

GRAY & PAPE

HERITAGE MANAGEMENT

*Phase I Cultural Resource
Survey for the United States
National Arboretum Canopy
Trail Project,
Washington, D.C.*

LEAD FEDERAL AGENCY:
United States Department of Agriculture

PREPARED FOR:

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Richmond, Virginia 23223



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DC HPO # 21-0829
Archaeological Report #882
Gray & Pape Project Number 22-91901.001

**Phase I Cultural Resource Survey for the United States National
Arboretum Canopy Trail Project, Washington, D.C.**

Lead Agency
United States Department of Agriculture

Prepared for:
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July 23, 2024

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ABSTRACT

The Friends of the National Arboretum (FONA) is proposing to construct a canopy trail (Canopy Trail Project [Undertaking]) located in the southeast corner of the United States National Arboretum property situated in the northeastern quadrant of Washington, D.C. The Friends of the National Arboretum has retained Tree-Mendous and Proper & O’Leary Engineering to design and install the proposed canopy trail. This project involves the installation of three self-guided, aboveground trails, weaving through existing forest on the USNA property, a treehouse ticket booth/entrance, Architectural Barriers Act-compliant and static bridges, suspension bridges, decks/platforms, and a custom net-scape. The limits of subsurface impacts for this project are minimal and include access roads, staging areas, fencing, and construction of the canopy trail itself. While design plans for the project are not yet finalized, in an abundance of caution a total of 7.7 acres (3.1 hectares) were defined as the Limit of Disturbance for this project. The Area of Potential Effect consists of the maximum possible Limit of Disturbance as indicated by the Tree-Mendous design team in consultation with Friends of the National Arboretum and United States National Arboretum, and an additional buffer area on the north, west, south, and east as follows: 1,000 feet (304.8 meters) from the northern boundary of the Limit of Disturbance to the north, over mostly open land, towards Meadow Road, NE, between Eagle Nest Road, NE, and Ellipse Road, NE; 700 feet (213.36 meters) to the west of Ellipse Road, NE, towards Eagle Nest Road, NE; 400 feet (121.92 meters) to the south of the southern boundary of the Limit of Disturbance, towards Langston Golf Course, to the edge of the dense vegetation around the Limit of Disturbance; and between 200 feet (60.96 meters) and 400 feet (121.92 meters) to the east of the eastern boundary of the Limit of Disturbance, towards Langston Golf Course, to the edge of the dense vegetation around the Limit of Disturbance. The Friends of the National Arboretum has contracted Gray & Pape, Inc. to conduct a Phase I cultural resource survey for the Canopy Trail Project.

The project is being conducted in compliance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 C.F.R. § 800: Protection of Historic Properties. The United States Department of Agriculture is the lead federal agency for the project.

Gray & Pape, Inc. conducted the archaeological fieldwork between June 21 and 23, 2022. This portion of the study consisted of a pedestrian survey and systematic shovel testing. Placement of shovel tests was based on any location where ground disturbing activities are planned for the Canopy Trail Project. Sixty-six shovel tests were excavated across the testable portions of the Limit of Disturbance. Areas of extreme slope (greater than 15%) were subjected to pedestrian survey, but no subsurface testing was conducted. Of the 66 shovel tests excavated across the Limit of Disturbance, 45 displayed intact soils, most of which displayed a modern A-horizon over an intact B-horizon (subsoil). Shovel tests exhibiting disturbance associated with the historic use of the Limit of Disturbance displayed layers of fill soils, modern debris such as candy wrappers, concrete, and asphalt. No cultural materials were recovered, and no archaeological sites were recorded. However, two historic built features were identified in the Limit of Disturbance, which consists of a brick spring box (Feature 1) and a ceramic drain (Feature 2) both located in the central portion of the Limit of Disturbance. These resources will be discussed in the architectural history chapter of this document. As a result, Gray & Pape, Inc. recommends that the Undertaking will not affect any National Register of Historic Places-eligible archaeological sites as no archaeological sites were identified. No further archaeological work is recommended for the proposed Canopy Trail Project.

Gray & Pape, Inc. conducted the built environment fieldwork on June 30 and July 14, 2022. The recommended Area of Potential Effect was determined through online mapping and on-site visual

inspection. One historic property—the National Register of Historic Places-listed United States National Arboretum—is located within the recommended Area of Potential Effect. Gray & Pape, Inc. finds that the Undertaking will have a direct effect on the United States National Arboretum, but that effect will not be adverse, as no character-defining features of the United States National Arboretum will be diminished by the project. No further work to identify historic built properties in the Area of Potential Effect is recommended.

PUBLIC REPORT SUMMARY

Gray & Pape, Inc., (Gray & Pape) conducted a Phase I cultural resource study on behalf of the Friends of the National Arboretum (FONA) for the Canopy Trail project at the United States National Arboretum (USNA) in Washington, D.C. The FONA has retained Tree-Mendous and Proper & O’Leary Engineering to design and install the proposed canopy trail. This project involves the installation of three self-guided, aboveground trails, weaving through existing forest on the USNA property. The limits of subsurface impacts for this project are minimal and include access roads, staging areas, fencing, and construction of the canopy trail itself. While design plans for the project are not yet completely finalized, the first trail with Architectural Barriers Act (ABA)-compliant and static bridges, suspension bridges, decks/platforms, a custom net-scape, and an entrance ticket booth/treehouse have been designed as part of Phase I. In an abundance of caution a total of 7.7 acres (ac) (3.1 hectares [ha]) were defined as the Limit of Disturbance (LOD) for this project. The Area of Potential Effect (APE) consists of the maximum possible LOD as indicated by the Tree-Mendous design team in consultation with FONA and USNA, and an additional buffer area on the north, west, south, and east as follows: 1,000 feet (ft) (304.8 meters [m]) from the northern boundary of the LOD to the north, over mostly open land, towards Meadow Road, NE, between Eagle Nest Road, NE, and Ellipse Road, NE; 700 ft (213.36 m) to the west of Ellipse Road, NE, towards Eagle Nest Road, NE; 400 ft (121.92 m) to the south of the southern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD; and between 200 ft (60.96 m) and 400 ft (121.92 m) to the east of the eastern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD (Figure 1). FONA contracted Gray & Pape to conduct a Phase I cultural resource survey for the Canopy Trail Project.

The project is being conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations, 36 C.F.R. § 800: Protection of Historic Properties. The United States Department of Agriculture (USDA) is the lead federal agency for the project.

The project will necessitate ground-disturbing activities such as potential grading for access roads, staging areas, and pedestrian paths. The Canopy Trail Project includes Architectural Barriers Act (ABA) and static bridges, suspension bridges, and custom net-scape. This aboveground trail will allow for an aerial perspective of the forested portion of the Arboretum. Stabilization of this canopy trail utilizes proprietary hardware attached to the existing trees to limit the amount of damage to both the trees and ground surface.

Prior to the initiation of archaeological investigations, Gray & Pape prepared a combined Phase Ia/Phase Ib archaeological work plan, approved by the District of Columbia Historic Preservation Office (D.C. HPO) in June 2022 (González 2022). The Phase Ia portion of the work provided an overview of previous archaeological investigations within 0.25 miles (0.4 kilometers [km]) of the project. During this phase, Gray & Pape also reviewed an existing cut-and-fill analysis conducted for the entire USNA property (Figure 2) (Trader and Cole 2021). This model suggested that episodes of cut-and-fill have been conducted within the current LOD, but that large portions may be undisturbed. In total, 7.7 ac (3.1 ha) were proposed for shovel testing with 66 shovel test pits (STPs) being excavated as part of the archaeological portion of this work, conducted on June 21 and 23, 2022. STPs were excavated at 50-ft (15.2-m) intervals (Figure 3–Figure 7). No artifacts or archaeological sites were identified during the subsurface investigations conducted by Gray & Pape. As a result, Gray & Pape recommends that the proposed Canopy Trail Project will not affect any National Register of Historic Places (NRHP)-eligible

archaeological sites as no archaeological sites were identified. No further archaeological work is recommended for the proposed Canopy Trail project.

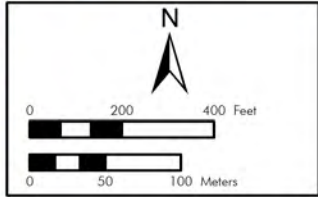
As a result of this work, Gray & Pape recommends that the Canopy Trail Project will not affect any NRHP-eligible archaeological sites as no archaeological sites were identified. No further archaeological investigations are recommended.

Gray & Pape conducted the built environment fieldwork on June 30 and July 14, 2022. Built resources and landscape features within the LOD and the APE were considered with two built resources being within the LOD, a spring box (Feature 1) and a ceramic drain (Feature 2) (Figure 8). There is only one previously identified historic property located within the APE: the USNA, itself, which is listed in the NRHP and is a D.C. Landmark. USNA built and landscape features observed within the APE include: the road system, a ceramic drain (Feature 2), the M Street Gate, the Comfort Station #1, the Washington Youth Garden, the iron fence and masonry wall near the M Street Gate, the Capitol columns, the Fern Valley Plant Collection, and the National Grove of State Trees (Figure 9–Figure 10). Two other resources in the APE that may predate the USNA, but are located within its current boundaries, are a pet cemetery and a spring box (Feature 1).

The USNA, a historic property, will be directly affected by the Canopy Trail Project. However, adverse effects to the USNA are not expected. The LOD is a densely vegetated forest area with steep inclines down to a ravine with water collecting at the bottom. The canopy trail will be built using natural materials, such as Black Locust logs, which are designed to blend into the existing environment. While visibility of the trail will be greater in the winter months, it is still not likely that the canopy trail will adversely impact character defining USNA viewsheds from any portion of the APE. Gray & Pape recommends no additional work to assess the effects of the Project on historic built properties.

4/16/2024, Created in ArcPro 3.0 for G&P Project 22-91901-001

OpenData DC; 2 Foot Contours; Esri, CGIAR, USGS, DCGIS, M-NCPPC, VGIN, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS, Maxar



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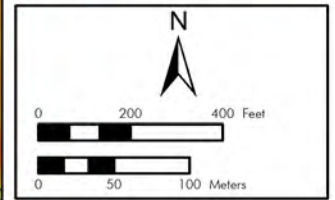
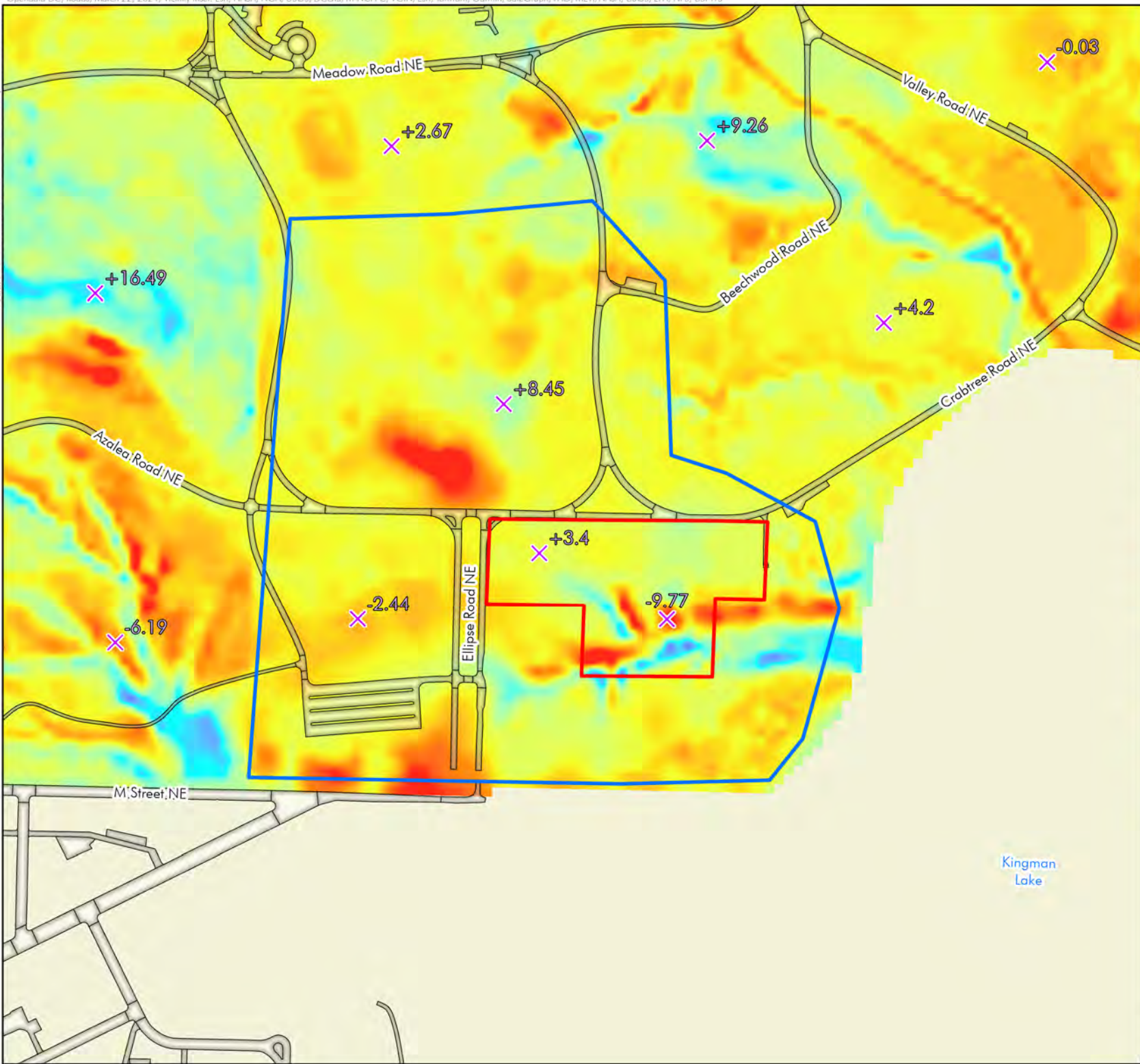
-  10-foot Contour
-  Limit of Disturbance
-  Area of Potential Effects

Figure 1
Detail of the USNA
Canopy Trail Project,
Washington, D.C. (Esri
2023, 2024a,
2024b).



LEGEND

- x Spot Elevation (feet)
- Road
- Limit of Disturbance
- Area of Potential Effects

Cut/Fill (feet)

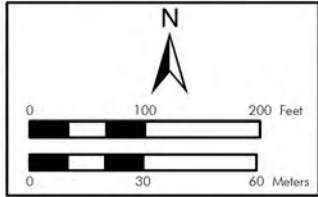
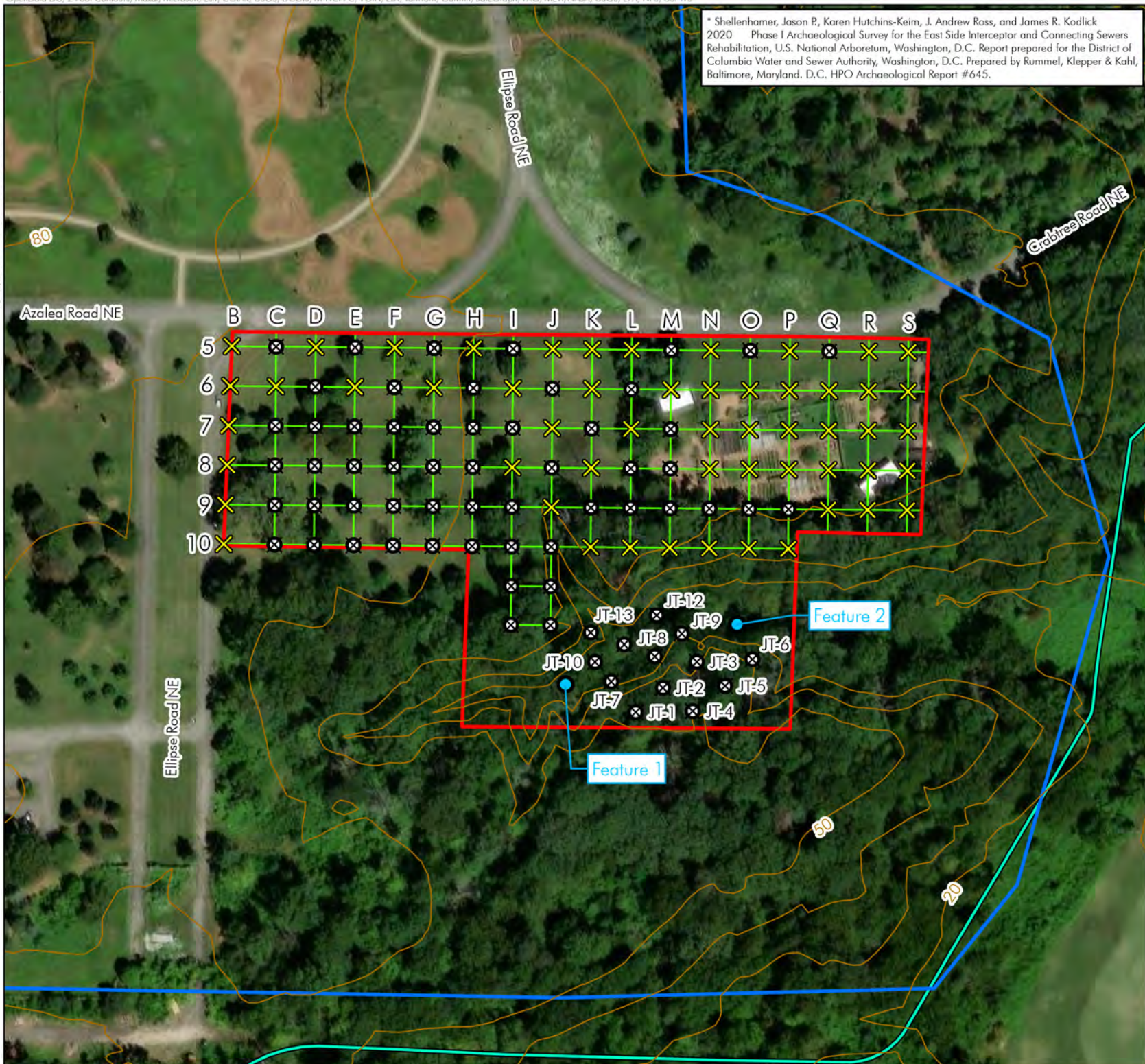
+36.89

Minimal Change: +/- 1.0

-19.12

Figure 2
Cut-and-fill analysis for the Canopy Trail Project
LOD (DC.gov 2024; Esri 2024a, 2024b).

* Shellenhamer, Jason P, Karen Hutchins-Keim, J. Andrew Ross, and James R. Kodlick 2020 Phase I Archaeological Survey for the East Side Interceptor and Connecting Sewers Rehabilitation, U.S. National Arboretum, Washington, D.C. Report prepared for the District of Columbia Water and Sewer Authority, Washington, D.C. Prepared by Rummel, Klepper & Kahl, Baltimore, Maryland. D.C. HPO Archaeological Report #645.



LEGEND

- Shovel Test Pit Result
- ⊗ Negative
- X Non-Excavated
- Feature
- ~ 10-foot Contour
- Existing Sewer Line*
- Grid Lines
- Limit of Disturbance
- Area of Potential Effects

Figure 3
Results of archaeological survey in LOD for the Canopy Trail Project, Washington, D.C. (Esri 2023, 2024a, 2024b).

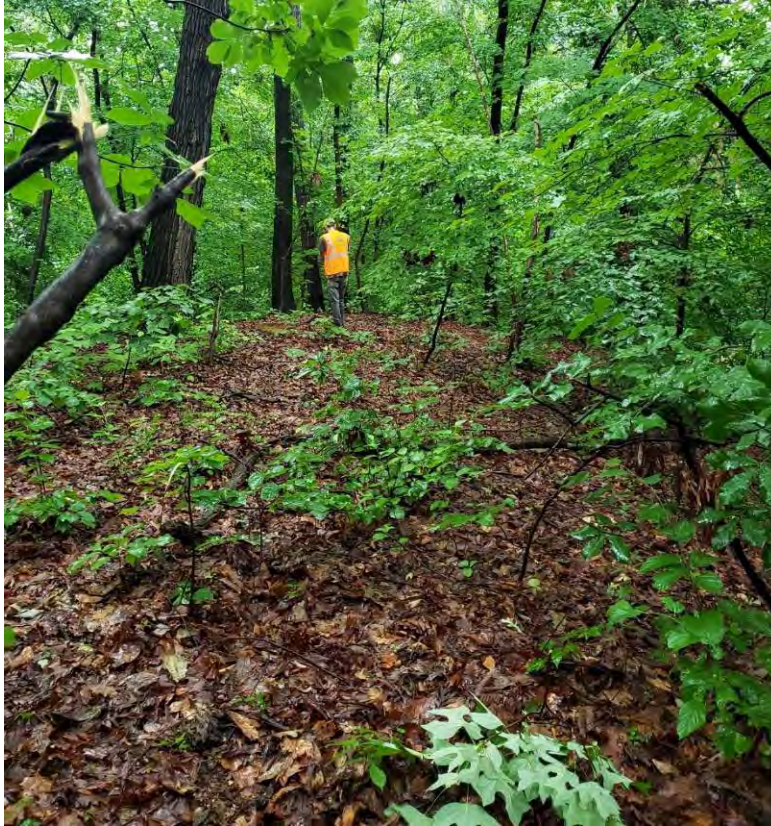


Figure 4. View of southern portion of LOD showing finger ridge, facing north.



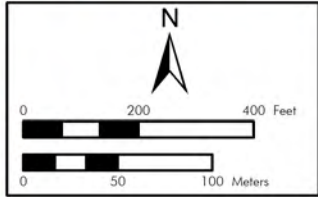
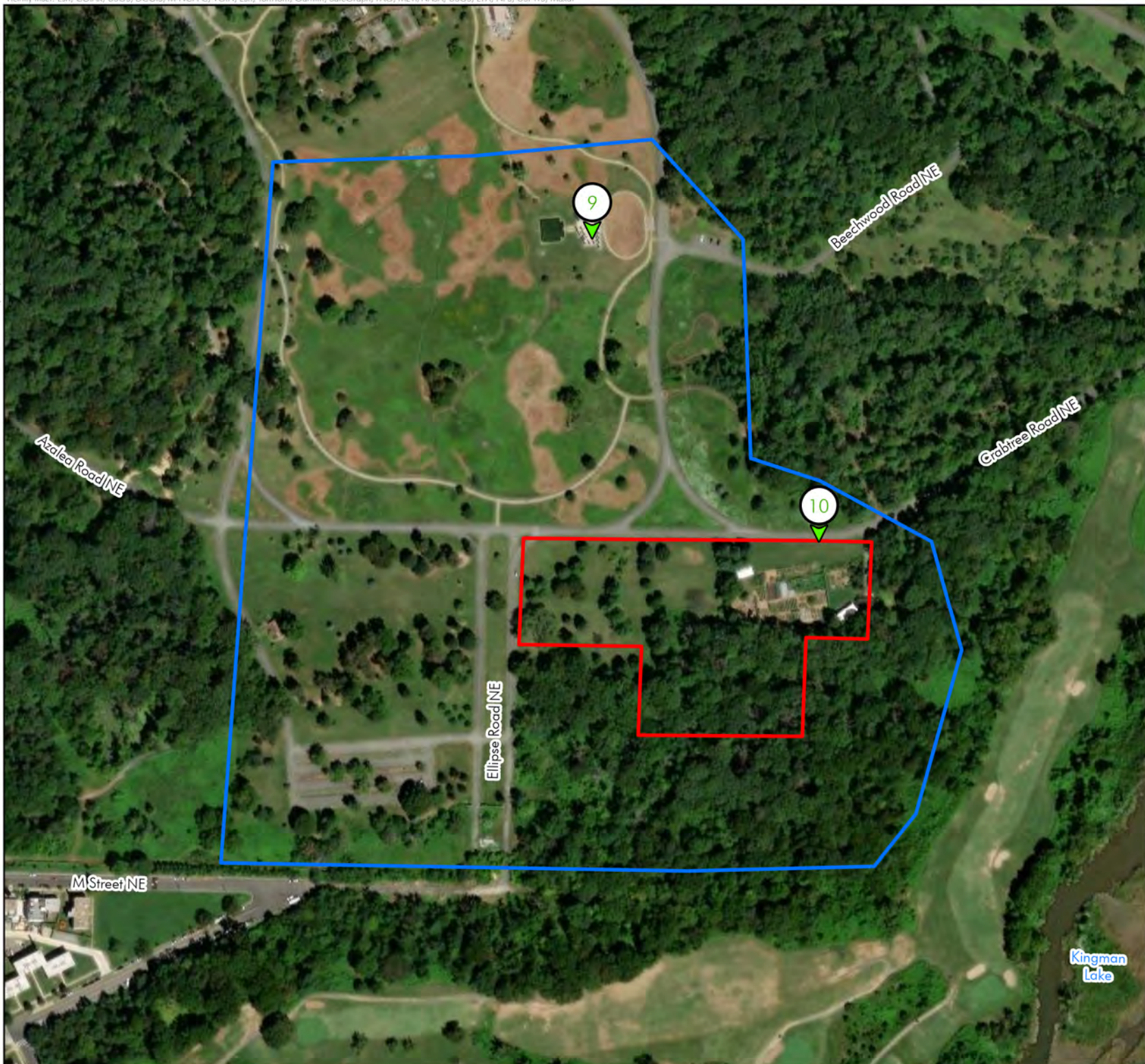
Figure 5. View of slope in southern portion of LOD, facing north.



Figure 6. View of Youth Garden, facing north.



Figure 7. View of north-central portion of LOD, facing east.



LEGEND




-  Photo Point
-  Limit of Disturbance
-  Area of Potential Effects

Figure 8
Map of the APE and LOD showing photo points from historic built environment survey (Esri 2023, 2024a, 2024b).



Figure 9. View from the Capitol Columns south toward the LOD.



Figure 10. View of the Washington Youth Garden and pavilion, looking south toward the LOD.

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1.0 INTRODUCTION

The Friends of the National Arboretum (FONA) is proposing to construct a canopy trail (Canopy Trail Project [Undertaking]) located in the southeast corner of the United States National Arboretum (USNA) property located in the northeastern portion of Washington City, Washington, D.C. The FONA has retained Tree-Mendous and Proper & O’Leary Engineering to design and install the proposed canopy trail. This project involves the installation of three self-guided, aboveground trails, weaving through existing forest on the USNA property. The limit of subsurface impacts for this project are minimal and include access roads, staging areas, fencing, and construction of the canopy trail itself. While design plans for the project are not yet completely finalized, the first trail with Architectural Barriers Act (ABA)-compliant and static bridges, suspension bridges, decks/platforms, a custom net-scape, and an entrance ticket booth/treehouse have been designed as part of Phase I (see Appendix D for proposed drawings).

In an abundance of caution a total of 7.7 acres (ac) (3.1 hectares [ha]) were examined as part of this project, defined as the Limit of Disturbance (LOD) for the project. The APE consists of the maximum possible LOD as indicated by the Tree-Mendous design team in consultation with FONA and USNA, and an additional buffer area on the north, west, south, and east as follows: 1,000 feet (ft) (304.8 meters [m]) from the northern boundary of the LOD to the north, over mostly open land, towards Meadow Road, Northeast (NE), between Eagle Nest Road, NE, and Ellipse Road, NE; 700 ft (213.36 m) to the west of Ellipse Road, NE, towards Eagle Nest Road, NE; 400 ft (121.92 m) to the south of the southern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD; and between 200 ft (60.96 m) and 400 ft (121.92 m) to the east of the eastern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD (Figure 1-1 and Figure 1-2). FONA contracted Gray & Pape, Inc. (Gray & Pape) to conduct a Phase I cultural resource survey for the Canopy Trail Project.

The project is being conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations, 36 C.F.R. § 800: Protection of Historic Properties. The United States Department of Agriculture (USDA) is the lead federal agency for the project. FONA is providing the funding for the canopy trail and will ultimately retain an easement on the canopy trail portion of the USNA property, but the undertaking is being completed on federal land. The following report provides a project overview, a review of previous cultural resource investigations and previously identified historic built resources and archaeological sites, the potential for archaeological resources, the proposed field methods, as well as the results of the archaeological and historic built environment resource surveys.

1.1 Project Overview

The USNA covers an area of 451 ac (182.5 ha) and is bound on the north by New York Avenue, NE (United States [U.S.] Route 50), the Anacostia River to the east, the Langston Golf Course to the south and southeast, M Street, NE and private properties to the south, Bladensburg Road, NE to the west, and R Street, NE and private properties to the northwest. The USNA was listed on the National Register of Historic Places (NRHP) in 1973 (Albee 2019).

The Canopy Trail Project is located in the southeastern section of the USNA property, in an area that is largely undeveloped (Figure 1-3 and Figure 1-4). While much of the project will require little to no ground disturbance, portions of the project will necessitate ground-disturbing activities, such as grading

for access roads, staging areas, and pedestrian paths. The Canopy Trail Project includes ABA-compliant and static bridges, suspension bridges, a custom net-scape, and a treehouse to serve as a controlled entrance where tickets are purchased (see Appendix D for proposed drawings). This aboveground trail will allow for an aerial perspective of the forested portion of the Arboretum. The canopy trail is designed to blend into the existing natural area and will not extend higher than the current tree canopy.

Stabilization of the canopy trail utilizes proprietary hardware attached to the existing trees to limit the amount of damage to both the trees and ground surface. The canopy trail is designed to blend into the existing natural area and will not extend higher than the current tree canopy. Vegetative clearance will be minimal, if at all. Tree-Mendous prides itself on providing a nature experience to its clients and their visitors, and the purpose of the project is to immerse people in nature without disturbing the forest as it exists today. Gray & Pape will assess effects for all stages of the phased installation approach to the proposed canopy trail project.

1.2 Project Results

As previously noted, archaeological fieldwork was conducted between June 21 and 23, 2022. The archaeological work consisted of a combination of pedestrian survey and shovel testing. In total, 66 shovel tests were excavated. Over most of the northern portion of the LOD, shovel tests revealed a significant amount of disturbance. The disturbance consisted of fill deposits over B soil horizons. Soils in the southern and central portion of the LOD, while intact also produced no cultural materials. No archaeological sites were identified during the archaeological investigations; however, two historic built features were identified in the Limit of Disturbance, which consists of a brick spring box (Feature 1) and a ceramic drain (Feature 2) both located in the central portion of the Limit of Disturbance.

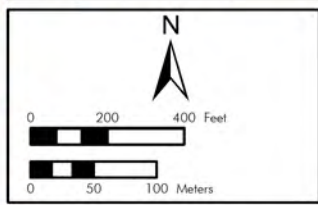
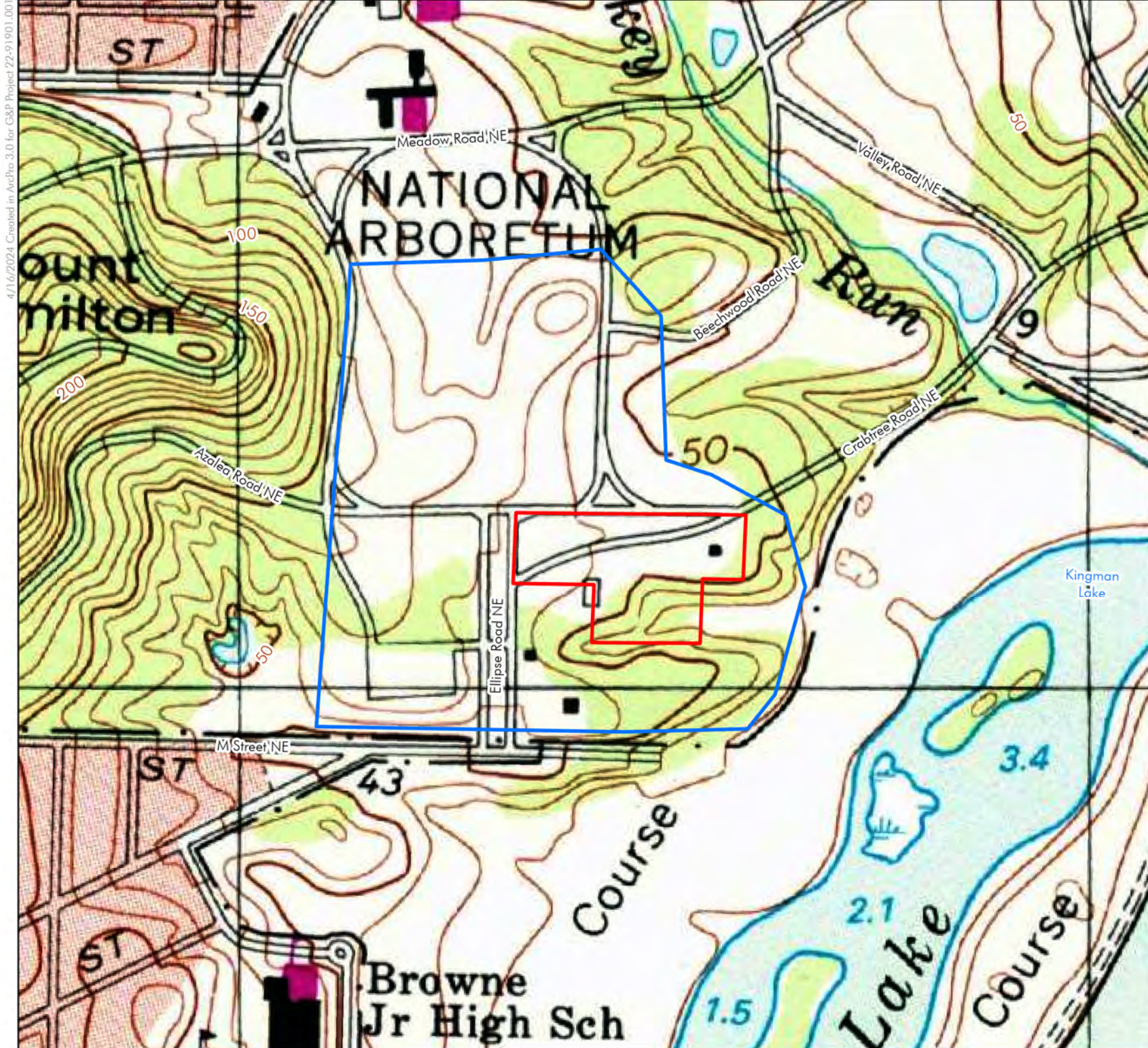
Gray & Pape conducted the built environment fieldwork June 30 and July 14, 2022. The recommended APE was determined through online mapping and on-site visual inspection. One historic property—the NRHP-listed United States National Arboretum—is located within the recommended APE. Gray & Pape finds that the Undertaking will have a direct effect on the USNA, but that effect will not be adverse, as no character-defining features of the USNA will be diminished by the Project. No further work to identify historic built properties in the APE is recommended.

1.3 Report Organization

This report is divided into eight separate sections. Section 1 is the introduction, which provides an overview of the proposed project. Section 2 is the environmental context for the Canopy Trail Project and Section 3 is the cultural context for the area, with relevant historical maps and refined information on the Arboretum itself. Section 4 presents the project field (above and below-ground) and laboratory methods. Section 5 presents the archaeological site file data. Section 6 details the results of the archaeological survey and Section 7 provides the results of the architectural history components of the work. Section 8 is the project conclusions and recommendations, and Section 9 is the references cited.

1.4 Personnel

Kerry S. González, M.A., RPA, was the Principal Investigator (PI) for the archaeological portion of the project with Katherine M. Stefanic (née Watts), M.A., serving as PI for the historic built environment survey. Carrie Albee, M.A., was the Project Manager. Kerry S. González, M.A., RPA, was the project Field Director and conducted the fieldwork. Seth Van Dam, M.A., RPA, provided geographic information system (GIS) and Survey123 support during the field effort, and prepared graphics and figures used in the report with the assistance of Claudia Abernathy. Jessica Bludau edited and produced the report.

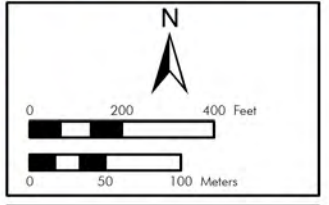


LEGEND

- Limit of Disturbance
- Area of Potential Effects

Figure 1-1
Location of the USNA
Canopy Trail Project,
Washington, D.C.
(USGS 1965; Esri
2024a, 2024b).

4/16/2024, Created in ArcPro 3.0 for C&P Project 22-91901.001



LEGEND	
	10-foot Contour
	Limit of Disturbance
	Area of Potential Effects

Figure 1-2
Detail of the USNA
Canopy Trail Project,
Washington, D.C. (Esri
2023, 2024a, 2024b).



Figure 1-3. View of northern portion of LOD, facing northeast.



Figure 1-4. View of the northern portion of the LOD, facing east.

2.0 ENVIRONMENTAL CONTEXT

2.1 Physiography and Geomorphology

The USNA is found within the Atlantic Coastal Plain Physiographic province as defined by Thornbury (1965). Specifically, it is found within the Glen Burnie Rolling Upland District of the Western Shores Uplands Region, Embayed Section (Figure 2-1) (Reger and Cleaves 2008a). The region is characterized by nearly level to gently rolling uplands, with steep valley walls and narrow valley bottoms (Froelich and Hack 1976:75).

Topographically, the area is characterized by low relief. Froelich and Hack (1976:75) note that elevations range from sea level to 415.0 ft (126.5 m) near the Piedmont region. Reger and Cleaves (2008b:5) report that elevations range from 20 to 40 ft (6 to 12 m) above mean sea level (amsl) in valley bottoms to 100 ft (30.4 m) in upland settings (Reger and Cleaves 2008b:50).

2.2 Geology

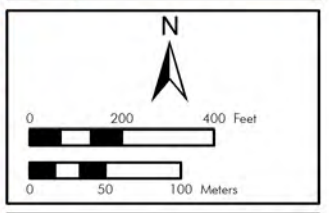
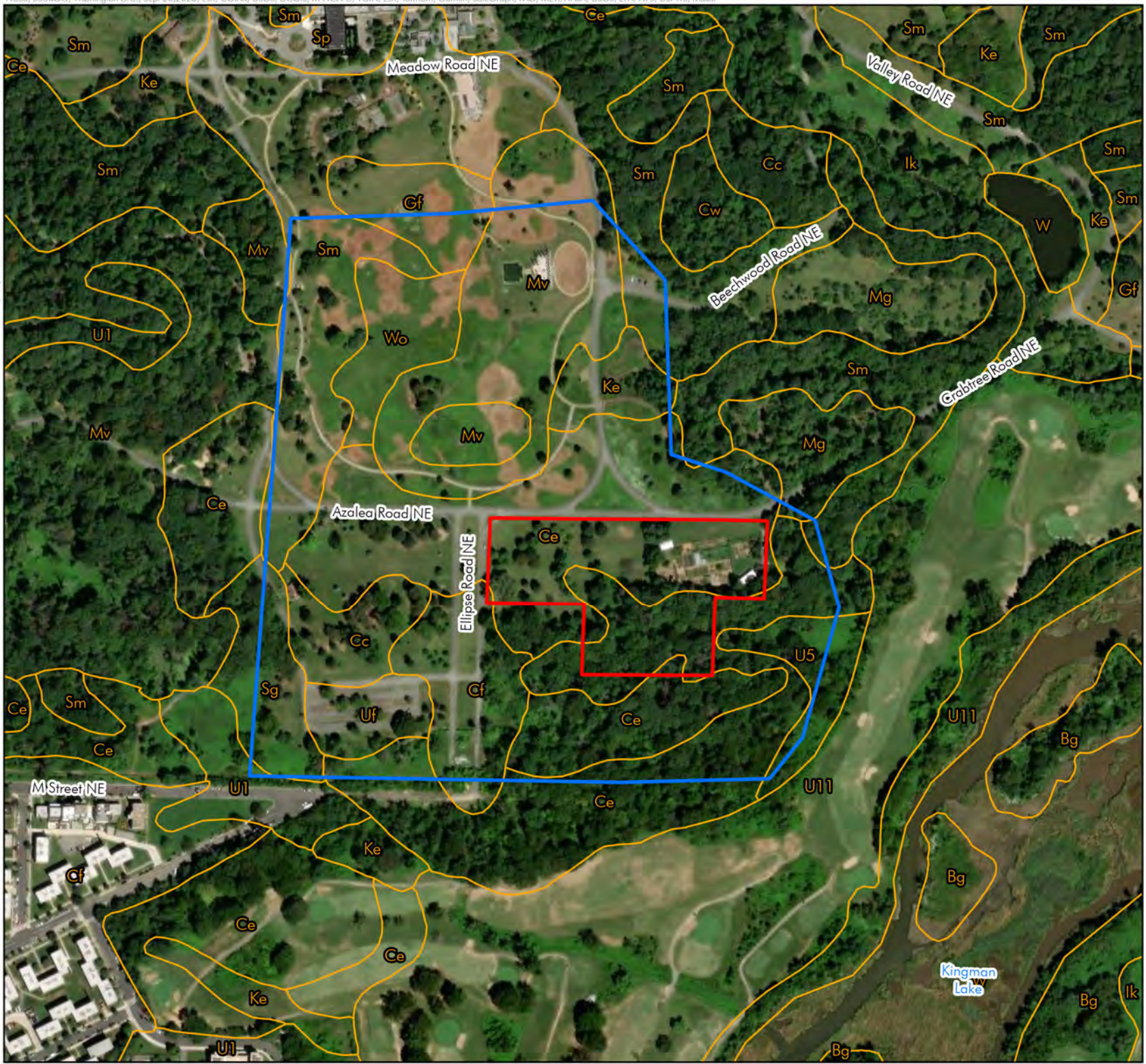
Basement rock in the Atlantic Coastal Plain is composed of Cambrian- and Ordovician-aged igneous and metamorphic rock (Figure 2-2) (Johnston 1964:10). Metamorphic rocks belong to the Wissahickon Formation and are composed of quartz, mica, schist, phyllite, and quartzite (Johnston 1964:10). The basement rock is covered with unconsolidated sediments of Early Cretaceous to Recent age (Thornbury 1965:31). Sediments belong to the Potomac group, are composed of gravel, sand, and clay, and reach thicknesses between 100.0 and 1,500.0 ft (30.4 and 457.2 m) (Froelich and Hack 1976:75). The basal portion of the Potomac group is composed of sand, gravel, and poorly sorted quartz and quartzite gravels. The upper portion consists of silty and sandy clay, mixed with interbedded sand and gravel (Froelich and Hack 1976:76).

The area was unglaciated during the Pleistocene; however, Pleistocene deposits belonging to the Wicomico Formation have been identified, consisting of coarse gravel, with sand and silt (Johnston 1964:38). Recent deposits consist of alluvium composed of alluvial gravels, sand, silt, and clay along stream bottoms and can reach depths up to 25.00 ft (7.62 m) (Froelich and Hack 1976:76). Much of the area has been modified over the past 200 years, with varying depths of artificial fill where extensive cut-and-fill activities have occurred (Froelich and Hack 1976:76).

2.3 Soils

Soils within the LOD include Christiana silt loam, 0–8 percent slopes (CeB), Christiana silt loam, 15–40 percent slopes (CeD) and Christiana-Urban Land Complex, 8-15 percent slopes (CfC). Christiana silt loams are strongly sloping and dissected and found at higher elevations (Smith 1976:17). Soils are deep and well drained (Smith 1976:85). These soils exhibit a mature soil sequence, with an E and argillic (Bt) soil horizon (Figure 2-1; Table 2-1). Where Christiana soils are still present, they exhibit well-developed soil horizons that include E and argillic (Bt) horizons. Christiana-Urban Land Complex, 8-15 percent slopes (CfC) are well-drained Christiana series soils that have been modified by grading for industrial centers and residential developments (Smith 1976:18). The USNA falls within the Atlantic Slope Section of the oak-pine forest region, as defined by Braun (2001).

4/16/2024, Created in ArcPro 3.0 for G&P Project 22-291901_001



LEGEND

- Soil Unit Boundary
- Limit of Disturbance
- Area of Potential Effects

Figure 2-1
Soil types mapped within the Canopy Trail Project LOD, Washington, D.C. (USDA 2023; Esri 2024a, 2024b).

Table 2-1. Soils Mapped in Canopy Trail Project LOD.

Soil Name	Soil Symbol	Landform	Drainage	Soil Horizonation
Christiana silt loam, 0–8 percent slopes	CeB	Well-dissected uplands	Well drained	Oi-A-E-Be-Bt1 -Bt2-Bt3-Bt4-BC
Christiana silt loam, 15–40 percent slopes	CeD	Well-dissected uplands	Well drained	Oi-A-E-Be-Bt1 -Bt2-Bt3-Bt4-BC
Complex, 8–15 percent	CfC	Uplands	Well drained	Oi-A-E-Be-Bt1 -Bt2-Bt3-Bt4-BC

2.4 Hydrology

Southern flowing streams drain the area and form a dendritic drainage system (Froelich and Hack 1976:75). The LOD is drained principally by Hickey Run and the Anacostia River, which are tributaries of the Potomac River (Froelich and Hack 1976:75). The Anacostia River is a major tributary and drains an area of 173.7 square miles (m²) (450 square kilometers [km²]) (Maa 2008:1,102).

2.5 Floral and Faunal Resources

The following section reviews the floral and faunal resources that would have been available to precontact and early historical groups.

2.5.1 Floral Resources

The Pleistocene/Holocene transition was a time of rapid and dramatic climatic change, impacting the distribution of floral and faunal populations, which in turn affected human subsistence and settlement patterns. Vegetation differed greatly during the Pleistocene south of the Wisconsin Ice Sheet, which was composed of a spruce parkland (Kutzbach and Webb 1991:305). Whitehead et al. (1982:251) suggest the parklands were transitional between closed boreal forest and tundra, based on the high percentages of spruce and grass pollen. Drastic vegetation changes occurred at the onset of the Younger Dryas ca 12,900 Before Present (B.P.), with a decline in pine and oak and a rise in spruce (Fiedel 2014:85). Near the terminus of the Younger Dryas around 11,600 B.P., a marked decline in spruce occurred and an increase in white pine. After 10,000 B.P., pine declined, with an emergence of modern plant assemblages, such as deciduous trees and mixed forests (Kutzbach and Webb 1991:205).

During the Middle Holocene (8000–4000 B.P.) and the onset of the Hypsithermal and more xeric conditions, pine forests declined and were replaced by beech forests (Anderson et al. 1996:4; Fiedel 2014:85). After 5500 B.P., hemlock declined. Around this time, oak trees dominated, and alder was commonly found. By 3800 B.P., oak-hickory became the dominant species. By 1200 B.P., pine increased, likely because of increased agricultural practices by precontact groups (Katz et al. 2016:10).

The Canopy Trail Project falls within the Atlantic Slope Section of the Oak-Pine Forest Region as defined by Braun (2001). The dominant native vegetation consists of deciduous forests that include chestnut, black oak, white oak, mockernut hickory, and pignut hickory (Smith 1976:3). Floodplain species include swamp oak, river birch, white ash, white willow, and hornbeam. The uplands along the coastal plain include sweetgum, ash, elm, birch, sycamore, and hickory. The upper portions of the Anacostia River support extensive marshlands with Indian rice, cat tails, grasses, and sedges (Smith 1967:3). The Canopy Trail Project is located entirely within the USNA property. The northern portion of the LOD is comprised of a manicured lawn with a garden in the eastern section and formally planted trees in the western portions. The southern section of the LOD is within deciduous forests of old-growth trees.

2.5.2 Faunal Resources

Animal species were impacted by climatic conditions and also influenced by the distribution of plants and succession of plant communities. The distribution of faunal species had a direct influence on the distribution and movement of human populations.

As noted above, the Pleistocene/Holocene transition was a time of dramatic change, affecting the distribution of plant and animal species. The most drastic change was the extinction of Pleistocene taxa during this transition. The extinction of mammalian megafauna has been attributed to some combination of overkill and environmental change (Semken 1983:184). Whitehead et al. (1982:254) suggest that the rapid restriction of boreal forests during the Last Glacial Maximum led to a reduction in mastodon populations, which would have made them susceptible to short-term weather extremes, disease, and human predation. The mammalian assemblage from Horsterman's Pit in Pennsylvania, dated to 9290 B.P., was essentially modern (Semken 1983:193).

Semken (1982:202) stated that Holocene mammalian fauna "...can be regarded as an impoverished residuum of the late-Pleistocene fauna." The Pleistocene/Holocene faunal transition was somewhat rapid and was completed within a few hundred years; local faunal were essentially modern in composition. Graham and Mead (1987:387) note that despite the modern aspect of these taxa "...early Holocene faunas were still quite different from the modern fauna of the region."

During the mid-Holocene Hypsithermal, faunal assemblages were severely impacted. Archaeological evidence from Midwestern rockshelters suggests an eastward expansion of prairie-adapted animal species, concurrent with the eastward expansion of the prairies. Additionally, climatic stress on faunal populations caused clinal changes in overall animal size (Graham and Mead 1987; Semken 1983:191). Environmental conditions during the mid-Holocene were time-transgressive and exhibited some regional differences. "In the eastern U.S., there is little faunal evidence for environmental change, although forests may have been slightly more open" (Graham and Mead 1987:391). Thus, climatic, floral, and faunal data suggest that the Middle Holocene environmental change had little impact on biotic communities in the eastern United States.

Following the Middle Holocene, faunal distributions stabilized and reached modern proportions. Semken (1983:190) suggests that the modern distribution of small mammals has been affected by European settlement, pre-Columbian cultural patterns, Holocene climatic change, and climatic changes associated with the glacial retreat.

Knowledge of presettlement faunal distribution during the Late Holocene is based on the occurrence and analyses of archaeofaunal assemblages from archaeological sites. Little faunal data exists for Late Archaic sites in the region. Archaeological work conducted on the Atlantic seaboard has identified numerous shell middens dating from the Early Woodland through the early Contact period (Torben et al. 2011; Torben et al. 2015). Excavations at site 44NH478 in Virginia identified a mix of shellfish, including hard-shelled clams, scallops, and oysters. Trace amounts of deer bone were also identified (Torben et al. 2015:25–27). Today, a diverse faunal population inhabits the area and includes 35 species of mammals and 175 species of birds (Smith 1976:70). Mammal species include both terrestrial and aquatic species, such as white-tailed deer, gray squirrel, cottontail rabbit, gray and red fox, beaver and muskrat. Avian species include raptors, songbirds, waterfowl, and shore birds (Smith 1976:70). Reptiles and amphibians are present, as well as fish species including catfish, sunfish, carp, and bass (Smith 1976:70).

2.6 Climate

The effect of climate change on human societies is undeniable, inexorable, and can be quite profound. Proxy data recovered from ice cores, tree rings, pollen, stalactites, and lakes and bog sediments all provide information on past climatic events. Long-term changes in temperature, precipitation, and atmospheric gases all affect climate, which in turn affects the migration of plant and animal species, can impact human populations.

Archaeology and climatic studies have had a long relationship. Griffin's (1961) pioneering article on the influence of climatic change on prehistoric cultures paved the way for future work. A growing body of information exists regarding the impact of naturally occurring climatic fluctuations on ancient societies (Diaz and Stahle 2007:3). Recently, Fiedel (2014:89) has proposed that abrupt changes in projectile point styles are correlated with cold events and droughts that occurred in 1500-year intervals.

2.6.1 Paleoclimate

Climatic change is variable and can occur over a period of several thousand years or in a matter of decades. Climate is cyclical and changes can be brought upon by variations in the Earth's orbital inclination and eccentricity, which in turn impacts the distribution of solar radiation on the planet's surface (Anderson 2001:151).

During the Late Pleistocene, river systems were narrower and more deeply incised (Anderson 2001:152). At this time, sea levels along the Atlantic coast were 230 ft (70 m) lower than they are today. By 9000 B.P., sea levels reached present elevations (Anderson et al. 1996:3). According to Kutzbach and Webb (1991:195), postglacial climate was a response to changes in solar radiation and residual effects of the melting ice sheets. Environmental changes at the end of the Pleistocene were profound, resulting in the extinction of over 30 genera of megafauna, shifting vegetation patterns, and landscape modification (Anderson et al. 1996:3). After a warming period following the northward retreat of the glaciers, a sudden reversal between 11,000 and 10,000 B.P. resulted in cooler temperatures during a period known as the Younger Dryas, which had a significant impact on plants, animals, and humans (Herrmann 2013:27).

Mayewski et al. (2004:243–244) noted that climatic variations during the Holocene have occurred more frequently than has been previously documented. Mayewski et al. (2004:244) have demonstrated that Holocene climate "...has not been stable, but rather it was dynamic at scales significant to humans and ecosystems". As part of their research, they have identified several periods of what they refer to as "rapid climate change (RCC)" (Mayewski et al. 2004:244). These changes occurred around 9000–8000, 6000–5000, 4200–3800, 3500–2500, 1200–1000, and 600–0 B.P. (Mayewski et al. 2004).

The onset of the Middle Holocene around 8000 B.P. experienced a cooling trend, followed by an abrupt cold snap. Anderson (2001:159) attributes this to the final melting of the Laurentide ice sheet and draining of glacial lakes Agassiz and Obijibway, which impacted atmospheric and ocean circulating patterns resulting in drastic drops in temperature. After 8000 B.P., a climatic amelioration, known as the Hypsithermal, resulted in seasonally warmer temperatures that would have stressed human, animal, and plant populations (Anderson 2001:158). Schuldenrein (1996:9) suggests at the onset of the Middle Holocene river systems generally transitioned to lower-energy channel environments, which gave way to meandering systems and stabilized base levels that allowed lateral accretion to occur. Paleoclimatic data, gathered in the Midwest, suggests that temperatures during the Hypsithermal were more extreme with lowered precipitation, resulting in eastward encroachment of animal and plant species adapted to

a prairie environment (Delcourt and Delcourt 1980:150). According to Semken (1983:191), drier, warmer conditions resulted in decreased animal size. Semken (1983:202) notes that the Hypsithermal was greatly diminished in the east. The pollen record from southwest Ohio suggests that climatic conditions were moister during the Hypsithermal than previously thought (Shane et al. 2001:30). Near the end of the Middle Holocene, El Niño events escalated, resulting in extremely variable climatic conditions and increased flooding (Anderson 2001:161).

During the beginning of the Late Holocene, Anderson (2001:161) notes increased precipitation and flooding occurred, as well as channel migrations in the major river systems. Mayewski et al. (2004:250) note that between 4200 and 3800 B.P., temperatures fell in North America and glaciers advanced in western North America and prevailing westerlies were strong. Anderson (2001:163) notes that the beginning of the Woodland period corresponds to a severe decline in global temperatures, which may have contributed to the socioeconomic collapse of Archaic societies (Anderson 2001:163). Around 2350 B.P., the Sub-Atlantic climatic amelioration occurred, with conditions favorable to agricultural pursuits. This climatic episode may have facilitated the development of the Hopewell florescence. The Vandal Minimum, which occurred between 1550 and 1150 B.P., was a slight decline in global temperatures and may have stressed agricultural systems, contributing to the overall Hopewell decline (Anderson 2001:165). After 1414 B.P., a significant global cooling trend occurred, causing widespread global impacts on human society. The spread of Late Prehistoric cultures (i.e., Mississippian) between 1150 and 650 B.P. corresponds with the Medieval Warm Period, which was favorable for agricultural societies with warmer temperatures favorable to those experienced today.

Stahle et al. (2007:133) have identified several decadal prolonged droughts that occurred after A.D. 1300, which had "...significant environmental and socioeconomic impacts...". The onset of the Little Ice Age, after 650 B.P. was attributed to climate-induced stress on crops, which was a time of settlement nucleation, decreased long-distance exchange, and increased settlement fortification, a likely result of increased warfare (Anderson 2001:166). Following the Little Ice Age, climatic conditions stabilized during the early Historic period.

2.6.2 Modern Climate

The Canopy Trail LOD is characterized by a continental-temperate climate, with a broad range in temperatures and precipitation throughout the year. Precipitation is reliable and well distributed throughout much of the year and averages 21 inches (in) (53.3 centimeters [cm]) between April and September (Smith 1976:2). The average annual snowfall is 18 in (45.7 cm). Overall, summers are hot and humid, and winters are cold. The average temperature during the winter is 37° degrees Fahrenheit (°F) (2.7 degrees Celsius [°C]), with a daily minimum of 29°F (-1.6°C) and a record low of -15°F (-26.1°C). Average summer temperatures are 77°F (25°C) and an average daily maximum of 86°F (30°C). The highest recorded daily temperature was 106°F (41°C) (Smith 1976:2).

3.0 CULTURAL CONTEXT

Archaeologically, the Middle-Atlantic region, while somewhat loosely defined, includes that area extending from Virginia northward to coastal New York. Curry (2018:9) defines the region as essentially comprising the “greater Chesapeake Bay-Delaware Bay region.” The Middle Atlantic encompasses portions of the Coastal Plain, Piedmont, Blue Ridge, Ridge and Valley, and Appalachian Plateau physiographic provinces (Stewart 1995) and includes the watersheds of the James, Potomac, Delaware, Susquehanna, and Ohio Rivers (Wholey and Nash 2018:1).

The following section of the report provides an overview of the precontact and historical periods for the Middle-Atlantic and more specifically, the Washington, D.C. region, to provide a context for the Canopy Trail Project.

3.1 Prehistoric Context

The following discussion provides an overview of precontact archaeological cultures that have been identified in Washington, D.C., Maryland, northern Virginia, and the surrounding region. Four main precontact periods are discussed: the Paleoindian, Archaic, Woodland, and Contact periods. Unless otherwise noted, bracketing dates for these periods follow those generally accepted for the state of Maryland (Maryland Archaeological Conservation Laboratory 2012).

3.1.1 Paleoindian Period (13,500–11,400 B.P.)

The earliest known academically accepted human inhabitants of North America are referred to as Paleoindians. These currently are the first groups that are widely accepted to have colonized the continent. However, there are rapidly evolving perspectives on this subject that derive from new discoveries in North and South America Miller and Gingerich (2013:10) have divided the Paleoindian into three subperiods: Early Paleoindian (13,500–12,800 B.P.), Middle Paleoindian (12,800–12,550 B.P.), and Late Paleoindian (12,550–11,400 B.P.).

Although fluted projectile points, including those of the Clovis type and its variants, were long seen as representing the earliest human habitation in North America, there is increasing evidence for pre-Clovis occupation in the region. Hranicky (2010:53–55) suggests evidence for pre-Clovis groups in the Middle-Atlantic region by 15,000 B.P. Archaeological investigations in the Delmarva Peninsula identified a lanceolate projectile point manufactured from chert, a quartzite core, and blades dated to around 18,000 B.P. (Lowery et al. 2010:1474). A Clovis point was found associated with a surprisingly early date of 15,590 ± 60 B.P. (Lowery et al. 2010:1477, Figure 6). Excavations at the Cactus Hill site in Sussex County, Virginia have produced a radiocarbon date of 15,070 ± 60 B.P. from beneath the Clovis-age sediments (McAvoy and McAvoy 1997:165).

Climatic conditions at the time of first colonization were harsh and the region consisted of spruce parkland (Carr and Adovasio 2012:276). Glaciers impounded seawater, which resulted in lowered sea levels by as much as 328 ft (100 m) and extended the Atlantic coastal plain by as much as 202 mi (325 km) (Carr and Adovasio 2012:276). By 12,800 B.P., megafauna in the region, such as mastodon, horse, and camillids, likely were extinct and replaced by modern fauna that included elk, moose, and caribou (Carr and Adovasio 2012:277; Fiedel 2014:77).

Lithic implements are one of the most diagnostic artifacts of this period and provide the basis for the interpretation of the most ancient cultural lifeways. Perhaps the most distinctive artifact characterizing

Paleoindian period is the lanceolate-shaped and fluted Clovis projectile point and its variants. One set of dates for fluted points in the region comes from the Shawnee-Minisink site in the upper Delaware Valley of Pennsylvania, where radiocarbon dates on the Clovis level average $10,937 \pm 15$ B.P. (Gingerich 2007).

Fluted points were replaced by side-notched forms, such as Dalton and Hardaway types at the end of the Paleoindian period (Coe 1964; McAvoy and McAvoy 1997). The Paleoindian toolkit also included utilized flakes, bifaces, and an assortment of prepared flake tools, such as triangular end scrapers, wedges, burins, and graters (Carr and Adovasio 2012:285; Gingerich 2007).

Artifacts were manufactured from a variety of high-quality cryptocrystalline materials, such as jasper and chert (Gardner 1989; Hranicky 2010:55). Other raw material types used included quartzite (Hranicky 2015). At the Paw Paw Cove Archaeological Site Complex in Maryland, an assortment of raw material types was used, including a variety of quartzite, slate, jasper, and chert (Lowery 1989). Along the Atlantic coast, raw materials most often were obtained from cobbles found in secondary stream deposits, rather than from bedrock deposits (Lowery 1989), although there were a handful of actual quarries that were exploited, including the Magothy Quartzite Quarry in Anne Arundel County (18AN760).

Fiedel (2014:93) suggests that abrupt climatic change, which included cold events and megadroughts, resulted in abrupt and widespread changes in projectile point styles. For example, around 10,000 B.P., a stylistic change occurred from fluted to notched point types that coincided with the transition from the Younger Dryas to the Holocene (Fiedel 2014:87, Table 1). According to Carr and Adovasio, Paleoindian settlement focused on the following:

- (1) high-quality lithic sources;
- (2) high-biomass ecotones, emphasizing riverine settings;
- (3) a curated tool assemblage with many standardized tool types;
- (4) a staged biface reduction lithic technology; and
- (5) a settlement pattern characterized as cyclical and accompanied by the direct procurement of lithic resources (Carr and Adovasio 2012:274).

A cyclical settlement pattern was circumscribed by a small area that covered approximately a 25–90-mi (40–150-km) radius (Carr and Adovasio 2012:286). In the Middle Atlantic, Paleoindian sites were small and found in riverine settings. Larger sites were found near quarries. The exception is sites found in the Delmarva Peninsula, which were probably located on former upland landforms (Carr and Adovasio 2012:291). Evidence for Paleoindian subsistence is limited. Carr and Adovasio (2012:291) suggest that no evidence exists in the mid-Atlantic that Paleoindian groups focused on a big-game hunting lifestyle. Rather, subsistence relied on a variety of foods, such as fish, white-tailed deer, and smaller game, a diet that was supplemented with the possible use of hickory nuts, walnuts, and hackberries (Carr and Adovasio 2012:291). The recovery of numerous hawthorn fruit seeds from the Shawnee-Minisink site suggests that it was being exploited by the site's occupants, also suggesting a subsistence strategy based on generalized foraging as well as hunting (Gingerich 2013).

The end of the Paleoindian period is generally associated with a transition to the Early Archaic period; however, Carr and Adovasio (2012:296) suggest that the Early Archaic, in terms of subsistence, settlement, and technology, is a continuation of the Paleoindian period and the major transition and end of the Paleoindian period occurs at the Middle Archaic transition, when there was a "...significant change in adaptive strategy...".

3.1.2 Archaic Period (11,400–3250 B.P.)

The Archaic period has traditionally represented the period in North American archaeology when human adaptations to Pleistocene environments were ending, but dependence on agriculture had not yet begun. While this category is convenient, it tends to obscure the fact that the Archaic period represents approximately 7,000 years of human adaptation to a highly dynamic environment. Early Archaic hunters and foragers were vastly different from semisedentary Late Archaic foragers, fishers, hunters, and incipient agrarians, and with those changes in subsistence strategies came concomitant shifts in technological adaptations. For this reason, the Archaic period has been divided into three sub-periods.

3.1.2.1 Early Archaic Period (11,400–9000 B.P.)

As noted above, Carr and Adovasio (2012:296) suggest that the Early Archaic period was a continuance of Paleoindian lifestyles. Commonalities included an emphasis on curated technology that included bifaces, utilized flakes, prepared flake tools, and a preference for high-quality raw materials.

Early Archaic point types were found during work in the Delmarva Peninsula that were 11,300 years old (Lowery et al. 2010:1479). Early Archaic point types in the Middle Atlantic have been dated to 9800 B.P. at the Thunderbird site and 9400 B.P. at the Varney site (Carr and Adovasio 2012:309). Diagnostic point types included Kirk Corner Notched and Stemmed, Palmer Corner Notched, Fort Nottoway, Kessell, Charleston, and Amos (Custer 1990; Fiedel 2014:87, Table 1)

A continued preference for high-quality raw materials is noted. These resources were generally found within 62 mi (100 km) of reported Early Archaic sites. The number of sites increased, particularly in upland settings; however, riverine settings were also inhabited (Carr and Adovasio 2012:307, Table 12.12). Exploitation of upland resources is reflected in the introduction of a ground stone tool technology, including implements such as mortars, pestles, and nutting stones. Chenopods, amaranth, hickory nuts, butternut, and possibly acorns have been recovered from the Crane Point Site on the Eastern Shore (Lowery and Custer 1990).

The main difference between Paleoindian and Early Archaic groups is that Early Archaic groups have been interpreted as practicing a serial or embedded settlement pattern, rather than one that was cyclical (Carr and Adovasio 2012:296). While the availability of lithic resources likely continued to play a role in settlement patterns, a broader range of resources influenced site location, with increased reliance on new types of environments, such as wetlands. Early Archaic sites tend to be small in size, but numerous, and located in a wide variety of landscape settings (Dent 1995). This type of settlement patterning would allow Early Archaic groups to take advantage of the full range of resources found in a particular region, while frequent movement across a large geographical area may have promoted interaction between groups by increasing the chances of them encountering one another (Dent 1995).

3.1.2.2 Middle Archaic Period (9000–5750 B.P.)

According to Carr and Adovasio (2012), the Middle Archaic period is the end point of Paleoindian lifeways and is when Middle Atlantic groups fully transitioned to an Archaic lifestyle. Climatic conditions are warmer and drier, and temperatures reach a post-glacial maximum, averaging 33–35°F (1–2°C) (Carr and Adovasio 2012:280). Faunal resources were completely modern and consisted of deer and elk as the big-game animals. Floral assemblages were also essentially modern (Carr and Adovasio 2012:281).

Stylistic changes in projectile points transitioned from notched forms to bifurcate forms, which included Saint Albans, Kanawha, and LeCroy types. Fiedel (2014:87, Table 1) notes this stylistic change occurred around 8800 B.P. Approximately 8000 B.P., another stylistic change occurred, from bifurcate to stemmed point types that included Stanly Stemmed, Morrow Mountain I and II, and Guilford Lanceolate (Fiedel 2014; Justice 1987). Middle Archaic toolkits and lithic preferences differed from those seen during the Paleoindian and Early Archaic periods; the use of quartz, quartzite, and rhyolite increased, and with it there was a shift from curated technologies to more expedient technologies that included increased use of utilized flakes at the expense of prepared flake tools (Carr and Adovasio 2012:297). Other tool types included drills, chipped stone axes, and ground stone items (Wall 1991:50). Along the Coastal Plain, few primary lithic outcrops were present, forcing groups to utilize cobbles and gravels found in secondary stream deposits (Gardner 1987:67). Locally derived cobble and gravel lithic sources also were supplemented in the Mid-Atlantic with lithic material from the Piedmont and Ridge and Valley physiographic provinces, including metarhyolite, that was available from quarry sources and procured through direct extraction or some form of exchange.

During the Middle Archaic, sites included small transient camps found on broad floodplains or near swamps. Gardner (1987:69–70) notes that inland and coastal swamps were important to Middle Archaic people, who relied on a more general foraging subsistence pattern. Carr and Adovasio (2012:297) suggest that social units during the Middle Archaic were smaller and consisted of nuclear families.

Subsistence strategies for the Middle Archaic seem to follow trends established in the Early Archaic. Sites in the region show evidence of the use of hickory nuts, acorns, and sunflower. The presence of ground stone tools such as pestles and mano/metates also indicate an increased reliance on plant foods which require processing through crushing or grinding (Dent 1995).

3.1.2.3 Late Archaic Period (5750–3250 B.P.)

The population growth that began during the Early Archaic endures throughout the Late Archaic due to the continued development of the Eastern Woodland environment. According to Fiedel (2014:87, Table 1), a series of cold and droughty conditions coincided with stylistic projectile point styles from broad, corner, or side-notched Brewerton point styles to smaller stemmed points, such as Lamoka (Fiedel 2014:88).

The most significant technological advance of this period is the introduction of steatite bowls. Other ground stone tools associated with the Late Archaic include polished atlatl weights and grooved axes with the latter being indicative of more heavy woodworking activities (Coe 1964:123–124).

According to Gardner (1987:69), the tradition of small transitory camps continued through the Late Archaic period. The use of swamps was deemphasized, and settlement patterns were more diffuse, with groups spread across upland and floodplain settings (Gardner 1987:71). Near the end of the Late Archaic period, Gardner (1987:71) notes a change in vegetation to increased pine forests, with a reduction in chestnut and hickory. It was during this period that fishing camps appeared more frequently. Along the coastal plain, fishing and exploitation of oysters were important activities and site locations increased along floodplains and at the mouths of creeks. The number of shell midden sites increased as well (Gardner 1987:71).

The latter portion of the Late Archaic, often referred to as the Transitional Archaic, displays characteristics that set it apart from the earlier portions of the period and marks the beginnings of

technological shifts that would culminate in the subsequent Woodland Period. Broad-bladed projectile points, such as Susquehanna, Perkiomen, and Savannah River points enter the archaeological record at this time. Usewear analysis of these points shows that they functioned as knives and generalized cutting and prying tools, although use as projectiles is also indicated (Custer 1991; Truncer 1990). Steatite bowls also appeared in the archaeological record during this time, and with them came new ways of processing foods using durable containers that could be heated directly (Dent 1995). The introduction of new ways to process foods opens up possibilities for what resources are available for subsistence and may reflect both environmental changes and concomitant changes in settlement patterns (Blondino 2015).

Another hallmark of the Transitional Archaic in the Middle Atlantic is the presence of large fire-cracked rock features (Blondino 2015; Carr 2015). While these features have been interpreted as hearths, possibly used for the drying of large quantities of fish (Kinsey 1972; Kraft 2001), Blondino (2015) points out that they tend to lack characteristics that would indicate use of fire in direct association with the features themselves. Rather, he suggests that the association of these features with steatite bowls and wetlands bordering low-order streams may indicate a shift toward processing of a more diverse range of plant foods and that the features may have served as dumps of stones used to process resources in earth ovens (Blondino 2015). Miller (2015) has noted the use of roasting pits in the Susquehanna Valley during the Transitional Archaic, as well as evidence for the processing of plant foods in steatite bowls.

3.1.3 Woodland Period (3250–400 B.P. [1250 B.C.–A.D. 1600])

Traditionally, the beginning of the Woodland period in the Middle Atlantic coincides with the introduction of ceramic technology during the Early Woodland and terminates with European contact at the end of the Late Woodland period. New technological and economic changes appear to have sparked broad socio-political changes throughout the Woodland period. Although Early Woodland peoples would have closely resembled Late Archaic populations, Late Woodland populations had increased dramatically in size and developed complex social, political, and economic institutions. The Woodland period has been subdivided into three subperiods.

3.1.3.1 Early Woodland Period (3250–1950 B.P.)

Traditionally, the transition between the Late Archaic and Early Woodland periods is marked by the introduction of ceramic technology. Ware types include Marcey Creek, which uses steatite temper and resembles steatite bowls in form, Selden Island, and Accokeek (Dent 1995). During this period, focus continued on riverine settlement and subsistence, with an overall decrease in the number of archaeological sites (Hantman and Gold 2002:274, Figure 13.2). Early Woodland groups practiced a semisedentary lifestyle, as evidenced by the documentation of residential structures associated with pit features and an assortment of artifact types (Stewart 1995:183). At site 44WR329, in the Shenandoah Valley of Virginia, nine oval-to-circular dwellings were identified that measured between 48.5 and 80.3 ft (14.8 and 25.4 m) in diameter (Stewart 1995:183). A hierarchic settlement system has been inferred by site size, artifact density, and variety of artifact classes that included hamlets and camps (Stewart 1995:183). Knight-Iske (2017) has noted an increase in the use of jasper during the Early Woodland period.

The subsistence and settlement system were influenced by a diverse environmental and resource base. Subsistence focused on anadromous fish, nuts, shellfish, large mammals, seeds, and tuber-producing plants (Stewart 1995:185). According to Stewart (1995:185), no direct evidence for domesticated plants is found in the region. With the more widespread use of durable containers, options for plant-

based food resources continued to open up, and storage pits provide additional evidence for new subsistence strategies (Dent 1995).

Extensive evidence for widespread trade is present within and outside the region, but the volume of exchange had declined in comparison to the preceding Late Archaic period (Stewart 1995:185).

Archaeological investigations in the Delmarva Peninsula have identified a widespread Meadowood presence (Lowery et al. 2015). Archaeological work at several sites in Maryland and Virginia has identified burial features and shell middens along the Atlantic coastline. Investigations at the Nassawango Creek site (18WO23) in Worcester County, Maryland, resulted in the recovery of Vinette 1 pottery associated with thin, side-notched Meadowood projectile points. Associated 14C dates ranged from 2735 ± 75 to 2445 ± 40 B.P. (Lowery et al. 2015:39). Projectile points and bifacial cache blades manufactured from Onondaga chert are a trademark of Meadowood sites, as are ornaments manufactured from marine shell (Lowery et al. 2015:40). Meadowood projectile points found in the Delmarva Peninsula were manufactured from jasper, chert, argillite, and quartzite, while cache blades were manufactured from Onondaga or Onondaga-like chert (Lowery et al. 2015:40).

A wide variety of artifacts was recovered from burial contexts at site 18WO23 and included debitage, copper beads, and quartz-tempered pottery (Lowery et al. 2015:43).

Archaeological work at the Savage Neck site (44NH478) in Virginia, identified an intact shell midden. Recovered artifacts included an assortment of Meadowood points, cached blades, and a drill. Recovered pottery was variously classified as Waterlilly, Mockley, Ware Plain, Pope's Creek, Wolfe Neck, and Accokeek types (Lowery et al. 2015:44). Archaeologists found Mockley pottery tempered with crushed Bay scallop shell (Lowery et al. 2015:44). Shell-tempered pottery was dated to 3310 ± 30 B.P. and is the earliest shell-tempered pottery found in North America (Torben et al. 2015:28, Table 1). Lowery et al. (2015:50) suggest that the procurement of whelk shell "...may have been the driving force behind Meadowood intrusion into the Delmarva Peninsula."

3.1.3.2 Middle Woodland Period (1950 B.P.–1050 B.P.)

During the Middle Woodland, sedentary settlement continues; however, societal complexity varies across the Middle Atlantic (Stewart 1995:186). Near the beginning of the Middle Woodland period, a cultural phenomenon is noted along the Delmarva Peninsula known as the Delmarva Adena, characterized by a distinctive mortuary behavior with connections to Adena groups in the Ohio Valley. Stewart (1995:188) notes that the "...distinguishing feature of Delmarva Adena is the occurrence of cemeteries with exotic trade goods, as well as caches of similar types of artifacts found away from cemeteries." Mortuary behavior includes secondary burials and cremations, with a rare occurrence of single inhumations (Hantman and Gold 2002:283). Long-distance connections to western Adena are characterized by the presence of Adena bifaces manufactured from Flint Ridge chert, Great Lakes copper, as well as gorgets and tubular pipes (Hantman and Gold 2002:283). Settlement consists of mound clusters and associated hamlets (Stewart 1995:188).

During the latter portion of the Middle Woodland period, a distinct Jack's Reef presence is noted in the Chesapeake Bay and Delmarva Peninsula region and has been associated with the Webb phase (Lowery 2013:5). Archaeological work at the Wheatley's Point site (18DO371) in Dorchester County, Maryland, yielded 30 Jack's Reef points, antler billets, bone awls, stone pendants and weights, drilled and modified fossil shark teeth, mica, jasper debitage and utilized flakes, and pottery fragments. Inhabitants subsisted

on shellfish and other estuarine resources (Lowery 2013:12). Knight-Iske (2017) notes an increase in the use of jasper during the Middle Woodland period.

An extensive Webb phase midden deposit was identified at the Upper Ridge site (44NH1440) in Virginia. Numerous Jack's Reef Corner-notched points were recovered, associated with platform pipe fragments, an antler knapping tool, and a copper awl (Lowery 2013:13–14). Lowery (2013:16) reports that whelk shell beads were being manufactured at the Upper Ridge site. The presence of bone harpoons and fishhooks suggest that fish were caught at the site, while the presence of fish bone indicates that fish were processed at the site (Lowery 2013:16). A 14C of date of 1560 ± 25 B.P. was obtained from the site (Lowery 2013:17).

Pottery in the region during the Middle Woodland included net-impressed varieties, including the use of net-impressed and shell-tempered Mockley pottery (Stewart 1995:189). The presence of zone-decorated pottery coincides with the use of Mockley pottery. Stewart (1995:191) suggests that highly decorated pottery was used in public ceremonies, such as feasting, and similarities between local zone-decorated wares and the Abbott zoned pottery found near Trenton, New Jersey suggest interaction across significant distances (Dent 1995).

Middle Woodland groups continued to exploit riverine, estuarine, and marine resources. Sites were located near the interface of saltwater/freshwater drainage systems (Stewart 1995:190). Farming was not an important activity; however, the collection of starchy roots and tubers from swamps and marshes seems to have had a prominent place in the diet (Stewart 1995:192). In the Coastal Plain, large shell middens evidence the intensive exploitation of oysters (Dent 1995).

3.1.3.3 Late Woodland Period (1050–400 B.P.)

The Late Woodland period marks the terminus of the Woodland tradition and the precontact period in the Middle-Atlantic region. The end of the Late Woodland period also marks initial contact with European explorers.

During the Late Woodland period, societies were predominantly sedentary, and an increased use of maize and other cultigens is noted (Stewart 2013). Stewart (1995:193) suggests that maize first appeared around A.D. 900/1000, but a notable increase doesn't occur until A.D. 1200/1300. Maize identified in archaeological contexts consisted of eight-rowed northern flint (Stewart 1993:167).

At the Great Neck Site (44BV7) the carbonized remains of a variety of different plants including nuts, persimmon, blueberry, maize, and squash were recovered from features dating to the Late Woodland period (Gardner 1990). Still important in the Virginia Coastal Plain, however, would have been the abundant aquatic resources available in the estuarine environment. Late Woodland peoples throughout the region also continued to rely on large mammals, small mammals, and birds (Dent 1995:251).

As a result of maize agriculture, settlements are found nearer large tracts of arable land in floodplains that facilitated farming (Stewart 1995:193). Populations were organized into hamlets and/or villages. Overall, territories were rather small and circumscribed (Stewart 1995:194). Between A.D. 1300 and 1400, groups nucleated, with larger planned settlements. The increased construction of stockaded villages suggested violent conflicts between groups (Stewart 1995:194). Stewart (1995:194) notes that nucleation occurred without fortified villages. At the time of European contact, native groups were members of stratified societies that have been referred to as chiefdoms (Grumet 1996:197).

The onset of the Little Ice Age and its impact on climatic and environmental conditions might have altered agricultural productivity in some regions (Stewart 1995:194).

The use of triangular arrowpoints heralded the use of bows and arrows in the Middle-Atlantic region and would have resulted in changing hunting practices that allowed greater mobility (Stewart 1995:195). Tool production during the Late Woodland consisted of core and flake technology. Bifaces were manufactured from flakes struck from cores (Stewart 1995:196). High-quality cryptocrystalline raw material types were emphasized. Pottery consisted of decorated and undecorated conoidal or globular pots.

Ossuary burials are common during the Late Woodland along the coastal plains and were in use primarily between A.D. 1300 and 1650 (Curry 2015:1). Several ossuary sites have been identified in the region, including the Nacotchtanke site, Piscataway Fort, Nanjemoy, and Warehouse Point, located along the Anacostia River (Curry 2015:8–9, Table 1). While Nacotchtanke has yet to be officially relocated, it is likely located within the Southeast quadrant of Washington, D.C. Curry (2015:9) notes that ossuaries are found in three settings: cemeteries, villages, and isolated areas. Grave goods found associated with ossuaries are generally nonutilitarian, highly decorative, and included beads (shell, copper, glass). Pottery vessels are rarely associated with ossuaries (Curry 2015:15–16). As contact with Europeans intensified, trade items placed in ossuaries increased, including hawk bells, rings, spoons, hoes, pins, bracelets, earrings, and scissors (Curry 2015:15). Grumet (1996:200) suggests that Late Woodland traditions and lifeways continued into the 1500s but changed dramatically with European contact.

3.1.4 Contact Period

Washington, D.C. was largely inhabited by Algonquin-speaking people who were part of the Conoy chiefdom prior to the arrival of Europeans (Klein 2018). According to Humphrey and Chamber (1977), four potential villages were once located within the District limits, one of which was the large village called Nacotchtanke. The Nacotchtanke people were a branch of the Piscataway who lived on the banks of the Anacostia River (Klein 2018).

Captain John Smith's exploration of the region (1607–1609) is the earliest account of the Washington, D.C. area and generally marks the end of the Late Woodland period and the beginning of what is referred to as the Contact period. Initially, interactions between Native American groups and European settlers were relatively cooperative (Rountree 1990). Each typically engaged in frequent trade with the other, with only occasional small-scale confrontations. Over the next two decades, however, these relations degenerated. Turner and Opperman (1993), among others, have suggested that one source of the friction between Native American groups and the settlers lay in their competition for the same resources. Although contact generally is seen as causing major disruption, and even the extinction of traditional Native American lifeways in the Middle-Atlantic region, it is clear that cultural influences flowed both ways, with Euroamericans adopting elements of Native American technology and practice, particularly in regard to agriculture (Blanton and King 2004; Hodges 1993; Mouer 1991; Potter 1993).

Probably the earliest account of contact between Europeans and Native groups was Giovanni da Verrazano's 1524 journal of his voyage along the Atlantic Coast (Grumet 1996:201). The unrelenting search for the Northwest Passage throughout the sixteenth century resulted in increased contact between Europeans and Native groups (Grumet 1996:202). The continued exposure between Natives and Euroamericans led to the transmission of new ideas, trade goods, and infectious diseases (Grumet 1996:203). The establishment of permanent European settlements during the seventeenth century

resulted in significant changes in Native communities (Grumet 1996:203). Continued contact with European interlopers resulted in violent wars between Native groups and Europeans. As tensions increased, Europeans and Native allies waged war up and down the eastern seaboard that resulted in forced removal, migration, and decimation of other Native groups in the region (Grumet 1996:204–206). By the end of the seventeenth century, Native populations dropped to less than a few thousand (Grumet 1996:206). By the eighteenth century, Middle Atlantic Native populations were significantly reduced as groups were moved to reservations, or remote backcountry regions (Grumet 1996:207). For example, Rountree (2004) suggests that there was an increased use of swamps by Native groups in the eighteenth century.

3.2 Historic Context

Before the American Revolution, the area that is now Washington, D.C., was originally part of the Maryland and Virginia colonies. The area was generally rural and predominately used as parts of large tobacco plantations worked by enslaved labor. However, port towns like Alexandria, Georgetown, and Bladensburg, were more populated and shipped goods via the river. Shortly after the Revolutionary War, the location was chosen to serve as the national capital. The federal city was laid out in a grid pattern according to Pierre L’Enfant’s urban development plan of 1792.

The area around the USNA remained rural and was once part of Washington County, D.C., the limits of which were generally north of the Potomac and Anacostia Rivers (Figure 3-1). By the early twentieth century, when New York Avenue was extended into northeast Washington, D.C., the area began to witness more rapid growth (First Federal Congress Project [FFCP] 2000). In the first quarter of the twentieth century, a brickyard was established in the 2800 block of New York Avenue by the United Brick Corporation as well as a pottery works named Ernest Brothers Pottery on M Street, NE (Figure 3-2–Figure 3-4). The pottery works closed in the late 1940s (Shellenhamer et al. 2020). Between 1927 and 1931, the United Brick Corporation was expanded to include nine large, down-drafted beehive kilns. The brickyard closed in 1972, and the property was incorporated into the USNA complex. The United Brick Corporation Brick Complex was listed in the NRHP in 1978 (Jacobson 1976).

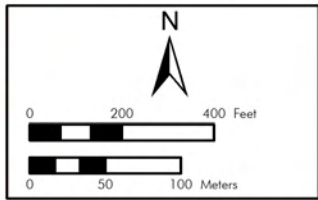
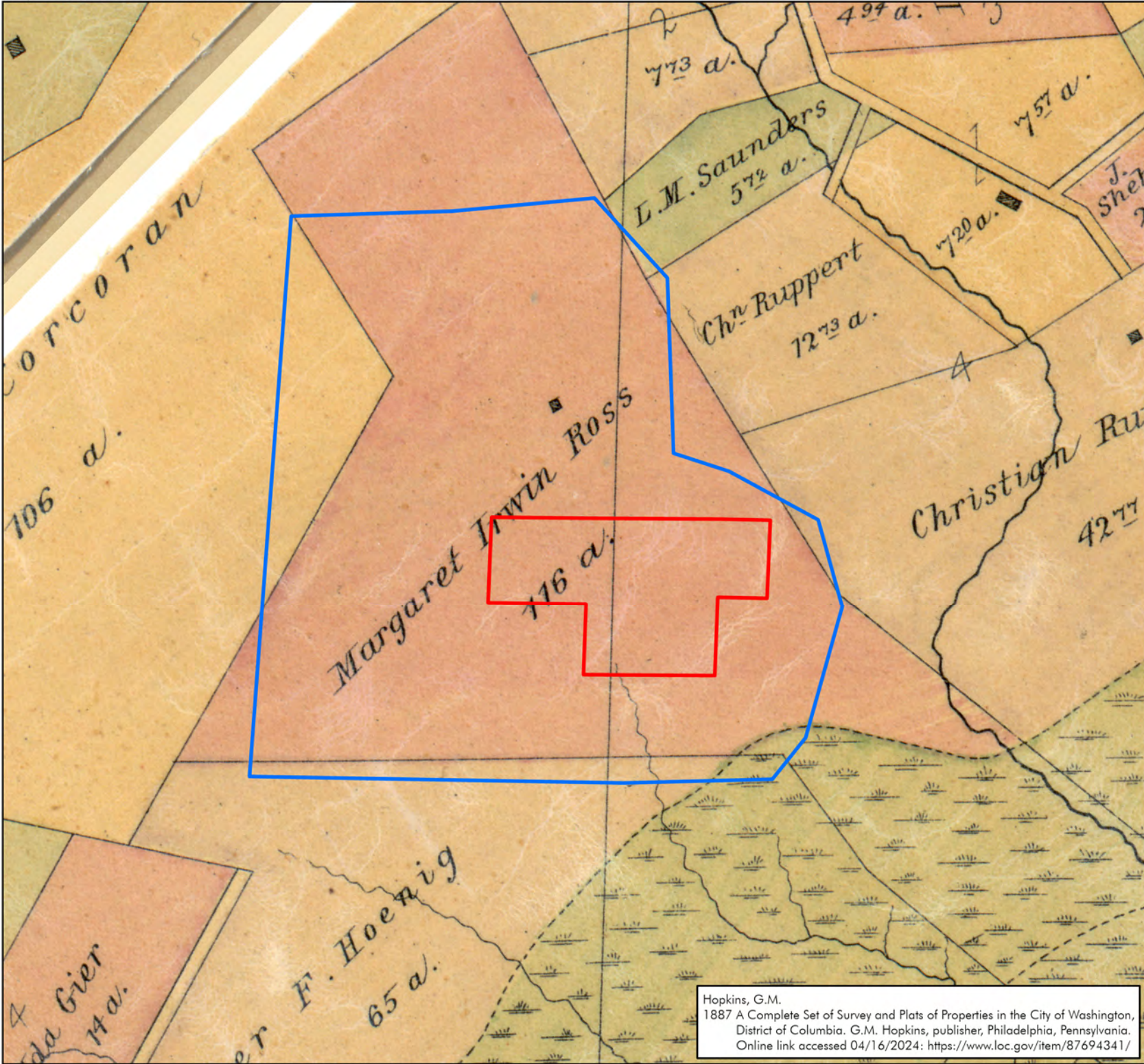
From about 1909 to 1970 a pet cemetery was located in the southern, heavily vegetated part of what is now the USNA, east of the M Street gate. The cemetery was associated with area veterinarian, Dr. David Eastburn Buckingham (b. 1870), who would go on to work as the White House veterinarian in 1914. The cemetery associated with Dr. Buckingham appears to have been in disrepair by 1914, but it seems likely that area residents intermittently kept up the tradition, as headstones were also found from the 1970s and one as late as 1982 (Pet Cemetery Stories 2020).

Proposals for the establishment of an arboretum in the Washington, D.C. area date back to the McMillan Commission of 1901. The present Mount Hamilton site was chosen by the U.S. Commission of Fine Arts, the 1901 Commission’s successor, a group which included noted landscape architect Frederick Law Olmsted, Jr. Mount Hamilton was a natural landmark in the area, a high point above the natural bowl where L’Enfant chose to lay out the capital city (Gerson 1972). Mount Hamilton still provides incredible views of the Capitol Building and downtown D.C. today. The USNA was established by Congress in 1927, and originally included 189.00 ac (76.48 ha). Additions in 1934, 1938, 1948, and 1949 brought the total size to 412.00 ac (166.73 ha). A preliminary plan for the design of the USNA was completed in 1930, but this plan was never implemented. Some site construction was performed by the Civilian Conservation Corps (CCC) in the 1930s, but little development occurred before a master plan was created by the Public Buildings Administration in 1947–1948 (Gerson 1972) (see Figure 3-4 for the CCC camp location). The CCC camp at the USNA, known as NA-1-DC or

Camp Mount Hamilton, was notably the first CCC camp in the Washington, D.C. area for African American enrollees (Davidson and Jacobs n.d.:14–15). Construction of the road system within the USNA was begun about 1949 and completed in 1958 (Gerson 1972). The Arboretum was first opened to the public in 1949, but multiple sources indicate that access was limited to the Spring months or by appointment, and to a 60-acre area until 1959. Most of the buildings and landscape features that characterize the property today were planned and built in the 20-year period from 1947 to 1967. The USNA was designated a D.C. Landmark in 1968 and listed in the NRHP in 1973 (Albee 2019).

About a decade after the USNA was authorized by Congress, a golf course for African Americans was planned by the U.S. Commission of Fine Arts as a component of the “Anacostia Water Park” to balance community development in the northeast quadrant of the city with that of the northwest. As at the USNA, some work on the golf course was undertaken by the CCC (Cole 1989:15–16). Langston Golf Course is a federally owned public facility located to the south and east of the USNA and covering approximately 145.00 ac (58.68 ha) along the Anacostia River. It is owned and operated by the National Park Service and opened in June 1939 as a nine-hole course. By 1955, eighteen holes were completed. The Langston Golf Course Historic District was listed in the NRHP in 1991, significant for its association with the desegregation of public golfing in the D.C. area and the growth in popularity of the sport for African Americans in the early-to-mid-twentieth century (Cole 1989:2–4).

At the same time, the decade of the 1930s proved a difficult time for African American Washingtonians seeking comfortable housing. They were mostly prohibited from new suburban housing developments due to racial restrictions, and many of the city’s older white neighborhoods were not an option because of racial covenants found in deeds. Kingman Park, a neighborhood in Northeast Washington, D.C., located to the south of the USNA near Langston Golf Course, was newly built and marketed specifically to middle-class African Americans looking to purchase homes (Williams 2018). The Kingman Park Historic District was listed in the NRHP in 2018. Housing along M Street, NE developed beginning in the mid-1920s with narrow, mostly brick-clad rowhouses along the western edge closer to 17th Street, NE, and continued through the 1940s on the eastern side of M Street, NE, closer to the USNA property boundary (HistoryQuest DC 2022). Today, the USNA is still surrounded by mostly residential neighborhoods (and Langston Golf Course) on the south, east, and west, with more commercial development along New York Avenue, NE and Bladensburg Road, NE.



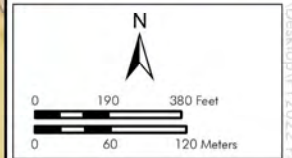
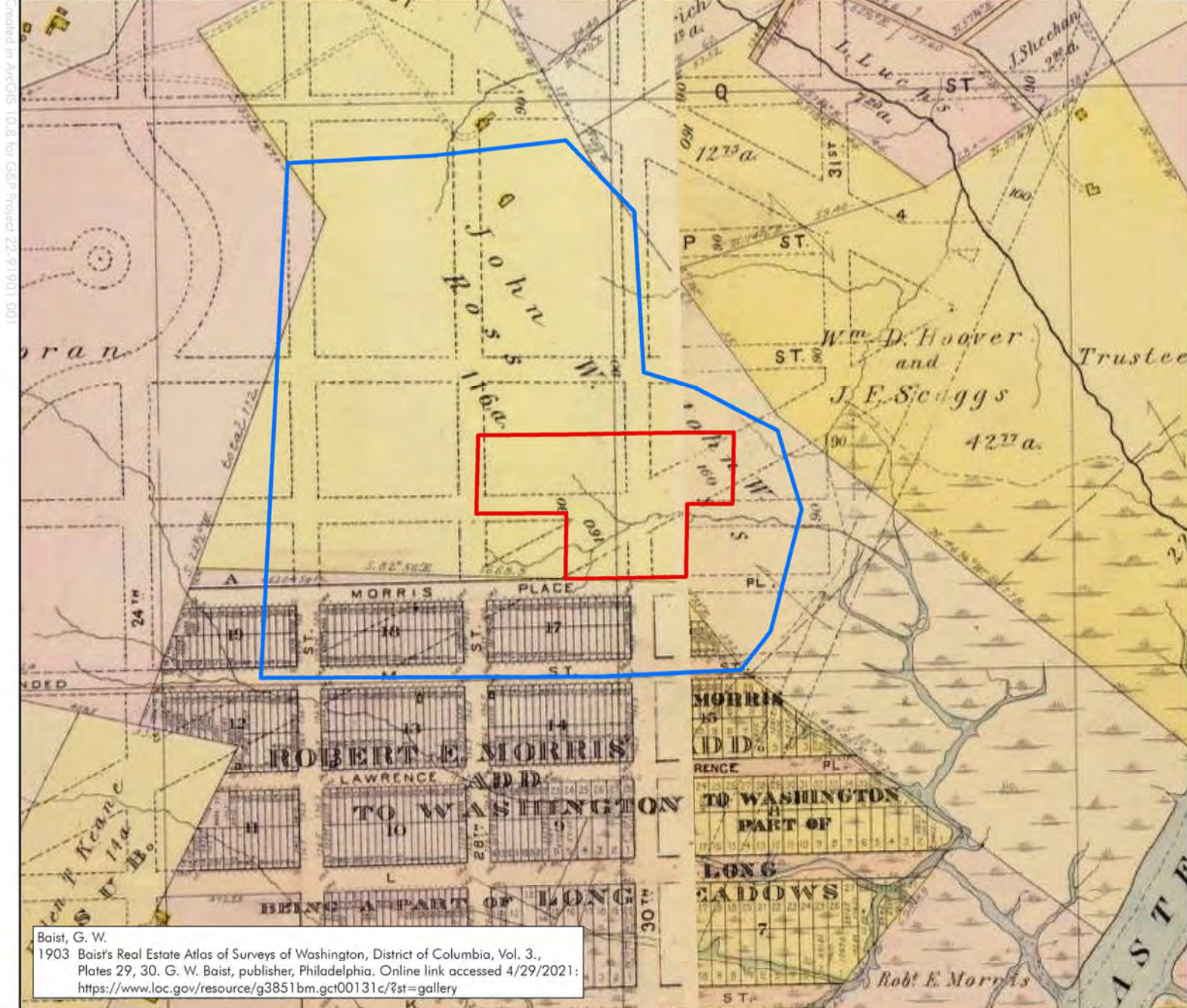
LEGEND

- Limit of Disturbance
- Area of Potential Effects



Hopkins, G.M.
 1887 A Complete Set of Survey and Plats of Properties in the City of Washington,
 District of Columbia. G.M. Hopkins, publisher, Philadelphia, Pennsylvania.
 Online link accessed 04/16/2024: <https://www.loc.gov/item/87694341/>

Figure 3-1
 Project APE and LOD
 shown on A Complete Set of
 Surveys and Plats of
 Properties in the City of
 Washington, District of
 Columbia (Hopkins 1887;
 Esri 2024a, 2024b).





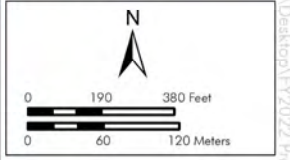
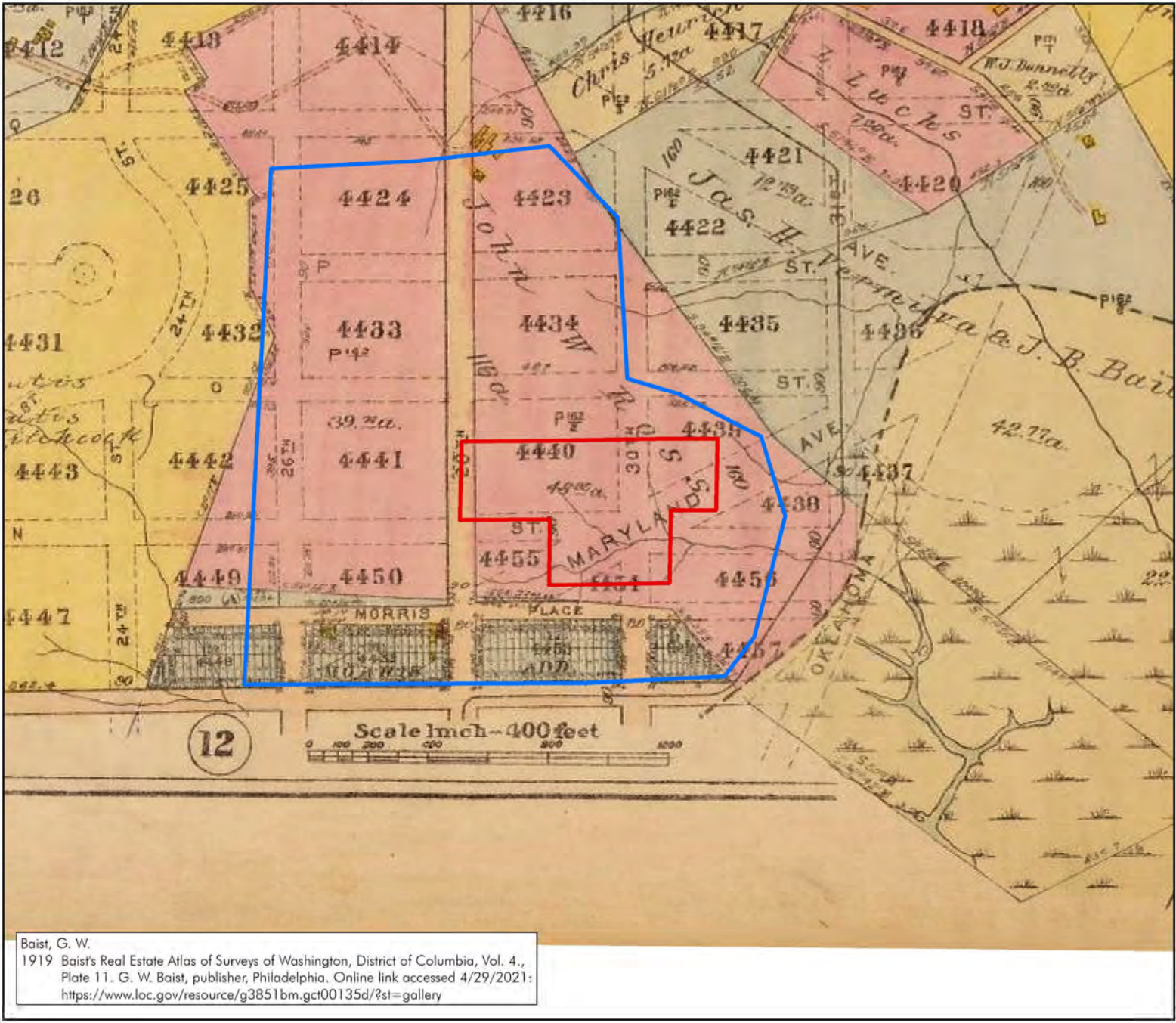
LEGEND

-  Limit of Disturbance
-  Area of Potential Effect



Baist, G. W.
 1903 Baist's Real Estate Atlas of Surveys of Washington, District of Columbia, Vol. 3.,
 Plates 29, 30. G. W. Baist, publisher, Philadelphia. Online link accessed 4/29/2021:
<https://www.loc.gov/resource/g3851bm.gct00131c/?st=gallery>

Figure 3-2
 Project APE and LOD
 shown on Baist's Real
 Estate Atlas of Surveys
 of Washington, District
 of Columbia, Vol. 3
 (Baist 1903:Plates 29,
 30; Esri 2024a,
 2024b).





LEGEND

-  Limit of Disturbance
-  Area of Potential Effect

Baist, G. W.
 1919 Baist's Real Estate Atlas of Surveys of Washington, District of Columbia, Vol. 4., Plate 11. G. W. Baist, publisher, Philadelphia. Online link accessed 4/29/2021: <https://www.loc.gov/resource/g3851bm.gct00135d/?st=gallery>

Figure 3-3
 Location of the project shown on Baist's Real Estate Atlas of Surveys of Washington, District of Columbia, Vol. 4 (Baist 1919:Plate 11; Esri 2024a, 2024b). Yellow box showing the approximate location of Ernest Brothers Pottery.

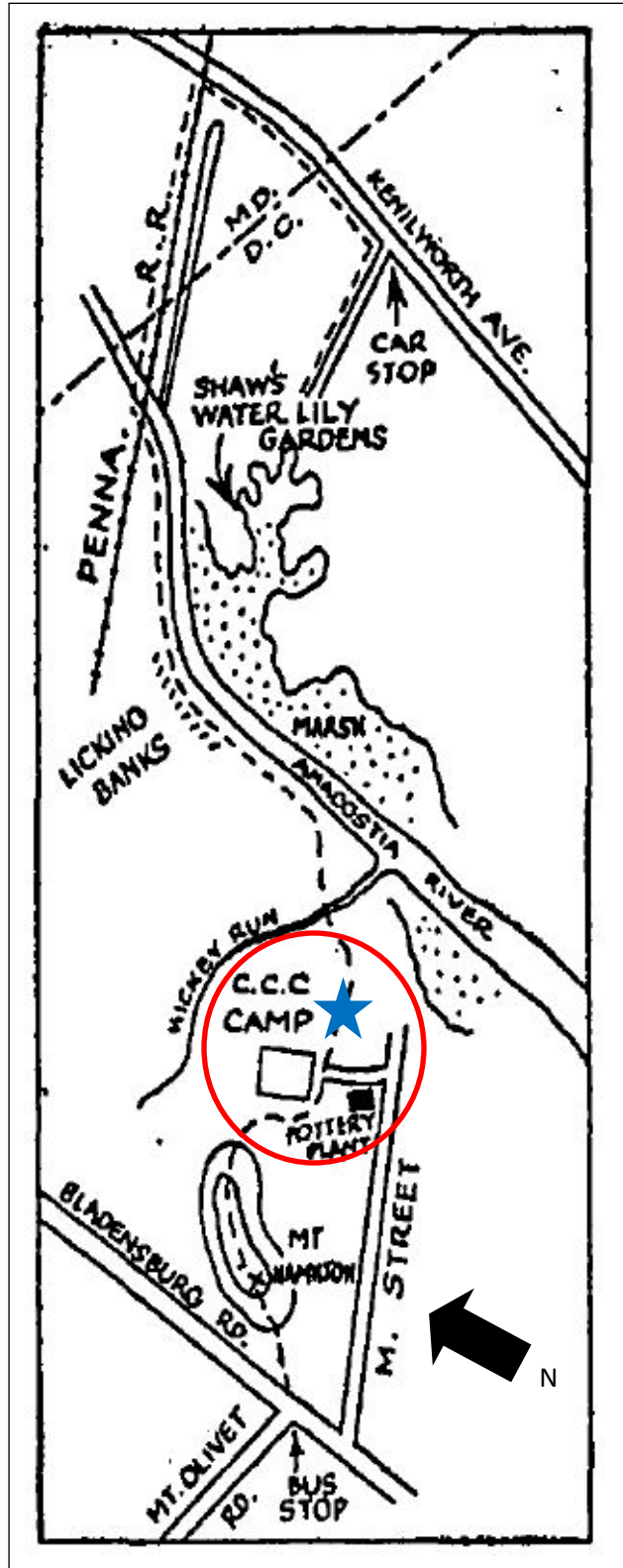


Figure 3-4. Map from June 28, 1935, *Washington Post* article that mentions the CCC Camp and “an old pottery plant and clay pits” at 28th and M Streets, NE (circled in red, Shosteck 1935:30). Note that north is to the left. Approximate location of the LOD marked with a blue star.

4.0 FIELD METHODOLOGY

The following section provides field and laboratory methods that Gray & Pape used for the cultural resource survey in association with the Canopy Trail Project. All archaeological investigations were conducted in compliance with the District of Columbia Historic Preservation Office (D.C. HPO) Guidelines for Archaeological Investigations in the District of Columbia, issued in 1998. In addition, the archaeological fieldwork was conducted in accordance with an approved work plan (González 2022).

4.1 Phase Ia Cultural Resource Review

The Phase Ia portion of this work included a detailed review of previous archaeological work in the region. Site file records associated with the USNA property and within a 0.25-mi (0.4 km) buffer of the Canopy Trail Project were provided by D.C. HPO. This work also included an examination of historical aerial photography to assess the potential for historical archaeological sites and historic built resources within the LOD. Other documents reviewed included historical maps and atlases dating to the late nineteenth through mid-twentieth centuries, illustrated in Section 3.3 of this document; the NRHP Information System (NRIS); as well as insurance records and maps, including Sanborn/Baist Company maps, soils survey mapping, and taxation maps (D.C. HPO 1998, as amended). Gray & Pape also consulted the plethora of data obtained from their previous survey associated with the Perimeter Fence project (Trader and Cole 2021).

A desktop archaeological assessment was also conducted over the entirety of the LOD to examine areas defined by the previously conducted cut-and-fill analysis and to determine the placement of shovel tests conducted by Gray & Pape as a result of the 2019 study of the property (Trader and Cole 2021). No fieldwork was conducted as part of the Phase Ia component of the project.

4.2 Phase Ib Archaeological Field Methods

A combination of pedestrian survey and subsurface testing was conducted to assess the LOD for the Canopy Trail Project. This work was conducted by professionals that meet or exceed SOI standards for archeology. Specifics on the survey methodology are provided below.

4.2.1 Pedestrian Survey

Prior to the excavation of the STPs, two Gray & Pape archaeologists walked the LOD to look for artifact concentrations or aboveground features. This was done by walking transects at 50-ft (15.2-m) intervals. During this phase of work photographs were taken to fully document the LOD.

4.2.2 Shovel Testing

Per the approved work plan (González 2022), a total of 7.7 ac (3.1 ha) was proposed for shovel testing within the LOD with the potential for 120 STPs being recommended for excavation. STPs measured 15.8 in (40 cm) in diameter and were excavated in natural and/or cultural strata to a depth of 3.28 ft (1.0 m), if possible (Figure 4-1). Initially, STPs were excavated at 50-ft (15.2-m) intervals, however, due to the level of disturbance in the northern portion of the LOD, the interval was increased to 100-ft (30.4-m) intervals. This change in methodology was approved by the D.C. HPO in an email dated June 22, 2022.



Figure 4-1. Archaeological shovel testing north of Youth Garden, facing east.

All excavated soils were screened through a 0.25-in (0.64-cm) wire mesh screen to ensure complete artifact recovery. Measured drawings were made of all shovel tests and soils were described following standard USDA terminology as discussed in the Soil Survey Manual (Soil Survey Division Staff 1993). Descriptions included soil horizon, Munsell color, texture, mottling, soil structure, ped coatings, sedimentary structure, boundary type, and inclusions, such as organic material or artifacts.

Descriptions were by master horizon, with suitable subdivisions. Shovel test locations were recorded using a submeter global positioning system (GPS) unit consisting of ESRI's ArcGIS Collector app on an iPad with a GPS receiver.

4.2.3 Artifact Collection Strategy

No cultural materials were collected as a result of this survey. However, all associated records and documents associated with this project will be curated at the D.C. HPO on behalf of the USDA as a temporary loan. The D.C. HPO will also retain a copy of all associated records for their files.

4.3 Built Environment Field Methods

Built environment fieldwork was conducted by a Secretary of Interior (SOI)-qualified architectural historian within the LOD, the APE, and the surrounding area to the south and east (M Street, NE and Langston Golf Course) for additional viewshed analysis. Geo-referenced photos were taken using ESRI's ArcGIS Field Maps collection application on an iPhone. Notes from the field were taken along with the photos documenting the current conditions in the LOD and the topography changes throughout the APE. A viewshed analysis was performed within the APE, looking towards and from the LOD, and from the neighboring properties (along M Street, NE and the Langston Golf Course) back towards the APE. Gray & Pape did not evaluate the contributing status of historic built resources in the APE, but readily observable built and landscape features within the APE were considered.

5.0 RESULTS OF ARCHAEOLOGICAL SITE FILE AND LITERATURE REVIEW

The following section provides methods and results of the site file and literature review, as well as the methods and results of the cut-and-fill analysis. Finally, this section provides a discussion of the archaeological, geoarchaeological, and geomorphological potential of the Canopy Trail Project.

5.1 Results of Site File and Literature Review

The site file and literature search were facilitated by staff at the D.C. HPO, particularly Dr. Ruth Troccoli, District Archaeologist, and Christine Ames, Assistant District Archaeologist, who provided archaeological site forms for sites recorded within and near the USNA. D.C. HPO also provided archaeological technical reports for previous work conducted within and near the USNA.

5.1.1 Previously Recorded Archaeological Surveys

Thirteen archaeological investigations have been conducted within 0.25 mi (0.4 km) of the LOD, see Trader and Cole 2022 for a full summary of previous surveys within the USNA property. Investigations conducted nearby include several Phase I surveys (Cheek 1986; Chase et al. 1988; Geidel 1993a, 1993b, 1996; Jackson 2016; Katz et al. 2016; Kreisa et al. 2019; Shellenhamer et al. 2020; Trader and Cole 2022); combined Phase I/II investigations (Cheek et al. 1987); one intensive archival (Baumgardt 1994); and a dissertation (Henley 1993). The following discussion focuses on work conducted within the USNA and work pertinent to the present undertaking.

Table 5-1. Previous Archaeological Investigations within and near the United States National Arboretum.

Survey Name	Project Type	Reference	Report #
National Bonsai Museum	Phase I Survey	Chase et al. 1988	76
Site 51NE026 (Capitol Columns)	Phase I/II Investigation	Cheek et al. 1987	78
Archaeological Resources Study	Preliminary Assessment	Geidel 1993a	79
Proposed Water Main	Phase I Survey	Geidel 1993b	80
National Grove of State Trees	Phase I Survey	Geidel 1996	81
Anacostia Basin Environmental Restoration, Kingman Lake & wetlands	Intensive Archival	Baumgardt 1994	279
NE Washington, D.C. Survey - Henley Dissertation Catholic University, Anthro Dept.	Assessment	Henley 1993	364
East Side Interceptor and Connecting Sewers Rehabilitation	Phase I Survey	Shellenhamer et al. 2020	645
Anacostia and Kenilworth Parks Archaeological Survey Locations (Areas A, B, C, D)	Phase I Intensive	Katz et al. 2016	654
National Capitol Column	Phase I Survey	Cheek 1986	655
Washington Youth Garden Pavilion	Phase I Assessment	Jackson 2016	761
Arboretum Park and Community Center Improvements and Construction	Phase I Intensive	Kreisa et al. 2019	763
USNA Fence Replacement West Fence A Survey Area and USNA Fence Replacement Reconnaissance	Phase I Intensive and Phase I Reconnaissance	Trader and Cole 2022	832

In 1986, John Milner and Associates conducted a Phase I survey at the site of the National Capital Columns, which resulted in the identification of site 51NE026, a nineteenth-to-twentieth-century farmstead. Phase II investigations were recommended to assess the NRHP eligibility of the site (Cheek 1986). Subsequent Phase II investigations conducted by John Milner and Associates found that the site had been significantly disturbed during the twentieth century, lacked archaeological integrity, and recommended that the site was not eligible for listing in the NRHP (Cheek et al. 1987).

In 1988, the Potomac River Archaeology Survey (PRAS) conducted an archaeological survey for the Bonsai Pavilion. Shovel test profiles indicated some level of disturbance from past utility line construction. No archaeological sites were identified (Chase et al. 1988).

In 1992, KCI Technologies, Inc. (KCI) conducted an archaeological resources study of the USNA property (Geidel 1993a). The study consisted of archival research and an examination of D.C. HPO site files. Research identified one previously recorded archaeological site, 51NE012, a late precontact village site located near the Anacostia River. Additionally, 32 potential historical archaeological sites were identified that consisted of residences, farmsteads, commercial/industrial sites, and public facilities (Geidel 1993a). Of the 32 potential sites two had been examined and were disturbed, 12 additional sites were also found to be disturbed, and 18 resources were thought to have intact deposits (Geidel 1993a).

Location 4 was identified on the west side of the USNA property along Bladensburg Road NE. Three structures were illustrated on historical mapping in an area known as Mount Hamilton (Geidel 1993a:II-17). Location 4 was in use during the mid-nineteenth century, but its function was unknown. Geidel (1993a:II-17) suggests Location 4 was destroyed when Bladensburg Road NE was widened.

Location 5 was identified south of Location 4 at the southwest corner of the USNA property along Bladensburg Road NE (Geidel 1993a:II-17). Historical mapping illustrated an L-shaped structure in the late nineteenth and early twentieth centuries. Geidel (1993a:II-19) suggests that the property was used as a residence and for an unknown commercial function; archaeological evidence might be preserved.

Location 8 was identified along New York Avenue NE at the northwest corner of the USNA property. A complex of buildings dated to the mid-nineteenth to mid-twentieth centuries was illustrated on historical mapping (Geidel 1993a:II-24). Geidel (1993a:II-24) suggested that the buildings represented more than a farmstead and might represent initial brick-making operations. Construction and grading for nearby New York Avenue NE resulted in disturbance within the area; however, some archaeological deposits might be preserved (Geidel 1993a:II-24–25).

Location 9 is the site of 51NE038, the United Brick Corporation Brick Complex, New York Avenue, NE Brick Kilns, and was acquired by the USNA in 1976 (Geidel 1993a:II-26). Several standing structures, including kilns, outbuildings, and a factory building, are located at the site. Geidel (1993a:II-26) notes that the original topography of the area has been altered by grading and filling activities to depths of 5 ft (1.52 m). Geidel (1993a:II-26) noted that “[t]his area has a substantial fill layer, and archaeological deposits associated with earlier buildings may be preserved beneath the fill.”

The final location, Location 10, was identified along the north side of the USNA adjacent to New York Avenue NE. Historical mapping illustrated a structure at this location dating from the mid-nineteenth century. Its function is unknown, but Geidel (1993a:II-28) speculated that it might have served as a tenant or servant residence for the Hickey mansion, located nearby. Geidel (1993a:II-28) notes that “[i]t is unlikely that significant archaeological deposits associated with the structure at Location 10 are

preserved.” Based on Geidel’s (1993a) assessment, a potential exists for archaeological deposits at Locations 8 and 9.

In 1993, KCI conducted a Phase I survey for a proposed water main (Geidel 1993b). Shovel tests were excavated at four stream crossings where the water main would be placed (Geidel 1993b:1). Shovel tests identified fill deposits of variable thickness, reaching a maximum depth of 19.6 inches (50 centimeters [cm]). A buried A horizon was identified near Hickey Run below a fill horizon at 10.2 inches (26 cm) (Geidel 1993b:13). Fill material consisted of rocks, coal fragments, glass fragments, aluminum can fragments, and brick fragments (Geidel 1993b:6–19). Significant disturbances from grading and filling occur across the Arboretum landscape. No prehistoric artifacts were recovered, and all historical artifacts were recovered from disturbed contexts. Geidel (1993b:19) concluded that no intact archaeological deposits existed at the stream crossings investigated.

In 1994, the U.S. Army Corps of Engineers (USACE) conducted Phase I and II investigations for the Anacostia River Basin environmental restoration feasibility study at thirteen select locations: two are located within the District of Columbia, two within Prince George’s County, Maryland, and the remaining nine in Montgomery County, Maryland (Baumgardt 1994). Two of the select locations, area A Kingsman Land and area B District of Columbia Fringe Wetlands, are in the southern vicinity of the current LOD including portions of Langston Golf Course and Anacostia Park. Through background research, both areas were determined to be landforms previously disturbed by dredging of riverbed materials, the construction of seawalls, and the placement of large amounts of fill. Areas A and B were eliminated from field investigations, based upon evident modern disturbance (Baumgardt 1994:8–9).

In 1996, KCI conducted a Phase I investigation along the National Grove of Trees Pathway, in which three locations were investigated (Geidel 1996). While the overall project area for KCI’s study extends into the current LOD, no subsurface investigations were conducted in the current LOD as part of KCI’s work. Eight shovel tests were excavated at the three locations. One of the areas was located near a former Civilian Conservation Corps camp, Camp Mount Hamilton, which operated between 1934 and 1940, for Black youths in the Washington, D.C., area (Geidel 1996:1). Shovel test excavations yielded small amounts of modern trash or brick fragments from disturbed deposits. Geidel (1996:11) notes that brick fragments associated with site 51NE038 “...are common throughout the property as a result of erosion and the transport of soils during construction activities” (Geidel 1996:11). No archaeological remains were identified that could be associated with Camp Mount Hamilton, nor were any intact archaeological deposits identified (Geidel 1996:11).

In 2015, 2017, and 2018, Rummel, Klepper & Kahl, LLP (RK&K) conducted a Phase I archaeological survey, geoarchaeological investigations, and monitoring for the East Side Interceptor and Connecting Sewers Rehabilitation Project (Shellenhamer et al. 2020). Proposed work included new manhole/structure locations and sewer relocations (Shellenhamer et al. 2020). Some of the work for this project was conducted near the current undertaking. Twenty-four shovel tests were excavated for six proposed manhole locations and no archaeological resources were identified (Shellenhamer et al. 2020:32). Fill deposits were identified 1.3 to 1.6 ft (0.39 to 0.48 m) below the ground surface (Shellenhamer et al. 2020:34–38). Geoarchaeological investigations identified fill horizons, with no evidence for intact A or B horizons. In areas where no B horizons were found, or truncation occurred, these areas can be attributed to significant amounts of grading (Shellenhamer et al. 2020:41). Up to 2.62 ft (0.8 m) of fill was reported during boring (Shellenhamer et al. 2020:41). Previously identified site 51NE038, and newly documented site 51NE058, were recorded during monitoring activities. In addition, two precontact artifacts—a quartzite biface and an obsidian nodule—were recovered during monitoring near M Street NE. Unfortunately, both artifacts were found in disturbed contexts

(Shellenhamer et al. 2020:64–67). Of significance to the current undertaking was monitoring of manhole MH-1C during the installation of siltation fencing and mechanical excavations during construction of the manhole. Manhole MH-1C was found near New York Avenue NE within the boundaries of site 51NE038 (Shellenhamer et al. 2020:86). During excavation for MH-1C, portions of an exterior foundation wall and interior brick kiln were identified at 6 ft (3.2 m) below the surface. It was interpreted that some of the bricks were used for a flue of the kiln to create a downdraft (Shellenhamer et al. 2020:87).

In 2016, the Louis Berger Group, Inc. (Louis Berger) conducted investigations to collect and assess baseline cultural resource information for the National Park Service to help determine the need for and design of future archeological studies of Anacostia Park (ANAC) and Kenilworth Park and Aquatic Gardens (KEAQ) (Katz et al. 2016). The study included a review of existing archeological reports, a study of artifact collections kept at the Smithsonian, the GIS-based comparison of nineteenth-century maps with contemporary mapping, soil coring, and a limited shovel testing survey in four select areas (A, B, C, D). The compiled site inventory consists of 47 sites: 31 prehistoric sites, 2 historic sites, and 13 sites with both historic and prehistoric components. Field survey relocated previously recorded site 51NE001 in Area C. One new site, 51NE053, was located in Area A and two new sites, 51NE54 and 51NE55, in Area B. No new sites were located in Area D, the only area shovel tested within a quarter mile of the current project. Further study was recommended for multicomponent site 51NE001 and paleo sites 51NE007 and BP17. Relocation surveys were recommended for three sites with rich assemblages: Molly Boat Cove (Site 51NE006), Bennings Racetrack (Site 51NE007), and South of Bennings Bridge (Site 51NE018). Additional surveys were recommended for areas with high archaeological potential including land near South Capitol Street and Howard Road, land north and south of East Capitol Street and Benning Road, and sections of Kenilworth Park. Further study was recommended for Buzzard Point and the James Creek Marine due to development pressure (Katz et al. 2016:109–128).

In 2016, staff from the D.C. HPO conducted a Phase I archaeological assessment for the Washington Youth Garden Pavilion where shovel testing was conducted within their project area to explore for archaeological deposits (Jackson 2016:7). Shovel tests exhibited fill deposits, and none exhibited buried A horizons. Fill ranged between 3 and 12.5 in (7.62 and 31.75 cm) thick. Artifacts recovered from fill included brick and glass fragments, and possible quartzite shatter (Jackson 2016:11–12). No intact archaeological deposits were identified.

In 2019, Stantec Consulting Services, Inc., conducted archaeological investigations for Arboretum Park and Community Center improvements (Kreisa et al. 2019). Fifty-three shovel tests were excavated as part of the project. Ninety-four percent of excavated shovel tests identified fill deposits over Bt horizons, while shovel tests excavated along the edge of the park identified buried A or E-horizon soils between the fill horizons and Bt horizons (Kreisa et al. 2019). Generally, fill deposits ranged between 9.8 and 19.6 in (25 and 50 cm) in thickness; however, some deposits were as thin as 3.9 in (10 cm) (Kreisa et al. 2019:39). Generally, buried soil horizons were less than 3.9 in (10 cm) in thickness (Kreisa et al. 2019:41). Shovel tests found that much of the area had been disturbed and lacked intact soil profiles. Artifacts were recovered from three shovel tests. Three artifacts were found in an intact A horizon, while two artifacts were found in disturbed contexts. Artifacts were recovered from fill deposits or secondary deposits based on stratigraphic evidence and were not considered part of an archaeological site (Kreisa et al. 2019).

In 2021, Gray & Pape conducted a Phase Ia study and Phase Ib archaeological investigation for STV Incorporated on behalf of the USDA for a proposed fence replacement project at the USNA (Trader and

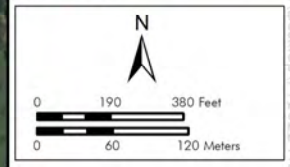
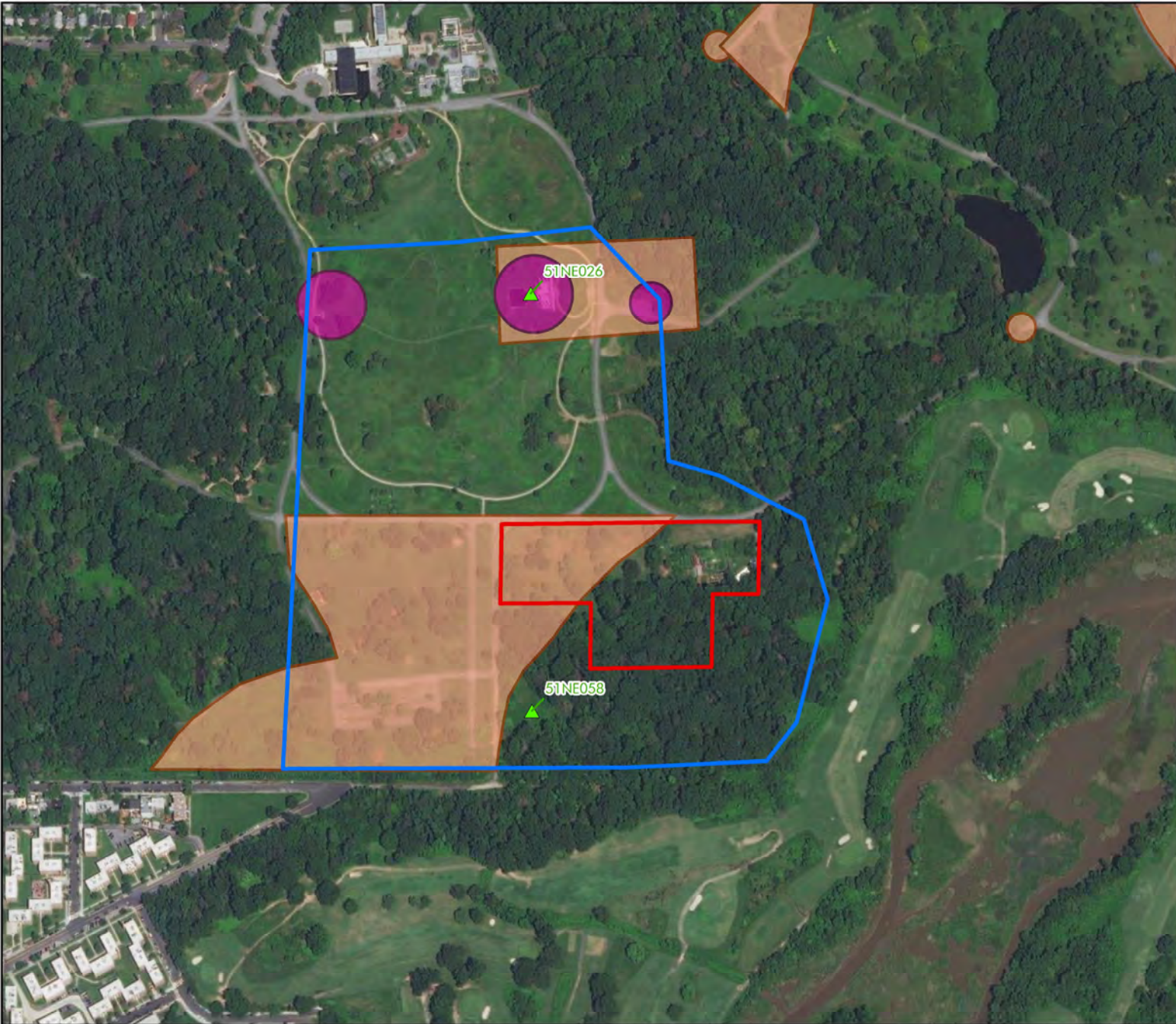
Cole 2022). Fieldwork consisted of a combination of geoarchaeological investigations and systematic shovel testing. Geoarchaeological investigations consisted of hand excavation of 18 bucket augers. Bucket augers were excavated at 328-ft (100-m) intervals to assess the potential for intact landforms and archaeological deposits. Ten bucket augers exhibited intact soil deposits and eight exhibited disturbed soil deposits. While intact soil deposits were identified in bucket augers, no buried soils or archaeological deposits were found. Disturbed augers consisted of modern trash, brick, and asphalt fragments to depths of 29.2 in (75.0 cm) (Trader and Cole 2022:55–69). Placement of shovel tests was based on the results of bucket augers. Twelve survey areas were identified and resulted in the excavation of 29 shovel tests. Twelve shovel tests exhibited areas where the original ground surface was removed and 17 shovel tests exhibited extremely disturbed fill deposits, consisting of mixed soil horizons containing modern trash, and asphalt, concrete, and brick fragments to a depth of 27.5 in (70.0 cm). One precontact piece of debitage manufactured from quartzite was recovered from disturbed contexts in a shovel test and was assigned the designation of Isolated Find 1. Otherwise, no buried soils, intact archaeological deposits, or archaeological sites were identified. Although intact soils were found in certain locations, this alone does not warrant additional investigations. No further archaeological work was recommended for the proposed fence replacement project (Trader and Cole 2022:69–82).

5.1.2 Previously Recorded Archaeological Sites




Two previously recorded archaeological sites are located within 0.25 mi (0.4 km) of the Canopy Trail project LOD (Figure 5-1 ; Table 5-2). These consist of the National Capitol Columns site (51NE026), a historic farmstead occupied through 1934, and two components associated with the Robert Morris Addition and Ernest Brothers Pottery (51NE058). Site 51NE026 was determined to be not eligible while site 51NE058 warrants further study due to the presence of intact cultural features associated with the Ernest Brothers Pottery. The two components associated with this site consist of foundation remains, an artifact scatter primarily composed of stoneware waster fragments as well as remains of an earlier USNA gatehouse, represented by an articulated brick foundation and concrete wall dating from the early 1950s to late 1990s (Shellenhamer et al. 2020). The site dates from the late nineteenth through late twentieth centuries and retains intact structural foundations and features associated with the pottery works (Shellenhamer et al. 2020) (Table 5-2).

Table 5-2. Previously Recorded Archaeological Sites within 0.25 Miles (0.4 Kilometers) of the LOD.

Site #	Site Name	Site Type	Cultural Affiliation	National Register Eligibility
51NE026	National Capitol Columns Site	Farmstead	Nineteenth to Twentieth Century	Not Eligible
51NE058	Robert Morris Addition and Ernest Brothers Pottery Site and potential M Street Gatehouse (Foundation)	Industrial/Residential	Late Nineteenth to Late Twentieth Century (1893–1948; 1951–1992)	Not evaluated; future investigation recommended
51NE058	Robert Morris Addition and Ernest Brothers Pottery Site (Stoneware waster concentration)	Industrial/Residential	Late Nineteenth to Late Twentieth Century (1893–1948; 1951–1992)	Not evaluated; future investigation recommended



LEGEND

-  Archaeological Sites
-  Limit of Disturbance
-  Area of Potential Effect

Previous Archaeological Surveys and Investigations



-  Phase I/II Investigation
-  Phase I Survey

Figure 5-1
Previously identified archaeological sites and previous archaeological work in relation to the USNA Canopy Trail Project, Washington, D.C. (D.C. HPO 2022; Esri 2023, 2024a, 2024b).

GRAY & PAPE
HERITAGE MANAGEMENT

5.1.3 Elevation (Cut-and-fill) Analysis

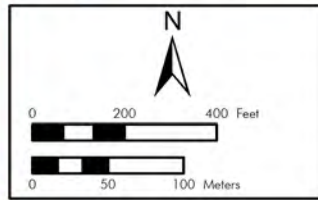
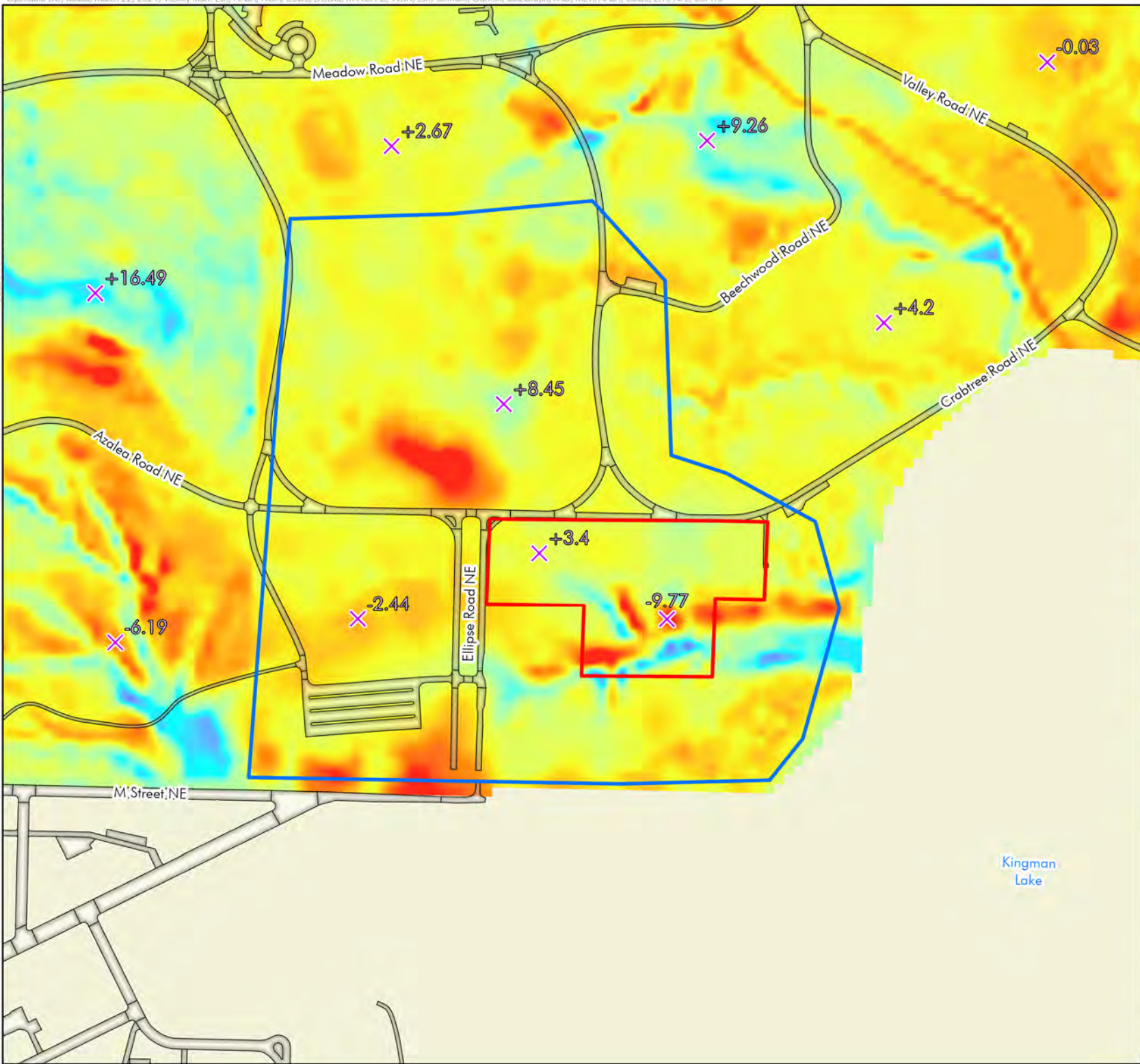
In 2021, Gray & Pape conducted a GIS-based elevation change, or cut-and-fill analysis, using ArcGIS to assess the extent of landscape modification for the entire USNA property. These data were used to assess the potential for subsurface deposits in the current LOD. To create the cut-and-fill analysis, Gray & Pape used the U.S. Coast and Geodetic Survey (USCGS) 1888 Topographic Map of Washington and Vicinity (Sheets 7, 8, 17, and 18) (U.S. National Oceanographic and Atmospheric Administration, Office of Coast Survey [NOAA] 2019). The map was georeferenced to the 2019 base map of Washington D.C., and the 5-ft (1.5-m) contour lines were digitized to create a shapefile. The contour lines file was transformed into a triangulated irregular network (TIN), which was transformed into a raster image. To account for a necessary correction of the vertical elevation datum, 2.2 ft (0.67 m) were subtracted from the historical elevations. The transformation process was then repeated with a shapefile of modern (2019) 2-ft (0.61-m) contour lines obtained from Open Data DC (DC.gov 2020) to create another raster. The ArcMap minus tool was used on the two raster images to calculate the difference between the historical and modern elevations. The resulting final raster image was symbolized with a stretched renderer to distinguish areas with increased elevations from areas with decreased elevations. The results of the elevation analysis suggested that the majority of the LOD remains intact, indicating original ground elevations. These portions of the LOD are denoted in yellow (Figure 5-2). See the following section for the results of testing this model.

5.1.4 Archaeological Site Potential

Synthesizing all the data discussed above, information gathered for the cultural context, as well as additional nearby cultural resource studies, specifically, a 2008 study of Rock Creek Park performed by the Louis Berger Group, Inc. (Fiedel et al. 2008), has highlighted the potential for discovering an archaeological site or sites in the stream valley used as part of the current undertaking. Based on previous work conducted within the USNA, where the majority of precontact artifacts were found in disturbed contexts, there is little potential for precontact archaeological sites along the upper landforms within the majority of the current LOD. However, there remains a potential for intact precontact deposits along the floodplain associated with the unnamed drainage leading to the Anacostia River, similar to the Foundry Branch Floodplain site (51NW173) identified in Rock Creek Park (Fiedel et al. 2008).

A greater potential exists for encountering historical archaeological sites related to early settlement in the region, consisting of farmsteads and residences dating from the late nineteenth through the early twentieth century as well as the potential remains of pre-1960s USNA greenhouses located on the property. While historic mapping shows no obvious historic cultural activity within the LOD, there remains a potential for unmapped ancillary structures associated with the historic occupation of the general vicinity. For example, those associated with the nearby 1909–1970 pet cemetery, which at one time was associated with the area veterinarian, Dr. Buckingham, as well as the Civilian Conservation Corps Camp NA-1-DC and NP-11-DC located in the area in the 1930s and 1940s.

Similarly, a potential exists for encountering industrial sites related to a kiln and kiln flue associated with the Ernest Brothers Pottery operation (51NE058) (Shellenhamer et al. 2020). Other types of potential industrial-type sites within the LOD could include a mill or ice pond and dam along the unnamed drainage leading to the Anacostia River. Civil War sites are possible given the proximity to Fort Lincoln; however, no Civil War-related materials have been identified within the USNA.



LEGEND

- × Spot Elevation (feet)
- Road
- Limit of Disturbance
- Area of Potential Effects
- Cut/Fill (feet)
- +36.89
- Minimal Change: +/- 1.0
- 19.12

Figure 5-2
Cut-and-fill analysis for the Canopy Trail Project APE and LOD (DC.gov 2024; Esri 2024a, 2024b).

6.0 RESULTS OF ARCHAEOLOGICAL SURVEY

Gray & Pape conducted a Phase Ib archaeological survey between June 21 and June 23, 2022. Field investigations consisted of a combination of pedestrian survey and systematic shovel testing throughout the LOD (see Figure 6-11). In total, 66 shovel tests were excavated. No archaeological sites or cultural materials were recovered during this work; however, two historic built features were identified in the Limit of Disturbance, which consists of a brick spring box (Feature 1) and a ceramic drain (Feature 2) both located in the central portion of the Limit of Disturbance. These resources will be discussed in the following section.

6.1 Overview of the Limit of Disturbance

The northern portion of the LOD is situated in a flat open manicured area containing the Youth Garden, two pavilions, a mulched open-air meeting area, and plantings associated with the USNA consisting of trees representing species such as the Kentucky coffeetree, various species of oaks and maples, cottonwoods, buckeyes, Eastern white pines, and hemlocks (Figure 6-1–Figure 6-4).

The southern portion of the LOD is dominated by older growth of deciduous trees with a dense understory of briars, poison oak, and poison ivy in sporadic locations (Figure 6-5). The topography of this portion of the LOD includes an elevated finger ridge with greater than 15% slope leading to the drainage bottom in the central portion of the LOD (Figure 6-6–Figure 6-8). This unnamed drainage ultimately leads to the Anacostia River. A topographic low spot has created a shallow pool of water (Figure 6-9). This area was investigated during the pedestrian survey to ensure no historic features such as ice pond dams or mill features were present. No apparent modification to this area was observed, and if modifications did occur, they would likely have been farther east beyond the limits of the LOD. However, what appears to be an excess of water may simply be the result of water being diverted from the upper portions of the property. A ceramic drain and stabilizing riprap were observed along the south-facing slope, south of the southwest corner of the Youth Garden and labeled as Feature 2 (Figure 6-10).



Figure 6-1. View of LOD along Ellipse Road showing utility markings (red flags), facing south.



Figure 6-2. View behind Youth Garden pavilion, facing west.



Figure 6-3. View of Youth Garden, facing north.



Figure 6-4. View of north-central portion of LOD, facing east.

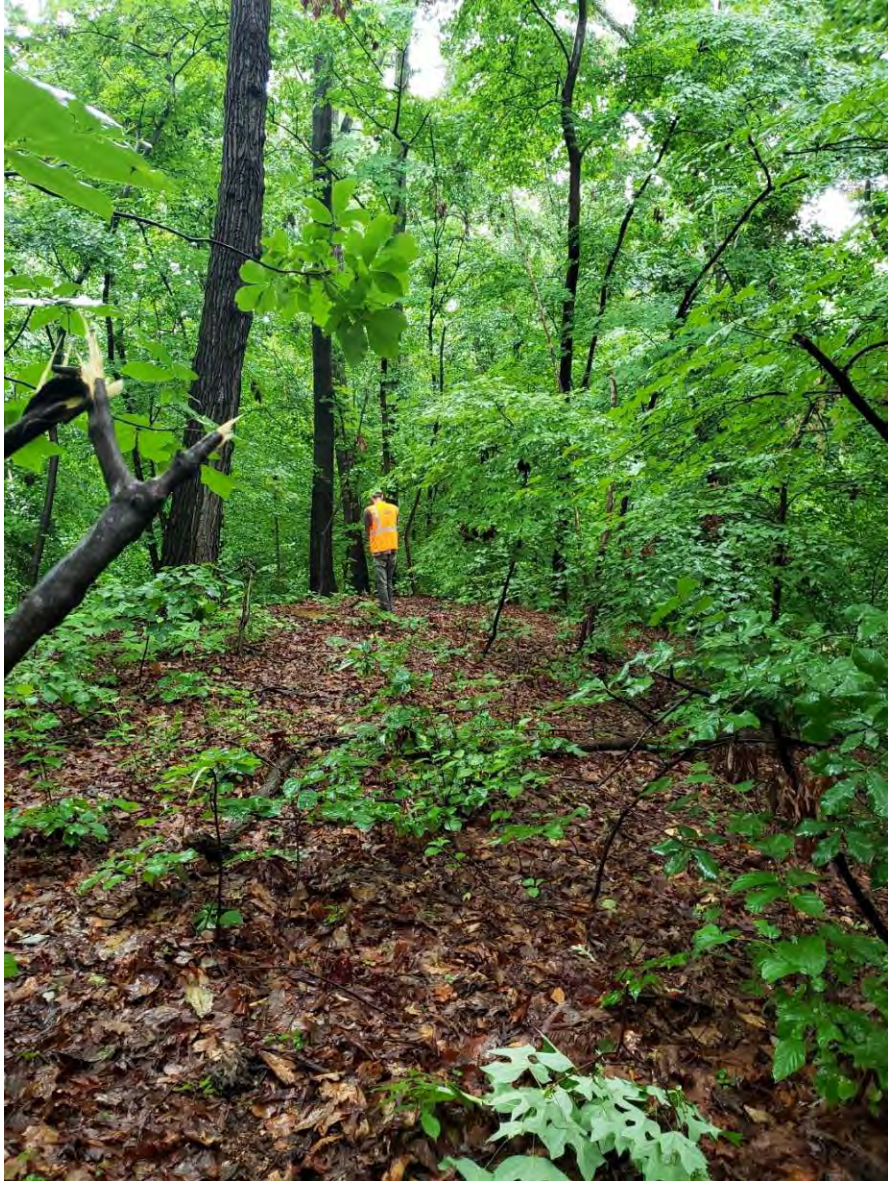


Figure 6-5. View of southern portion of LOD showing finger ridge, facing north.

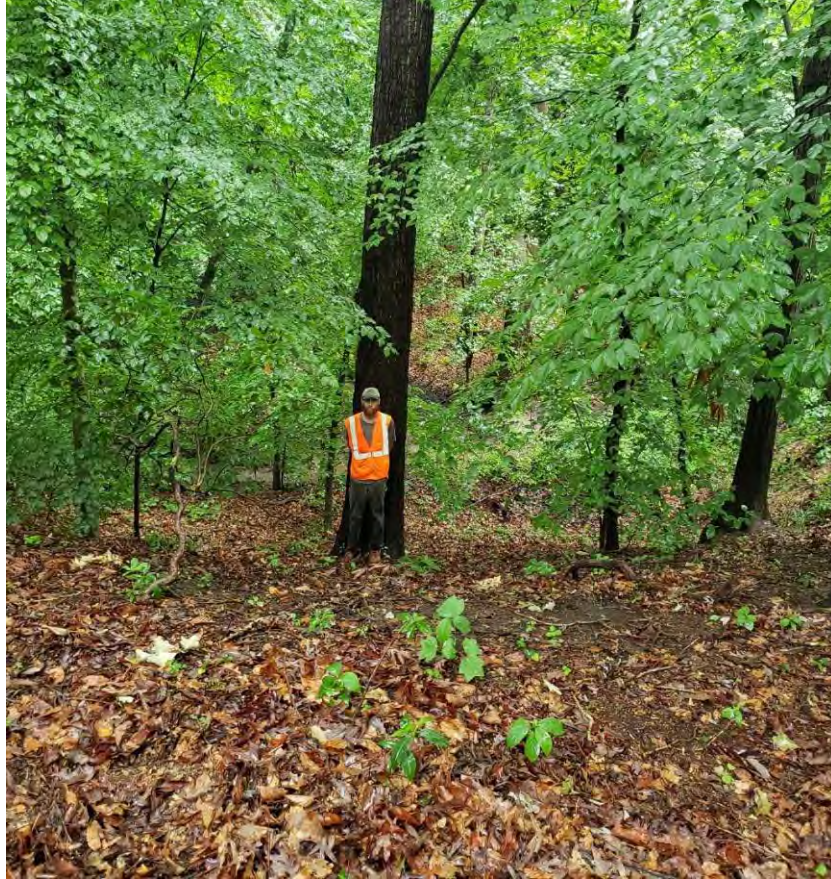


Figure 6-6. View of slope with archaeologist Jordan Scott for scale, facing north.



Figure 6-7. View of slope on east side of finger ridge, facing north.



Figure 6-8. View of drainage in LOD, facing northeast.



Figure 6-9. View of water retention area along eastern edge of LOD, facing northeast.



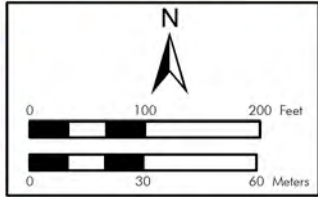
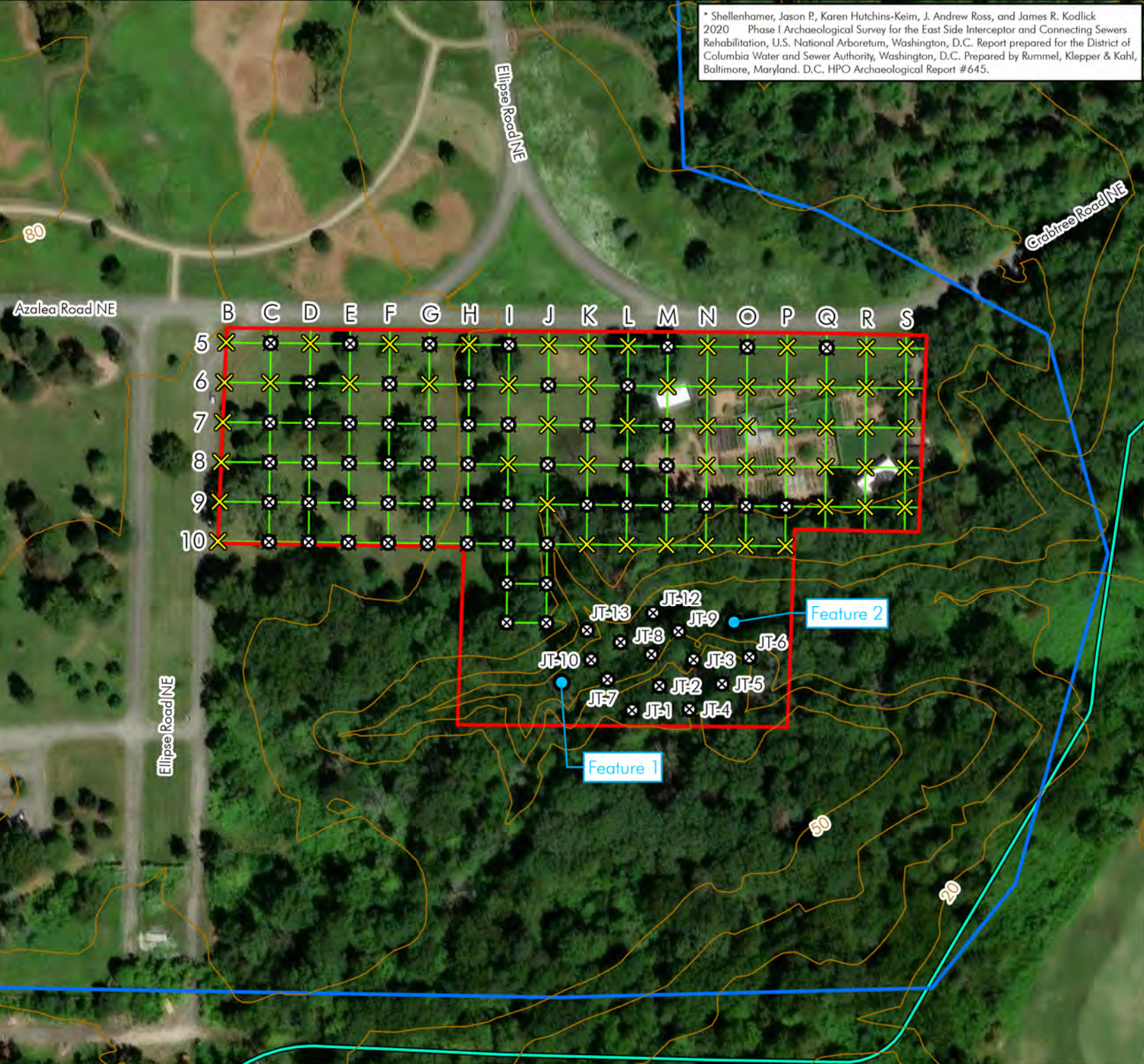
Figure 6-10. View of ceramic drain and riprap (Feature 2) along southern slope below Youth Garden, facing north.

6.2 STP Results

A total of 66 STPs was excavated across the LOD for the Canopy Trail Project, with 36 additional STP locations not excavated due to buried utility lines, location within a USNA planting zone, extant buildings, a gravel access road, and the Youth Garden (Figure 6-11). An additional 19 STPs were not excavated due to an STP interval increase to avoid the excavation of highly disturbed soils (see Section 4.1.1). Utility lines within the LOD were located along Ellipse Road, NE as well as north of the Youth Garden. STPs not excavated due to marked utility lines include STPs B5-B10 along Ellipse Road, NE as well as STPs Q6-S6 near the Youth Garden (Figure 6-1).

STPs within the northern portion of the LOD varied greatly, showing numerous profiles exhibiting disturbance throughout the area. For instance, STP C-7 displayed a brown (10YR 3/3) silt loam A horizon measuring 2.7 in (7 cm) thick situated over a fill layer with concrete extending to a maximum depth of 6.2 in (16 cm) (Figure 6-12). F-8 displayed a brown (10YR 4/3) silt loam A horizon measuring 6.2 in (16 cm) thick that was positioned over a brown (10YR 4/3) mottled with strong brown (7.5YR 5/8) silty clay fill layer over a second fill layer of strong brown (7.5YR 5/6) sandy clay mottled with yellowish red (2.5YR 5/6) sandy clay. This sealed a strong brown (7.5YR 5/6) sandy clay B horizon subsoil. Excavation of this STP ceased at 20.8 in (53 cm) below ground surface (bgs) (Figure 6-13 and Figure 6-14).

* Shellenhamer, Jason P, Karen Hutchins-Keim, J. Andrew Ross, and James R. Kodlick
 2020 Phase I Archaeological Survey for the East Side Interceptor and Connecting Sewers
 Rehabilitation, U.S. National Arboretum, Washington, D.C. Report prepared for the District of
 Columbia Water and Sewer Authority, Washington, D.C. Prepared by Rummel, Klepper & Kahl,
 Baltimore, Maryland. D.C. HPO Archaeological Report #645.



LEGEND

- Shovel Test Pit Result
- ⊗ Negative
- ✕ Non-Excavated
- Feature
- ~ 10-foot Contour
- Existing Sewer Line*
- Grid Lines
- ▭ Limit of Disturbance
- ▭ Area of Potential Effects

Figure 6-11
 Results of archaeological survey in LOD for the
 Canopy Trail project,
 Washington, D.C. (Esri
 2023, 2024a, 2024b).

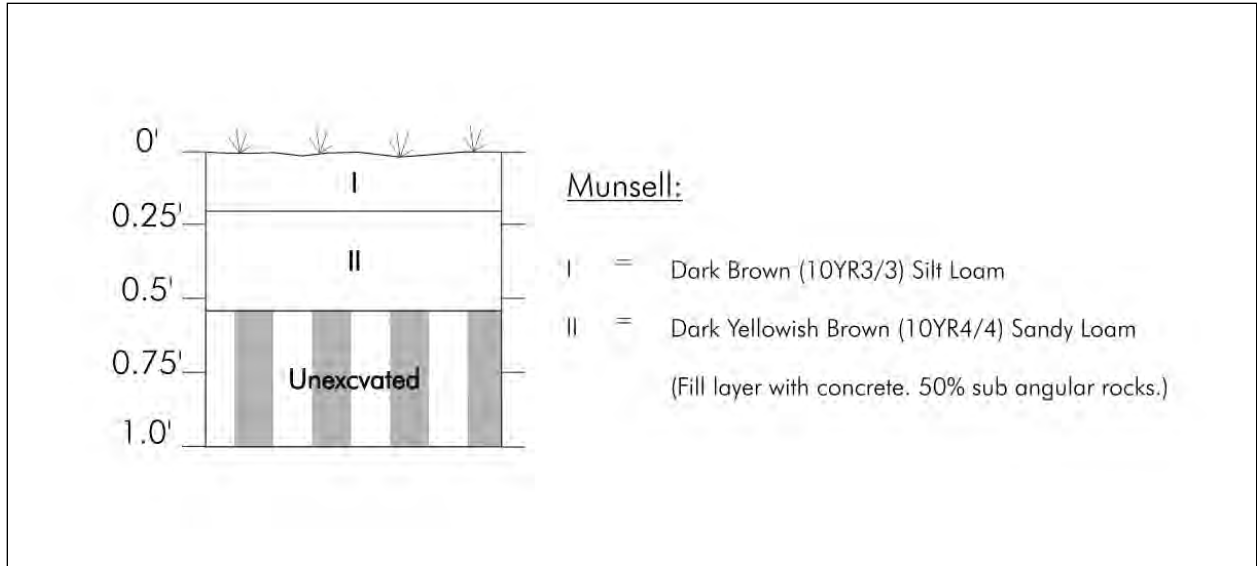


Figure 6-12. STP C-7 located in the northern portion of the LOD.

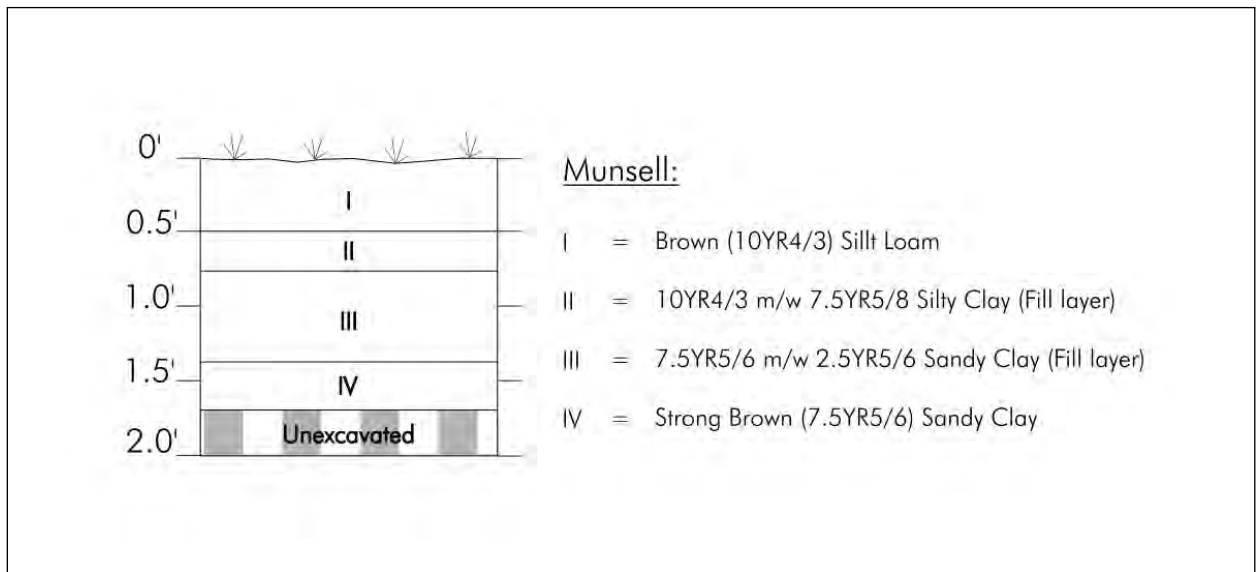


Figure 6-13. STP F-8 located in the northern portion of LOD.



Figure 6-14. Profile of STP F-8 showing fill soils over sterile B horizon.

STP G-10 not only displayed several layers of fill soils, but also a potential redeposit of materials from nearby industrial activities such as the Ernest Brothers Pottery (Figure 6-15 and Figure 6-16). Soils within this STP consisted of an A horizon of a brown (10YR 4/3) silt loam extending to 4.3 in (11 cm) bgs. Beneath the A horizon was a strong brown (7.5YR 5/8) silty clay mottled with a reddish brown (2/5YR 4/5) sand fill layer ceasing at 9.8 in (25 cm) bgs. This layer sealed a 5 in (13 cm) black (10YR 2/1) sandy loam with approximately 10 percent cinders. Beneath this dark cinder layer was another black (10YR 2/1) sand with approximately 40 percent slag. This fill deposit sat atop a brown (10YR 4/4) sandy clay which sealed a strong brown (7.5YR 5/8) sandy clay B horizon (subsoil) exposed at 27.5 in (70 cm) bgs.

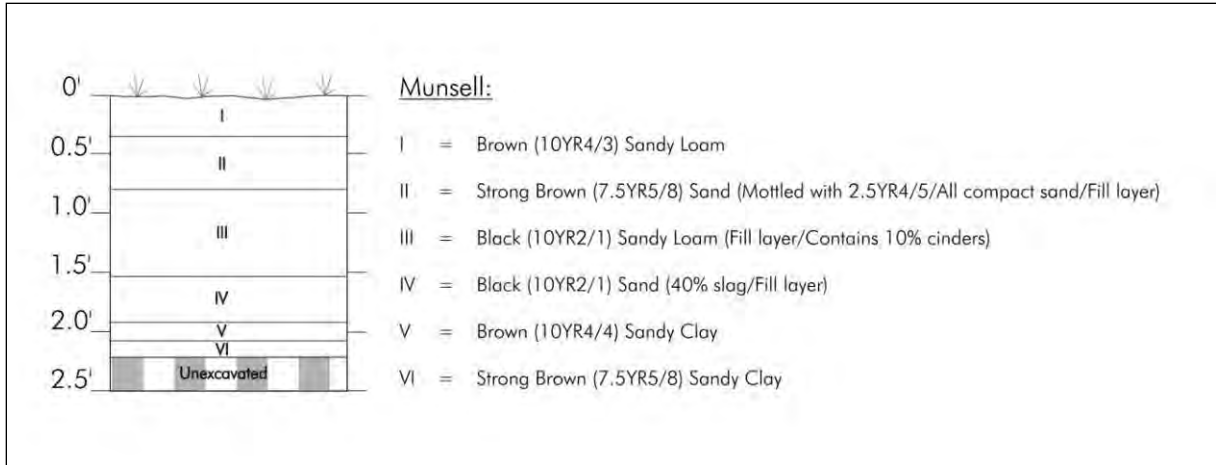


Figure 6-15. STP G-10 in northern portion of LOD.



Figure 6-16. Profile of STP G-10 showing fill soils over sterile B horizon.

Soils in the southern portion of the LOD revealed a much lower level of disturbance; however, the A horizons were extremely deflated (Figure 6-17 and Figure 6-18). A typical profile in this location consisted of a brown (10YR 4/3) silt loam A horizon extending to a depth of 5 in (13 cm) bgs. This overlaid a poorly formed E horizon of light brownish gray (10YR 6/2) compacted sand which overlaid a strong brown sandy (7.5YR 5/8) clay B horizon (subsoil) at 7 in (18cm) bgs. Excavation of this STP ceased at 15.3 in (39 cm) bgs.

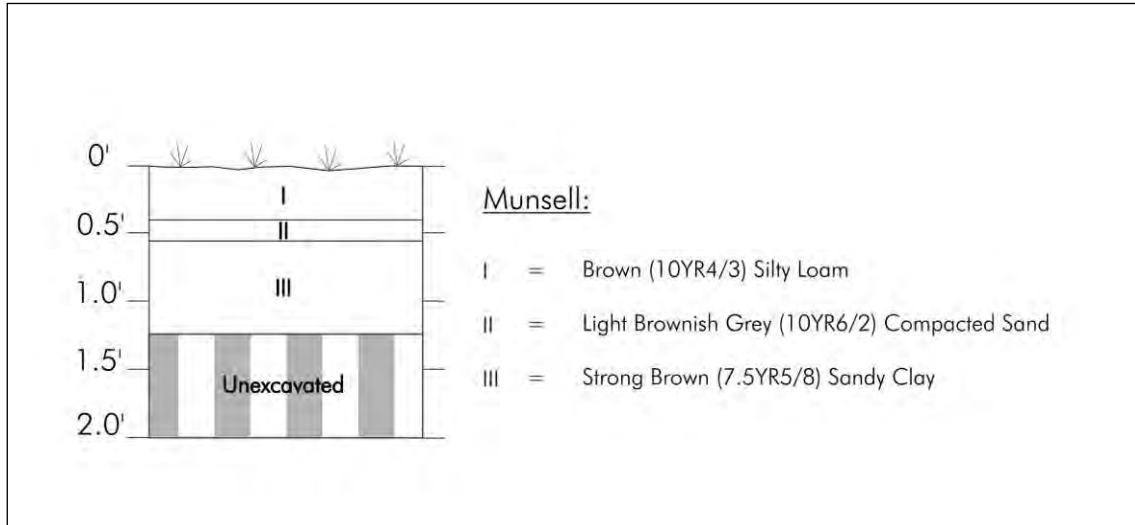


Figure 6-17. STP JT-3 located in southern portion of LOD.



Figure 6-18. Profile of STP JT-3, showing deflated soils.

A total of seven STPs were excavated in the central portion of the LOD along the edges of the drainage leading to the Anacostia River to determine if buried precontact sites were present. Two of these STPs, JT-7 and JT-8, extended to a depth of 36.2 in (92 cm) bgs and displayed a series of gley soils, typically found along drainages and inundated areas (Figure 6-19 and Figure 6-20).

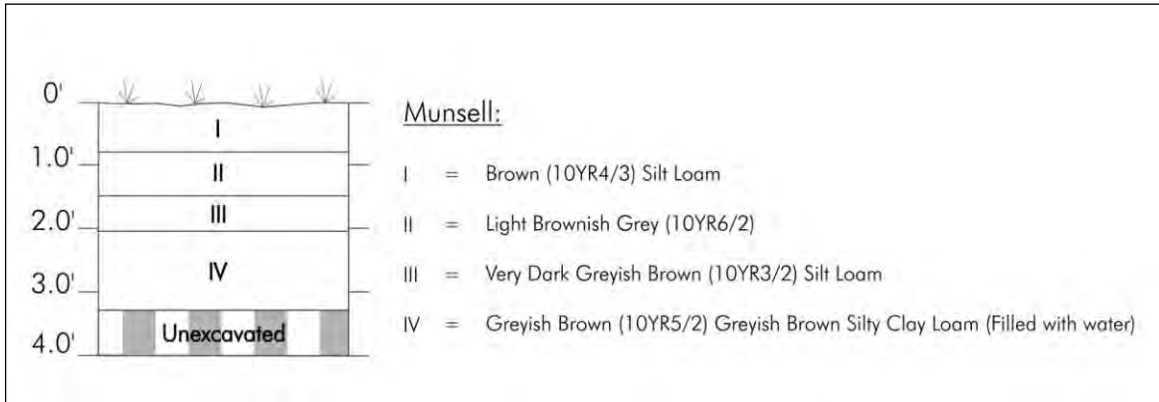


Figure 6-19. STP JT-7 located along southern edge of drainage in central portion of LOD.



Figure 6-20. Profile of STP JT-7, showing various layers of gley.

The Phase I archaeological survey resulted in the excavation of 66 STPs with no cultural material being recovered. Soils throughout the LOD varied and displayed a variety of disturbance, entirely in the northern portion of the LOD. This information suggests an inaccuracy in the cut-and-fill analysis as that model showed the soils were relatively intact.

6.3 Effects

No artifacts or archaeological sites were identified during the subsurface investigations conducted by Gray & Pape. As a result, Gray & Pape recommends that the proposed Canopy Trail Project will not affect any NRHP-eligible archaeological sites as no archaeological sites were identified. No further archaeological work is recommended for the proposed Canopy Trail project.

7.0 RESULTS OF BUILT ENVIRONMENT SURVEY

7.1 Overview of the APE

The APE consists of the maximum possible LOD as indicated by the Tree-Mendous design team in consultation with FONIA and USNA, and an additional buffer area on the north, west, south, and east as follows: 1,000 ft (304.8 m) from the northern boundary of the LOD to the north, over mostly open land, towards Meadow Road, NE, between Eagle Nest Road, NE, and Ellipse Road, NE; 700 ft (213.36 m) to the west of Ellipse Road, NE, towards Eagle Nest Road, NE; 400 ft (121.92 m) to the south of the southern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD; and between 200 ft (60.96 m) and 400 ft (121.92 m) to the east of the eastern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD (Figure 7-1).

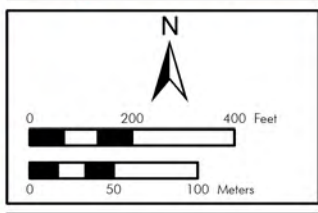
7.2 Resources Within the APE

There is only one previously identified historic built property located within the APE: the USNA, itself, which is listed in the NRHP and is a D.C. Landmark. Built and landscape features of the USNA observed within the APE include: the road system, a ceramic drain (Feature 2), the M Street Gate, the Comfort Station #1, the Washington Youth Garden, the iron fence and masonry wall near the M Street Gate, the Capitol columns, the Fern Valley Plant Collection, and the National Grove of State Trees. Two other resources in the APE that may predate the USNA, but are located within its current boundaries, are a pet cemetery (located in the APE, but not the LOD) and a spring box (Feature 1). Feature numbers were only assigned to features located within the LOD.

Construction of the road system within the USNA was begun about 1949 and completed in 1958 (Gerson 1972). The road system has likely been repaired and repaved over the years. Currently, the road system consists of a paved asphalt surface that loops around and through the Arboretum with parking lots at designated intervals (Figure 7-2). Some roads are one-way for vehicular traffic. Bicyclists and pedestrians also use the roads for movement through the USNA (although there are also concrete sidewalks and woodchipped trails for pedestrians). As previously mentioned in the archaeological results section, a ceramic drain and stabilizing riprap were observed along the south-facing slope of the LOD, south of the southwest corner of the Washington Youth Garden. The drain is likely part of the overall stormwater management system of the USNA.

The M Street Gate is located southwest of the LOD, within the APE, near the junction of Maryland Avenue, NE and M Street, NE (Figure 7-3). Although no longer functional, the M Street Gate was originally intended to serve as the primary public entrance to the USNA. Construction of the M Street Gate began around 1960 (Albee 2019). By the time the NRHP nomination was written in 1972, the M Street Gate had already been closed. Today, the poured concrete piers remain with the USDA seal at the top of each and “National Arboretum” across the center portion which has metal grillwork between poured concrete squares. The gate is partially covered in vegetation overgrowth.

The Comfort Station #1 is a one-story, brick-clad building located to the west of the LOD, within the APE, along Eagle Nest Road, NE (Figure 7-4). The building was constructed around 1960 (Nationwide Environmental Title Research, LLC 1957, 1963). The concrete block construction is clad in red brick veneer with horizontal stone accents and vertical wood siding in the gable ends. The side-gabled roof is clad in corrugated metal.



LEGEND

- Photo Point
- Limit of Disturbance
- Area of Potential Effects

Figure 7-1
Map of the APE and LOD showing photo points from the historic built environment survey for the Canopy Trail Project, Washington, D.C. for the figures used in this chapter of the report (Esri 2023, 2024a, 2024b).



Figure 7-2. Looking south along Ellipse Road, NE towards its intersection with Azalea Road, NE.



Figure 7-3. The M Street Gate, looking northwest.



Figure 7-4. Comfort Station #1 located along Eagle Nest Road, NE, looking south.

The Washington Youth Garden, established in 1971, is located just north of the LOD, within the APE (Figure 7-5). Today the youth garden includes a fenced-in garden area, a storage shed, a covered pavilion, and a nature playground. Seasonally, a white tent is also used for shade with picnic tables. None of the built resources in the Washington Youth Garden are more than 50 years of age.

The iron fence and masonry wall near the M Street Gate were added around 1982. Although its fence style matches that of the original USNA fence (Fence Type 'A'), it is not from the 1960s installation (Albee 2019). A small portion of the iron fence and masonry wall is located within the APE just south of the M Street Gate at the southern end of Ellipse Road, NE.

The Capitol Columns sit atop a hill to the north of the LOD, near the northern boundary of the APE (Figure 7-6). The 22 Corinthian columns made of sandstone were part of the set of 24 which were located on the east central portico of the United States Capitol, completed in 1826. Charles Bulfinch oversaw construction based on the designs of his predecessors, William Thornton and Benjamin Henry Latrobe. In 1958, the columns were dismantled when the east front of the Capitol was extended. The columns were restored and placed on the grounds of the USNA by garden designer Russell Page and dedicated in 1990.



Figure 7-5. Washington Youth Garden, looking south.



Figure 7-6. Capitol Columns, installed in 1990, looking northeast.

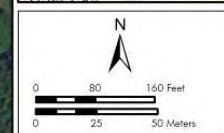
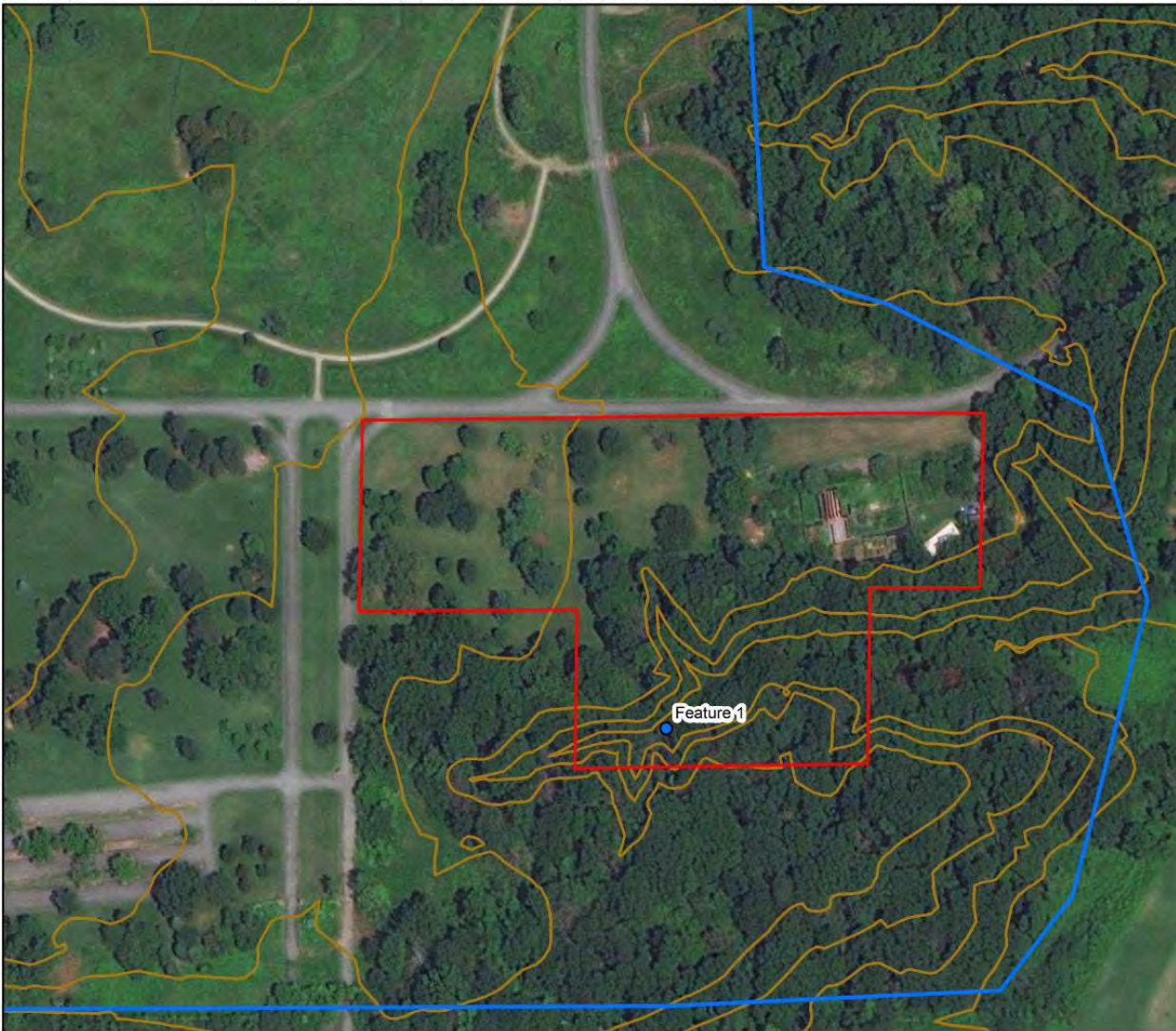


Figure 7-7. National Grove of State Trees, looking south within LOD.

A small portion of the Fern Valley Plant Collection falls within the APE. The Fern Valley is located east of Ellipse Road, NE. It features plants native to the eastern United States and is organized by habitat and geography. The open, flat portion of Fern Valley east of Ellipse Road, NE extending to the denser vegetation along where the tree line begins is located within the APE.

The National Grove of State Trees (the Grove) is a display of trees representing the 50 states and the District of Columbia. The Grove covers more than 30 ac (12.1 ha), a portion of which is within the LOD and APE. The first tree was planted in 1990 and over the next three years, every state provided its own trees and helped with the planting. The Grove partnership with the USNA and the U.S. Forest Service ended around 2020 and the collection was transformed into a mobile application tour highlighting the state trees (Craven Rand personal communication 2022).

During the archaeological pedestrian survey, a spring box (Feature 1) was located within the LOD, near the bottom of the ravine where water collects, at the southern edge of the center of the T-shaped LOD (Figure 7-8). The brick and concrete structure may date to the era (circa 1934 to 1940) when a CCC camp was located near Mount Hamilton (Figure 7-9). This CCC Camp, NA-1-DC, or Camp Mount Hamilton, was significant as the first CCC camp for African American enrollees in the Washington, D.C. area (Davidson and Jacobs n.d.:14–15). It is possible that CCC workers from NA-1-DC helped channelize springs at the USNA, as they did at Fort Mahan, but no conclusive evidence has been found (Davidson and Jacobs n.d.:102). Spring boxes are water-tight structures built around springs and designed to isolate the springs from contaminated surface runoff. Spring boxes can provide reserve water storage when the flow rate of the spring is below normal (Penn State Extension 2017). This spring box is constructed of machine-made bricks adhered with Portland cement and a concrete top. The circa 1934–1940 spring box does not appear to have been used in many decades.



LEGEND





- Feature_Nu**
-  Feature 1
 -  Limit of Disturbance
 -  Area of Potential Effect
 -  Contour Major 10ft

Figure 7-8
Map showing the Spring Box (Feature 1) location within the LOD at USNA Canopy Trail Project (Esri 2023, 2024a, 2024b).



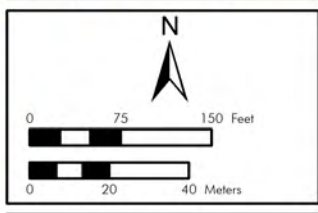
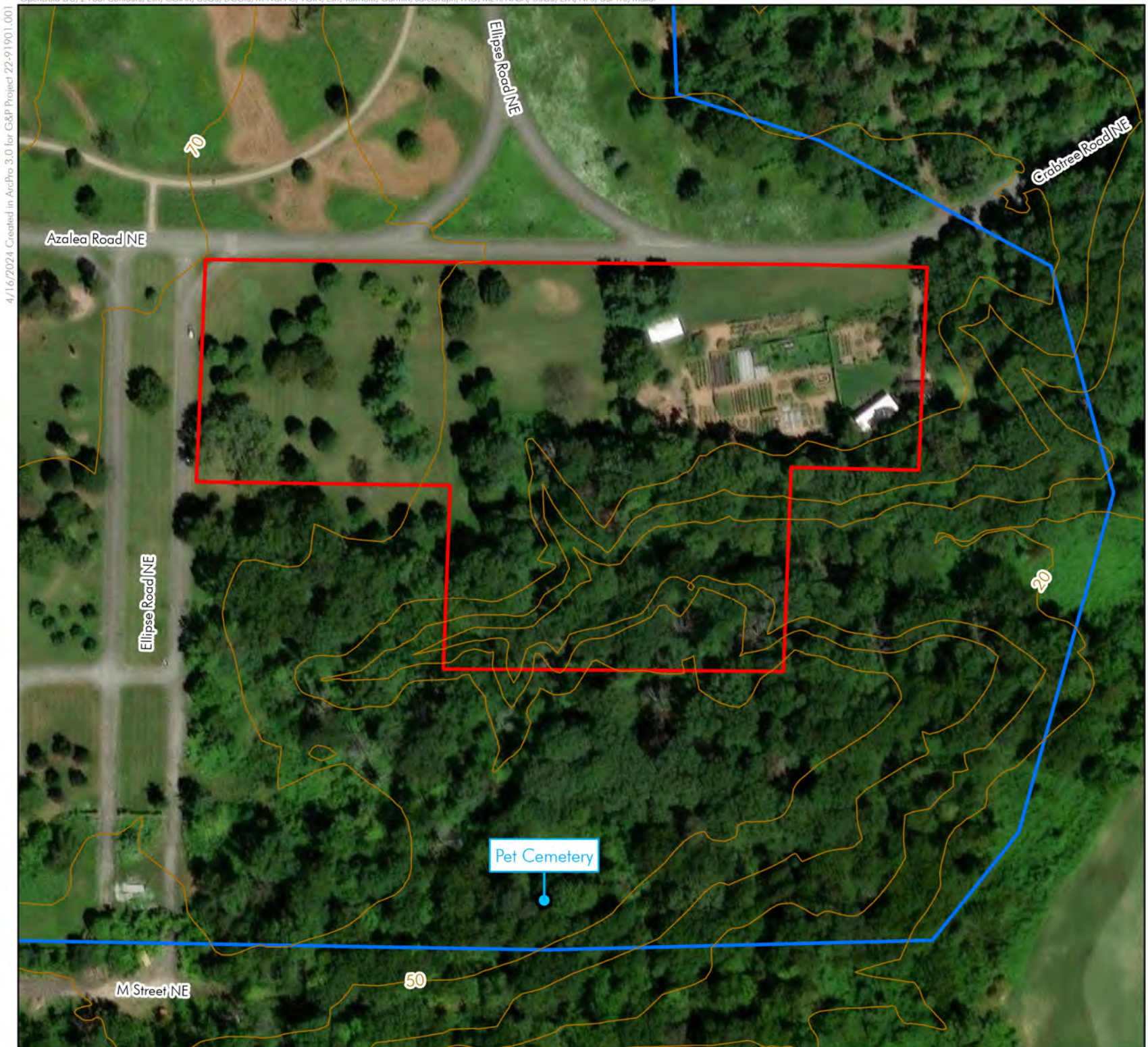


Figure 7-9. Looking southwest at a brick and concrete Spring Box (Feature 1) located within the southern portion of the LOD.

Also, an inactive pet cemetery is located within the USNA property and has been previously recorded in archaeological reports. The circa 1909–1970 pet cemetery was associated with area veterinarian, Dr. David Eastburn Buckingham, and is located south of the LOD within the APE (Figure 7-10). Dr. Buckingham would go on to work as the White House veterinarian (Pet Cemetery Stories 2020). Although no extant historic headstones were found related to the historic era of the cemetery, two more recent (post-1970) wooden pet headstones were noted during the archaeological pedestrian survey (Figure 7-11). The cemetery is located outside of the LOD for the proposed project, but within the APE, so it was not assigned a feature number.

7.3 Resources Adjacent to the APE

Several areas located outside of, but adjacent to, the APE were observed during the historic built environment survey and a viewshed analysis was performed, out of an abundance of caution. These include the NRHP-listed Langston Golf Course, the M Street, NE residential neighborhoods, and the Morrison Garden and Azalea Collection at USNA. The current recommended APE was confirmed based on observations from these adjacent areas (Figure 7-12). It is unlikely that the Canopy Trail Project will be visible from these areas, and as such no change in character or use from the project is expected.



LEGEND

- Pet Cemetery
- ~ 10-foot Contour
- Limit of Disturbance
- Area of Potential Effects

Figure 7-10
Map showing the Pet Cemetery location within the APE at USNA Canopy Trail Project (Esri 2023, 2024a, 2024b).

4/16/2024, Created in ArcPro 3.0 for G&P Project 22-91901.001



Figure 7-11. Two post-1970 grave markers at the Pet Cemetery, located south of the LOD, looking south.



Figure 7-12. Looking west from Langston Golf Course, near the tee box at hole 15, toward the APE.

7.4 Assessment of Effects

The USNA, a historic property, will be directly affected by the Canopy Trail Project. However, adverse effects to the USNA are not expected. The LOD is a densely vegetated forest area with steep inclines down to a ravine with water collecting at the bottom (Figure 7-13–Figure 7-14). The canopy trail will be built using natural materials, such as Black Locust logs, that are designed to blend into the existing environment (see Appendix D for proposed drawings of the Canopy Trail). While visibility of the trail will be greater in the winter months, it is still not likely that the canopy trail will adversely impact character defining USNA viewsheds from any portion of the APE. Gray & Pape recommends no additional work to assess the effects of the Project on historic built properties.

The forest where the canopy trail will be located is not a designed feature like the nearby National Grove of State Trees, and instead, it has been allowed to grow freely for many decades. The Washington Youth Garden is the closest built resource to the proposed trail entrance, and its existing wood-chipped trail and play area will be improved during this project. The canopy trail is designed to blend into the existing natural area and will not extend higher than the current tree canopy. Vegetative clearance will be minimal, if at all. Tree-Mendous prides itself on providing a nature experience to its clients and their visitors, and the purpose of the project is to immerse people in nature without disturbing the dense forest as it exists today. Gray & Pape has assessed effects for all stages of the phased installation approach to the proposed canopy trail project. In conclusion, the proposed Canopy Trail Project will not adversely affect the NRHP-listed historic built property, the USNA.



Figure 7-13. Looking north toward the Youth Garden from the forested portion of the LOD.



Figure 7-14. Looking south into the forested area towards the ravine, from the wood-chipped trail behind the Youth Garden.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The FONA is proposing to construct a canopy trail (Canopy Trail Project) located in the southeast corner of the USNA property located in the northeastern quadrant of Washington, D.C. The FONA has retained Tree-Mendous and Proper & O’Leary Engineering to design and install the proposed canopy trail. This project involves the installation of three self-guided, aboveground trails, weaving through the existing forest on the USNA property, along with a treehouse entrance/ticket booth, static and ABA-compliant bridges, platforms, and custom Netscape (see Appendix D). The limits of subsurface impacts for this project are minimal and include access roads, staging areas, fencing, and construction of the canopy trail itself. While design plans for the project are not yet finalized, in an abundance of caution a total of 7.7 ac (3.1 ha) could) were examined as part of this project. The APE consists of the maximum possible LOD as indicated by the Tree-Mendous design team in consultation with FONA and USNA, and an additional buffer area on the north, west, south, and east as follows: 1,000 ft (304.8 m) from the northern boundary of the LOD to the north, over mostly open land, towards Meadow Road, NE, between Eagle Nest Road, NE, and Ellipse Road, NE; 700 ft (213.36 m) to the west of Ellipse Road, NE, towards Eagle Nest Road, NE; 400 ft (121.92 m) to the south of the southern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD; and between 200 ft (60.96 m) and 400 ft (121.92 m) to the east of the eastern boundary of the LOD, towards Langston Golf Course, to the edge of the dense vegetation around the LOD. FONA has contracted Gray & Pape, to conduct a Phase Ib archaeological survey for the Canopy Trail Project.

The project is being conducted in compliance with Section 106 of the NHPA, as amended, and its implementing regulations, 36 C.F.R. § 800: Protection of Historic Properties. The USDA is the lead federal agency for the project.

Gray & Pape conducted the archaeological fieldwork between June 21 and 23, 2022. This portion of the study consisted of a pedestrian survey and systematic shovel testing. Placement of shovel tests was based on any location where ground-disturbing activities are planned for the Canopy Trail Project, defined as the LOD. Twelve shovel tests exhibited areas where the original ground surface was removed and 17 shovel tests exhibited extremely disturbed fill deposits, consisting of mixed soil horizons containing modern trash, and asphalt, concrete, and brick fragments to a depth of 27.5 in (70.0 cm). Otherwise, no buried soils, intact archaeological deposits, or archaeological sites were identified. Although intact soils were found in certain locations, this alone does not warrant additional investigations. As a result, Gray & Pape recommends that the Undertaking will not affect any NRHP-eligible archaeological sites as no archaeological sites were identified. No further archaeological work is recommended for the proposed Canopy Trail Project.

Gray & Pape conducted the historic built environment fieldwork on June 30 and July 14, 2022. The recommended APE was determined through online mapping and on-site visual inspection. One historic property—the NRHP-listed United States National Arboretum—is located within the recommended APE. Gray & Pape finds that the Undertaking will have a direct effect on the USNA, but that effect will not be adverse, as no character-defining features of the USNA will be diminished by the Project. No further work to identify historic built properties in the APE is recommended.

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APPENDIX A: NABD FORM

NADB – REPORTS CITATION FORM

Complete items 3 and 5-14. The State Historic Preservation Office will record information for items 1 through 4.

1. DOCUMENT NO. _____

2. SOURCE _____ AND SHPO – ID _____

3. FILED AT
District of Columbia Historic Preservation Office
District of Columbia Archives
Washington Historical Society
Martin Luther King, Jr. Library

4. UTM COORDINATES

Zone	<u>18S</u>	Easting	<u>329353</u>	Northing	<u>4308417</u>
Zone	<u>18S</u>	Easting	<u>329618</u>	Northing	<u>4308414</u>
Zone	<u>18S</u>	Easting	<u>329618</u>	Northing	<u>4308333</u>
Zone	<u>18S</u>	Easting	<u>329565</u>	Northing	<u>4308333</u>
Zone	<u>18S</u>	Easting	<u>329565</u>	Northing	<u>4308264</u>
Zone	<u>18S</u>	Easting	<u>329445</u>	Northing	<u>4308264</u>
Zone	<u>18S</u>	Easting	<u>329445</u>	Northing	<u>4308324</u>
Zone	<u>18S</u>	Easting	<u>329353</u>	Northing	<u>4308324</u>

Continuation, see 14.

5. AUTHORS Kerry S. González, M.A. and Katherine M. Stefanic, M.A.

6. YEAR 2022 _____

Year published.

7. TITLE Phase I Cultural Resource Survey for the United States National Arboretum Canopy Trail Project, Washington, D.C.

8. PUBLICATION TYPE (circle one)

1. Monograph or Book
2. Chapter in a Book or Report Series
3. Journal Article
4. Report Series
5. Dissertation or Thesis
6. Paper presented at a Meeting

7. Unpublished or Limited Distribution Report

8. Other

9. INFORMATION ABOUT PUBLISHER/PUBLICATOIN

Follow the American Antiquity style guide for the type of publication circled.

González, Kerry S. and Katherine M. Stefanic

2022 Phase I Cultural Resource Survey for the United States National Arboretum Canopy Trail Project, Washington, D.C. Submitted to the D.C. Historic Preservation Office. Copies available from Gray & Pape, Cincinnati, Ohio

10. STATE/COUNTY (Referenced by report. Enter as many states, counties, or towns, as necessary. Enter all, if appropriate. Only enter Town if the resources considered are within the town boundaries.)

STATE 1 _____ COUNTY Northeast _____

TOWN _____

STATE 2 _____ COUNTY _____

TOWN _____

STATE 3 _____ COUNTY _____

TOWN _____

Continuation, see 14.

11. WORKTYPE (circle all code numbers that are appropriate)

0 General Management Plan/Environmental Document

1 Cultural Resources Research Plan

2 Statement for Management

3 Outline of Planning Requirements

4 Cultural Resources Preservation Guide

5 Development Concept Plan

6 New Area Study/Reconnaissance Study

7 Boundary Study

8 Interpretive Prospectus

9 Special Planning/Management Study

10 Historical Study

11 Primary Document – Original

12 Primary Document – Translation

13 Advertisement

14 Popular Culture/History Document

- 15 Journal/Periodical
- 20 Historical Resource Study
- 21 Historical Base Map
- 22 Historical Handbook Text
- 23 Park Administrative History
- 24 Special History Study
- 30 Archeological General Considerations
- 31 Archeological Overview and Assessment
- 32 Archeological Identification Study (Phase I)
- 33 Archeological Evaluation Study (Phase II)
- 34 Archeological Data Recovery (Phase III)
- 35 Archeological Collections and Non-Field Studies
- 36 Socio-Cultural Anthropology Study
- 37 Social Impact Statement
- 38 Ethnohistory Study
- 39 Special Archeology/Anthropology Study
- 40 Field Reconnaissance, Sampling
- 41 Field Reconnaissance, Intensive
- 42 Paleo-environmental Research
- 43 Archeometrics
- 44 Archeoastronomical Study
- 46 Remote Sensing
- 47 Archeozoological Study
- 48 Archeobotanical Study
- 49 Bioarcheological Study
- 50 Historic Buildings Report-Beginning February 1956
- 51 Historic Buildings Report After February 1957-Part I
- 52 Historic Buildings Report-Part II
- 54 Historic Buildings Report-After March 1960-Part III
- 56 HSR-Administrative Data-After December 1971
- 57 HSR-Historical Data
- 58 HSR-Archeological Data
- 59 HSR-Architectural Data
- 61 Historic Structures Preservation Guide-After December 1971
- 62 Historic Structures Report-After October 1980
- 63 Cultural Landscape Report (Historic Grounds Report)
- 64 Ruins Stabilization and Maintenance Report
- 70 Scope of Collection Statement
- 71 Historic Furnishings Report-After October 1980
- 72 Collection Condition Survey
- 73 Collection Storage Plan
- 82 Collection Management Plan (Collection Preservation Guide)
- 83 Special Curatorial Study
- 84 Archeological Field Work, Indeterminant
- 85 Archeological Survey, Indeterminant
- 86 Field Reconnaissance, Minimal
- 87 Underwater Survey
- 88 Resource/Site Based Work, Indeterminant

- 89 Minimal/Informal Site Visitation
- 90 Oral History
- 91 Subsurface Activity, Indeterminant
- 92 Testing/Limited Excavation
- 93 Major Excavation
- 94 Underwater Resource/Site Based Work
- 95 Artifact/Collection Based Study/Report
- 96 Literature Synthesis/Review/Research Design
- 97 Intensive Determination of Surface Characteristics
- 98 Environmental Research
- 99 Geomorphological Study
- 100 Geological Study
- 101 Paleontological Study
- 102 Population Reconstruction
- 103 Rock Art Study
- 104 Architectural Photography
- 105 Architecture Site Plan
- 106 Architectural Floor Plan
- 107 HABS Drawing
- 108 Physical Anthropology Study
- 109 Boat Survey
- 110 Other (Furnish a Keyword in Keyword Category 1 to identify the nature of this study.)

12. KEYWORDS and KEYWORD CATEGORIES

- 0 Types of Resources (or “no resources”)
- 1 Generic Terms/Research Questions/Specialized Studies
- 2 Archeological Taxonomic Names
- 3 Defined Artifact Types/Material Classes
- 4 Geographic Names or Locations
- 5 Time
- 6 Project Name/Project Area
- 7 Other keywords

Enter as many keywords (with the appropriate keyword category number) as you think will help a person (1) who is trying to understand what the report contains or (2) who is searching the database for specific information. Whenever appropriate, record the number of acres studied in a document.

Arboretum	[6]		[]		[]
Cut and fill	[7]		[]		[]
7.7 acres	[]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]

Continuation, see 14.

13. FEDERAL AGENCY United States Department of Agriculture (USDA) Agricultural Research Service

14. CONTINUATION/COMMENTS (include item no.) _____

FORM COMPLETED BY

Name Joseph R. Blondino

Date 7/28/2022

Address Gray & Pape
2005 East Franklin Street, Suite 2
Richmond, Virginia 23223

Telephone Number (804) 644-0656

APPENDIX B: STP DATA

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
B	5	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
B	6	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
B	7	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
B	8	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
B	9	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
B	10	N/A	N/A	N/A	N/A	N/A	No Dig- utilities	
C	5	I	8.6	A	(10YR4/3) Brown	silt loam		
C	5	II	12.5	B	(7.5YR5/8) Strong brown	Sandy clay	10 ft from fire hydrant	
C	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
C	7	I	2.7	A	(10YR3/3) Dark brown	silt loam		
C	7	II	6.2	See comment	(10YR4/4) Dark yellowish brown	sandy loam	Fill layer with concrete. Ceased excavation due to concrete pad. 50% sub angular rocks	
C	8	I	8.2	A	(10YR4/3) Brown	silt loam		
C	8	II	12.1	B	(7.5YR5/6) Strong brown	Sandy clay		
C	9	I	2.7	A	(10YR4/4) Dark yellowish brown	silt loam		
C	9	II	6.2	See comment	(10YR4/4) Dark yellowish brown	sandy loam	Full of sub angular rocks. Over cement pad	
C	10	I	5.9	A	(10YR5/4) Yellowish brown	silt loam	Gravelly	
C	10	II	9.8	B	(10YR6/6) Brownish yellow	silty clay		
D	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
D	6	I	4.7	A	(10YR5/4) Yellowish brown	Silt loam		
D	6	II	8.6	B	(7.5YR5/8) Strong brown	Sandy clay		
D	7	I	3.5	A	(10YR4/3) Brown	silt loam	Off set due to planting feature	
D	7	II	10.1	See comment	See comment	silty clay	Compact fill	
D	7	III	15.2	B	(7.5YR5/8) Strong brown	Clay	Sub	
D	8	I	5.1	A	(10YR4/3) Brown	silt loam	Lens of construction bedding at 11 cmbs	
D	8	II	10.1	A	(10YR5/4) Yellowish Brown	Silty clay loam		
D	8	III	14.0	B	(7.5YR5/6) Strong brown	silty clay		
D	9	I	6.6	A	(10YR5/4) Yellowish brown	sandy loam	D-9 less than a meter from sewer drain, machine cut brick	Two brick fragments, one oyster shell
D	9	II	11.7	B	(10YR6/6) Brownish yellow	sandy clay		
D	10	I	3.9	A	(10YR4/3) Brown	silt loam		
D	10	II	9.4	See comment	(10YR4/4) Dark yellowish brown	sandy loam	Fill with cinders and asphalt	
D	10	III	12.9	C	(7.5R5/8) Red	clay		
E	5	I	4.7	A	(10YR4/3) Brown	silt loam		
E	5	II	8.6		(10YR6/3) Pale brown	Silty sand		
E	5	III	13.3		(7.5YR5/8) Strong brown	silty clay		
E	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
E	7	I	3.1	A	(10YR3/3) Dark brown	silt loam		

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
E	7	II	10.5	See comment	See comment	silty clay	Compact fill with 10% sub angular rocks	
E	7	III	14.8	B	(7.5YR5/8) Strong brown	Clay		
E	8	I	9.8	See comment	See comment	silt loam	Demolition rubble, 80% busted concrete, fill layer	
E	8	II	13.7	See comment	See comment	Sandy clay	STP terminated due to demolition fill impasse, fill layer	
E	9	I	2.7	A	(10YR4/3) Brown			
E	9	II	11.7	See comment	(10YR4/6) yellowish brown	silt loam		
E	9	III	15.6	See comment	(7.5YR) strong brown	silt loam	Compact fill layer	
E	10	I	5.9	A	(10YR5/4) Yellowish brown	silt loam	Gravelly	Slag (1)
E	10	II	9.8	B	(10YR6/6) Brownish yellow	silty clay		
F	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
F	6	I	9.0	A	(10YR5/4) Yellowish brown	Silt loam		
F	6	II	12.9	B	(7.5YR6/8) Reddish yellow	Sandy clay		
F	7	I	3.1	A	(10YR4/3) Brown	silt loam		
F	7	II	10.1	See comment	(10YR4/6) m/w (2.5YR4/5)	silty clay	Fill deposit of red and bright yellow clay mixed with compact brown silty sand	
F	7	III	14.0	B	(7.5YR5/8) Strong brown	Clay		
F	8	I	6.2	A	(10YR4/3) Brown	silt loam	Sub angular rock lens at 13-16 cmbs	
F	8	II	9.4	fill	10YR4/3 m/w 7.5YR5/8	SILTY CLAY	fill layer	
F	8	III	16.8	fill	7.5YR5/6 m/w 2.5YR 5/6	Sandy clay	Fill layer	
F	8	IV	20.7	B	(7.5YR5/6) Strong brown	Sandy clay		
F	9	I	8.6	A	(10YR4/3) Brown	silt loam	Gravels	Galvanized spike, foil, plastic
F	9	II	10.9	See comment	(10YR4/6) m/w (2.5YR4/5)	Sandy clay	Fill layer, (10YR4/6) m/w (2.5YR4/5)	
F	9	III	14.8	B	(10YR6/8) Brownish Yellow	Sandy clay		
F	10	I	8.2	A	(10YR4/3) Brown	silt loam	Gravels	
G	5	II	10.9	See comment	(10YR4/6) m/w (2.5YR4/5)	Sandy clay	Fill layer, (10YR4/6) m/w (2.5YR4/5)	
G	5	II	10.1	Unknown	(10YR6/8) Brownish Yellow	Sandy clay		
G	5	III	15.2	B	(7.5YR6/8) Reddish yellow	Sandy clay		
G	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
G	7	I	3.1	A	(10YR4/3) Brown	silt loam		
G	7	II	10.1	See comment	See comment	Silty sand	Compact fill with machine made brick fragment	
G	7	III	14.4	B	(7.5YR5/8) Strong brown	sand		
G	8	I	5.5	A	(10YR4/3) Brown	sandy loam		
G	8	II	17.2	B	(7.5YR5/6) Strong brown m/w 10YR6/2	Sandy clay		

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
G	9	I	5.5	A	(10YR4/3) Brown	clay	Compact fill layer. Ceased excavation due to impenetrable soils	
G	9	II	13.7	See comment	See comment	silt loam	Compact fill layer. Ceased excavation due to impenetrable soils	
G	10	I	4.3	A	(10YR4/3) Brown	sandy loam		
G	10	II	9.8	See comment	(7.5YR5/8) Strong brown	sand	Mottled with 2.5YR4/5, all compact sand, fill layer	
G	10	III	18.3	See comment	(10YR2/1) Black	sandy loam	Fill layer, contains 10% cinders	
G	10	IV	23.4	See comment	(10YR2/1) Black	sand	40% slag, fill layer	Slag
G	10	V	25.4	Unknown	(10YR4/4) Brown	Sandy clay		
G	10	VI	27.3	B	(7.5YR5/8) Strong brown	Sandy clay		
H	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
H	6	I	10.1	A	(10YR5/4) Yellowish brown	Silt loam	Offset 2 meters East	
H	6	II	14.0	B	(7.5YR5/8) Strong brown	Sandy clay		
H	7	I	3.9	A	(10YR3/3) Dark brown	silt loam		
H	7	II	8.2	See comment	See comment	sand	Construction fill	
H	7	III	12.5	See comment	See comment	Silty sand	Compact fill with 20% gravels. Ceased excavation due to impenetrable soils and rocks	
H	8	I	6.2	A	(10YR4/3) Brown	sandy loam		
H	8	II	10.1	B	(7.5YR5/6) Strong brown	sandy clay		
H	9	I	2.7	A	(10YR4/3) Brown	silt loam		
H	9	II	12.9	See comment	See comment	silt loam	Compact fill layer. Ceased excavation due to impenetrable soils	
H	9	III	15.6	B	(7.5YR) strong brown	clay		
H	10	I	1.2	A	(10YR4/3) Brown	silt loam	Topsoil	
H	10	II	12.9	See comment	See comment	sandy loam	Very compact. Ceased excavation	
I	5	I	10.1	A	(10YR6/3) Pale brown	silt loam		
I	5	II	14.8	B	(7.5YR6/8) Reddish yellow	Silty sand		
I	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
I	7	I	5.5	A	(10YR3/3) Dark brown	silt loam		
I	7	II	9.0	See comment	See comment	Silty sand	Compact fill with 20% gravels. Ceased excavation due to impenetrable soils and rocks	
I	7	III	12.9	B	(7.5YR5/8) Strong brown	silty clay		
I	8	N/A	N/A	N/A	N/A	N/A	No Dig-Start of interval change	
I	9	I	4.7	A	(10YR4/3) Brown	silt loam		

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
I	9	II	8.6	B	(10YR6/8) Brownish yellow	silty clay		
I	10	I	3.9	A	(10YR5/4) Yellowish brown	sandy loam		
I	10	II	11.7	B	(10YR6/6) Brownish yellow	Sandy clay		
I	11	I	18.3	See comment	(7.5YR5/8) Strong brown	Sand	Asphalt in bottom. Ceased excavation	
I	12	I	7.0	A	(10YR3/3) Dark brown	silt loam		
I	12	II	10.9	See comment	(7.5YR5/8) Strong brown	Sandy clay		
J	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
J	6	I	9.0	A	(10YR4/3) Brown	Silt loam	50% busted concrete, cinder lens at 20-23cmts	
J	6	II	12.9	B	(7.5YR5/8) Strong brown	Sandy clay		
J	7	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
J	8	I	3.9	A	(10YR4/3) Brown	silt loam		
J	8	II	7.8	A	(10YR5/4) Yellowish Brown	Compacted sand		
J	8	III	11.7	B	(7.5YR6/8) Reddish Brown	Compacted sand		
J	9	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
J	10	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
J	11	I	10.1	A	(10YR3/3) Dark brown			
J	11	II	14.0	B	(10YR6/3) Pale brown		At edge of slope	
J	12	I	7.4	A	(10YR3/3) Dark brown	silt loam	At edge of slope	
J	12	II	11.3	B	(7.5YR5/8) Strong brown	Sandy clay		
JT	1	I	5.9	A	(10YR4/3) Brown	Silt loam		Modern shot gun shell
JT	1	II	8.6		(10YR6/2) Light brownish grey	Compacted sand		
JT	1	III	12.5	B	(7.5YR5/8) Strong brown	Sandy clay		
JT	2	I	7.0	A	(10YR4/3) Brown			
JT	2	II	11.3	B	(7.5YR5/8) Strong brown			
JT	3	I	5.1	A	(10YR4/3) Brown	Silt loam		
JT	3	II	7.0	E	(10YR6/2) Light brownish grey	Compacted sand		
JT	3	III	15.2	B	(7.5YR5/8) Strong brown	Sandy clay		
JT	4	I	4.3	A	(7.5YR5/8) Strong brown	Compacted sand		
JT	4	II	8.2	B	(10YR4/3) Brown	Silt loam		
JT	5	I	4.7	A	(10YR4/3) Brown	Silt loam		
JT	5	II	6.2	E	(10YR6/2) Light brownish grey	Compacted sand		
JT	5	III	10.1	B	(7.5YR5/8) Strong brown	Sandy clay		
JT	6	I	5.1	A	(10YR4/3) Brown	Silt loam		
JT	6	II	5.9	E	(10YR6/2) Light brownish grey	Compacted sand		
JT	6	III	10.5	B	(7.5YR5/8) Strong brown	Sandy clay		
JT	7	I	9.0	A	(10YR4/3) Brown	Silt loam		
JT	7	II	17.2		(10YR6/2) Light brownish grey	Silt loam		
JT	7	III	23.4	O	(10YR3/2) Very dark greyish brown	silt loam		
JT	7	IV	35.9		(10YR5/2) Greyish brown	Silty clay loam	Filled with water	
JT	8	I	8.6	A	(10YR4/3) Brown	Silt loam		
JT	8	II	16.0		(10YR6/2) Light brownish grey	Silt loam		

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
JT	8	III	23.0	O	(10YR3/2) Very dark greyish brown	silt loam		
JT	8	IV	35.5		(10YR5/2) Greyish brown	Silty clay loam	Filled with water	
JT	9	I	9.4	A	(10YR4/3) Brown	Silt loam	Filled with water	
JT	10	I	10.9	A	(10YR4/3) Brown	Silt loam		
JT	10	II	15.6		(10YR6/3) Pale brown	sandy loam	Filled with water	
JT	11	I	10.9	A	(10YR4/3) Brown	Silt loam		
JT	11	II	15.6		(10YR6/3) Pale brown	sandy loam	Filled with water	
JT	12	I	8.6	A	(10YR4/3) Brown	Silt loam		
JT	12	II	13.3		(10YR6/3) Pale brown	sandy loam	Filled with water	
JT	13	I	10.9	A	(10YR4/3) Brown	Silt loam		
JT	13	II	15.6		(10YR6/3) Pale brown	sandy loam	Filled with water	
K	5	N/A	N/A	N/A	N/A	N/A	No dig. Adjacent to storm drain	
K	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
K	7	I	6.6	A	(10YR3/3) Dark brown	silt loam		
K	7	II	11.7		(10 YR 5/4)	Silty sand		
K	7	III	15.6	B	(7.5YR 6/8) reddish brown	Silty sand		
K	8	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
K	9	I	3.1	A	(10YR2/3) Very dark brown	silt loam		
K	9	II	6.6	B	(7.5YR5/8) Strong brown	Sandy clay		
K	10	N/A	N/A	N/A	N/A	N/A	No Dig- slope	
L	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
L	6	I	3.9	A	(10YR3/3) Dark brown	Silt loam		
L	6	II	10.5	See comment	10YR4/3 m/w 7.5YR4/5	SILTY CLAY	Fill layer, 10YR4/3 m/w 7.5YR4/5	
L	6	III	14.4	B	(7.5YR5/8) Strong brown	Sandy clay		
L	7	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
L	8	I	4.3	A	(10YR4/3) Brown	Silt loam		
L	8	II	8.2	B	(7.5YR6/8) Reddish Brown	Sandy clay		
L	9	I	5.9	A	(10YR2/3) Very dark brown	silt loam		
L	9	II	9.8	B	(7.5YR5/8) Strong brown	Sandy clay		
L	10	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
M	5	I	7.0	A	(10YR6/3) Pale brown	silt loam		
M	5	II	8.6		(10YR4/6) Dark yellowish brown	sandy loam		
M	5	III	13.3	B	(7.5YR6/8) Reddish yellow	Sandy clay		
M	6	N/A	N/A	N/A	N/A	N/A	No Dig- interval change	
M	7	I	2.3	A	(10YR4/3) Brown	silt loam		
M	7	II	10.9	See comment	See comment	silty clay	Compact fill with 10% sub angular rocks. At edge of garden	
M	8	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
M	9	I	4.7	A	(10YR2/3) Very dark brown	silt loam		
M	9	II	8.6	B	(7.5YR5/8) Strong brown	Sandy clay		
M	10	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
N	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
N	6	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	

STP	Transect	Stratum	Base of Strat (in)	Soil Horizon	Munsell	Texture	Comments	Discarded Materials
N	7	N/A	N/A	N/A	N/A	N/A	No dig. Garden	
N	8	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
N	9	I	6.6	A	(10YR2/3) Very dark brown	silt loam		
N	9	II	10.5	B	(7.5YR5/8) Strong brown	Sandy clay		
N	10	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
O	5	I	4.7	See comment	See comment	Clay	Ceased due to impenetrable rocks. Disturbed	
O	6	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
O	7	N/A	N/A	N/A	N/A	N/A	No dig. Garden	
O	8	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
O	9	I	4.7	A	(10YR3/3) Dark brown	silt loam	Skittles wrapper in A	
O	9	II	8.6	B	(7.5YR5/8) Strong brown	Sandy clay		
O	10	N/A	N/A	N/A	N/A	N/A	No dig. Slope	
P	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
P	6	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
P	7	N/A	N/A	N/A	N/A	N/A	No dig. Garden	
P	8	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
P	9	I	4.7	A	(10YR3/3) Dark brown	silt loam		
P	9	II	8.6	B	(7.5YR5/8) Strong brown	Sandy clay		
P	10	N/A	N/A	N/A	N/A	N/A	No Dig- Slope	
Q	5	I	5.5	A	(10YR4/3) Brown	Silt loam		
Q	5	II	9.4	B	(7.5YR5/8) Strong brown	Silty clay		
Q	6	N/A	N/A	N/A	N/A	N/A	No Dig- Utilities	
Q	7	N/A	N/A	N/A	N/A	N/A	No dig. Garden	
Q	8	N/A	N/A	N/A	N/A	N/A	No Dig- Garden	
Q	9	N/A	N/A	N/A	N/A	N/A	No Dig- building	
R	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
R	6	N/A	N/A	N/A	N/A	N/A	No Dig-Utilities	
R	7	N/A	N/A	N/A	N/A	N/A	No Dig- garden	
R	8	N/A	N/A	N/A	N/A	N/A	No dig- garden	
R	8	N/A	N/A	N/A	N/A	N/A	No Dig- garden	
R	9	N/A	N/A	N/A	N/A	N/A	No Dig- garden	
S	5	N/A	N/A	N/A	N/A	N/A	No dig due to interval increase	
S	6	N/A	N/A	N/A	N/A	N/A	No Dig-Utilities	
S	7	N/A	N/A	N/A	N/A	N/A	No Dig- gravel road/garden	
S	8	N/A	N/A	N/A	N/A	N/A	No dig- garden	
S	8	N/A	N/A	N/A	N/A	N/A	No Dig- gravel road/garden	
S	9	N/A	N/A	N/A	N/A	N/A	No Dig- gravel road/garden	
F	10	I	10.1	See comment	(10YR4/6) m/w (2.5YR4/5)	Sandy clay	Fill layer, (10YR4/6) m/w (2.5YR4/5)	
F	10	II	14.8	B	(10YR6/8) Brownish Yellow	Sandy clay		

APPENDIX C: RESUMES OF RELEVANT STAFF



KERRY S. GONZÁLEZ, M.A., RPA

Senior Principal Investigator, Archaeology

EDUCATION

2001, M.A., Early American History, State University College at Brockport

1999, B.A., History, State University College at Brockport

SUMMARY OF EXPERIENCE

Ms. González has over 20 years of professional experience in the field of archaeology and collections management. She has worked on a multitude of archaeological and historic research projects ranging from prehistoric village sites to twentieth century domestic sites, including several cemetery investigations. In her role as project manager, Ms. González has extensive experience overseeing a variety of cultural resource projects throughout the Mid-Atlantic. She is also extremely passionate about collections management and has worked to influence regional and national curation standards through service on collections committees of three professional organizations. She is also a strong proponent of advocating for and implementing advancements in lab methodologies and curation strategies through social media, serving on committees and teaching workshops and webinars.

SELECT PROJECT EXPERIENCE

- **Sage Fiber Optic Line:** Project Manager for Phase I survey of proposed fiber optic line in Maryland and Virginia. This work involved archaeological survey of selected areas including the excavation of shovel test pits augmented by test units to further explore floodplain deposits. This project required extensive consultation with the client, Maryland Historic Trust, the Department of Historic Resources, and the Army Corps of Engineers.
- **James River Water Authority Phase I and Deep Testing:** Archaeological support staff for large Phase I survey of proposed waterline and pumpstation. This work was augmented with the excavation of deep trenches along the floodplain of the James and Rivianna rivers to investigate for potential buried cultural deposits. This project included consultation with the Monacan Indian Nation as well as coordination with Fluvanna County, the Department of Historic Resources, and the James River Water Authority (the client).
- **Cultural Landscape Inventories:** Historical support staff for three cultural landscape inventories conducted on behalf of the National Park Service (NPS). These inventories were centered on portions of the National Mall in Washington, D.C. as well as a segment of Mount Vernon Memorial Highway. The project included the recordation of historically significant features of these areas as well as their developmental histories.



- **Unites States National Arboretum Perimeter Fence Phase I Survey:** Archaeological support staff for Phase I survey associated with the installation of new fencing for the United States National Arboretum (USNA) in Washington, D.C. This project involved the creation of a cut-and-fill analysis of the entire Arboretum property, geomorphological borings, historic map research, and the excavation of shovel test pits. This data was compiled into a technical document to meet the standards for the Washington, D.C. Historic Preservation Office as well as the creation of a Cultural Resource Management Guide for the entire USNA property.
- **Mallory Pointe:** Emergency excavation of two Native American burials conducted behalf of the Virginia Department of Historic Resources (DHR). The purpose of this project was to exhume the identified burials and determine if additional burials were present. This project required extensive consultation with the DHR, the client, and the Nansemond Tribe.
- **South Mountain Battlefield Project, Frederick and Washington Counties, Maryland:** Project Manager for the archival and archaeological investigations for the South Mountain Battle in Maryland. This project involved the examination of three properties associated with the 1862 Battle of South Mountain and included archival research and controlled metal detecting followed by a detailed analysis of the findings to help interpret troop positions, avenue of approach, and fields of fire.
- **Embrey Family Cemetery Excavations:** Principal Investigator on exhumation and reinterment of small family late-nineteenth through early-twentieth century cemetery in Stafford County, Virginia. This project required extensive coordination with the DHR, the client, the descendants, and the construction team as it was an active construction site. Ms. González worked extensively with the family to form a reburial plan and guided all involved parties through the entire process.
- **1300-1312 King Street Excavations:** Project Manager for excavations on two adjacent parcels in the City of Alexandria, Virginia. This project required extensive coordination with Alexandria Archaeology and the client. The work consisting of the excavation of domestic-related features associated with the occupation of the lots as well as the mechanical excavation of an 1820s brick basement. Extensive architectural analysis was completed on the basement as it contained several sub-features that were not contemporaneous with the construction of the home. These features included a barrel well, a brick well which was later modified as a cistern, and an elaborate covered brick drain system.
- **Riverfront Data Recovery:** Project Manager and Archaeological Lead on four separate excavations within the planned Riverfront Park in the City of Fredericksburg, Virginia. Work on this large site consisted of the removal of the topsoil to expose all archaeological features. The most significant of these features was a burial feature that contained the disarticulated remains of three Civil War soldiers and the bundled up remains of one coat and pair of pants, complete personal possessions in the pockets.



- **Skiffe's Creek Archaeological Collections Curation and Conservation Assessment:** Project Manager for collections assessment for some of Virginia's most historic sites. The goals of the project were to assess the current state of the collections and determine the level of curation and conservation needs. This data was then used to make recommendations on the level of effort, including fee estimates for completing the recommended curation and conservation tasks.
- **Hurkamp Park Monitoring:** Project Manager for utility line monitoring prior to ground disturbing activities associated with the installation of proposed bathroom which resulted in the unanticipated discovery of human remains. Through extensive coordination with the City of Fredericksburg and DHR, the project was able to move forward without disrupting any burials.
- **Shockoe Valley Improvement Project:** Archaeological Team Lead for Phase II investigations associated with the limits of disturbance associated with the planned road improvements. This work involved the excavation of 18 backhoe trenches to expose potential building foundations associated with the mid- to late-nineteenth through early-twentieth century occupation of Shockoe Valley in the City of Richmond, Virginia.
- **Sentinel Square Project:** Project Manager for terminally exhaustive excavations in Washington, D.C. along K Street. This work involved an extensive archival study and the removal of the existing pavement and fill to expose late-nineteenth through early-twentieth century building foundations prior to archaeological investigations. While little cultural material was recovered due to modern disturbances the archival records helped to build a substantial narrative of the property.
- **Greenfield Outbuilding Relocation Project:** Lab Manger for the archaeological excavations for the Greenfield Outbuilding Relocation Project. Prior to the relocation of the historic building archaeological investigations were warranted at the new site as well as at the current location of the building to ensure compliance with requests from the county. The remnants of a refuse midden related to fences that spatially separated the kitchen yard from the yard of the main house provided evidence for processes of racialization and segregation that continued to define the African American experience after the Civil War.
- **DC2RVA Survey:** Archaeological Team Lead for Phase I archaeological survey associated with the DC2RVA high speed rail project which is part of a larger nation-wide high speed intercity passenger rail plan. Work for this project included background reviews for the entire corridor, a predictive model to determined areas of archaeological potential, and archaeological survey of all locations deemed to have moderate to high potential for archaeological deposits.
- **Southeast High Speed Rail:** Archaeological Team Lead for archaeological tasks occurring within Virginia. This work involved Phase I identification as well as Phase II testing at several sites identified throughout the project. Sites investigated at the Phase II level include a large Middle Woodland camp, an early-nineteenth century home known as Arrowfield, the Kress Box Factory,



and several late-nineteenth century domestic sites. This project required extensive coordination as several consulting parties were involved.

- **Bloody Angle Pedestrian Train:** Archaeological Team Lead for Phase I survey within the area known as Bloody Angle within the Spotsylvania Courthouse Battlefield. This work was done at the request of the National Park Service (NPS) and involved the standard survey methodology as well as close-interval metal detecting.
- **Petersburg Five Forks Visitor Center:** Project Manager for archaeological survey within the Petersburg Five Forks Battlefield conducted on behalf of the NPS. The archaeological studies included standard subsurface investigations augmented by close-interval metal detection.
- **Archaeological Survey Associated with the Stafford Civil War Park:** Project Manager for archaeological and cultural landscape studies prior to creation of the historic park. Resources identified during this work included two eighteenth century sandstone quarries, sandstone bridge abutments, an intact corduroy road, three Civil War era batteries, and two Civil War camps. This project involved extension coordination with the local metal detector enthusiasts, the client, and the county.
- **Data Recovery Excavations at the White-Taliaferro Site:** Data recovery excavations at a late-seventeenth through early-nineteenth century domestic site with English basement, brick well, brick dairy, earthfast structures, and servants quarters. While not a compliance project this study involved coordination with the landowner/developer, adjacent landowners, and the DHR.
- **Losey Site Excavations:** Field personnel on large data recovery of stratified Native American village site. The project was part of a larger road alignment being conducted by the Pennsylvania Department of Transportation. This site included the remains of long house structures, fire pits, burials, and a keyhole structure.



KATHERINE M. STEFANIC, M.A.

Principal Investigator, History/Architecture

EDUCATION

2018, MA, Architectural History, University of Virginia (with certificate in Historic Preservation)

2009, BA, History and Spanish, University of Virginia

REGISTRATION(S):

Meets Secretary of Interior's Standards for History and Architectural History

PROFESSIONAL AFFILIATIONS:

- Current board member, Junior Board of Historic Richmond
- Current member, Vernacular Architecture Forum
- Current member, Southeast Chapter of the Society of Architectural Historians
- Current member, National Trust for Historic Preservation
- Former member, Membership Committee of the Vernacular Architecture Forum
- Former member, Victorian Society in America and Alumni Association

SUMMARY OF EXPERIENCE

Ms. Katherine M. Stefanic (née Watts) has over eight years of professional experience in the field of historic research, architectural history, and cultural resource management (CRM). Ms. Stefanic is a principal investigator and architectural historian and has conducted reconnaissance and intensive architectural history surveys in Virginia, Maryland, North Carolina, South Carolina, New Jersey, Delaware, the District of Columbia, and internationally in Belgium, France, and the Netherlands. Prior to joining Gray & Pape in May 2021, Ms. Stefanic was a Field Director and Architectural Historian at Dovetail Cultural Resource Group in Fredericksburg, VA. Previously, she worked in the non-profit sector in Washington, D.C. for six years. While completing her graduate studies she had two internships, with the Historic Charleston Foundation in South Carolina, and with the Farmington Historical Society Foundation in Charlottesville, VA.

She has worked on many Phase I and II architectural surveys and led three National Register Nominations and a Tax Credit project. Her tasks include primary archival research; reconnaissance and intensive-level architectural field surveys; report writing and production; and data entry into State Historic Preservation Office databases. She meets or exceeds the Secretary of Interior Standards for Historian and Architectural Historian.

A 2009 and 2018 graduate of the University of Virginia, Ms. Stefanic has extensive cultural resource experience in the Mid-Atlantic region. In addition to architectural history surveys, she has completed HABS Level II and III documentation and mitigation for Section 106 compliance. She also completed an architectural forensic analysis of a demolished nineteenth-century house and extensive archival research in Annapolis, Maryland.

As a project manager, Ms. Stefanic has considerable experience formulating project operation and investigation plans pertaining to regulations and polices, individual project requirements, and client schedules. Ms. Stefanic has conducted architectural survey and intensive studies for a variety of project types including transportation and bridges, private development projects, Federal agencies Section 106



and 110 compliance, and cost shares with local government and State Historic Preservation Offices. Ms. Stefanic has worked with a variety of building types, including twentieth-century suburban houses and commercial and institutional properties, twentieth-century cemeteries and associated religious and support buildings, nineteenth-century rural farms, and African American religious, fraternal, and educational buildings.

Overall, Ms. Stefanic has worked on dozens of cultural resources projects, many of which she served as Project Manager. She has been the lead or co-author on numerous technical reports related to these projects. Below is a very select project experience list outlining her capabilities and experience.

SELECT PROJECT EXPERIENCE – WITH GRAY & PAPE

- **ABMC, Agency-wide Preservation Context Study:** Ms. Stefanic served as an architectural historian and one of the lead researchers and authors for the agency-wide Preservation Context Study (PCS) and a Cultural Resources Management Plan (CRMP) Framework. The PCS is intended to support ABMC as it implements its Preservation Policy by outlining the broad patterns and themes associated with the agency's design and construction of cemeteries and monuments during the past 100 years. The PCS will support the development of individual management plans. The CRMP Framework provides an annotated outline and guidance to the agency for scoping and preparing site-specific CRMPs.
- **ABMC, Cultural Resources Management Plan, Aisne-Marne American Cemetery and Belleau Wood, France (ongoing):** Ms. Stefanic currently is serving as an architectural historian and one of the lead researchers and authors for the Cultural Resources Management Plan (CRMP) for Aisne-Marne American Cemetery and Belleau Wood. Most of the research for the project is being conducted at the National Archives and Records Administration (NARA) in College Park, Maryland. The CRMP will provide guidance on management of the site's cultural resources and their significance at the individual site level.
- **HABS Level II Recordation of National Institutes of Health (NIH) Laboratory Buildings 29 and 29A, Montgomery County, Maryland:** Completed two HABS Level II recordation packages for Buildings 29 and 29A on the Bethesda campus of NIH. Worked on this collaborative project with the NIH, the FDA, SmithGroup, and large-format photographer Rob Tucher; the scientific achievements that occurred within these two utilitarian buildings changed the course of vaccine history and 20th-century public health. An online exhibition is now available on the Office of NIH History and Stetten Museum website that shares information about the buildings and the scientists who worked there for more than 50 years.
- **SmithGroup, Administrative History of National Capital Parks-East, Washington, D.C.:** Historian for the subcontracted historical research and lead author in support of an administrative history of the National Capital Parks- East (NACE) portfolio of park from 1924 to 2020. NACE park units include a diverse set of resources ranging from the Frederick Douglass National Historic Site to Piscataway Park. SmithGroup was the lead consultant to NPS for this project.
- **SmithGroup, Historic Structure Report for African American CCC Structures along the Chesapeake & Ohio Canal, Maryland:** Historian for the subcontracted historical research in



support of an HSR for the NPS National Capital Region and the C&O Canal National Historical Park focused on African American CCC camp activities along the C&O Canal from 1938–42. SmithGroup was the lead consultant to NPS for this project.

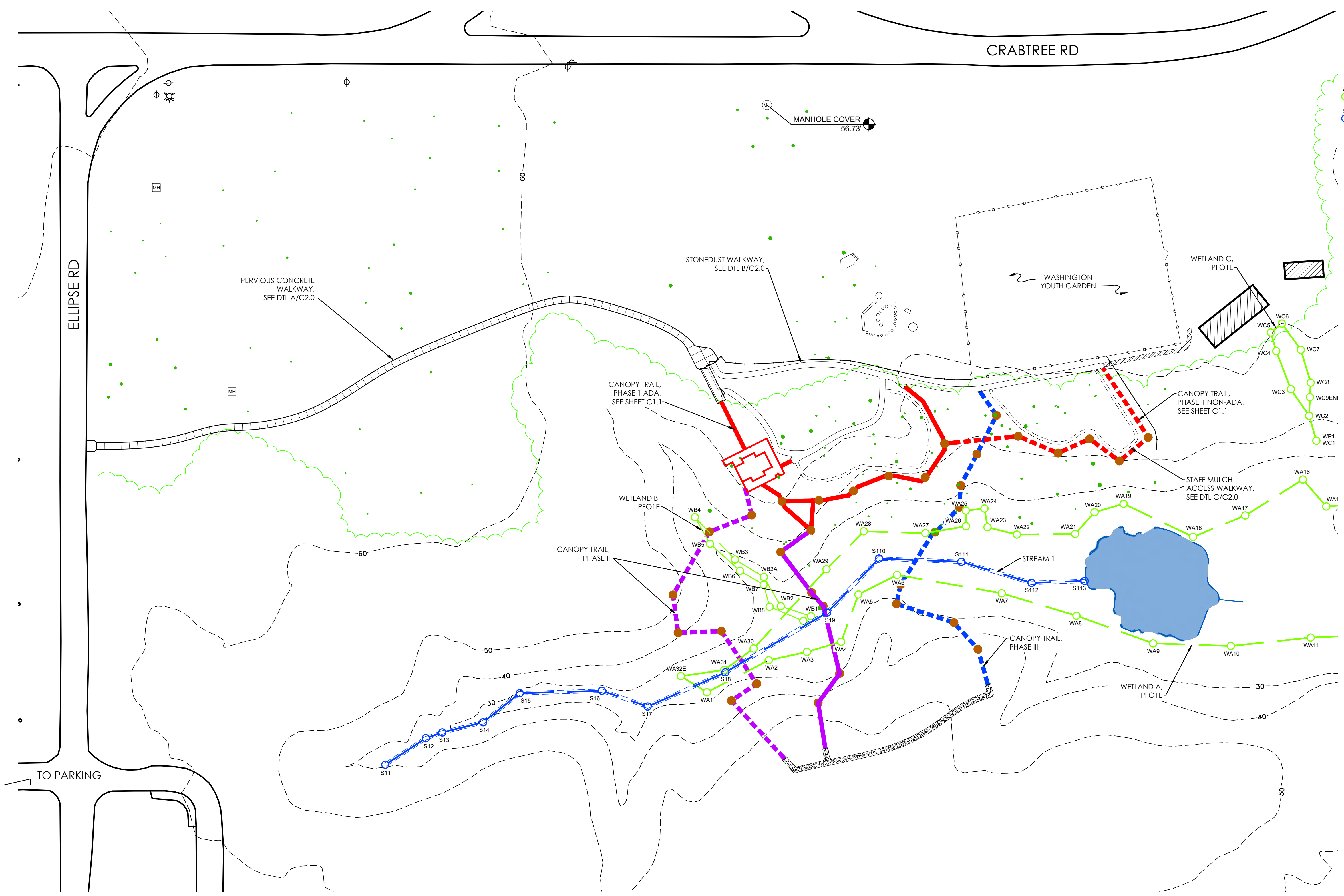
- **SmithGroup, Cultural Landscape Inventories for the Long Bridge Project, Virginia and Washington, D.C.:** Primary author and architectural historian for the Gray & Pape components of three Cultural Landscape Inventories (CLIs) that were required as a component of mitigation for the Long Bridge Project rail crossing of the Potomac. The CLIs covered a portion of the Mount Vernon Memorial Highway, East Potomac Park, and West Potomac Park. SmithGroup was the lead consultant for this project, with the additional contributions of RHI.
- **NASA Agency-wide Section 106 Program Alternative Development, U.S. (Nationwide):** Ms. Stefanic is a part of Gray & Pape’s team working with NASA’s FPO to develop alternative procedures to Section 106 compliance tailored to the agency’s unique mission and asset types. This multi-year effort involves close coordination with NASA’s environmental, master planning, and facilities personnel to develop feasible procedures that enable the agency to more efficiently and effectively meet compliance responsibilities and achieve preservation outcomes with broad public benefit.
- **NASA Fiscal Year 21–23 Triennial Report, U.S. (Nationwide):** Ms. Stefanic worked with NASA’s FPO and the Center Cultural Resource Managers to develop the 2023 triennial report submitted to the Advisory Council on Historic Preservation in compliance with Executive Order (EO) 13287, entitled *Preserve America*. Section 3 of EO 13287 requires NASA to submit a report on its progress in identifying, protecting, and using historic properties in the agency’s ownership, as mandated by the National Historic Preservation Act (NHPA) of 1966, as amended.

PROJECT EXPERIENCE – PRIOR TO GRAY & PAPE

- **Phase I Architectural Survey of African American Historic Resources, Fauquier County, Virginia:** Supervised a Phase I architectural survey of 47 African American historic resources for the cost-share project between Virginia Department of Historic Resources and Fauquier County. The project also included significant background research and community engagement, and preparation of a historic context for African American communities in Fauquier County, in addition to a report on the survey findings. Supervised and completed field work and primary report author.
- **Archival Research for a Phase I Archaeological Survey of Fort Pickett MA46, Nottoway County, Virginia:** Archival research and full chains of title on more than 30 parcels obtained by the U.S. Army to create Fort Pickett in 1942. Extensive research found many African American landowners and research was conducted to tell the story of nineteenth and early-twentieth century occupation of the land, prior to Fort formation. Consultation with archaeologists with historic maps and plats to compare former house sites with artifacts found during survey. Project historian and report author.

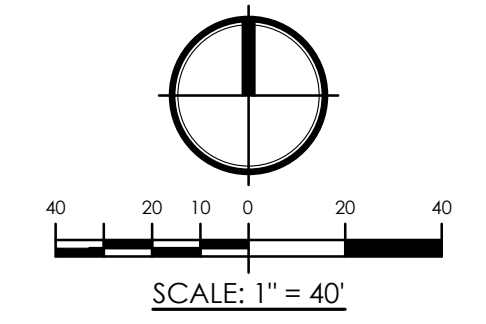
APPENDIX D: PROPOSED CANOPY TRAIL DRAWINGS

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 C:\Users\johndoe\OneDrive\Documents\Projects\National Arboretum\Canopy Trail\Overall Site Plan.dwg
 Plot: 6/24/2024 4:55 PM
 User: johndoe



LEGEND

- 140 --- EXISTING CONTOUR 10' INTERVAL
- 80 --- APPROX. EDGE OF WATER
- 80 --- APPROX. EDGE OF USACE/DOEE WETLAND
- 80 --- APPROX. CL OF USACE/DOEE STREAM
- EXISTING TREE
- PROP. PLATFORM
- PHASE I ADA TRAIL
- PHASE I NON ADA TRAIL
- PHASE II ADA TRAIL
- PHASE II NON ADA TRAIL
- PHASE III NON ADA TRAIL
- EXISTING PATH
- CONCRETE WALKWAY
- STONEDUST WALKWAY
- STAFF MULCH WALKWAY
- SURVEY BENCHMARK (VERT. DATUM)
- EXISTING HYDRANT / WATER VALVE
- EXISTING MANHOLE / CATCH BASIN



OVERALL SITE PLAN
SCALE: 1" = 40'

- SITE NOTES:**
- SITE BASE MAP OBTAINED FROM A PLAN DEVELOPED BY KCI TECHNOLOGIES ENTITLED "TOPOGRAPHICAL SURVEY FOR UNITED STATES NATIONAL ARBORETUM", SHEETS 4 & 5, DATED 12-24-96. PROPER & O'LEARY ENGINEERING, DPC MAKES NO REPRESENTATION TO THE CORRECTNESS OF SAID MAP.
 - TOPOGRAPHY DEVELOPED FROM A LIDAR SURVEY CONDUCTED BY PROPER & O'LEARY ENGINEERING, DPC DURING THE WEEK OF MARCH 13, 2023.
 - TOPOGRAPHIC DATUM IS ASSUMED TO BE MATCHED TO AN ELEVATION OF A MANHOLE GIVEN PER THE BASE MAP REFERENCED IN NOTE #1. PROPER & O'LEARY ENGINEERING MAKES NO REPRESENTATION TO THE CORRECTNESS OF THE DATUM.
 - POND BOUNDARY IS ESTIMATED FROM LIDAR SURVEY PER NOTE #2.
 - WETLAND AND STREAM INFORMATION OBTAINED FROM A CAD PLAN AND REPORT DEVELOPED BY LRS FEDERAL LLC, ENTITLED "UNITED STATES NATIONAL ARBORETUM - CANOPY TRAIL WETLAND DELINEATION REPORT", DATED JULY 2022.
 - NO COORDINATE SYSTEM IS ASSOCIATED WITH THE BASE MAP PER NOTE #1. LOCATIONS OF THE WETLAND AND STREAM DELINEATION FLAGS OBTAINED FROM THE PLAN PER NOTE #4 HAVE BEEN ADDED TO THIS PLAN BY OVERLAYING FROM SATELLITE IMAGERY. THE BASE POINT OF THE OVERLAY BEING THE RIGHT-HAND CORNER OF THE CONCRETE SIDEWALK WHERE IT ABUTS AZALEA ROAD NE NEAR THE INTERSECTION WITH ELLIPSE ROAD NE. IT IS ASSUMED THAT THIS METHOD OF LOCATING THE FLAGS CONTAINS HORIZONTAL ERROR OF 3' +/-.

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DATE: 7-11-23	
SCALE: 1" = 40'	
DRAWN BY: ARL	CHECKED BY: DBP
DESIGNED BY: DBP	APPROVED BY: -

REVISIONS:	
DATE	DESCRIPTION
6-24-24	UPDATE TREEHOUSE FOOTPRINT

NATIONAL ARBORETUM
CANOPY TRAIL
DISTRICT OF COLUMBIA
C/O WASHINGTON

OVERALL SITE PLAN

C1.0

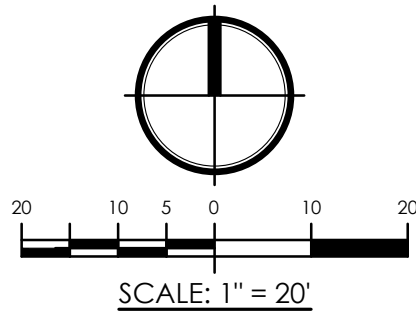
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LEGEND

- 52.73 EXISTING SPOT ELEVATION
- - - - - EXISTING CONTOUR 2' INTERVAL
- - - - - EXISTING CONTOUR 10' INTERVAL
- - - - - APPROX. EDGE OF WATER
- W # W # APPROX. EDGE OF USACE/DOEE WETLAND
- S # S # APPROX. CL OF USACE/DOEE STREAM
- - - - - EXISTING FENCE
- - - - - PROPOSED FENCE
- ▭ PROPOSED GATE
- ▭ NON-ADA BRIDGE
- ▭ ADA BRIDGE
- ▭ PROPOSED PLATFORM
- ▭ EXISTING PATH
- ▭ CONCRETE WALKWAY
- ▭ STONEDUST WALKWAY
- ▭ STAFF MULCH WALKWAY
- EXISTING TREE

PHASE I SITE PLAN
SCALE: 1" = 20'



SITE NOTES:

1. SITE BASE MAP OBTAINED FROM A PLAN DEVELOPED BY KCI TECHNOLOGIES ENTITLED "TOPOGRAPHICAL SURVEY FOR UNITED STATES NATIONAL ARBORETUM", SHEETS 4 & 5, DATED 12-24-96. PROPER & O'LEARY ENGINEERING, DPC MAKES NO REPRESENTATION TO THE CORRECTNESS OF SAID MAP.
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DESIGNED BY: DBP	APPROVED BY: -

REVISIONS:	
DATE	DESCRIPTION
6-24-24	UPDATE TREEHOUSE FOOTPRINT

NATIONAL ARBORETUM
CANOPY TRAIL

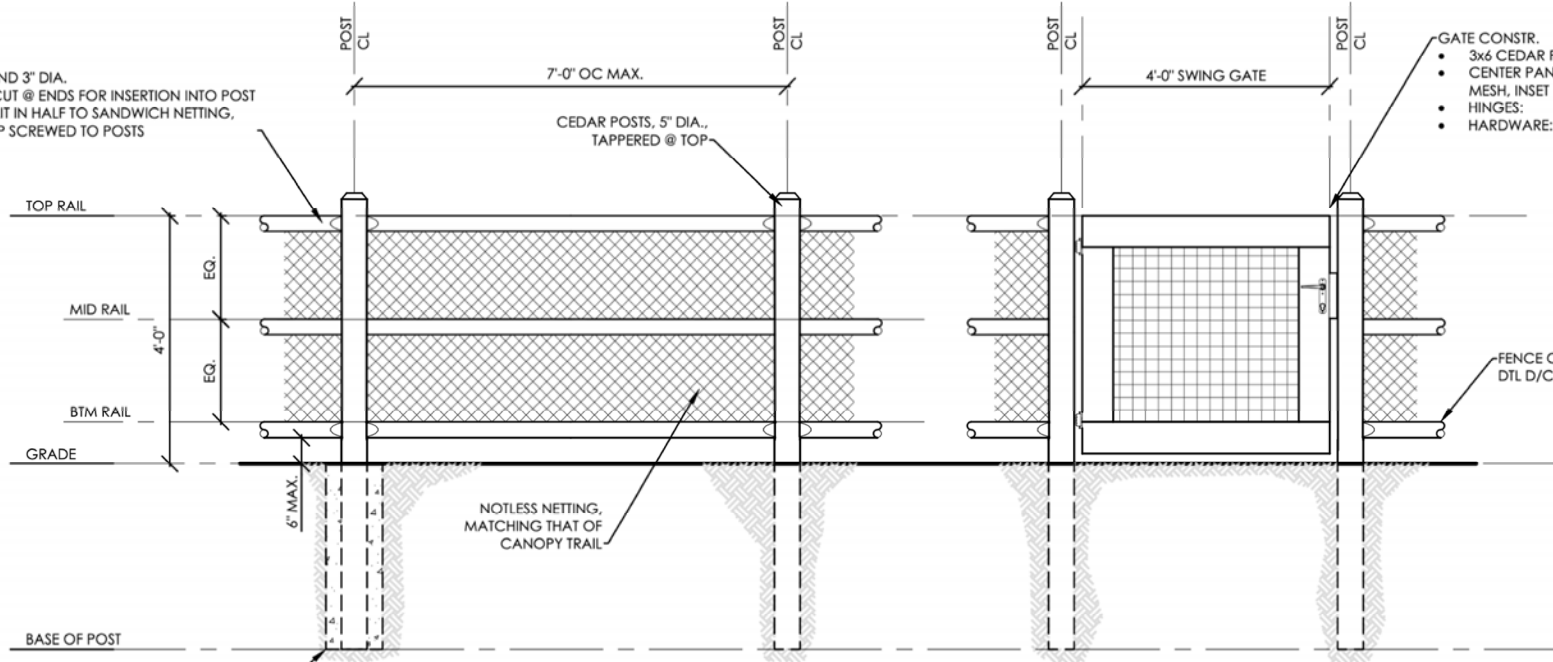
DISTRICT OF COLUMBIA

C/O WASHINGTON

PHASE I SITE PLAN

C1.1

- FENCE RAILS
- CEDAR ROUND 3" DIA.
 - TOP & BTM CUT @ ENDS FOR INSERTION INTO POST
 - MID-RAIL SPLIT IN HALF TO SANDWICH NETTING.
 - MID-RAIL TOP SCREWED TO POSTS

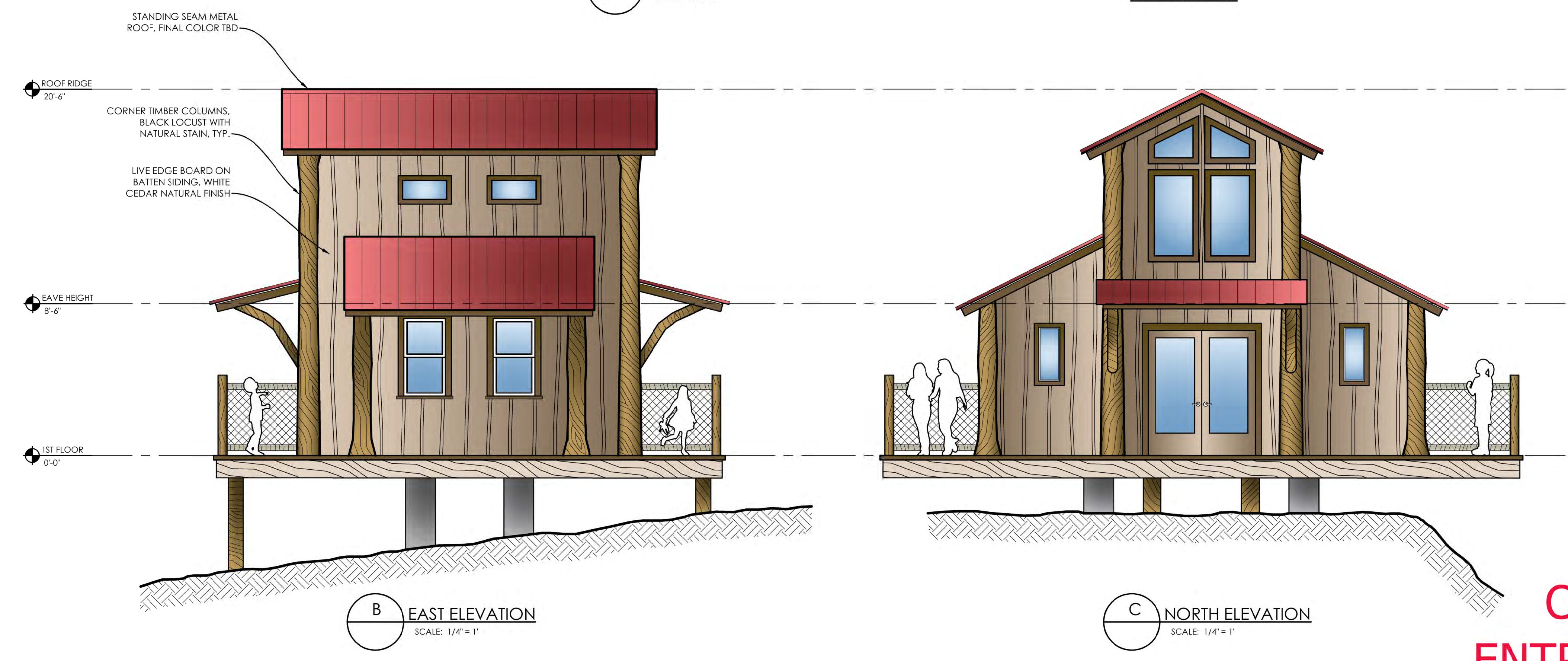
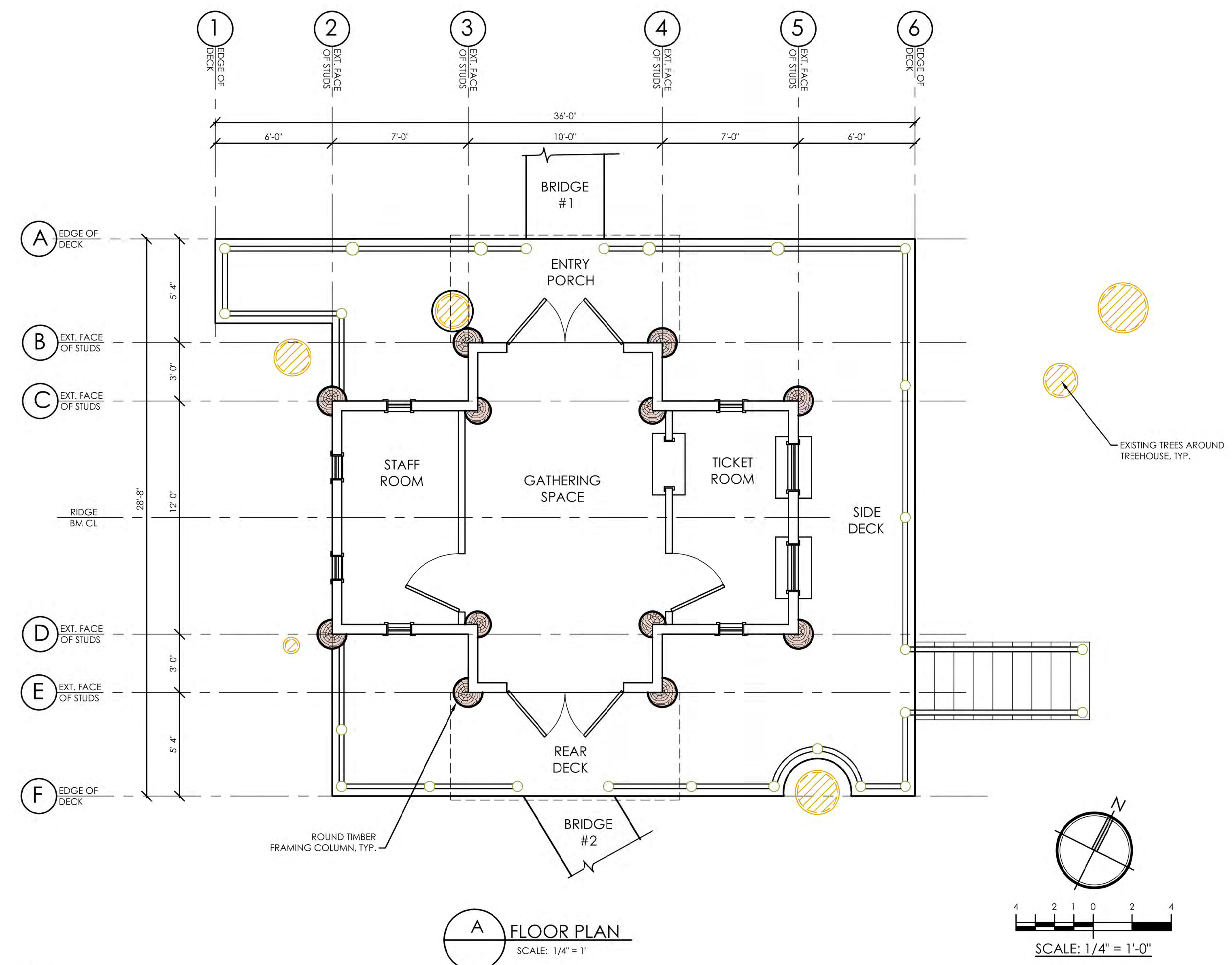


CONC. BACKFILL, 8" DIA., AROUND ALL POSTS, 4,000 PSI, TYP.

D PERIMETER FENCE
SCALE: 1/2" = 1'

E ACCESS GATE, TYP.
SCALE: 1/2" = 1'

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STANDING SEAM METAL ROOF, FINAL COLOR TBD
 ROOF RIDGE 20'-6"
 CORNER TIMBER COLUMNS, BLACK LOCUST WITH NATURAL STAIN, TYP.
 LIVE EDGE BOARD ON BATTEN SIDING, WHITE CEDAR NATURAL FINISH
 EAVE HEIGHT 3'-6"
 1ST FLOOR 0'-0"

Concept Plan
ENTRY TREEHOUSE
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DATE :	03/19/2024
SCALE :	1/4" = 1'
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CHECKED BY :	DBP
DESIGNED BY :	DBP
APPROVED BY :	

REVISIONS:

DATE	DESCRIPTION

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 CANOPY TRAIL
 DISTRICT OF COLUMBIA
 C/O WASHINGTON

TREE HOUSE
 FLOOR PLAN &
 ELEVATIONS

B1.0