proposed under alternative 2 would be a lower profile and a more historically-compatible design than the existing ramps and vestibule in terms of mass, scale, materials, and color. The new accommodations would be clearly differentiated from the historic structure, but the smaller footprint would make them less visually detracting than the existing accommodations. The non-reflective glass doors would allow historic material to be seen through it and would not visually block or detract from the portico as much as the existing vestibule. Therefore, these changes, including the removal of the existing vestibule, would result in a beneficial impact on the historic portico over the no-action alternative. The ramps and new stoop would be reversible and not result in any permanent adverse impacts on the historic structure.

Under alternative 2, construction of the ramp in the mansion's conservatory would have adverse impacts on the historic structure because it would introduce modern materials to the conservatory's interior and require changes to the historic appearance, as well as modifications to the existing door for accessibility. Neither the two sets of interior stairs nor the built-in shelves are original to the conservatory; therefore, their removal would not result in the loss of historic material. The design and materials of the ramp would be clearly differentiated from the historic structure but compatible in terms of mass, scale, materials, and color in order to mitigate the adverse impacts. There would be some loss of historic character, but the overall architectural character of the conservatory, and the house as a whole, would remain. These modifications would be reversible.

All preservation, restoration, and rehabilitation actions have the potential to result in adverse impacts due to improper use of tools, materials, and methods. However, all work would be done by skilled professionals who would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and would complete the work in such a way as to minimize impacts on, and allow preservation of, the remaining historic fabric.

All proposed changes to the grounds, including regrading and introduction of modern materials and elements would result in impacts on the historically significant setting of the historic structures within the project area. These impacts are discussed under the "Cultural Landscape" impact topic.

Slave Quarters. The impacts on the north and south slave quarters due to actions related to rehabilitation and repair of interior and exterior historic materials, finishes, and features; the installation of updated and new climate management, fire suppression, electrical, and security systems; and changes to the historic grounds would be the same as the impacts on the mansion described above. The following describes additional actions that would result in impacts on the north and south slave quarters.

In the north slave quarters, there would be beneficial impacts on the historic structure due to the removal of the bookstore and other modern materials in the west room because these actions would restore some of the historic integrity and character-defining features of that room. Adverse impacts on this room would result from the introduction of modern materials for the display cases and glass floor, though the floor would allow the historic materials in the lower level to be viewed while also being protected.

Actions related to rehabilitation in the south slave quarters would result in beneficial impacts by restoring historic integrity and character-defining features of the building, particularly on the exterior with the reconstruction of the chimney on the east end of the building, installation of replica doors, conservation of the frescos, and the removal of modern stucco and replacement with a historically-compatible material. On the interior, there would be similar impacts on the historic structure due to the reconstruction of the fireplace and hearth in the east room and the restoration of the west room to its period of significance for interpretation. Adverse impacts on the west room would result from the introduction of modern materials for the non-reflective glass barrier, as well as damage to historic materials that may be required for anchoring to the ceiling, walls, or floor, as was described for installation of barriers in the mansion above. However, this barrier would allow the historic materials of this space to be viewed while also being protected, which would result in a beneficial impact.

Museum Building. Under alternative 2, the two-story interior space of the building would be altered to create a one-story interpretive space. Although modifications to the building's interior occurred under previous renovations, the elimination of the second floor and structural augmentation of the interior would result in an adverse impact. The repair and restoration of windows, jambs, trim, doors, and frames as needed would result in a beneficial impact on the historic structure because these actions would maintain some of the remaining historic appearance and features. The replacement of the exterior doors for universally accessible doors would result in visual changes and introduction of modern materials to the historic structure. However, the replacement doors would be designed to replicate the style, materials, and scale of the original doors in order to be compatible with the historic building. Though the exterior doors would be changed, the overall historic integrity of the building's exterior would be maintained.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on historic structures include previous restoration and rehabilitation efforts for the mansion and slave quarters. Collectively, these actions have resulted in beneficial and adverse impacts on historic structures. These impacts are described under alternative 1. The impacts of alternative 2, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on historic structures. Alternative 2 would contribute a noticeable increment to the cumulative impact on historic structures.

Conclusion

Under alternative 2, actions would result in both adverse and beneficial impacts on historic structures. While activities associated with the addition of modern materials and structures into the project area would diminish certain characteristics of the site's historic appearance, actions associated with restoration of historic materials would restore many of the character-defining features. The rehabilitation of the north and south slave quarters would offer increased opportunities for visitors to understand the lives of the enslaved laborers who lived and worked at the estate. Overall, the historic buildings within the project area would maintain their historic character and integrity, and would remain eligible for listing in the National Register under alternative 2. All preservation, rehabilitation, and restoration work would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and would be done in such a way as to minimize impacts on, and allow preservation of, the remaining historic fabric. Though modern materials would be introduced into the historic setting, there would be no major changes in the site's

design or destruction of character-defining features. Therefore, the impacts on historic structures under alternative 2 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 3

Impact Analysis

Under alternative 3, actions related to the rehabilitation and restoration of the historic materials and finishes of the mansion and slave quarters; restoration and rehabilitation of the slave quarters for interpretation; improvements to mechanical, security, and fire protection systems; and changes to the historic grounds would have the same impacts as under alternative 2. The following describes the impacts that would be different.

The actions related to modifications at the mansion's portico would result in adverse impacts on the historic structure because they would change the character-defining features by adding a new floor surface what would be a higher level than the historic portico floor. The replacement of the existing vestibule with one made of non-reflective glass would result in a beneficial impact over the no-action alternative because the glass would allow visitors to see the historic character behind the glass. However, this vestibule would introduce modern materials and design to the mansion's character-defining portico. The sloped sidewalk would have similar impacts on the historic structure as the ramp proposed under alternative 2, but it would have a larger footprint due to the additional leg, which would result in a larger impact. However, as under alternative 2, these modifications would be reversible and would not result in any permanent adverse impacts on the historic structure.

Under alternative 3 rear mansion accessibility option A, the addition of the accessible ramp, landing, and stairs into the conservatory would result in adverse impacts by introducing modern materials and design along the south and east elevations of the mansion exterior. The conservatory door would require modification because the landing to enter the building would be at a raised level which requires a change in door height, resulting in an adverse impact due to the change in the appearance of the historic door. There would be slightly more adverse impacts on the interior than under alternative 2 because the entire floor height would be raised, therefore imposing a greater change to the visual character of the conservatory because the original floor height would not be visible. However, as under alternative 2, the raised floor would be fully reversible and would not result in any permanent adverse impacts on the conservatory.

For accessibility to the rear of the mansion under alternative 3, option B, the impacts on the historic structure would be similar, but in a different location than under option A. The ramp, landing, and stairs would have similar impacts on the mansion exterior due to a similar profile and footprint, and they would lead to the store room door, which would require modification for accessibility. The conservatory door would not require any modifications, and therefore option B would not result in the adverse impacts that would occur under option A on the door. Additionally, although there would be the introduction of modern materials in the form of a paved pad for accessibility into the conservatory, there would be no interior modifications and, therefore, no adverse impacts on the visual character of the conservatory interior.

Under alternative 3, the impacts on the museum building exterior doors and on the interior due to the repair and restoration of windows, jambs, trip, doors, and frames would be the same as under alternative 2. However, under alternative 3, there would be less adverse impacts than under alternative 2 because the interior floorplan and layout would not be changed. Though the first floor

would be rehabilitated for new exhibits, the interior has been previously altered and maintains little historic materials. Any impacts on any remaining historic materials and fabric would be avoided where possible and so the impacts to the overall historic materials would be minimal.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on historic structures include previous restoration and rehabilitation efforts for the mansion and slave quarters. Collectively, these actions have resulted in beneficial and adverse impacts on historic structures. These impacts are described under alternative 1. The impacts of alternative 3, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on historic structures. Alternative 3 would contribute a noticeable increment to the cumulative impact on historic structures.

Conclusion

Under alternative 3, actions would result in both adverse and beneficial impacts on historic structures. While activities associated with the addition of modern materials and structures to the project area would diminish certain characteristics of the site's historic appearance, actions associated with restoration of historic materials would restore many of the character-defining features. The rehabilitation of the north and south slave quarters would offer increased opportunities for visitors to understand the lives of the enslaved laborers who lived and worked at the estate. The impacts on historic structures would be slightly greater under alternative 3 when compared to alternative 2 due to the increased amount of modern materials introduced to the mansion's historic appearance. Overall, the historic buildings within the project area would maintain their historic character and integrity, and would remain eligible for listing in the National Register under alternative 3. All preservation, rehabilitation, and restoration work would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and would be done in such a way as to minimize impacts on, and allow preservation of, the remaining historic fabric. Though modern materials would be introduced into the historic setting, there would be no major changes in the site's design or destruction of historic features. Therefore, the impacts on historic structures under alternative 3 would not approach the level of significant.

CULTURAL LANDSCAPE

AFFECTED ENVIRONMENT

Cultural landscapes, as defined by the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (NPS 1995), consist of "a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values." The Arlington House cultural landscape was documented in the 2001 cultural landscape report (NPS 2001) and the 2009 cultural landscape inventory (NPS 2009b). The proposed action has the potential to directly or visually alter the cultural landscape and thus impact the cultural integrity of the landscape.

Though built prior to the design of the city, the mansion's prominent setting high above the city of Washington, DC played a role in its design. "The prominent house that presided over the vista below

would later influence both the placement of the Arlington Memorial Bridge and the overall plan designed for the city of Washington in 1902 by the McMillan Plan” (NPS 2014c). Views and vistas contributing to the project area’s cultural landscape include the principal vistas eastward between Arlington House and Washington, DC, especially the vista overlooking Arlington Memorial Bridge and the Lincoln Memorial. Overall, these views and vistas maintain their historic integrity of the period of significance (NPS 2009b).

Not only were principal vistas created overlooking Washington, DC to the east, but the mansion, the north and south slave quarters, and the flower and kitchen gardens were placed to create unimpeded views from one end of the domestic complex to the other. Views were also created linking the flower garden with the woodland grove that once occupied the area west of the flower garden upon which the Civil War Unknowns Monument now stands. Additional views were purposefully created or limited by vegetative plantings, topography, and man-made landscape features. Vistas were manipulated during the cemetery period to either emphasize or screen views of particular memorials. The cemetery landscape contributes to the sense of reverence that Arlington House strives to maintain among its visitors (NPS 2014a).

During the Custis and Lee residency certain circulation patterns were established that still remain today, though they have been altered throughout the site’s history of use as described in the site’s cultural landscape report (NPS 2001). The historic roadway known as Lee Drive that runs along the south and east sides of the flower garden was the historic access road for visitors to the mansion and still exists today for pedestrians. Historically, the road continued along the front of the mansion where a turnaround existed just north of the portico. Though this area is less formally a road than during the residency; a pedestrian path remains. Additionally, a circulation route historically existed that connected the work yard to the stables that were located west of the project area past Arlington Woods. This circulation route followed a historic road around the perimeter of the work yard, through what is currently the emergency and maintenance vehicle access point, across what is now Sherman Drive, and past the southern edge of Arlington Woods. It followed the general direction of the existing path next to Arlington Woods but was located a little further south. Though the overall pattern of this historic route can be followed today, it has been cut off by Sherman Drive and partially relocated slightly north. Throughout the site’s history of occupancy and use by the US Army, the War Department, and the National Park Service, additional paths were created throughout the site, such as through the gardens and to the northern end of the project area where the museum (potting shed) exists today.

The kitchen and flower gardens are contributing features to the cultural landscape, though the existing plantings in the gardens do not fully reflect the period of significance of the Lee family residency. The overall topography of the site is relatively flat and has been previously graded to create level foundations. The kitchen garden area was most likely built up with the addition of soils to improve fertility of the garden, putting it on grade with the mansion and other structures. However, the current grading of the kitchen garden does not promote proper drainage and ponding/puddling occurs on walkways. Most of the vegetation on site does not derive from the historic period but much of it is considered to be compatible with the historic time period (NPS 2009b).

The Arlington Woods is considered an integral part of the cultural landscape of Arlington House, as it was an early component in the history of the estate. The oldest trees in the woods, about 250 years old, are located in the area identified as mixed hardwood forest. This area, according to a forestry study conducted in 1996, reflects roughly the same composition as it did in the period of significance

for Arlington House, except for invasive species growth (NPS 2001). Along the western and northern sloped boundaries of the area, the forest retains the least integrity to the period of significance.

The landscape of Arlington House reflects two hundred years of development, change, and reuse. The estate once contained 1,100 acres of land, but today comprises approximately 16 acres. However, the mansion itself—the focal point of the original estate—remains flanked by the gardens, supported by the slave quarters, and framed by large hardwood canopy trees as it did during its period of significance. Some of the buildings within the cultural landscape are currently not fully reflective of the period of significance due to missing features or deteriorated condition. Missing features include exterior stairs on the west side of the mansion and the eastern chimney of the south slave quarters. Weathered and deteriorated conditions include the exterior shutters of the mansion and frescos of the slave quarters. Additional discussion of the buildings' exterior conditions are described under the "Historic Structures" impact topic and would apply to the affected environment of the cultural landscape, as well. Though the site's topography and surroundings have changed over the years of use and development of the cemetery, the historic character of the cultural landscape remains. Overall, the existing spatial organization, buildings and structures, and circulation patterns of the project area remain similar to the arrangement of the site during its period of significance (NPS 2009b).

METHODOLOGY AND ASSUMPTIONS

Potential impacts on the cultural landscape are analyzed in terms of changes to character-defining features of the resources, based on the Director's Order 28: *Cultural Resource Management Guidelines* definition of a cultural landscape. Director's Order 28 defines a cultural landscape as "a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions" (NPS 2002). These features contribute to the property's integrity, which is composed of location, design, setting, materials, workmanship, feeling, and/or association. It should be noted that this document assesses impacts under the National Environmental Policy Act. An NHPA section 106 assessment of effect is being completed concurrently with, but separately from, this document. The current conditions of the cultural landscape, as presented under the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine the impacts on the cultural landscape.

The resource-specific context for the evaluation of impacts on the cultural landscape includes the following:

- § The cultural landscape defined by the park's boundaries includes the mansion, the two slave quarters, the former potting shed, the flower garden, the kitchen garden, and the 12-acre forest known as Arlington Woods. The period of significance for Arlington House is 1802-1935, comprising the Custis and Lee residencies, occupation by the US Army during the Civil War, the establishment of the national cemetery, and the first professional restoration of the house and grounds (NPS 2014b).
- § Views and vistas are important character defining features of the cultural landscape and are present within the project area. High priority views include the principal vistas eastward between Arlington House and Washington, DC, especially the vista overlooking Arlington

Memorial Bridge and the Lincoln Memorial. Other contributing views include the unimpeded view from one end of the project area to the other and the westward view from the flower garden.

- § Historic circulation patterns, though altered, still exist within the project area and include the historic Lee Drive around the flower garden and the connection between the work yard and the historic stables past Arlington Woods.
- § Vegetation plays an important role in the cultural landscape and was manipulated over the past 200 years to emphasize or limit views, particularly during the cemetery period to manage views of particular memorials and maintain a sense of reverence.
- § Because of the project area's location surrounded by Arlington National Cemetery, America's most sacred military shrine, the value of reverence is considered fundamental and must be maintained.

IMPACTS OF ALTERNATIVE 1: NO-ACTION

Impact Analysis

Under alternative 1, the landscape features would remain in their existing conditions and certain exterior finishes of the mansion and slave quarters would continue to deteriorate, including paint, stucco, and wood. This would continue to result in adverse impacts on the cultural landscape because the deterioration would continue to result in visual changes to the historic appearance of the site and would continue to detract from the historic character of the landscape. However, routine and emergency maintenance of the historic buildings and landscape under current NPS management practices would continue to mitigate some of the adverse impacts related to deterioration of historic materials and would continue to preserve the resources as time and funding allow. Missing original features such as the exterior stairs on the west side of the mansion and the eastern chimney of the south slave quarters would continue to limit the accuracy of the site's historic appearance. Additionally, the modern materials of the existing vestibule and temporary ramps at the mansion's portico and the modern stucco finish on the south slave quarters would continue to visually detract from the original features and materials that contribute to the cultural landscape. The existing circulation patterns; significant views within, from, and into the project area; as well as the vistas overlooking Washington, DC would remain unchanged under the no-action alternative.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on the cultural landscape include previous rehabilitation and preservation efforts to the buildings and grounds as well as local transportation infrastructure improvements. Collectively, these actions have resulted in adverse and beneficial impacts on the cultural landscape under the NEPA definitions. For instance, the 2009-2011 rehabilitation campaign resulted in adverse impacts due to the introduction of new structures and modern materials of the comfort station and the mechanical bunker into the cultural landscape, which slightly changed the visual appearance of the site. Beneficial impacts occurred due to the rehabilitation of the kitchen garden, which returned the site to a more historic appearance. The installation of new fire and climate management systems resulted in beneficial impacts by protecting the mansion and slave quarters from deterioration or loss due to temperature or fire. Additionally, this campaign removed the 1921 comfort station from directly next to the north slave quarters and constructed a new comfort station on the northern boundary of the project area, which resulted in a beneficial impact on the cultural landscape by moving a modern structure to a

less conspicuous area of the site, thus restoring the historic appearance of that area. Local transportation infrastructure improvements will rehabilitate the Arlington Memorial Bridge and reduce conflicts and congestion at Memorial Circle, both of which are within the significant vista overlooking Washington, DC from the front of the Arlington House mansion. Construction equipment and activities within the construction and staging areas will result in temporary adverse impacts on this vista that will last the duration of construction. The impacts of alternative 1, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on the cultural landscape. Alternative 1 would contribute an imperceptible increment to the cumulative impact on the cultural landscape.

Conclusion

Under alternative 1, because no formal rehabilitation effort would be undertaken, certain finishes and features of the mansion and slave quarters would continue to deteriorate, resulting in the continuation of adverse impacts on the cultural landscape. Peeling paint, missing shutters and stairs, and the modern vestibule and ramp at the mansion's portico would continue to detract from the visual character of the cultural landscape. However, routine and emergency maintenance would continue to ensure those structures and features that make up the cultural landscape would be managed to reflect the period of significance as time and funding allow. This includes the historic integrity and spatial organization of the historic buildings and gardens, the historic circulation patterns, historic plantings and vegetation, and maintenance of the historic views and vistas, particularly the vista overlooking Washington, DC. Under alternative 1, the National Park Service would continue to ensure a sense of reverence that is fundamental to the site and surrounding cemetery. Therefore, the impacts under alternative 1 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 2

Impact Analysis

Actions under alternative 2 would result in both beneficial and adverse impacts on the cultural landscape.

Restoration and refinishing of the exterior of the mansion and slave quarters would have a beneficial impact on the cultural landscape because it would return the exteriors to their finished historic appearances. These efforts would remove non-historic materials, particularly the non-historic stucco on the south slave quarters, and replace them with historically compatible materials, resulting in a beneficial impact on the cultural landscape.

Regrading of the paths and the addition of hardened surfaces throughout the project area, particularly in the work yard and the kitchen garden, would change the topography and introduce modern materials, resulting in a direct visual change and adverse impact on the cultural landscape. However, these changes in grade would be relatively small and archeological evidence shows that the site's grading has changed throughout its history due to the addition of topsoil in the kitchen garden and multiple episodes of surface treatments in the work yard (O'Neill and LeeDecker 2005). The materials chosen for the surface treatment of paths would be complementary with the historic setting, therefore mitigating the adverse impacts on the cultural landscape.

The proposed changes to the kitchen garden vegetation would result in beneficial impacts on the cultural landscape because these plantings would improve the historical accuracy of the garden

vegetation during the site's period of significance, based on evidence presented in the cultural landscape report, particularly the addition of the allee of fruit trees along the center path, which existed during the Custis and Lee residency (NPS 2001). The canopy trees and flowering trees proposed throughout the site would be placed to screen the view of modern elements, such as Sherman Drive, that detract from the historic setting and create a landscape more reminiscent of the site's period of significance, as described in the cultural landscape report (NPS 2001). Because the plantings would be non-invasive and native where possible, adverse impacts due to invasive species would not be anticipated. The addition of the wood fence with rail around the kitchen garden and the railing picket fence around the flower garden would result in similar beneficial impacts because they would be similar to the post and rail fences that historically existed during the Custis and Lee residency, as described in the cultural landscape report, restoring additional historic integrity to the gardens (NPS 2001).

Interpretive displays, wayfinding, and orientation signage proposed under alternative 2 would result in adverse impacts on the cultural landscape because they would introduce modern materials to the historic appearance and historically significant views and vistas. These displays and signs would result in some changes to the views within the project area because they would be within sightlines of visitors. However, some interpretive displays would replace existing displays and all would be designed to have minimal visual and physical impacts on the character-defining features of the cultural landscape, thus mitigating the adverse impacts. The signs and displays would be of an appropriate size and height so not to detract from the significant views and vistas, including the vista overlooking Washington, DC. Though the proposed exhibit near Arlington Woods would require a small amount of fill to regrade the lawn to the edge of the proposed pavement, it would be minimal in relation to the overall topography that it would not result in adverse impacts. Disturbed grass would be revegetated after construction of the gathering area.

Under alternative 2, the improved tram stop—and the associated stairs and ramp—would introduce modern materials to the cultural landscape, which would have an adverse impact due to changes to the visual character and views of the landscape. However, the stairs, ramp, and new surface treatment of the path would be in a location previously modified with modern materials for the existing tram stop so the impacts would be mitigated.

The creation of the vehicle pull-off and closure of vehicle access directly into the work yard from Sherman Drive would result in an adverse impact on the cultural landscape because it would cut off the historic circulation pattern that existed to connect the work yard and stables west of the project area. However, this circulation pattern has been previously altered due to Sherman Drive and the relocation of the path past Arlington Woods. There would also be a set of stairs through this area to enable continued use of this circulation pattern and connection by pedestrians across Sherman Drive to Arlington Woods. The use of historic Lee Drive for emergency and maintenance vehicle access would be a historically-compatible use because this historic circulation route was used as carriage access into the site and would not result in any adverse impacts on the cultural landscape.

The changes to the front portico of the mansion would have both beneficial and adverse impacts on the cultural landscape. The addition of the two architectural ramps, the new stoop, and new front doors would result in adverse impacts because they would introduce modern materials to the historic landscape of the property. However, these elements would replace the existing ramps and vestibule and would be more compatible with the historic fabric of the mansion's front façade in mass, scale, color, and material. The removal of the existing vestibule would result in a beneficial impact on the cultural landscape because it would remove the modern feature and restore integrity

of the character-defining portico, which did not historically have a vestibule. The proposed ramps and stoop would be reversible and not result in any permanent adverse impacts on the cultural landscape.

Under the bookstore option A, there would be adverse impacts on the cultural landscape because it would introduce a new structure with modern materials into the cultural landscape in a location where a building did not historically exist during the period of significance. The construction would also require clearing of a couple trees and several shrubs within an approximately 0.03-acre footprint on the east side of the existing comfort station. Tree removal would generally be limited to small, immature trees; impacts on and removal of canopy trees would be avoided if at all possible, although removal of one or two canopy trees may ultimately be required, pending future, more detailed design. When compared to the overall amount of large canopy trees and forest in this area, this is a relatively small amount of vegetation. The tree removal would not change the overall appearance of this area or the view looking north from within the project area. The bookstore would be an addition to an area previously disturbed by the existing modern comfort station and would be visually screened from the rest of the project area. Under option A, the bookstore would be constructed at an angle from the existing comfort station and along the same axis as the historic buildings on the property, increasing its compatibility with the historic buildings. The final design and scale of the bookstore would ensure that its visual impact would be as minimal as possible on the cultural landscape. The bookstore option B would have similar impacts on the cultural landscape as option A, but would be slightly less compatible with the cultural landscape because it would be set on the same axis as the existing comfort station and at an angle to the historic buildings. However, this slight incompatibility would result in a relatively small impact because the mitigation measures under option A would apply under option B as well. Though several more trees and shrubs would be removed than under option A, it would still be a relatively small amount compared to the overall vegetation in the area and would not change the visual appearance or view of this area.

All actions related to construction would require temporary visual disruptions and impacts to soundscapes due to the presence and use of construction equipment and materials. These actions would also have indirect impacts on the reverent soundscape of the surrounding Arlington National Cemetery due to construction noise, which would be disruptive to those attending funerals or wishing to experience a quiet atmosphere. However, these adverse impacts would only last the duration of construction and noise abatement measures would be undertaken as described in the “Mitigation Measure of the Action Alternatives” section in chapter 2. Construction activities would result in no permanent adverse impacts on the cultural landscape.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on the cultural landscape include previous rehabilitation and preservation efforts to the grounds. Collectively, these actions have resulted in beneficial and adverse impacts on the cultural landscape. These impacts are described under alternative 1. The impacts of alternative 2, in conjunction with the impacts of the cumulative actions, would result in a beneficial and adverse impact on the cultural landscape. Alternative 2 would contribute a noticeable increment to the cumulative impact on the cultural landscape.

Conclusion

The actions under alternative 2 would result in both adverse and beneficial impacts on the cultural landscape in the project area. The introduction of modern materials and structures into the landscape would detract slightly from the historic setting. However, the cultural landscape would continue to reflect the period of significance because the modern additions would be of compatible materials and design. The rehabilitation of the gardens and grounds through the use of non-invasive, historic plantings would improve the cultural landscape, as would the restoration of historic finishes on building exteriors because these features would more closely resemble the historic visual features during the period of significance. None of the proposed actions under alternative 2 would change the principal views or vistas of the site, including the vista overlooking Washington, DC, the views from one end of the complex to the other, and the views into and out of the project area. The National Park Service would continue to ensure a sense of reverence that is fundamental to the site and surrounding cemetery. Therefore, the impacts under alternative 2 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 3

Impact Analysis

The actions under alternative 3 related to restoration and refinishing of the historic buildings' exteriors, regrading of paths, addition of trees and rehabilitation of the kitchen garden, installation of displays and signage, introduction of new materials and bookstore structure, and construction activities would result in the same impacts as described under alternative 2. The following differences in impacts would occur under alternative 3.

Under alternative 3, tram stop option A would result in similar adverse impacts on the cultural landscape as the tram stop under alternative 2, but would be located at the site of the existing emergency and maintenance vehicle access point from Sherman Drive into the work yard. As under alternative 2, though modern materials for the stairs and ramp would be introduced into the cultural landscape, they would be in an area that has been previously modified and that is currently used for emergency and maintenance vehicle access. However, because no stairs or ramp currently exist in this area, there would be greater changes to the visual appearance and views of the project area than under alternative 2, resulting in a greater adverse impact on the cultural landscape. As under alternative 2, closing this area to vehicle access would result in an adverse impact on the cultural landscape because it would cut off the historic circulation pattern that existed to connect the work yard and stables west of the project area. However, this circulation pattern has been previously altered due to the creation of Sherman Drive and the relocation of the path past Arlington Woods, and it would remain available for pedestrian circulation.

Under the tram stop option B, the adverse impacts on the cultural landscape would be greater than under option A because it would require the creation of a new path, stairs, and ramp where no access point currently exists and it would visually change that area of the landscape. However, because the new path would be relatively small in relation to the entire landscape and it would be located near existing modern improvements of the existing tram stop stairs, the existing emergency and maintenance vehicle entrance, and a paved road, the adverse impacts would be mitigated. Because the existing emergency and maintenance vehicle access would remain, there would be no adverse impacts on the historic circulation pattern from the work yard to the path past Arlington Woods.

The actions to create accessible entry into the mansion through the front portico under alternative 3 would result in adverse impacts on the cultural landscape due to visual changes and introduction of new materials. The construction of a sloped, two-leg sidewalk up to the north side of the portico would change the front grade of the site and would introduce new materials. The addition of new, raised flooring to make the portico at the same level as the floor of the mansion interior would result in a visual change in the portico because it would change the portico floor height, add an additional step, and add modern materials. The addition of a glass vestibule at the front door would improve the integrity over the existing vestibule that would remain in the no-action alternative because it would be less visually intrusive to the character-defining features, but it would result in an adverse impact because it introduces modern elements and changes the important historic appearance of the mansion's front façade.

For accessibility to the rear of the mansion under alternative 3 option A, the proposed route through the conservatory would result in adverse impacts on the cultural landscape because it would require the addition of modern materials in the historic setting and would visibly change the appearance of the conservatory exterior and door because of the required modifications. Accessibility to the mansion's rear under option B would result in similar adverse impacts due to the introduction of modern materials as under option A, except there would be no direct impacts on the conservatory door because no modifications would be made. A paved pad at the door would introduce new materials to the landscape, but it would be at grade, small, and visually unobtrusive.

The proposed bookstore under alternative 3 would have greater adverse impacts on the cultural landscape than alternative 2 because alternative 3 would introduce a new building with a larger footprint into the historic landscape of the project area. Though the bookstore would be a similar size and design as under alternative 2, the stand-alone building would require a larger footprint because of the space required between the two buildings. This construction would include the disturbance of vegetation within an approximately 0.04-acre footprint and would require the removal of a few more trees than alternative 2, though it would still be a relatively small amount when compared to the overall amount of trees in the area. The bookstore would have a larger impact on the cultural landscape over alternative 2, particularly the visual appearance of this area and the views from the project area looking north.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on the cultural landscape include previous rehabilitation and preservation efforts to the grounds. Collectively, these actions have resulted in beneficial and adverse impacts on the cultural landscape. These impacts are described under alternative 1. The impacts of alternative 3, in conjunction with the impacts of the cumulative actions, would result in a beneficial and adverse impact on the cultural landscape. Alternative 3 would contribute a noticeable increment to the cumulative impact on the cultural landscape.

Conclusion

The actions under alternative 3 would result in both adverse and beneficial impacts on the cultural landscape in the project area. The introduction of modern materials and structures into the landscape would slightly detract from the historic setting. The impacts on the cultural landscape would be slightly greater under alternative 3 when compared to alternative 2 due to the increased footprint and scale of modern materials introduced into the historic site. However, as under

alternative 2, the cultural landscape would continue to reflect the period of significance because the modern additions would be of compatible materials and design. The rehabilitation of the gardens and grounds through the use of non-invasive historic plantings would improve the cultural landscape, as would the restoration of historic finishes on building exteriors, because it would more closely resemble the visual historic features during the period of significance. None of the proposed actions under alternative 3 would change the principal views or vistas of the site, including the vista overlooking Washington, DC, the views from one end of the complex to the other, and the views into and out of the project area. The National Park Service would continue to ensure a sense of reverence that is fundamental to the site and surrounding cemetery. Therefore, the impacts under alternative 3 would not approach the level of significant.

ARCHEOLOGICAL RESOURCES

AFFECTED ENVIRONMENT

A few major programs of archeological investigation have been conducted at Arlington House, as well as several smaller studies. As a result, the archeological record of the site is fairly well known. The first known studies began in the 1950s, though they were small and sometimes informal. These studies uncovered china, glass, stoneware, trash deposits, and artificial grading (NPS 2009b). The first major study, led by NPS archeologist John Pousson, was completed in the early 1980s in conjunction with preparation of a Historic Structures Report and planning for structural stabilization and preservation of the main house. Pousson's study documented kitchen features, including a hearth; stairways leading from the north side of the lower loggia walkway of the north wing; remains of a 1850s heating system; and a series of historical grades interpreted as early nineteenth-century surfaces and landscaping events around the house, including deposits associated with the initial construction period of 1803-1804. In the basement of the south wing, Pousson identified two areas with distinct patterns of brick flooring. Excavations in the north wing identified the remains of fireplaces and an oven, as well as interior foundation walls and support footings for the original loggia walkway (NPS 1983).

Monitoring of the removal of an underground fuel tank in the late 1990s allowed a brief exposure of the subsurface conditions of the area north of the north slave quarters. Major modifications to the landscape have occurred in that area, as a 1920s-era pavement was exposed beneath three feet of fill (NPS 1999a). Test excavations along the west side of the mansion were also completed in 2001. These units did reveal a trench along the main house foundation, but it was not clear whether the trench was associated with the initial construction period or a later repair/rehabilitation episode, such as an episode of repointing of the brickwork.

Prior to the completion of the 1999 Proposed Transfer of Land (Section 29 at Arlington House, The Robert E. Lee Memorial) from George Washington Memorial Parkway to Arlington National Cemetery Environmental Assessment, an archeological survey was undertaken to document resources within Arlington Woods. This survey found a multi-component prehistoric and historic site, termed the Arlington House Ravine Site, which yielded a significant number of prehistoric and historic artifacts.

Another major study was completed in 2005 and focused specifically on areas where ground disturbance was proposed in the 2006 *Rehabilitation of Arlington House, Outbuildings & Grounds Environmental Assessment*. This study focused on selected areas of the mansion, the north and south

slave quarters, the kitchen garden, work yard, and the area of potential effect associated with the proposed mechanical bunker, utility corridor, and comfort station. This program demonstrated that the landscape around the site has been greatly altered, not only during the site's historic Custis/Lee period (1802–1861), but also during subsequent rehabilitation and preservation campaigns carried out during the periods of ownership by the War Department and the National Park Service.

In the south slave quarters, excavations in the west room revealed a complex archeological record, beginning with a buried natural landscape surface and culminating with features and deposits associated with a 1959-era restoration. Investigations in the smokehouse found a twentieth-century reconstructed hearth over a larger hearth and wall trench that may date to the Custis/Lee period. Much of the work in the north slave quarters focused on the areas adjacent to doorways. Previous rehabilitation and preservation campaigns have significantly altered the interior and exterior grades in these areas, virtually obliterating the physical record of nineteenth-century occupation in the summer kitchen (east lower room) and the center room. In the west room, evidence of a possible early to mid-nineteenth-century floor was found, along with rubble deposits from the 1871 and 1929 War Department reconstruction campaigns.

Testing in the kitchen garden showed that this area has generally maintained its nineteenth-century contours, although the ground surface appears to have been raised slightly by the addition of topsoil, presumably introduced as a soil amendment. The archeological record in the work yard shows a complex sequence of landscaping events over the past 200 years, including multiple episodes of surface treatment (concrete, granolithic paving, and gravel) and the installation of many subsurface utility lines. Archeological survey of the area west of the kitchen garden did not identify any significant archeological resources; however, some midden areas may be present along the utility corridor (O'Neill and LeeDecker 2005).

Most recently, in June 2016, archeological investigations were conducted to assess the locations of proposed waysides and found evidence of several episodes of disturbance and fill throughout the site's history. A total of 15 shovel test pits were completed and all exhibited both surface and soil disturbance to some degree. One site in particular had clearly delineated stratigraphy and eight separate strata to a depth of 1.85 feet, which represents different filling episodes. Other sites had notable construction debris layer with evidence of a possible base layer for historic pavers installed in the late 19th century. An archeological feature consisting of a decorative brick border dating to the late 19th century was found along the front drive dating to the late 19th century. Other artifacts were discovered, such as pieces of historic ceramic and green glass, albeit from disturbed contexts (NPS, Krueger, pers. comm., 2016).

METHODOLOGY AND ASSUMPTIONS

Potential impacts on archeological resources are evaluated in terms of the amount of disturbance to an archeological resource and the degree to which the integrity remains or is otherwise lost without recordation of the remains, based on Director's Order 28: *Cultural Resource Management Guidelines*. Director's Order 28 defines archeological resources as "the physical evidences of past human activity, including evidences of the effects of that activity on the environment." Archeological remains in collections and the records that document them and their associated sites are also considered archeological resources and must be managed accordingly (NPS 2002). Impacts on archeological remains in museum collections are included under the "Museum Collections" impact topic. What makes archeological resources significant are their identity, age, location, and context in

conjunction with their potential to reveal information on American history or prehistory. The management of archeological resources on park lands is mandated by law and policy, including *NPS Management Policies*, the Antiquities Act of 1906, section 106 of the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriations Act. This document assesses impacts under the National Environmental Policy Act. An NHPA section 106 assessment of effect is being completed concurrently with, but separately from, this document. The current conditions of archeological resources, as presented under the “Affected Environment” section above, were compared with the alternatives described in chapter 2 to determine the impacts on archeological resources.

The resource-specific context for the evaluation of impacts on archeological resources includes the following:

- § Several archeological surveys of the project area have been conducted since the 1950s. As a result, the archeological record of the site is fairly well known.
- § The project area has been greatly altered throughout its centuries of occupancy and use, including site regrading, multiple episodes of surface treatment, and the installation of many subsurface utility lines.
- § An archeological survey completed for the 1999 Land Transfer Environmental Assessment identified the area known as Arlington Woods as a sensitive archeological site, with both prehistoric and historic artifacts discovered.
- § Small-scale archeological testing and investigations will be undertaken by park project team archeologists for actions requiring ground disturbance in areas not previously tested, such as the installation of interpretative signage.

IMPACTS OF ALTERNATIVE 1: NO-ACTION

Impact Analysis

Under alternative 1, there would be no impacts on archeological resources because there would be no construction activities and therefore no ground disturbance on the site.

Cumulative Impacts

Although past, present, and reasonably foreseeable future actions may result in impacts on archeological resources in the project area, alternative 1 would have no impacts and therefore would not contribute to the impacts of other actions. Consequently, there would be no cumulative impacts on archeological resources under alternative 1.

Conclusion

Alternative 1 would have no impacts on archeological resources within the project area because no construction efforts would be undertaken. Therefore, there would be no impacts on archeological resources under alternative 1 that would approach the level of significant.

IMPACTS OF ALTERNATIVE 2

Impact Analysis

Under alternative 2, ground disturbance associated with a number of actions has the potential for adverse impacts on archeological resources within the project area.

Regrading of the grounds around the mansion and gardens would result in adverse impacts on archeological resources due to soil compaction from construction equipment, the addition of topsoil, and the addition of a hardened surface or paving. However, the grounds were part of a 2005 archeological survey completed for a previous rehabilitation campaign, which found the site had already been greatly altered during its centuries of use. Because the grading of the grounds, particularly in the work yard and the kitchen garden, has been changed throughout the site's history, unknown and intact archeological resources in this area are not likely to be encountered. Any regrading efforts under alternative 2, including for the gathering area near Arlington Woods, would be completed with fill brought in from off-site to limit any unnecessary ground disturbance to gather fill.

The addition of wayfinding, interpretive, and orientation signage, as well as the installation of a new fence on the east boundary and the planting of canopy trees throughout the grounds would require some digging for installation, which would result in adverse impacts on any archeological resources occurring in those areas. However, the location of these features would be in locations already disturbed through previous construction and rehabilitation efforts, as described above, and archeological testing would be conducted by qualified professionals to ensure signage and waysides would not result in adverse impacts on archeological resources. Therefore, the risk of adverse impacts on archeological resources would be mitigated.

The proposed gathering area and interpretive signage at the edge of Arlington Woods has the potential to result in adverse impacts on archeological resources due to ground disturbance from construction and installation, and from soil compaction due to the hardened surface and visitor use. However, this gathering area would be limited in size and location to an area that is previously disturbed by the existing path and interpretive signage at the edge of the woods.

Digging required for the installation of utility lines for updated electrical, mechanical, and security systems has the same potential to result in adverse impacts on archeological resources as for installation of signage, though at a greater scale. However, just as for other construction and installation efforts, the area where these systems would be installed would be in areas already disturbed for previous subsurface utility lines. Therefore, the risk of adverse impacts on archeological resources would be mitigated. The installation of underdrains and other drainage improvement features, as well as the relocation of fire hydrants, would require ground disturbance and digging. However, the locations of these features would be dependent upon archeological clearance and would not be expected to result in adverse impacts on archeological resources.

The construction and installation of any curbing, ramps, stairs, and landings throughout the project area—including for the new tram stop and accessibility into the mansion—would have the same potential for adverse impacts due to construction and soil compaction as regrading and installation of signage, discussed above. These actions would also occur on previously disturbed and surveyed areas, and have the same measures undertaken as the actions described above to avoid archeological resources where possible and mitigate any adverse impacts.

Construction of either bookstore option A or option B would result in the same impacts on archeological resources. There would be ground disturbance during construction activities including digging for the foundation and compaction of soils due to use of construction equipment. If any intact archeological resource deposits exist in the location of the proposed bookstore, there is the potential for adverse impacts due to disturbance. However, this area was previously disturbed for the construction of the existing comfort station and a 60 by 60 foot survey completed found no intact levels or features within this footprint (O'Neill and LeeDecker 2005). Additional archeological surveys would be completed as necessary for the areas requiring ground disturbance outside of the previous survey footprint. Therefore, the risk of adverse impacts on archeological resources in this area is low.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have, or would have, impacts on archeological resources include previous rehabilitation and preservation efforts to the project area. Collectively, these actions have resulted in beneficial and adverse impacts on archeological resources. For instance, the 2009-2011 rehabilitation campaign required ground disturbance for the construction of a new mechanical bunker and comfort station, foundation stabilization, drainage improvements, rehabilitation of the grounds, and the installation of new utility lines. However, the adverse impacts of the ground disturbance were mitigated by archeological survey before construction and monitoring and documentation during construction. The archeological surveys completed prior to this work resulted in a beneficial impact by identifying areas of intact archeological resources that should be protected and avoided during future actions. The impacts of alternative 2, in conjunction with the impacts of the cumulative actions, would result in an adverse impact on archeological resources. Alternative 2 would contribute an imperceptible increment to the cumulative impact on archeological resources.

Conclusion

Alternative 2 has the potential to result in adverse impacts on archeological resources, if measures to identify and avoid archeological resources are not undertaken. However, because an archeological survey of the project area was recently completed and measures to identify and avoid archeological resources would be carried out, adverse impacts on intact archeological resources under alternative 2 are unlikely. An Unidentified Discovery Plan would be developed and implemented as needed to further mitigate potential adverse impacts to unknown archeological resources. The sensitive archeological sites within Arlington Woods would remain undisturbed. In addition, the project area has been greatly altered throughout its centuries of occupancy and use, therefore all actions under alternative 2 would be in previously disturbed locations where intact archeological resources are not likely to exist. Alternative 2 would not involve unique or unknown risks to archeological resources. Therefore, the impacts under alternative 2 on archeological resources would not approach the level of significant.

IMPACTS OF ALTERNATIVE 3

Impact Analysis

The actions under alternative 3 related to regrading of the site, installation of signage, and installation of any utility lines would result in the same impacts described under alternative 2. The following differences in impacts would occur under alternative 3.

Under alternative 3 option A, the proposed tram stop would be located in the area previously disturbed by the existing emergency and maintenance vehicle access. Adverse impacts on archeological resources have the potential to occur because of soil disturbance and compaction due to construction and installation of an accessible ramp and stairs, as well as due to regrading of the path and the addition of a hardened surface. However, as under alternative 2, this area is currently used for vehicle access and has been previously disturbed. Actions under alternative 3 option B would have a slightly increased risk of adverse impacts on archeological resources over option A because a new path would be constructed for the relocated tram stop. Ground disturbance would be required for the creation of the new tram stop, including the construction and installation of stairs and an accessible ramp as well as a new path with a hardened surface leading visitors into the site. Soil compaction due to construction activities and use of the area has the potential to disturb any intact archeological resources that may exist in this area. However, the area that would be disturbed for a new path, stair, and ramp would be relatively small and would connect with an existing path into the site. The area would be surveyed prior to choosing the exact location and designed so potential archeological resources would be avoided. The same mitigation measures under alternative 2 would apply under alternative 3 options A and B.

Under alternative 3, the proposed accessibility ramp to the portico would result in increased adverse impacts on archeological resources due to soil compaction for construction and use because it would have a larger footprint of ground disturbance. However, the same mitigation of impacts would also apply to this alternative.

Accessibility at the rear of the mansion under either alternative option A or option B would result in similar impacts on archeological resources though they would be located in slightly different configurations. The impacts and mitigation measures would be the same as the accessibility ramp proposed under alternative 2, though the impacts would be located mainly on the west side of the conservatory and less on the south side.

Under alternative 3, the impacts on archeological resources due to the construction of a stand-alone bookstore would have a slightly larger footprint than those under alternative 2. Though the bookstore would be of a similar size as under alternative 2, it would not overlap the existing comfort station and thus the construction area would be larger. Therefore, the area of soil compaction and disturbance as a result of the stand-alone bookstore would be larger than the attached bookstore under alternative 2. However, the same mitigation measures would apply and additional archeological surveys would be completed as necessary for the areas requiring ground disturbance outside of the previous survey footprint.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have, or would have, impacts on archeological resources include previous rehabilitation and preservation efforts to the project area. Collectively, these actions have resulted in beneficial and adverse impacts on archeological resources. These impacts are described under alternative 2. The impacts of alternative 3, in conjunction with the impacts of the cumulative actions, would result in an adverse impact on archeological resources. Alternative 3 would contribute an imperceptible increment to the cumulative impact on archeological resources.

Conclusion

Alternative 3 has the potential to result in adverse impacts on archeological resources, if measures to identify and avoid archeological resources are not undertaken. However, because an archeological survey of the project area was recently completed and measures to identify and avoid archeological resources would be carried out, impacts on intact archeological resources under alternative 3 are unlikely. An Unidentified Discovery Plan would be developed and implemented as needed to further mitigate potential adverse impacts to unknown archeological resources. The sensitive archeological sites within Arlington Woods would remain undisturbed. The impacts on archeological resources would be slightly greater under alternative 3 when compared to alternative 2 due to the increased footprint required for construction. However, the project area has been greatly altered throughout its centuries of occupancy and use and so all actions under alternative 3 would be in locations previously disturbed locations where intact archeological resources are not likely to exist. Alternative 3 would not involve any unique or unknown risks to archeological resources. Therefore, the impacts under alternative 3 on archeological resources would not approach the level of significant.

MUSEUM COLLECTIONS

AFFECTED ENVIRONMENT

The museum collections of Arlington House are considered to be a fundamental resource of the site, according to the park's foundation document. Currently, the collections consist of more than 41,000 objects, including period furniture, fine art, household items, and archeological artifacts. Objects recovered as a result of archeological investigations account for the largest portion of the collections, and these are stored at the National Capital Region's Museum Resource Center in Landover, Maryland. The collection also includes a large number of historical objects and archival material as well as a few natural history objects. Arlington House was built in part as a showcase for the many objects collected by George Washington Parke Custis that had been associated with George Washington and Mount Vernon, known as the "Washington Treasury." Since that time, the museum collection has expanded through gifts, loans, purchases, transfers, and project field collecting. The collection now includes items original to the families of George Washington Parke Custis, Robert E. Lee, and the enslaved laborers who lived at the estate. Arlington House is also home to the largest collection of Robert E. Lee artifacts in the United States. Approximately a third of the artifacts are original to the Custis and Lee families (NPS 2014a).

Currently, the museum's collections are displayed within the mansion on the first and second floors, in the north and south slave quarters, and in the museum building. In the museum building, exhibits are located on the first floor, and curatorial storage is located on the second floor. Museum collections displayed and stored within the museum building are in relatively stable condition due to proper environmental conditions and monitoring. However, museum collections displayed and stored in the mansion are relatively less stable due to an unreliable climate management system (as discussed under the "Historic Structures" impact topic) as well as due to high relative humidity and temperature caused by frequent opening of the exterior doors in hot summer months due to the high volume of visitors into and out of the house. Due to these fluctuating environmental conditions within the mansion, some objects are in need of conservation treatment for improved stabilization and preservation.

METHODOLOGY AND ASSUMPTIONS

Potential impacts on museum collections are analyzed in terms of how well museum collections are being acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines. According to Director's Order 24: *NPS Museum Collections Management*, NPS museum collections inform and enhance every aspect of the NPS mission, from resource management and interpretation, to research and public accountability. NPS museum collections are key resources for educators, students, researchers, park managers, park neighbors, and the general public. Accessibility of museum collection is a prime component of museum management. Environmental conditions such as temperature and humidity are important factors governing the stability of museum objects and they are most stable when stored in a facility that meets museum standards. The current conditions of museum collections, as presented under the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine the impacts on museum collections.

The resource-specific context for the evaluation of impacts on museum collections includes the following:

- § The museum collections of Arlington House, The Robert E. Lee Memorial, including original artifacts associated with George and Martha Washington, George Washington Parke Custis, and Robert E. Lee, are considered a fundamental resource of the park according to the park's foundation document (NPS 2014a). Their preservation is vital to maintaining the park's historic significance.
- § Museum objects are often fragile and should be handled as little as possible to ensure their preservation. Relocation, transportation, and storage of objects could put them at risk of physical damage or loss.
- § Environmental conditions such as temperature and humidity are important factors governing the stability of museum objects. Museum objects are most stable and secure when they are under storage in a facility that meets museum standards.

IMPACTS OF ALTERNATIVE 1: NO-ACTION

Impact Analysis

Under the no-action alternative, the National Park Service would continue its current procedures for the preservation and conservation of museum collections, in accordance with the existing collections management plan, collections storage plan, and housekeeping plan. This would result in a continued beneficial impact because the collections would be preserved to the extent that time and funding allows. However, existing conditions of mechanical systems would continue to result in a risk of damage to or loss of museum collections.

Under this alternative, the climate management system would continue to operate outside of ideal levels, which would continue to put the museum collections at risk of damage due to high or low temperature and humidity. Temperatures that are too high can cause gradual disintegration or discoloration of organic materials, while temperatures that are too low can cause desiccation that can lead to fracture of paints, adhesives, and other materials. Fluctuating temperatures can cause objects to expand and contract rapidly, resulting in fractures and delamination of brittle solid materials. Humidity is directly related to temperature. High humidity can cause mold to form, cause rust and

corrosion to metals, and cause swelling of some materials. Low humidity may lead to dehydration or desiccation of organic materials. Fluctuating levels of humidity causes shrinking and swelling of organic materials that can lead to crushing or fracturing of organics, delamination of veneered furniture, and loosening of joints in furniture.

The fire suppression system would continue to lose pressure and malfunction, which would continue to put the collections at an increased risk of damage or loss in the event of a fire. Actions under alternative 1 would also result in a continued increased risk of theft due to the antiquated intrusion detection systems currently installed within the mansion and museum.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on museum collections include previous restoration and rehabilitation efforts for the mansion and slave quarters. Collectively, these actions have resulted in both beneficial and adverse impacts on museum collections under the NEPA definitions. For instance, the improvements made to the climate management system and addition of a fire suppression system in the mansion in the 2009-2011 rehabilitation campaign resulted in beneficial impacts because they offered increased protection from damage or loss due to fluctuating temperatures or fire. However, this campaign also resulted in adverse impacts because some collection objects sustained damage during transportation either off or back on site and some objects sustained damage due to inadequate environmental conditions, particularly high relative humidity. Therefore, long-term impacts on museum collections, particularly in the form of increased fragility, have resulted as a result of actions during the 2009-2011 rehabilitation campaign. The impacts of alternative 1, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on museum collections. Alternative 1 would contribute an imperceptible increment to the cumulative beneficial and adverse impact on museum collections.

Conclusion

The actions under alternative 1 would result in the continuation of both beneficial and adverse impacts on museum collections. Because the existing climate management, fire suppression, and security systems are not functioning at the desired level, there is a continued increased risk of damage, loss, or theft, which would result in an adverse impact on the museum collections. However, the museum collections would continue to be protected and preserved as time and funding allow, based on existing collections management procedures by trained staff. Museum objects would not be relocated, transported, or placed in storage outside of routine collections management actions. Therefore, the impacts on museum collections would not approach the level of significant.

IMPACTS OF ALTERNATIVE 2

Impact Analysis

Under alternative 2, there would be beneficial impacts on museum collections because of the installation of upgraded systems. An improved climate control management system would reduce the risk of deterioration and damage of the museum collections due to high or low temperature and humidity. The upgraded fire alarm system that would be installed in the mansion and slave quarters would result in a beneficial impact on museum collections because all systems would tie into one central annunciator that would provide a simple and clear way for NPS maintenance staff to be

notified of all signals that may need to be addressed. The upgraded fire alarm system, along with the upgraded fire suppression system would increase the overall protection from fire for the museum collections. In addition, the new intrusion detection system and video surveillance systems that would be installed in the mansion and museum building would provide increased protection from theft.

The proposed non-reflective glass visitor barriers would result in a beneficial impact on the museum collections by preventing access to certain areas and objects, thus protecting fragile historic furniture, objects, and artifacts.

For the duration of construction, activities associated with the interior treatments of the mansion, slave quarters, and museum would result in the risk of inadvertent damage to the museum collections that are currently stored within these buildings. To mitigate this risk, the National Park Service would remove these items and place them in storage or exhibit them in another location. This relocation would also result in adverse impacts because the handling, transportation, and storage required would put these objects at an increased risk of damage or loss. However, few if any adverse impacts would be anticipated because trained park staff and contractors would oversee the packaging of artifacts, monitor their transport, and ensure secure storage. The staffing requirements for these actions would be in addition to the current staffing structure of the site. These impacts would last the duration of the relocation process and would no longer occur once the objects are returned to their permanent display locations.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have, or would have, impacts on museum collections include previous restoration and rehabilitation efforts for the mansion and slave quarters. Collectively, these actions have resulted in beneficial and adverse impacts on museum collections. These impacts are discussed under alternative 1. The impacts of alternative 2, in conjunction with the impacts of the cumulative actions, would result in a beneficial and adverse impact on museum collections. Alternative 2 would contribute an imperceptible increment to the cumulative beneficial and adverse impact on museum collections.

Conclusion

The actions under alternative 2 would result in both beneficial and adverse impacts on museum collections. Upgrades to the existing climate management, fire alarm, fire suppression, and security systems would result in beneficial impacts by increasing protection of the museum collections from damage or loss due to environmental factors, fire, or theft. These upgrades would meet museum standards and would result in more stable conditions for the objects. There would be a risk of damage or loss due to relocation during construction activities in the building interiors, which would result in an adverse impact if any damage occurs. However, this risk would be limited to the construction duration and would be mitigated by trained NPS staff following established collections management procedures. Therefore, the impacts on museum collections would not approach the level of significant.

IMPACTS OF ALTERNATIVE 3

Impact Analysis

The impacts on museum collections under alternative 3 would be the same as under alternative 2.

Cumulative Impacts

The cumulative impacts on museum collections would be the same as under alternative 2.

Conclusion

Under alternative 3, actions would have the same adverse and beneficial impacts on museum collections as actions under alternative 2. The measures to avoid or mitigate adverse impacts on museum collections would also be the same as described under alternative 2. Therefore, the impacts on museum collections under alternative 3 would not approach the level of significant.

VISITOR USE AND EXPERIENCE

AFFECTED ENVIRONMENT

The National Park Service strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found within the project area. While the National Park Service places a high priority on restoring and maintaining the project area as it existed during the Lee family residency prior to 1861, it also seeks to ensure that visitors safely enjoy and are satisfied with availability and accessibility of appropriate interpretive opportunities. Because of the project area's location within Arlington National Cemetery, the National Park Service strives to maintain the reverent and memorial character of the area for those visitors seeking a quiet, introspective experience.

Arlington House is one of the most visited historic house museums in the United States. The mansion saw over 670,000 visitors in 2014 with an unknown number visiting the grounds, slave quarters, or museum (NPS 2016). The site is open daily year-round from about 9 a.m. to 5 p.m., though times vary by a half hour seasonally. Visitors to the site are able to take a self-guided tour through the mansion and grounds with information from several low-profile wayside exhibits throughout the project area, as well as from staff and volunteers in the mansion. Additionally, there is a wayside exhibit with information about Arlington Woods, located on a pathway west of the mansion grounds, across Sherman Drive. Guided tours of the sites are also available hourly and weekend guided tours bring visitors to areas not accessible to self-guided tours. Special events and programs take place throughout the year.

Though several wayside exhibits exist, there is an overall lack of orientation and general wayfinding within the project area. There are a number of entry points into the project area and all lack wayfinding and orientation to guide visitors to a starting point and circulation route. According to casual observation by NPS staff, approximately 50 percent of visitors enter from the existing Sherman Drive tram stop on the west side via a path between the flower garden and the south slave quarters. Approximately 40 percent of visitors enter via a southern path that follows the south and east edges of the flower garden, leading to the southeast corner of the mansion. The remaining 10

percent of visitors enter from the north via the Custis Walk, a pedestrian path and stair way from Arlington National Cemetery that leads to the northeast corner of the mansion.

Universal accessibility throughout the project site is currently limited. The existing route of the mansion tour starts at the portico front door and finishes through the rear of the mansion into the work yard through the outer hall/pantry. Currently, the only universal access to the mansion is via a temporary metal ramp leading from the northeast corner of the building to the portico. To enter the building from the portico, there is a plywood ramp up an additional step through the temporary vestibule at the building's front door. The only universally accessible exit is back through the front portico door. Once inside the mansion, universal access is limited by changes in floor level and iron barrier gates protecting exhibits. There is no universal access to the conservatory, basement, or second story of the mansion. The existing grading, surface materials, and width of paths throughout the grounds and gardens are deficient in providing a fully universally accessible experience for visitors. The existing tram stop drops visitors off at a path with only a set of stairs meeting the grade of the sidewalk; visitors with limited mobility currently have to enter the project area via the path to the Civil War Unknowns Monument, located approximately 80 feet farther away from the tram stop and that offers a less direct route into the site. A fully accessible comfort station exists on the northern edge of the project area.

Currently, there are only a few large shade trees within the project area, which receives ample amounts of sun. One is located within the work yard and provides an area for groups to gather for respite from the hot Virginia sun in the summer months. The other large trees are located around the perimeter, mainly on the west and northeast sides of the property.

METHODOLOGY AND ASSUMPTIONS

Potential impacts on visitor use and experience are assessed based on changes to the way people use the park, as well as how the alternatives would alter visitors' experiences. *NPS Management Policies 2006* states that the enjoyment of park resources and values by the public is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks (NPS 2006). The current conditions of visitor use and experience, as presented under the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine the impacts on visitor use and experience.

The resource-specific context for the evaluation of impacts on visitor use and experience includes the following:

- § Visitors to the site can experience and understand the significance and historical context through interpretive exhibits and through the historic integrity of the buildings and landscape within the project area.
- § The National Park Service strives to provide universal accessibility where possible in the park as an important part of the visitor experience.
- § The park's foundation document identifies the following interpretive themes as important for the project area: Arlington House, itself; the life and career of Robert E. Lee; the Washington-Custis-Lee family and legacy; slavery and freedom; and Arlington National Cemetery (NPS 2014a).

IMPACTS OF ALTERNATIVE 1: NO-ACTION

Impact Analysis

Under alternative 1, because no changes to the current visitor experience would occur the existing adverse impacts on visitor use and experience would continue. Because there would continue to be a number of entry points into the project area and an overall lack of orientation, visitors would continue to have no true sense of arrival when visiting the site. Visitors using wheelchairs or with difficulty using stairs and uneven surfaces would continue to have limited access throughout the project area due to the existing site grading and the existing barriers and changes in floor level within the mansion interior. Though Arlington Woods has a wayside exhibit interpreting its significance, the location of this wayside exhibit would continue to be outside the main interpretive area, across Sherman Drive. Because of this location, visitors may continue to miss the opportunity to learn of the significance of the woods from both an ecological and cultural standpoint, which would result in a continued adverse impact on visitor use and experience.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have or would have impacts on visitor use and experience include previous rehabilitation and preservation efforts to the project area. Collectively, these actions have resulted, or may result, in both beneficial and adverse impacts on visitor use and experience. For instance, the 2009-2011 rehabilitation campaign improved the historic appearance of the mansion and slave quarters through restoration of historic finishes and features, which provides visitors with a more accurate representation of the site during its period of significance. This campaign also constructed the current comfort station, which improved accessibility and restroom facilities for visitors to the project area, resulting in a beneficial impact on visitor use and experience. Future improvements to visitor amenities proposed in the *Arlington National Cemetery Real Property Master Plan*, such as improved wayfinding and a new transportation center, will result in beneficial impacts on visitor use and experience because visitors to Arlington House must travel through the cemetery and may utilize some of the cemetery's amenities while traveling to or from a visit to Arlington House. The Arlington National Cemetery Millennium Project will result in beneficial impacts on visitor use and experience by expanding burial space and thus creating an aesthetic similar to the rest of the cemetery on the northwest side of Arlington Woods, increasing the opportunity for visitors to experience the reverent atmosphere of the site. This project would also result in temporary adverse impacts due to construction noise in the vicinity of the Arlington House site. The impacts of alternative 1, in conjunction with the impacts of the cumulative actions, would result in both beneficial and adverse impacts on visitor use and experience. Alternative 1 would contribute an imperceptible increment to the cumulative impact on visitor use and experience.

Conclusion

Alternative 1 would result in the continuation of adverse impacts on visitor use and experience due to the lack of visitor orientation and wayfinding signage, the existing grading of the paths and grounds, and the existing wayside exhibits within the project area. However, visitors would continue to be able to understand the important interpretive themes through the existing interpretive information and through the site's existing historic integrity. Additionally, most visitors would be able to access the site, including the historic structures, though current conditions for accessibility are not ideal. Alternative 1 would not result in any additional adverse impacts as those that occur

under the existing conditions. Therefore, the impacts on visitor use and experience under alternative 1 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 2

Impact Analysis

The actions under alternative 2 would result in a beneficial impact on visitor use and experience because accessible paths and ramps would provide improved universal access throughout the grounds and the mansion. The universal accessibility into the rear of the mansion through the conservatory would provide improved flow throughout the mansion and would provide two fully accessible entrances/exits when combined with the proposed accessible ramps at the front portico.

The rehabilitation and restoration of the mansion and slave quarters would result in a beneficial impact on visitor use and experience because it would return some historic integrity to the mansion and slave quarters, improving opportunities for visitors to experience and understand the significance and context of the site. The rehabilitation of the north and south slave quarters, including the removal of the bookstore, would provide an improved visitor experience because restoring historic elements reflective of the time period when the buildings were occupied by enslaved laborers would allow visitors an opportunity to better understand the story and experiences of enslaved laborers at the estate.

Additional beneficial impacts under alternative 2 would result from the improved orientation, wayfinding, and interpretive signage proposed throughout the grounds. These improvements would provide visitors with opportunities to experience a sense of arrival and historical context when first arriving at the site from either the proposed tram stop or from the path around the flower garden. The improved interpretation signage throughout would provide visitors with additional information and opportunities for understanding the full context and historic significance of the site as a whole, as well as the individual elements of the site, such as Arlington Woods.

The proposed tram stop under alternative 2 would remain in its existing location, but the proposed accessibility ramp would result in a beneficial impact on visitors with limited mobility because they would be able to more easily access the project area from the tram.

Though the improvements to site accessibility would benefit the visitor experience, it would also introduce modern elements into the historic setting, such as the proposed ramps at the portico. However, these ramps would replace the existing ramps, which would not visually change the appearance from the existing conditions. The removal of the vestibule at the front portico, however, would improve the visitor experience of the historic setting because it would remove modern materials and return a more historic aesthetic to the mansion's front entrance. The new glass doors that would be installed would result in less of a visual impact than the existing vestibule and would therefore result in a beneficial impact on the visitor experience of the mansion. In the conservatory, the ramps on the interior would change the appearance of the conservatory and limit visitor's ability to experience the original condition and use of the conservatory.

Alternative 2 would result in a beneficial impact on visitor use and experience because the bookstore would be relocated into a new building that is larger than the existing bookstore. This would improve the accessibility through the bookstore for visitors relying on wheelchairs, walkers, and

canes, and at times when there are several visitors in the bookstore. The impacts would be the same for both option A and option B.

The rehabilitation of the museum building interior to a double-height exhibit space would result in a beneficial impact on visitor use and experience because the large, open space would allow for new and enhanced exhibits that would provide increased opportunities for visitors to learn and understand the history of the site. These actions would provide more flexibility in the types of exhibits that the National Park Service can provide over the no-action alternative because the space would be larger. The replacement of the exterior doors with universally-accessible doors would result in a beneficial impacts because the interior of the museum would be more accessible for visitors.

The addition of canopy trees throughout the project area would provide an increased amount shade for visitors in the warmer months, which would result in a beneficial impact on the visitor experience. Some of the trees would also add additional visual screening of Sherman Drive, the comfort station, and the proposed bookstore from the project area, which would provide a more authentic experience and restore some of the historic aesthetic of a backdrop of trees behind the mansion's grounds.

The actions under alternative 2 would also result in short-term adverse impacts on the visitor experience during construction activities. During this time, the presence and noise of construction equipment and landscape disturbance would detract from the visitor experience of the site's historic setting and context. Additionally, some areas would be temporarily closed to visitors while construction activities are undertaken, which would be an adverse impact if visitors are unable to view or experience a particular aspect of the project site, such as certain rooms of the slave quarters. Construction noise would also result in temporary, indirect impacts on visitors to Arlington National Cemetery, as discussed under the "Cultural Landscape" impact topic. However, noise abatement measures would be implemented to mitigate these adverse impacts.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have, or would have, impacts on visitor use and experience include previous rehabilitation and preservation efforts to the project. Collectively, these actions have resulted in beneficial and adverse impacts on visitor use and experience. These impacts are described under alternative 1. The impacts of alternative 2, in conjunction with the impacts of the cumulative actions, would result in a beneficial impact on visitor use and experience. Alternative 2 would contribute a noticeable increment to the cumulative impact on visitor use and experience.

Conclusion

Alternative 2 would result in both adverse and beneficial impacts on visitor use and experience. The beneficial impacts would be due to improved accessibility for visitors with limited mobility and improved interpretation for all visitors to better understand the significance and context of the site's fundamental resources. Long-term adverse impacts would result from the introduction of modern materials and elements within the historic setting, but all modern features would be designed to have as small a visual impact as possible on the visitor experience. There would be adverse impacts during the construction process due to the presence of construction equipment, which would result in a visual distraction and additional noise on the project area, which maintains a reverent atmosphere. However,

these impacts would be mitigated through standard practices and noise abatement measures, as described under the “Mitigation Measures of the Action Alternatives” section in chapter 2. Under alternative 2, visitors would be able to understand the key interpretive themes through improved orientation and exhibits, and through the improved historic integrity of the site. Improved accessibility would allow all visitors to more easily move throughout the site. Therefore, the impacts on visitor use and experience under alternative 2 would not approach the level of significant.

IMPACTS OF ALTERNATIVE 3

Impact Analysis

The actions under alternative 3 that relate to improved accessibility throughout the project area, restoration and rehabilitation of the mansion and slave quarters, improved interpretation and wayfinding signage, addition of canopy trees, introduction of modern materials, and construction activities would result in the same impacts as described under alternative 2. The following differences in impacts would occur under alternative 3.

The tram stop under alternative 3 option A would provide an improved visitor experience because the tram stop would be located directly at the work yard, which is approximately 150 feet closer to the central area of the site than the existing tram stop and the stop proposed under alternative 2. This would result in a beneficial impact for visitors who have limited mobility or who have difficulty walking longer distances. This would also be beneficial because visitors would begin their experience at the site with a clear view of the major attractions of the mansion and slave quarters. There would be similar impacts under option B, but because the tram stop would only be approximately 75 feet closer to the work yard and main orientation area of the site there would be slightly less beneficial impacts for visitors who have difficulty walking a longer distance when compared to option A.

Under alternative 3, modifications at the mansion front portico would result in beneficial impacts on visitor use because the ramp and raised portico floor would provide universal access to the portico and into the mansion. These beneficial impacts would be slightly greater on visitor use and experience over alternative 2 because once visitors are on the portico, they would be able to move about freely and approach the front door from any direction, rather than requiring another ramp to access the mansion interior. These modifications would also result in similar adverse impacts as under alternative 2 because modern materials and the change in floor height of the portico would result in changes to the visual character of the portico and would detract from the visitor’s experience of the historic setting.

For accessibility to the rear of the mansion under alternative 3, option A, the ramp that would be constructed at the conservatory would be visible from the flower garden, the work yard, and partially from the east side of the mansion. Because these materials are not part of the original structure, it would change the visual character and would detract from the visitor’s aesthetic experience of the historic setting. On the interior, there would be similar impacts on the visitor experience to those under alternative 2, though the interior of the conservatory floor under option 3A would be one level so visitors would have increased room to move around freely once inside. However, because the entire floor would be raised, visitors would not be able to experience the historic aesthetic of the lower floor level. Under this option, the landing would result in a change in the visual appearance of the exterior of the conservatory, as would the additional modifications required to the conservatory door.

Accessibility to the rear of the mansion under alternative 3, option B would result in similar adverse impacts related to the mansion exterior as under option A, except there would be no direct impacts on the conservatory door because no modifications would be made. Option B would not have the beneficial impact of universal accessibility between the conservatory and the mansion interior because visitors who cannot use stairs would be required to visit the conservatory separately from the mansion, through its exterior door. However, because the conservatory interior would not be modified, visitors would be able to experience the room as it would have been during the period of significance.

The proposed rehabilitation of the museum building under alternative 3 would have similar beneficial impacts on visitor use and experience as discussed under alternative 2 due to an improved interior space for new and enhanced exhibits. However, the beneficial impacts on visitor use and experience would be slightly less than under alternative 2 because the exhibit space would not be as large and would provide slightly less flexibility for the types of exhibits the National Park Service would be able to install within the space. Visitors would still be able to view enhanced exhibits that would provide increased opportunities for visitors to learn and understand the history of the site.

Cumulative Impacts

Other past, present, and reasonably foreseeable actions that have, or would have, impacts on visitor use and experience include previous rehabilitation and preservation efforts to the project area. Collectively, these actions have resulted in beneficial and adverse impacts on visitor use and experience. These impacts are described under alternative 1. The impacts of alternative 3, in conjunction with the impacts of the cumulative actions, would result in a beneficial impact on visitor use and experience. Alternative 3 would contribute a noticeable increment to the cumulative impact on visitor use and experience.

Conclusion

Alternative 3 would result in both adverse and beneficial impacts on visitor use and experience. The beneficial impacts would be due to improved accessibility for visitors with limited mobility and improved interpretation for all visitors to better understand the significance and context of the site's fundamental resources. Long-term adverse impacts would result from the introduction of modern materials and elements within the historic setting, but all modern features would be designed to have as small a visual impact as possible on the visitor experience. There would be adverse impacts during the construction process due to the presence of construction equipment, which would result in a visual distraction and additional noise on the project area, which maintains a reverent atmosphere. However, these impacts would be mitigated through standard practices and noise abatement measures, as described under the "Mitigation Measures of the Action Alternatives" section in chapter 2. Under alternative 3, visitors would be able to understand the key interpretive themes through improved orientation and exhibits, and through the improved historic integrity of the site. Improved accessibility would allow all visitors to more easily move throughout the site. Therefore, the impacts on visitor use and experience under alternative 3 would not approach the level of significant.

CONSULTATION AND COORDINATION

Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* requires the National Park Service to make "diligent" efforts to involve the interested and affected public in the National Environmental Policy Act process. This process, known as scoping, helps to determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. This chapter documents the agencies and tribes consulted and includes a list of preparers for the document.

AGENCY AND TRIBAL CONSULTATION

During the scoping period, the National Park Service contacted the following agencies for consultation via letters dated October 9, 2015: the Advisory Council on Historic Preservation, the US Commission of Fine Arts, the National Capital Planning Commission, the Virginia Department of Historic Resources, the US Fish and Wildlife Service, and the Virginia Department of Game and Inland Fisheries. These letters also served as notice of initiation of the NHPA section 106 process for the Virginia Department of Historic Resources, the Advisory Council on Historic Preservation, the US Commission of Fine Arts, and the National Capital Planning Commission. The National Park Service notified these agencies that section 106 compliance would be completed concurrently, but separately from this environmental assessment. The National Park Service coordinated with the Virginia Department of Historic Resources, the US Commission of Fine Arts, and the National Capital Planning Commission during the development of the alternatives at a meeting held on November 17, 2015. A follow up call with the Virginia Department of Historic Resources was held on January 20, 2016. The National Park Service will provide a copy of this environmental assessment to these parties, as well as the Pamunkey Indian Tribe. The National Park Service will continue to coordinate with these agencies, commissions, and tribe as needed throughout the project. See appendix A for copies of these letters and any relevant response letters received from the agencies.

PUBLIC SCOPING

Public scoping was initiated to provide information to and gather feedback from the public regarding the proposed Arlington House rehabilitation project and the National Park Service held an open

public comment period from October 14, 2015 to November 13, 2015. A public open house was held on October 20, 2015 from 6:30 pm to 8:30 pm at the Women in Military Service for America Memorial at Arlington National Cemetery in Arlington, VA. During the meeting, a slideshow provided background information and an overview of the proposed project and informational boards displayed around the room offered more detailed information on the site's history, the purpose and need for the project, existing conditions, and potential concepts for the rehabilitation. Sign-in sheets and comment cards were provided for attendees. One person attended the meeting. The boards and presentation were also posted to the park's Planning, Environment and Public Comment (PEPC) website.

Comments generally requested that certain elements be considered during alternatives development. One commenter suggested that information on wheelchair accessibility of the mansion interior be provided to the public through signage on site, specifically that the basement and second floor are not (and will not be) universally accessible. A couple of comments were specific to the museum collections. One commenter requested that two historical portraits of George Washington and Martha Dandridge Custis that once hung in the mansion's center hall be returned to the site for interpretation. Another commenter suggested that full documentation and inventory of the museum collections be a separate consideration as many items do not have verified provenance and are not available for public viewing.

LIST OF PREPARERS

PREPARERS

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Erin Leatherbee	Preservation Planner	Document preparation
Rita Walsh	Senior Preservation Planner	Document preparation
Mariah Murphy	Environmental Scientist	Project kickoff and internal scoping
Margaret Beavers	Environmental Scientist	Graphics and GIS analysis

GWWO, Inc.		
John Gregg	Architect	Alternatives development and graphics preparation
Bryan Fisher	Architect	Alternatives development and graphics preparation

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PUBLIC REVIEW

The environmental assessment will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the internet at <www.parkplanning.nps.gov/ARHOREhab2016>, and hard copies are available at the park's headquarters.

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