GEOARCHEOLOGICAL INVESTIGATION FOR THE WASHINGTON MONUMENT VISITOR SCREENING FACILITY NATIONAL MALL AND MEMORIAL PARKS DISTRICT OF COLUMBIA

FINAL TECHNICAL REPORT

CONTRACT NO. 1443C2000090700, TASK ORDER T2011090248

PREPARED FOR:

NATIONAL PARK SERVICE
DENVER SERVICE CENTER
12795 W. Alameda Parkway
Denver, Colorado 80225-0287

and

BEYER BLINDER BELLE
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Washington, D.C. 20007

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EXECUTIVE SUMMARY

On behalf of the National Park Service, Denver Service Center, The Louis Berger Group, Inc. (LBG), completed a program of geoarcheological testing for the proposed Washington Monument Visitor Screening Facility in Washington, D.C. The National Park Service (NPS) is evaluating various alternatives that would improve security and visitor screening at the Washington Monument. In 2004-2006 the NPS completed a program of security improvements for the Washington Monument that included a comprehensive landscape solution for a perimeter vehicular barrier system and an associated landscape design. The current visitor screening facility, intended as a temporary facility, stands at the base on the Monument's east face. Removal and replacement of this facility is the action that is now being evaluated under an Environmental Assessment (EA).

This geoarcheological study was designed to support the EA and ongoing Section 106 consultation for the Visitor Screening Facility, with specific attention to possible impacts to archeological resources. The goals of this study were to assess the general condition of the landscape, focusing on identification of prehistoric or historic landscapes that might contain archeological resources.

A total of 12 borings was made in the study area (or area of potential effects), which was defined to include the security zone established in the 2004-2006 program. This is an elliptical area of roughly 14 acres, centered on the Monument and defined by a low retaining wall and pathway. Using a Geoprobe, 12 borings were placed in a cruciform pattern oriented on the north-south and east-west axes from the Monument. The borings were advanced to depths ranging from 15 to 26 feet below ground surface, which was sufficient to reach the level were a buried natural landscape would have been present, given favorable preservation conditions.

Although the testing confirmed that the entire study area is covered by fill deposits, the results were somewhat surprising in that eight of the 12 borings contained an intact buried landscape. Fill depths ranged from roughly 6 to 20 feet, with greater depths in the areas nearest the Monument. The buried surfaces were found at elevations ranging from about 15 to 22 feet above mean sea level. These elevations depict the natural contours of the site as an elevated landform overlooking the original confluence of Tiber Creek and the Potomac River. This buried natural landscape, represented by a plowed surface soil (Ap-horizon or plowzone), was typically represented by a dark brown silt loam showing evidence of plowing. In some cases the Ap-horizon had been slightly truncated, indicative of minor grading of the landscape during the historic period. The fill deposits overlying the natural landscape would date to after 1880, when foundation work was completed and a raised terrace was created at the base of the Monument. Beneath the buried landscape represented by the Ap-horizon, an older landscape surface or paleolandscape is recognizable by a blanket of loess that formed during the Younger Dryas climatic episode, roughly 10,850 to 9550 BC.

This study's findings point to the need for further consideration of *possible* effects of the project on *possible* archeological resources. The previously identified Monument Grounds Site (51NW35) is the resource of primary concern, but its location cannot be pinpointed with any accuracy. Alternative project designs are now in the conceptual stage, so details regarding footprints and associated ground disturbance are speculative. Project alternatives that would place the footprint of the new screening facility within the existing plaza area might be the most benign in terms of potential effects on archeological resources, provided that any ground-disturbing activities are confined to the zone of post-1880 fill deposits that are of no archeological interest. The "New Approach through the Landscape" alternative would involve a below-grade concourse between the Monument and the Lodge, where the buried landscape was identified in Borings WAMO-4, WAMO-5 and WAMO-8; if this project alternative is chosen, careful attention should be given to its potential impact to archeological resources.

PUBLIC SUMMARY

As an element of the planning studies for the Washington Monument Visitor Screening Facility, the National Park Service has sponsored a geoarcheological study to determine whether any important archeological resources could be affected by the construction of the new facility. The new visitor screening facility will be located within the Washington Monument Grounds, at the heart of the city's monumental core area. The Monument Grounds were set aside as a public reservation in the L'Enfant city plan of 1790. In the L'Enfant Plan the Monument Grounds correspond to the intersection of two broad "avenues" of public land, one extending south from the President's House, the other extending west from the Capitol. Although the Washington Monument has been a public reservation since the founding the City of Washington, it does have an interesting history, and much of that history is written in the archeological record.

A great deal of historical information is available for this area because of its association with the Washington Monument, which is a national icon. But other than its general topography, the present condition of the site offers little evidence of the natural environment of the District as it existed in the late eighteenth century when the capital city was founded. Before the City of Washington was laid out in 1791, the Washington Monument Grounds bordered the channel of Tiber Creek, one of the District's natural inland waterways. The Washington Monument Grounds were then on the south bank of Tiber Creek, partially on dry land and partially within the creek bed. As the city developed in the nineteenth century, Tiber Creek was transformed first into the Washington Canal, then into the B Street Sewer, and then covered over and turned into Constitution Avenue.

Before European colonization, Native American (Indian) groups camped and built villages along the shores of the Potomac and Anacostia rivers, as well as the inland waterways such as Rock Creek and Tiber Creek. The Potomac River valley was inhabited by Native Americans starting at about 13,000 years before the present. Until about 4,000 years ago, the region was used by small transient foraging groups; the archeological evidence of their camp sites typically consists of the stone tools and the debris that resulted from the manufacture or resharpening of stone tools. Around 2000 BC, people began quarrying huge numbers of cobbles from the hill flanks along Rock Creek. These cobbles were shaped into rough oval forms, then carried to campsites for final trimming into broad spearpoints of the Savannah River style. The people who made broadspears also made tub-shaped cooking vessels by carving soapstone, which was hacked out of bedrock in the District of Columbia and nearby areas of Maryland and northern Virginia. A few centuries later (about 1000 BC), ceramic pots replaced these soapstone vessels. The Native American societies were linked by long-distance trade networks, so the stone bowls reached groups living far away from the soapstone sources.

Long-distance exchange seems to have alternately waxed and waned over the following 2,000 years. Chipped-stone tools, tubular stone smoking pipes, and other distinctive export items from the Adena culture of the Ohio Valley were deposited in well-appointed burials in Delaware in the period from around 400 BC to AD 1. These artifacts presumably were carried down the Potomac eastward from the Adena heartland. After the demise of the Adena mortuary cult, a regional trade network continued in the Middle Atlantic region, circulating items such as purplish argillite from New Jersey and rhyolite from central Maryland.

About AD 600 to 1000, long-distance trade routes were re-established, again in a context of mortuary ritual. This time, the network linked Middle Atlantic societies to groups in New York, New England, Ontario, Michigan, and Ohio. Distinctive items exchanged among these peoples included antler combs, fossil sharks' teeth, polished stone gorgets, and stone platform pipes with tulip-shaped bowls. A cremation burial containing such artifacts, and dated to about AD 750, was discovered several years ago

at the mouth of Rock Creek, beneath a ramp to the Whitehurst Freeway. The same site produced evidence of a later occupation by maize (corn)-growing villagers in the Late Woodland period (AD 1000 to 1600). At the time of first contact with English explorers in 1608, a major village of the Algonquian-speaking Nacotchtanks was located beside the Anacostia River (which was named for this group).

In the early 1800s the landscape along lower Tiber Creek had not changed much from its initial configuration, and the Washington Monument Grounds were part of an undeveloped area that was used primarily for pasture. Before the Civil War, construction of the Washington Monument progressed slowly and the surrounding grounds were largely vacant, used only for pasture. During the Civil War construction of the Monument ceased and the grounds were used for cattle grazing and military maneuvers. The Monument Grounds acquired names such as Beef Depot, the Cattle Meadow, and the Washington National Cattle Yard. As the war progressed, various quarters, storehouses, stables, pens, sheds, and a slaughterhouse appeared. During the final phase of construction of the Monument, the grounds were covered with shops, machinery, a railroad siding, and possibly barracks for workmen. Landscaping of the grounds, completed in the 1880s, included construction of carriageways and pedestrian paths through the grounds.

World War I returned the city to a wartime mentality, and once again the Washington Monument Grounds were given over, at least partially, to grazing. Recreational demands for the city's public lands increased during the early twentieth century; one result of this was the appearance of baseball diamonds, football and lacrosse fields, tennis courts, an archery range, a croquet court, a miniature golf course, and a swimming pool and bathhouse complex. During World War II part of the grounds was taken over by temporary military office buildings. The Age of the Automobile brought a series of changes to the adjacent roadway system in the late twentieth century.

The present geoarcheological study included a combination of archival research and field investigation of the site. The archival research focused on the site's physical development and historic uses. Historical maps were especially important, and these were available from a variety of sources. Other sources included many historical studies that describe the city's natural and early historic environment and its physical development for the urban period.

The geoarcheological field investigation was conducted by a soil scientist who used a truck-mounted probe that can examine deeply buried soils with minimal impact to the landscape. The test borings showed that the entire study area is covered by highly variable earthen fill deposits, but the results were somewhat surprising in that eight of the 12 borings contained evidence of the landscape as it appeared before 1880 when construction of the Monument was completed. These results point to the possibility that important archeological resources may be present on the Monument Grounds.

Of potentially the greatest interest is a Native American occupation of the Monument Grounds that is known on the basis of artifacts collected in the late 1800s. This artifact collection, now held by the Smithsonian Institution, includes artifacts that Native American use of the area for at least 7,000 years. Other potential archaeological resources that could be present include features related to the construction of the Washington Monument, such as a workshop, barracks, or masonry debris, or resources associated with the Civil War-era occupation of the Monument Grounds.

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INTRODUCTION

SCOPE AND LOCATION OF STUDY

On behalf of the National Park Service, Denver Service Center, The Louis Berger Group, Inc. (LBG), completed a program of geoarcheological testing for the proposed Washington Monument Visitor Screening Facility in Washington, D.C. Because of the need for heightened security at the Washington Monument that followed the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma City and the terrorist attacks of September 11, 2001, the National Park Service (NPS) is evaluating various alternatives that would improve security and visitor screening at the Washington Monument. In 2004-2006 the NPS completed a program of security improvements for the Washington Monument that included a comprehensive landscape solution for a perimeter vehicular barrier system and an associated landscape design. The current visitor screening facility, intended as a temporary facility, stands at the base on the Monument's east face. Removal and replacement of this facility is the action that is now being evaluated under an Environmental Assessment (EA). Construction of the new visitor screening facility would complete the overall program of security improvements the Washington Monument. This geoarcheological study was designed to support the EA with specific attention to possible impacts to archeological resources from the removal and replacement of the screening facility.

The Washington Monument is a formal landscape that is managed by the NPS's National Mall & Memorial Parks (NAMA). This landscape is bounded on the north and south by Constitution and Maine avenues, and on the east and west by 14th and 17th streets, NW (Figure 1). For purposes of this investigation, a more narrowly defined study area, or area of potential effects (APE), has been defined, coinciding with the security zone established by the 2004-2006 program; this area is defined by an elliptical wall centered on the Monument and measures approximately 1,000 feet east-west by 775 feet north-south (Figure 2). All ground-disturbing activities that could potentially impact archeological resources would be confined to this area, based on the design alternatives that are now under consideration. New alternatives or modifications to existing alternatives could emerge during ongoing design development and agency consultation; however, it is likely that areas of ground disturbance will be confined to the area immediately surrounding the Monument and on the axis between the Monument and the Washington Monument Lodge, where various ramps, walkways, and underground screening facilities might cut into the existing landscape. Project elements that would require ground disturbance include below-grade construction of a concourse or walkway between the Monument and the Monument Lodge; construction of a new entrance to the Monument, below the grade of the present plaza; and extension of the existing elevator system to a below-grade screening facility.

STUDY GOALS AND METHODOLOGY

The goals of the geoarcheological study were to assess the general condition of the landscape, focusing on identification of prehistoric or historic landscapes that might contain archeological resources. These goals can be expressed as a number of specific questions that were developed to guide the investigation:

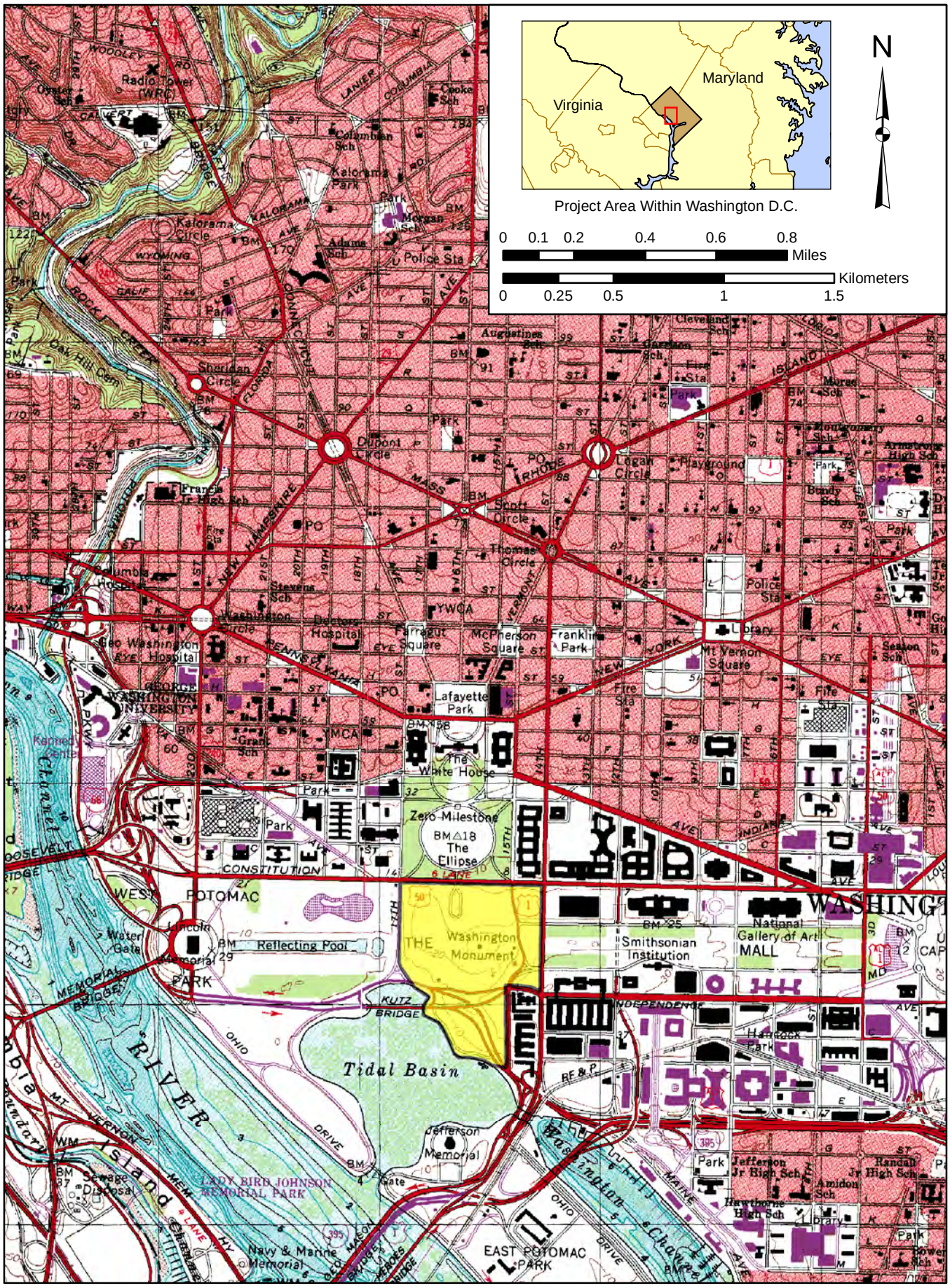

FIGURE 1: Location of the Washington Monument

SOURCE: USGS 7.5-Minute Quadrangle, Washington West, DC-MD-VA 1965 (Photorevised 1983)

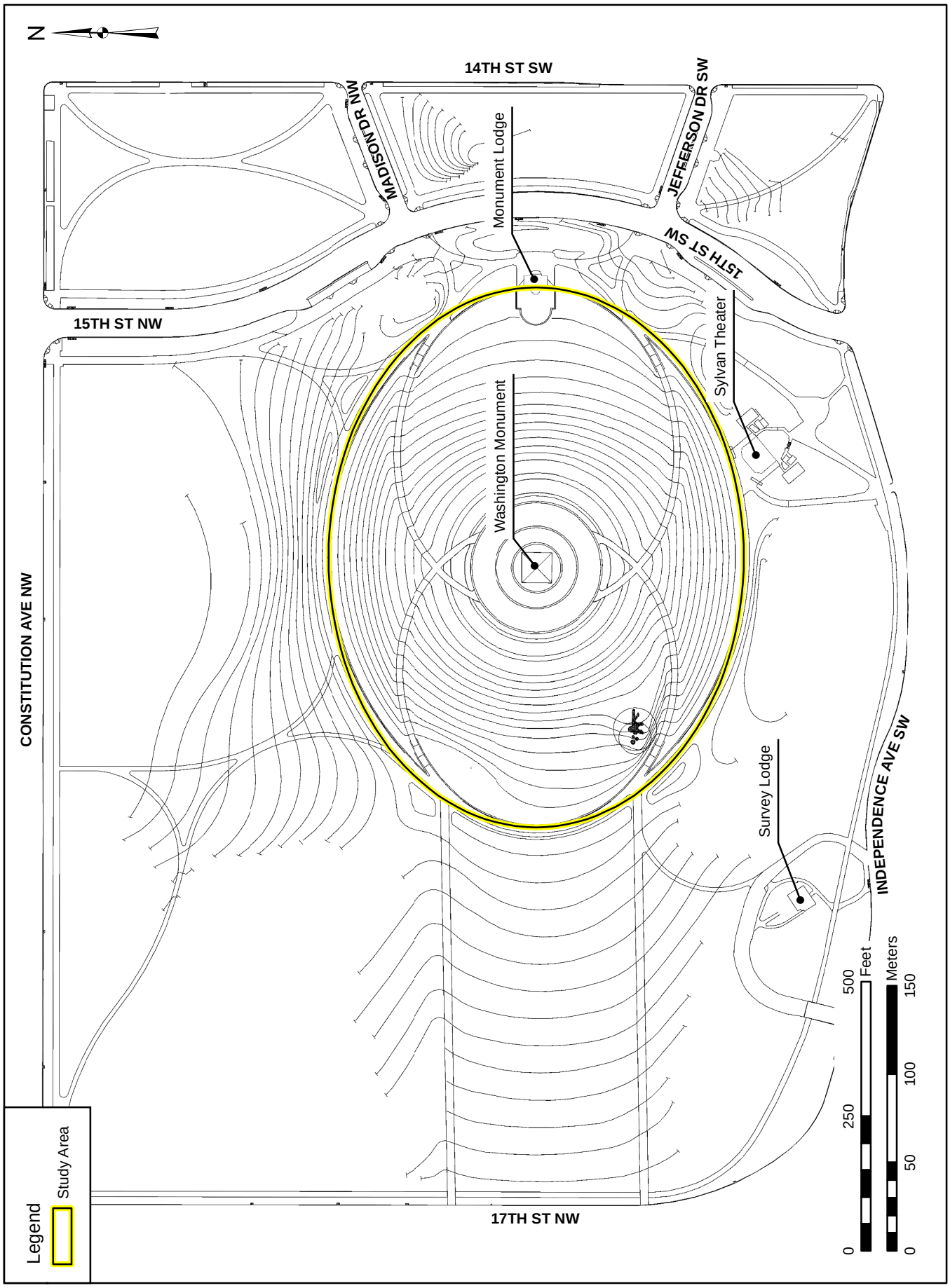

FIGURE 2: Study Area

- Does the study area contain areas of natural landscape associated with the bank of the lower Tiber Creek?
- What is the likely level of integrity associated with potential prehistoric and historic archeological resources in subsurface contexts in the study area?
- What effect have the processes of historic land use and formal landscaping of the Washington Monument Grounds had on landscapes that might contain significant archeological resources?
- How extensive is the disturbance associated with existing utility lines in the study area?

Given the widespread presence of fill deposits across the Monument Grounds, it was necessary to employ mechanical excavation techniques to systematically examine buried soils and possible landscape surfaces. The field investigation was completed with a direct-push geotechnical sampling machine, generically known as a Geoprobe. The Geoprobe recovered continuous soil columns in 4-foot increments with minimal damage to the landscape.

The test locations were distributed to broadly sample the study area. All test locations were plotted on a scaled base map and recorded using GPS equipment with sub-meter accuracy. In all cases the individual tests were advanced to natural soils. Test locations were placed along four transects north, east, west, and south of the Monument. No tests were placed within the paved plaza because of public safety concerns and the logistics that would be necessary to avoid damage to the hardscape. Avoidance of utility lines was also a major concern. Historical maps and surveys were reviewed prior to selection of boring locations, and the lack of complete as-built drawings for the most recent (2004-2006) security improvement program required a cautionary approach, especially in the areas immediately adjacent to the plaza where active water and electric lines were expected.

The soil core borings were provided to a professional geomorphologist for off-site analysis. The geomorphologist prepared detailed profile descriptions for each soil column in accordance with standard techniques and nomenclature for field description of soils. The geomorphological study was completed by Dr. Daniel Wagner of GeoSci Consultants, Inc., LBG's consulting geomorphologist. Results of that study are presented as Appendix A of this document. Individual auger tests were designated with a prefix "WAMO" (to denote Washington Monument) and a numeric suffix. Under normal conditions a detailed soil profile description is compiled for each test in accordance with standard techniques and nomenclature for the field description of soils. Fill soils, because they are highly variable and reflect anthropogenic rather than natural processes, are not normally described at this level of detail. Detailed descriptions were made for all natural soils.

Fieldwork was completed on June 23, 2011.

PREVIOUS INVESTIGATIONS

A formal Archeological Overview and Assessment Study has not been completed for NAMA, so information on archeological resources in the study area must be extrapolated from previous studies in the surrounding area and other sources. The Archeological Overview and Survey Plan

for the National Capital Area (Little 1995) established priorities for the systemwide archeological inventory project. In that document one of the Priority 1 projects was a shoreline study of the Potomac and Anacostia rivers, which would be relevant to four parks, including NAMA. To date this recommended shoreline study has not been completed. Lacking detailed information on archeological resources for NAMA, it is possible only to develop speculative statements regarding existing archeological resources.

Little's recommendation for a shoreline study stems from the fact that much of the downtown monumental core area, including the Washington Monument Grounds and the National Mall, is situated on the original shoreline of Tiber Creek, one of the District's natural inland waterways. Before the City of Washington was laid out in 1790, the south bank of Tiber Creek cut across what is now the Washington Monument Grounds (Figure 3). As a natural shoreline, areas immediately adjacent to Tiber Creek are of archeological interest primarily because such areas were attractive to Native American groups and because the city's early development was concentrated along its waterfront areas. The modern landscape associated with the study area reflects the filling of Tiber Creek and the creation of the formal landscapes of the Monument Grounds. Because most of the land in the study area consists of fill deposits and formal landscapes, archeological resources associated with earlier historic landscapes, if present, may be found in buried contexts.

Native American occupation in the downtown area around Tiber Creek has been well established despite the urban character of the modern environment. Many artifact collections from sites in the District of Columbia were amassed prior to the advent of modern archeology, and therefore they typically lack specific information about their provenience or location of origin. Among the prehistoric artifact collections from the District of Columbia is an assemblage of 147 specimens from the Washington Monument Grounds that was recently described by Krakker (2005). This collection (Figure 4) is apparently from a site on the south bank of Tiber Creek, although the exact origin is unknown. The collection was obtained in the 1880s and includes artifacts that indicate episodic use of the area for at least 7,000 years. The collection has been cataloged as archeological Site 51NW35-Monument Grounds.

Previous studies within the Monument Grounds and adjacent park land of the National Mall have demonstrated that the archeological record of this area can be quite complex, with physical remains of a great variety of events that vary widely in their historical and archeological significance. Although few archeological studies have been conducted, there are other sources of important information regarding the physical history of this area, which is essential for understanding the archeological record. The NPS has completed various studies, including a Cultural Landscape Report (CLR) for the Washington Monument Grounds (John Milner Associates, Inc. [JMA] 2008), a history of the Washington Monument (Olszewski 1971), a Historic Structure Report (Oehrlein and Associates 1993), and Historic American Buildings Survey (HABS) documentation for the National Mall and Monument Grounds and the L'Enfant-McMillan Plan (HABS 1993a, 1993b, 1994). Archives of the NPS and the National Capital Planning Commission contain a wealth of maps and planning studies that document the site's physical history. Among the many published histories of the District's monumental core area, the most useful are Richard Longstreth's compilation of essays (Longstreth 2002) and John Reps's (1991) visual history of Washington. A number of geotechnical studies and soil surveys also

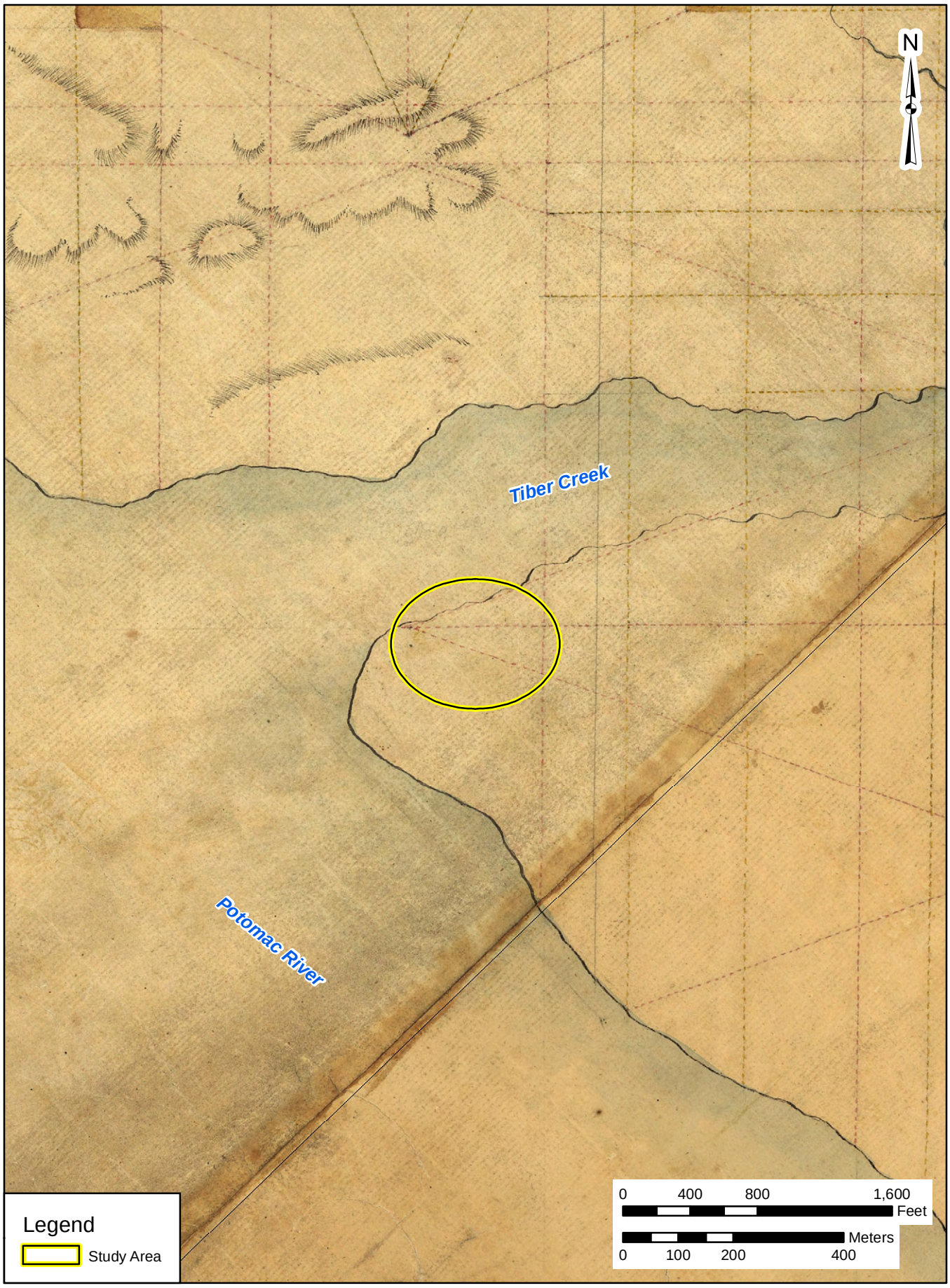

FIGURE 3: Washington Monument Study Area, 1791

SOURCE: L'Enfant 1791

FIGURE 4: Prehistoric Artifacts from the Washington Monument Site *SOURCE: James Krakker, Smithsonian Institution*

provide useful information for understanding the subsurface conditions that characterize the Monument Grounds (Mueser Rutledge Consulting Engineers 2002; Short et al. 1986).

There have been relatively few opportunities for modern archeological investigations on the Monument Grounds. An assessment of the 1980s-era Development Concept Plan for the Washington Monument concluded that the area immediately surrounding the Monument had been so severely disturbed that there was no possibility that archeological resources could have survived (Potter 1983). This assessment refers to a prehistoric artifact that had been collected from the site in 1875 as evidence of Native American use of the area, but concludes that a single, isolated artifact was inconclusive with regard to a possible Native American settlement. As detailed by Olszewski (1971) and others, the building history of the Monument — especially the 1879-1880 underpinning of the foundation and the subsequent landscaping of the adjacent grounds — also suggested that the proposed 1980s-era development would have no effect on archeological resources (Potter 1983).

Archeological investigations for the National Museum of African American History and Culture (NMAAHC) demonstrated that, despite a complex archeological record, some remnants of the natural landscape along Tiber Creek may be preserved beneath deep fill deposits. The NMAAHC site is located on the northeast panel of the Monument Grounds, and historically that site was on the south bank of Tiber Creek. The Phase I study of the NMAAHC site (LeeDecker et al. 2007) included an extensive program of archival research followed by a geoarcheological study and a more standard Phase I archeological survey. The geoarcheological investigations indicated that the site contains areas of a preserved natural landscape surface that correspond to the south bank of Tiber Creek as well as a possible early nineteenth-century landscape surface that was created in conjunction with the extension of the Washington Canal within the channel of Tiber Creek.

Building on the Phase I study, the Phase II study for the NMAAHC (LeeDecker et al. 2008) had two primary goals: (1) delineation of the extent of the natural landscape surface, focusing on the identification of intact prehistoric deposits; and (2) exploration of the northern area of the site, where the Phase I study pointed to a possible buried nineteenth-century surface with associated domestic deposits and possible remains of structures associated with the canal or construction of the Washington Monument. Very few prehistoric artifacts were recovered during the Phase II investigation, so research questions dealing with prehistory could not be addressed. No intact features identified with the Washington Canal were discovered, but a possible remnant of a nineteenth-century carriageway was found that is believed to be associated with the first formal landscaping of the Washington Monument Grounds. The complex stratigraphy throughout the NMAAHC site reflects numerous fill deposits from various sources during the nineteenth century related to the canal's construction and filling of low areas along Tiber Creek. The combined Phase I and Phase II findings provided information about the historical development of the Washington Monument Grounds, where the landscape changed from open agricultural space to public areas of the nation's capital, complicated by numerous attempts to build, maintain, and repair an ill-conceived and poorly managed canal.

A series of soil core borings sampled the near-surface soils of the National Mall in the 1980s (Short et al. 1986). These borings were distributed along five east-west transects, with 20 core

samples on each transect. The goal of that study was to characterize the physical and chemical properties of the Mall soils, and the borings were limited to the upper 0.7 meter (2.46 feet) of soil. The study noted some of the land use patterns that have influenced the Mall landscape, including filling, construction of temporary buildings, and formal landscaping. Overall, 95 percent of the borings showed evidence of filling, some with multiple discontinuities that reflected a series of filling or grading episodes. More than four in 10 (42 percent) of the soil core borings showed evidence of a buried surface soil (A-horizon). It is assumed that archeological resources may be present in surface soils; these surfaces could represent the natural landscape of the city as it existed before the city was laid out in 1791 or intermediate surfaces formed by the addition of fill soils onto the underlying landscape surface. The investigators noted that some areas of the Mall may have fills that reach a depth of 20 feet, particularly the former channel of Tiber Creek (Short et al. 1986).

A more recent geoarcheological study (LeeDecker 2010) for the National Mall Turf and Soil Reconstruction Project concluded that most areas of the Mall are characterized by soil columns composed of varying amounts of fill over truncated natural soils, a conclusion that is consistent with the Mall's well-documented landscape history. These findings might be projected to the Monument Grounds, given the broadly similar developmental history of the Mall and the Monument Grounds; however, the geoarcheological study for the Turf and Soil Reconstruction Project did present some intriguing findings. Recognizable tidal flat soils associated with the south bank of Tiber Creek were identified at the 4th Street cistern location, and these represent the best preserved remnants of the natural environment that existed in this area prior to urban development. These soils would have been part of the landscape associated with the prehistoric and early historic periods, and they may have been exploited for aquatic resources. The tidal flats would have not been suitable for occupation, however, so their archeological potential is minimal. Two soil core borings—at the 10th Street and 7th Street cistern locations—contained soils that are characteristic of moderately well-preserved upland natural landscapes. These columns contained a possible loess deposit (wind-deposited silt), raising the possibility that a more ancient landscape surface may be buried beneath the loess. Mapping and characterization of this loess deposit has become a primary research interest for the archeology of the District of Columbia, as the underlying paleolandscape may have been used by very early prehistoric populations.

OVERVIEW OF HISTORIC LANDSCAPE DEVELOPMENT

NATURAL SETTING

The Washington Monument is situated in the Coastal Plain physiographic province, in which surficial geology consists of unconsolidated sediments composed of sands, gravels, and clays of marine or fluvial origin. The thickness of these deposits in the District of Columbia ranges up to several hundred feet, but there also some localized outcrops or exposures of metamorphic rock. The natural (and now largely obliterated) topography of the downtown area of the District was dominated by a series of recognizable terraces formed in the Coastal Plain sediments. Pierre L'Enfant's plan for the Federal City (see Figure 3) took advantage of the topography afforded by the remnant terraces, with two of the most elevated sites set aside for the Capitol and the Executive Mansion (the White House). Jenkins's Hill became Capitol Hill, and Burnes Farm knoll was chosen as the site of the President's House (the White House). In the L'Enfant Plan the Washington Monument Grounds correspond to the intersection of two broad "avenues" of public land, one extending south from the President's House, the other extending west from the Capitol. At the intersection of these Executive and Legislative axes, L'Enfant reserved a site for a memorial statue of George Washington. The Monument Grounds were also known as Reservation 3 in the L'Enfant city plan of 1790; when the public appropriations were renumbered in 1883, it became known as Reservation 2.

Tiber Creek, also known as Goose Creek, drained about half of the downtown area, emptying into a broad, shallow tidal estuary. The headwaters of Tiber Creek began more than 3 miles north of the Capitol; in the downtown area it meandered west toward the Potomac, roughly following the present course of Constitution Avenue (formerly B Street). It emptied into the Potomac River at 17th Street, at which point it was some 700 to 800 feet wide.

PREHISTORIC AND COLONIAL WASHINGTON

The Potomac River valley was inhabited by Native Americans beginning about 13,000 years before the present. Until about 4,000 years ago, the region was used by small transient foraging groups; the archeological evidence of their campsites typically consists of the stone tools and the debris that resulted from the manufacture or resharpening of stone tools. Around 2000 BC, people began quarrying huge numbers of cobbles from the hill-flanks along Rock Creek. These cobbles were shaped into rough oval forms, then carried to campsites for final trimming into broad spearpoints of the Savannah River style. The people who made broadspears also made tub-shaped cooking vessels by carving soapstone, which was hacked out of bedrock in the District of Columbia and nearby areas of northern Virginia and Maryland. A few centuries later (about 1000 BC), ceramic pots replaced these soapstone vessels. The Native American societies were linked by long-distance trade networks, so that the stone bowls reached groups living far distant from the soapstone sources.

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The departure of the Nacotchtancks left the Washington area open for British colonists. Among the first to claim patents in this area, in 1663, were Francis Pope and George Thompson. Francis Pope evidently had a sense of humor concerning his surname; he called his patent "Rome" and the adjacent creek "Tiber." There is no documentary or cartographic evidence that the creek's alternative name, Goose Creek, was used by anyone prior to Pope. The first known use of "Goose Creek" is on the survey map of the Potomac banks drawn in 1737 by Robert Brooke (Brooke 1737). Louise Hienton's (1959) reconstruction of the area's early tracts locates Rome on the upper reaches of the creek, north of the present Capitol. George Thompson patented lands to the south and east of the current project area, and south of Tiber Creek. Thompson was a lawyer who served as Clerk of the Charles County Court. Thompson was granted three tracts totaling 1,800 acres: Duddington Pasture, Duddington Manor, and New Troy. He leased these tracts to Thomas Notley for 40,000 pounds of tobacco. Notley's title was corrected in 1671, when he patented the tracts collectively as "Cerne Abbey Manor" (Downing 1912).

This area was still a frontier zone in the late seventeenth century. Iroquois hunting and raiding parties were periodically reported in the vicinity of the falls on the Potomac, and a small fort was built by the Potomac Rangers in the vicinity of Fletcher's Boathouse in 1692 (Fiedel et al. 2005). Given the insecurity of the area, it is unclear if the early patentees actually settled on their lands; it should be noted that Augustine Herrman's map (1673) showed no colonists' houses in the D.C. area in 1673.

In 1674 Thomas Notley deeded his Cerne Abbey Manor property to his godson, Notley Rozier, who patented it years later in 1716 as Duddington Manor. In 1711, when the Swiss speculator, Baron von Graffenried, was scouting locations for a colony on the Potomac, Rozier was actually residing far to the south, in the area of present-day Oxon Hill, Maryland. Graffenried's sketch map also showed a "village," denoted by three houses, in the area of the present District of Columbia (Graffenried 1714). This is the earliest cartographic evidence of actual settlement in the vicinity of the study area. Notley Rozier married Jane Diggs, and their daughter, Anne, married Daniel Carroll (1707-1764) of the powerful Maryland Irish clan. The eldest son of Daniel and Anne Carroll became known as Charles Carroll of Duddington II (1729-1773). After

her husband's death, Anne Carroll married Benjamin Young. Their son, Notley Young, inherited in 1761 all of Cerne Abbey Manor except the Duddington Manor tract, which remained in the Carroll family (Downing 1912). Charles Carroll's son, who inherited Duddington Manor, was Daniel Carroll of Duddington (1764-1849) (Clark 1938). The Priggs map of 1790 shows the location of Notley Young's seat along the Potomac River shoreline, downstream from the mouth of Tiber Creek. The actual location of Young's seat is at the foot of 10th Street, SW (now L'Enfant Promenade).

THE CITY OF WASHINGTON

Since the establishment of the City of Washington, the Monument Grounds area has been reserved for public use, and therefore its history from 1790 to the present is closely linked to the development of the City's monumental core area. The formal landscape that is now the Washington Monument Grounds began as the lower reaches of Tiber Creek, and the Monument Grounds straddle the original shoreline of the Creek. During the nineteenth century this natural waterway was transformed first into the Washington City Canal and later into the B Street Sewer. The topography of the Monument Site still reflects the natural drainage system centered on Tiber Creek, but the succession of landscapes associated with the Monument Grounds has brought attendant changes in the topography, circulation system, vegetation, utilities, and standing structures, all of which have a physical expression in the archeological record.

The Cultural Landscape Report for the Washington Monument Grounds (JMA 2008) provides a useful chronology for discussion of the Monument Grounds archeology. The major periods or developmental phases for the urban period are 1791 to 1848, 1848 to 1889, 1889 to 1943; 1943 to the present.

Early Growth of the Capital, 1791 to 1847

Archival information relevant to the Monument Grounds during the early nineteenth century is virtually non-existent. Reservation 3 remained a poorly drained, undeveloped area that was used primarily for pasture (HABS 1993a). Construction of the Washington City Canal certainly altered the northern, inland shoreline of Tiber Creek, but the southern shoreline may have remained untouched by development.

At the end of the eighteenth century, as already mentioned, the shorelines along the mouth of Tiber Creek cut across the landscapes that are presently known as the Washington Monument Grounds and the Ellipse (Figure 5). The Tiber meandered across the downtown area west toward the Potomac, roughly following the present course of Constitution Avenue (formerly B Street). Across the Monument Grounds, the Tiber's south bank meandered northeast to southwest, so that a portion of the Monument Grounds would have been in the channel of the creek and the adjacent mud flats.

By 1800 lower Tiber Creek had not changed much from its initial configuration, although the City's outline was beginning to take shape with the construction of major government buildings and their connecting avenues. L'Enfant envisioned a canal that would allow goods easily to reach the interior of the city, facilitating commerce and building construction in the downtown

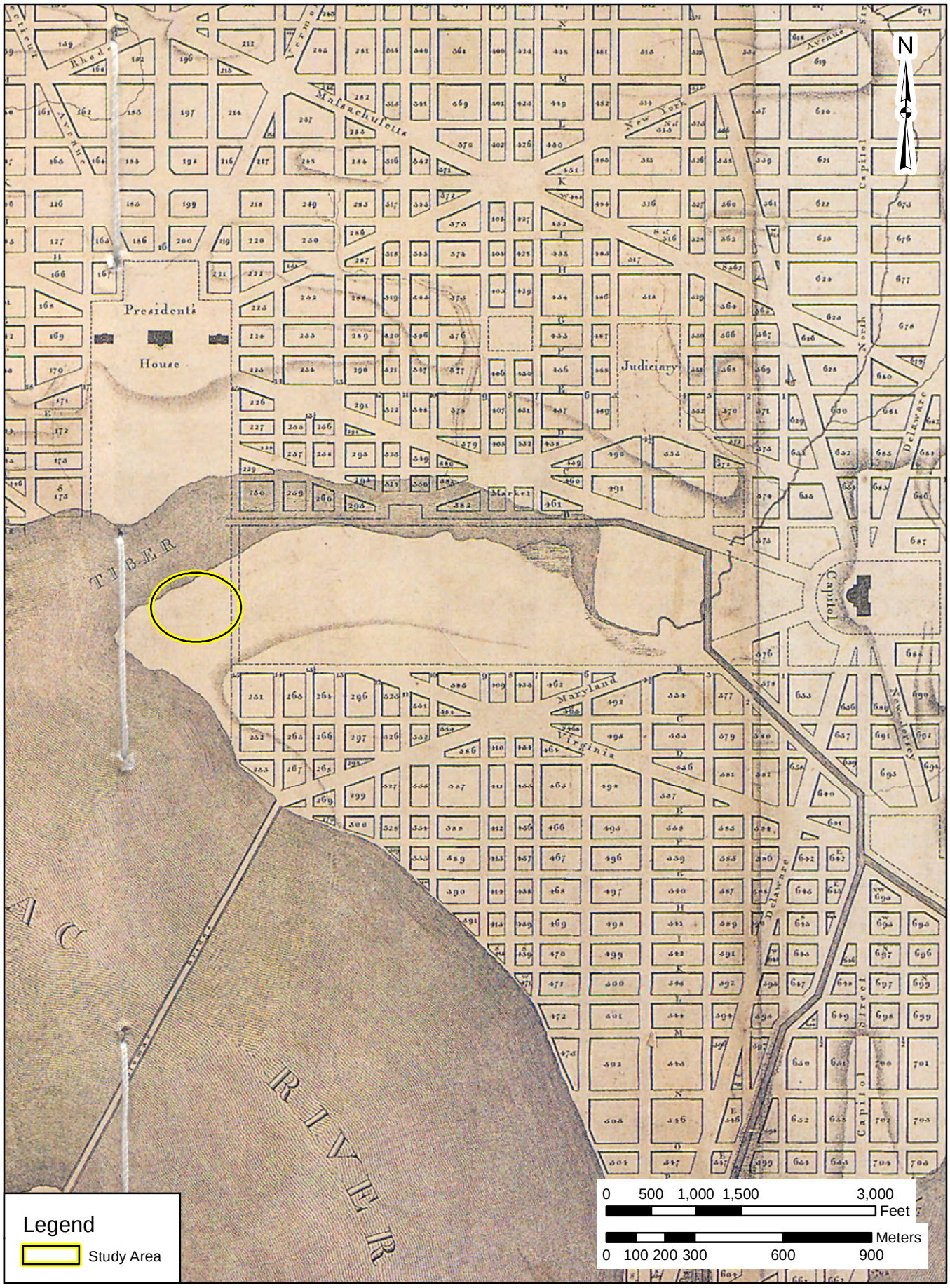

FIGURE 5: Washington Monument Study Area, 1818

SOURCE: King 1818

area. The Washington City Canal would connect the Potomac and Anacostia rivers via Tiber and James creeks, thereby facilitating traffic between Georgetown and the deepwater ports on the Anacostia. River traffic between these points was difficult because of tidal fluctuations, a problem that was would be addressed by construction of an inland canal. L'Enfant's plan featured a narrow canal channel, or prism, that would extend along B Street from the interior of the city to the mouth of Tiber Creek at 17th Street.

The first phase of canal construction, completed during 1810-1815 under the supervision of Benjamin Latrobe, did not fully realize L'Enfant's plan; in its original configuration the canal followed the existing banks of the Tiber as far upstream as 6th Street, where the western lock raised the water level 4 feet above low tide (Stapleton 1980). The canal, as well as the lower Tiber Creek, was quite shallow, so only boats with drafts of 3 feet or less were allowed to enter it. The mouth of Tiber Creek served as a turning basin for canal boats, and a wharf projected into the mouth of the creek at the foot of 17th Street.

Early nineteenth-century maps (DeKrafft 1846; Elliot 1822; King 1918) show that the canal channel had been extended across the northern margin of the Monument Grounds by 1822, indicating that some filling had occurred by that date (see Figure 5). By 1833 the C&O Canal had been extended from its existing terminus at Rock Creek to the foot of 17th Street, thereby allowing a continuous inland passage from the Navy Yard upstream to points far above the Falls of the Potomac. This extension of the C&O began at the basin on Rock Creek near H Street, cut through Easby's Point to near 22nd Street, and then followed B Street to 17th Street, where a lock lowered the water level to the basin at the mouth of Tiber Creek. The 17th Street wharf was built in 1807 and expanded within a few years.

The canal prism was simply a flat-bottomed ditch with sloping banks. In scale, the Washington City Canal was grand. In its original design, the channel itself was 80 feet wide and flanked on both sides by two 80-foot-wide streets (HABS 1993a; Heine 1956). Typical canals of the period were designed with a bottom width of only 12 feet and a width of 22 feet at the towpath height; the sides of these canals were built with a 1:1 slope to a depth of 3 feet (Stapleton 1980). Extension of the canal through the lower Tiber Creek would have been more a matter of filling the channel and forming an appropriately sloped bank to support a towpath. Filling the creek channel, or at least construction of a bulkhead for a towpath, was necessary for the functioning of a canal. The towpath would have been on the inland side of the canal, which would have required alteration of the north bank of Tiber Creek, as has been demonstrated during the previous archeological investigation of the Ellipse (LeeDecker 2006). The typical canal prism widths were calculated to accommodate the passage of canal boats or barges, so the typical prism cross section represented a minimum size. Sections of the Washington City Canal that were built in lower Tiber Creek were probably much wider than 22 feet, owing to the cost of filling the creek channel as opposed to excavating a channel through dry ground. Views of the Washington City Canal in the National Mall area typically illustrate a channel that is much wider than 22 feet.

Construction of the Washington Monument and the Initial Landscape Design, 1848 to 1889

The January 31, 1848, Congressional authorization of a monument to George Washington led to the first phase of construction on the Monument Grounds. Under the jurisdiction of the

Washington National Monument Society, the initial work progressed slowly, hampered by a lack of funds and political interference from the Know-Nothing party. The chosen site for the Monument was near the center of Reservation 3, but because of the marshy soils, the Monument foundation was laid at a location somewhat south of the Capitol latitude and east of the White House longitude, thereby contravening the perfect orthogonalism of the L'Enfant Plan. (The precise intersection of the Executive and Legislative axes was marked by a monument known as the Jefferson Pier, erected in 1804). Construction began according to the Robert Mills design, which called for steps at the base of the shaft. As a construction site the adjacent grounds contained various sheds, an engine house, a saw house, a stone cutter's shop, carpenter's shop, a smith's shop, a cement house, and a stable (Figure 6). The initial stages of the work progressed fitfully, delayed by lack of a steady source of funding, until 1861, when construction was interrupted by the Civil War (JMA 2008).

Construction of the Smithsonian Institution began in the same year that construction of the Monument was authorized, and this was followed by efforts to improve the public grounds in the downtown area. Ignatius Mudd, first Commissioner of Public Buildings under the newly created Department of the Interior, commissioned Andrew Jackson Downing, the leading American landscape architect of the day, to prepare plans for the Mall. Downing's plan was a series of six gardens or "scenes" that connected the grounds of the Capitol, the White House, and the Smithsonian (Figure 7). Downing's designs featured serpentine paths and carriageways that afforded naturalistic, picturesque views. One of the most distinctive features of Downing's plan for the Monument Grounds (which he called Monument Park) was a suspension bridge across the canal at 15th Street. Although the suspension bridge appears in many late nineteenth-century views of the Mall, it was never built. Aside from the Smithsonian grounds and the Ellipse (President's Park), little of Downing's vision for the Mall was implemented before the Civil War. Drowned in 1852 as a result of a steamboat accident, Downing never saw his designs realized.

Andreas Boschke's map of the District of Columbia, which was published in 1857 (Figure 8), illustrates the Downing-inspired landscaping for the Smithsonian and the Ellipse. Much of the Monument Grounds still formed a tidal basin at the mouth of Tiber Creek, and the areas of dry land were undeveloped except for the partially completed Washington Monument. The area that would become the northwest section of the Monument Grounds included a small island surrounded by an open basin that would have allowed water-borne traffic to dock at the 17th Street wharf or to enter the Washington Canal or the C&O Canal.

During the Civil War construction of the Monument ceased and the grounds were used for cattle grazing and military maneuvers. The Monument Grounds acquired names such as Beef Depot, the Cattle Meadow, and the Washington National Cattle Yard (Figure 9). As the war progressed, various quarters, storehouses, stables, pens, sheds, and a slaughterhouse appeared, and one observer noted that the buildings were "surrounded by offal rotting two or three feet deep" (*Frank Leslie's Illustrated News* 1862).

Following the assignment of responsibility for the public grounds to the Office of Public Buildings and Grounds (OPB&G), under the jurisdiction of the Army Corps of Engineers, Maj. Nathaniel Michler prepared a series of annual reports (1867, 1868, 1869, 1870) for the OPB&G

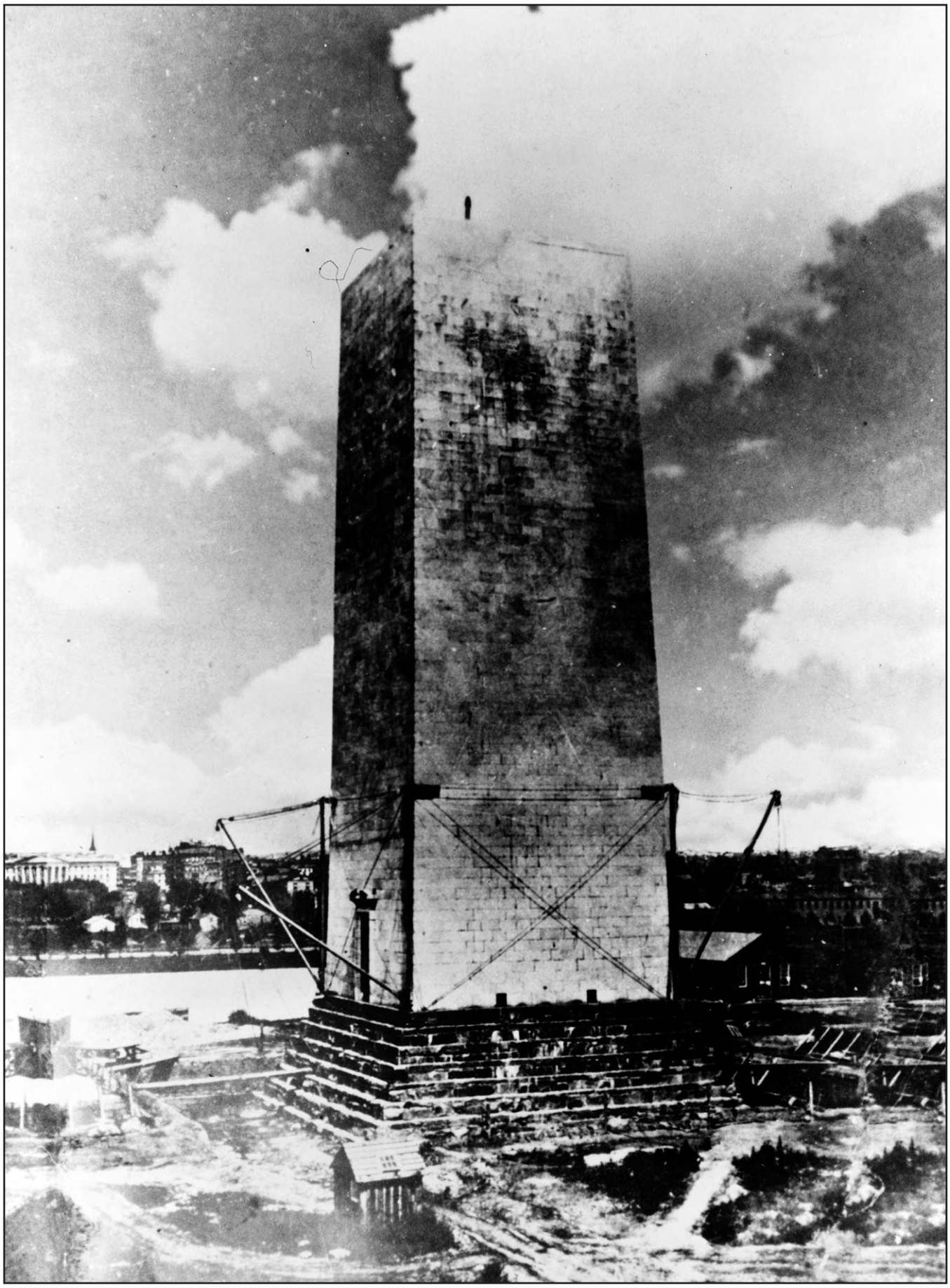

FIGURE 6: View of Washington Monument During Construction, First Phase *SOURCE: HABS 1994*

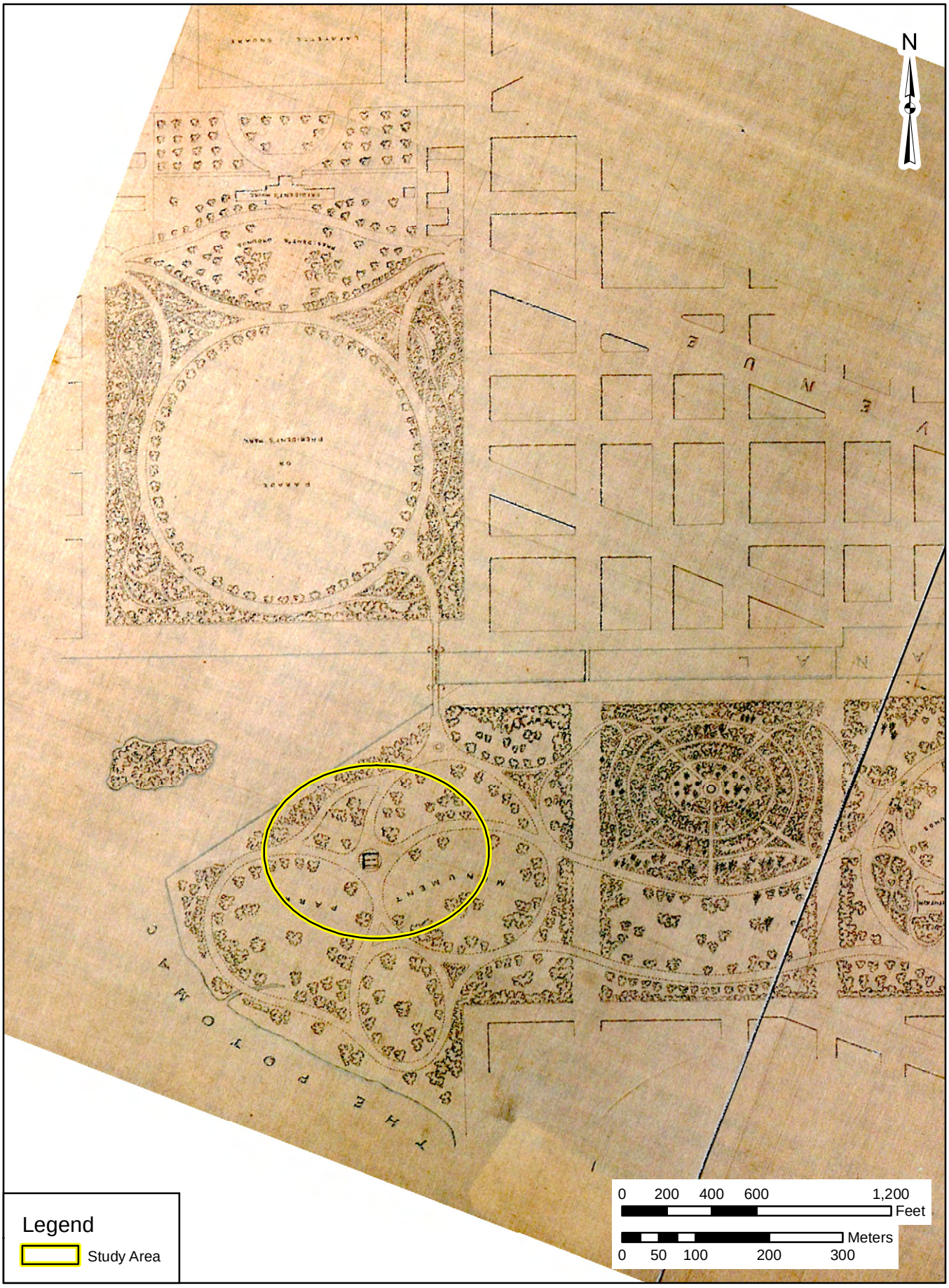

FIGURE 7: Downing Plan for the Mall

SOURCE: Downing 1851

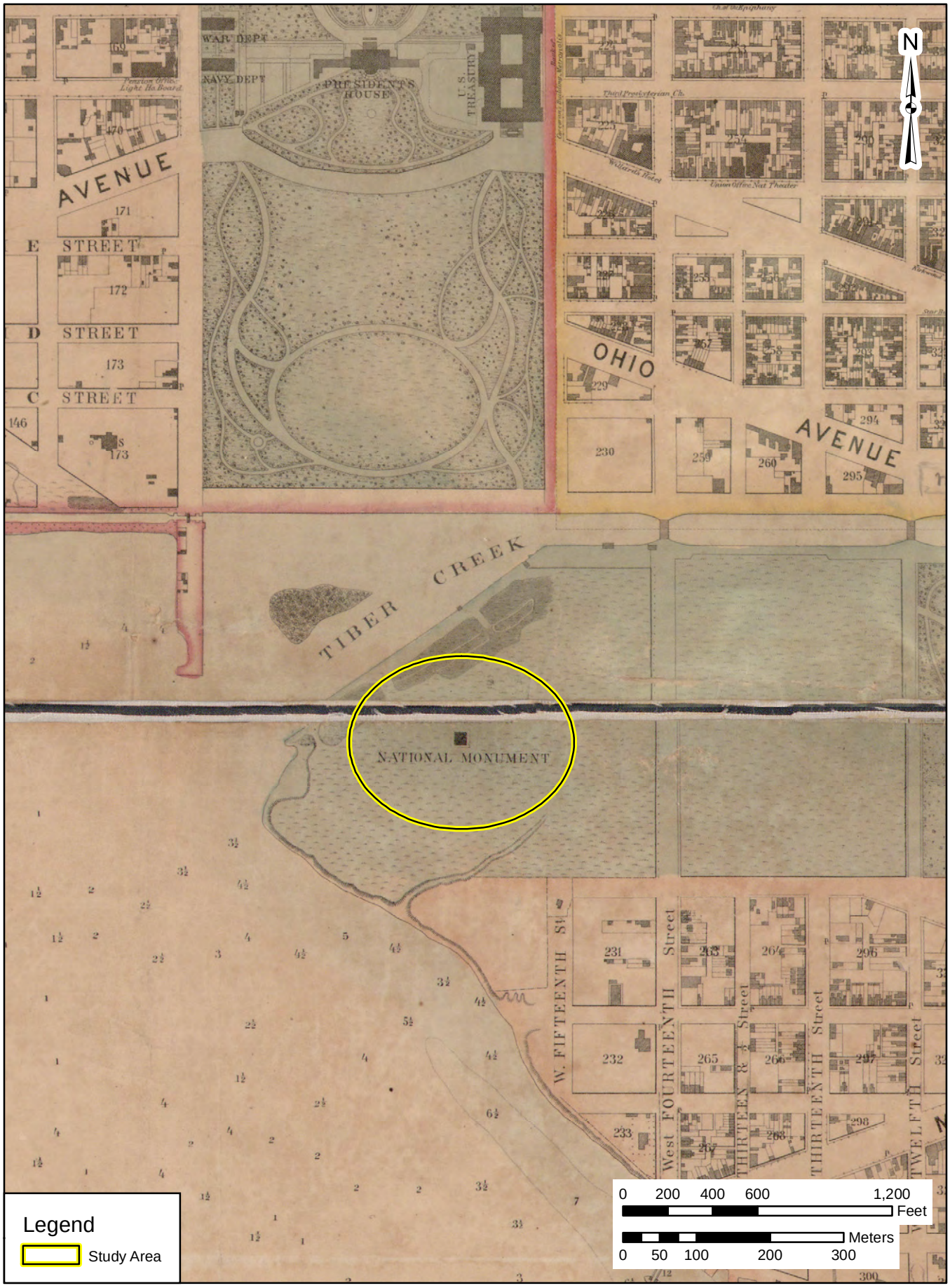

FIGURE 8: Washington Monument Study Area, 1857

SOURCE: Boschke 1857

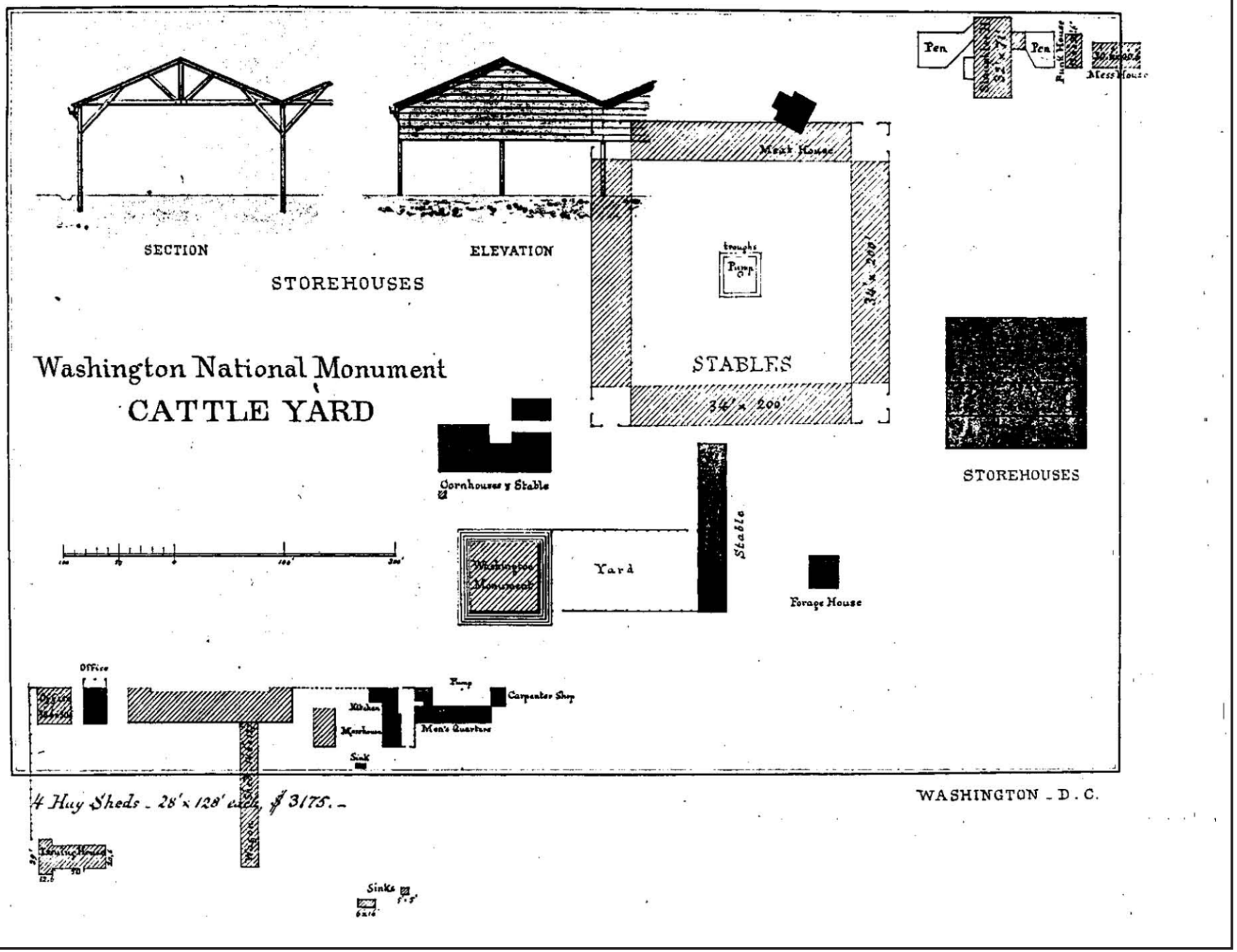

FIGURE 9: Washington National Monument Cattle Yard

SOURCE: Olszewski 1971: Plate 26

that detailed the condition of public lands and urban infrastructure. Michler expressed admiration for Downing's designs for the Mall and urged Congress to appropriate funds to extend the landscaping that had been accomplished on the Smithsonian grounds and the Ellipse. In one of the few observations that pertain to the Monument Grounds, Michler remarked:

> The Washington Monument reservation still remains in the same unimproved condition. The simple preservation of the fence enclosing it is all that has been done. The grounds are capable of very great adornment, and should not be allowed to present the dull, wide waste that they now do [Michler 1868:896].

Despite the repeated efforts of Michler and others, dramatic improvement of the city's landscape did not occur until creation of the Territorial Government in 1871. When responsibility for public works was transferred to the Territorial Government, Michler received only 12 days' notice that he was being transferred to the Military Division of the Pacific. Then, during a brief period of local government in the early 1870s, the Board of Public Works, under the direction of Alexander "Boss" Shepherd, completely transformed the city's landscape. During Shepherd's tenure (1871 to 1873) water and sewer service was extended, streets and sidewalks were improved, trees were planted, street lights were installed, and a trolley system was built. Where others had advocated dredging or covering the canal, Shepherd, a plumber by trade, converted it to a sewer so it could be paved over and reborn as Constitution Avenue. Before dissolving in "debt and shame" in 1874, the Board of Public Works transformed the landscape of Washington forever, although Shepherd's plan for a "City of Trees" did not achieve fruition until the 1880s and the debt incurred by the Board of Public Works would not be repaid until 1922 (HABS 1993b).

Although the surrounding city was renovated within a few years, construction and landscaping of the Washington Monument and Grounds progressed much more slowly. Orville Babcock, demoted to the position of Superintendent of the OPB&G after a series of scandals, oversaw improvement of the Monument Grounds in the 1870s. He expanded the grounds to the northwest by filling a 20-acre area northwest of the Monument, creating a series of lakes separated by dikes. These lakes or ponds were used by the U.S. Commission of Fish for raising carp. By 1877 a third pond, known as South Pond, had been created on newly made land west of the Monument.

The approach of the national centennial in 1876 led to renewed enthusiasm for completion of the Monument, but concerns over the stability of the foundation required additional engineering studies. Tests found that the original foundation would not support the weight of the completed Monument. Underpinning and reinforcement of the foundation required excavation around the base of the monument, then placement of a new concrete foundation to enclose the original footings. When the foundation work was completed in 1880, a new terrace was constructed around the base. The terrace was enlarged in 1881 to a rectangular area measuring 175x200 feet with a square embankment that required placement of 11,810 cubic yards of fill material. Underpinning the foundation was a major effort in itself that required a workforce of carpenters, masons, stone dressers, blacksmiths, drivers and laborers, along with shops, storehouses, forges, a lapidarium, a 10-ton scale, and a temporary roadway from 14th Street to the Monument (Olszewski 1971).

With the foundation work completed, work turned to completing the shaft. This required construction of new stonecutting sheds and an attendant cadre of stonecutters, along with railroad tracks, trestles, and a turntable to facilitate transport of raw material to the site (Figure 10). The capstone was set in 1884 but much work remained to be done, including finishing the interior, dismantling and removal of equipment, and landscaping the grounds. More fill was added during this period, primarily to the western areas that had been an open tidal basin adjacent to the 17th Street wharf. Annual OPB&G reports from the 1870s and 1880s document a series of repair and repaving episodes for the carriageways and paths as well as the extension of water and gas service (JMA 2008).

When completed in 1888, the first phase of formal landscaping of the Monument Grounds featured curving paths and carriageways that followed Downing's 1851 design for the Mall (see Figure 7). The northern and western panels had not yet been completely filled, consisting of a network of ponds and dikes created in the 1870s. Sachse's 1883 bird's eye view (Figure 11) shows two carp ponds north of the Monument. On the eastern part of the grounds, 15th Street cut directly through Reservation 3. A few years later, Silversparre's map of 1887 (Figure 12) showed a slightly different configuration of the ponds and dikes, along with a system of curvilinear walkways that followed the Downing Plan. The lakes on the Monument Grounds were known as the Babcock Lakes, named for Orville Babcock, who as Superintendent of the OPB&G in the 1870s oversaw various other public works projects in Washington, ranging from repair and maintenance of the Washington Canal to finding a site for a new presidential mansion and the maintenance of the bridges and navigation channels of the Potomac River.

Changes Through the McMillan Plan and Other Early Twentieth-Century Plans, 1889 to 1943

After completion of the Monument and Grounds, the landscape remained relatively stable through the end of the nineteenth century, although periodic repairs were made to the circulation system and new utility lines were added, including a sewer and a water intake that served the PEPCO substation at the northeast corner of 14th Street and Constitution Avenue. Electric lines replaced the older gas lines, and new water lines cut across the site. Grading of the low ground north of the Monument was also completed in the 1890s, but the Babcock Lakes evidently remained until at least 1903 (Figure 13). Immediately west of the Monument Grounds, filling of Potomac Flats was completed, allowing the creation of West Potomac Park. The 17th Street Wharf finally disappeared from view with the construction of 17th Street (then Park Entrance Road) below B Street (now Constitution Avenue) in 1902.

The creation of the McMillan Commission in 1901 brought new designs for landscaping of the Mall and the Monument Grounds. The McMillan Plan featured an elaborate system of rectilinear gardens and terraces, a dramatic departure from the naturalistic scenes and curvilinear circulation system of the Downing-inspired landscape. Some of the more radical design ideas for the Monument Grounds, such as a sunken garden, were never built because of concerns about the stability of the Monument foundation. Detailed surveys in 1917 and 1930 (Figure 14) showed that the Downing-inspired, curvilinear circulation system remained largely intact, although 16th Street entered the site directly from Constitution Avenue. World War I returned the city to a wartime mentality, and once again the public grounds were given over, at least partially, to cattle grazing. Recreational demands increased during the early decades of the twentieth century, met

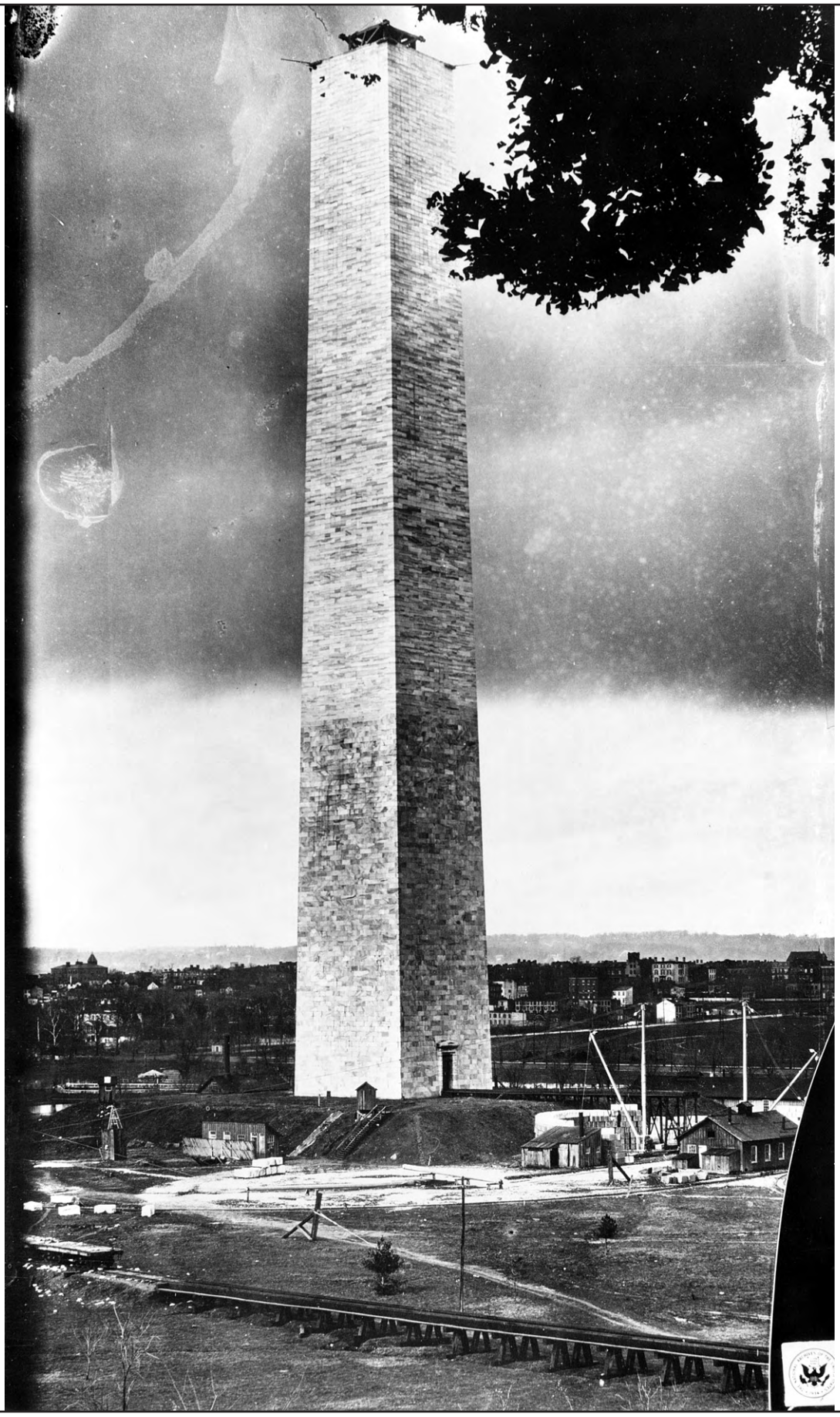

FIGURE 10: View of Washington Monument During Construction, Second Phase *SOURCE: HABS 1994*

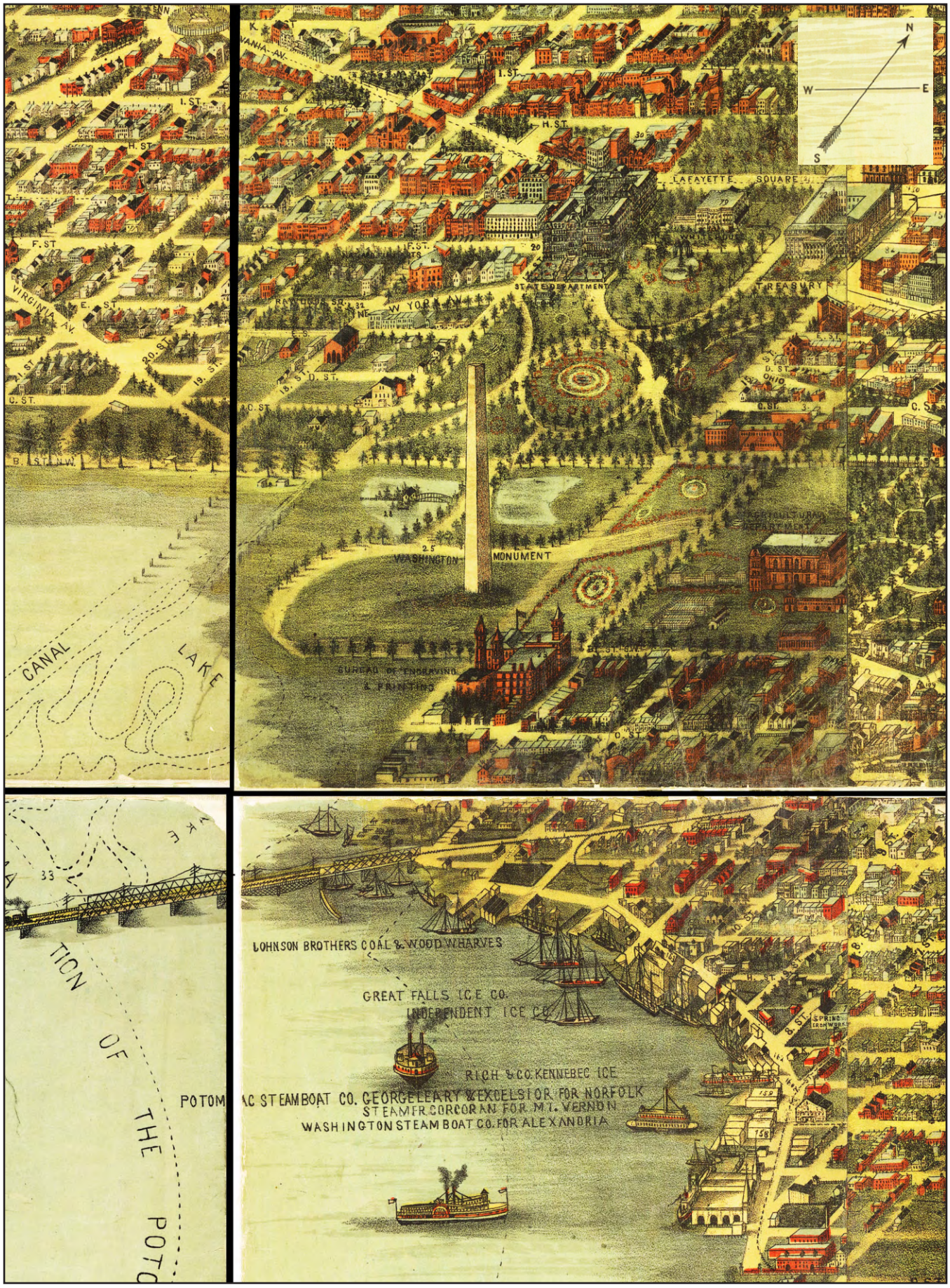

FIGURE 11: Bird's Eye View of Washington Monument, 1883 *SOURCE: Sachse 1883*

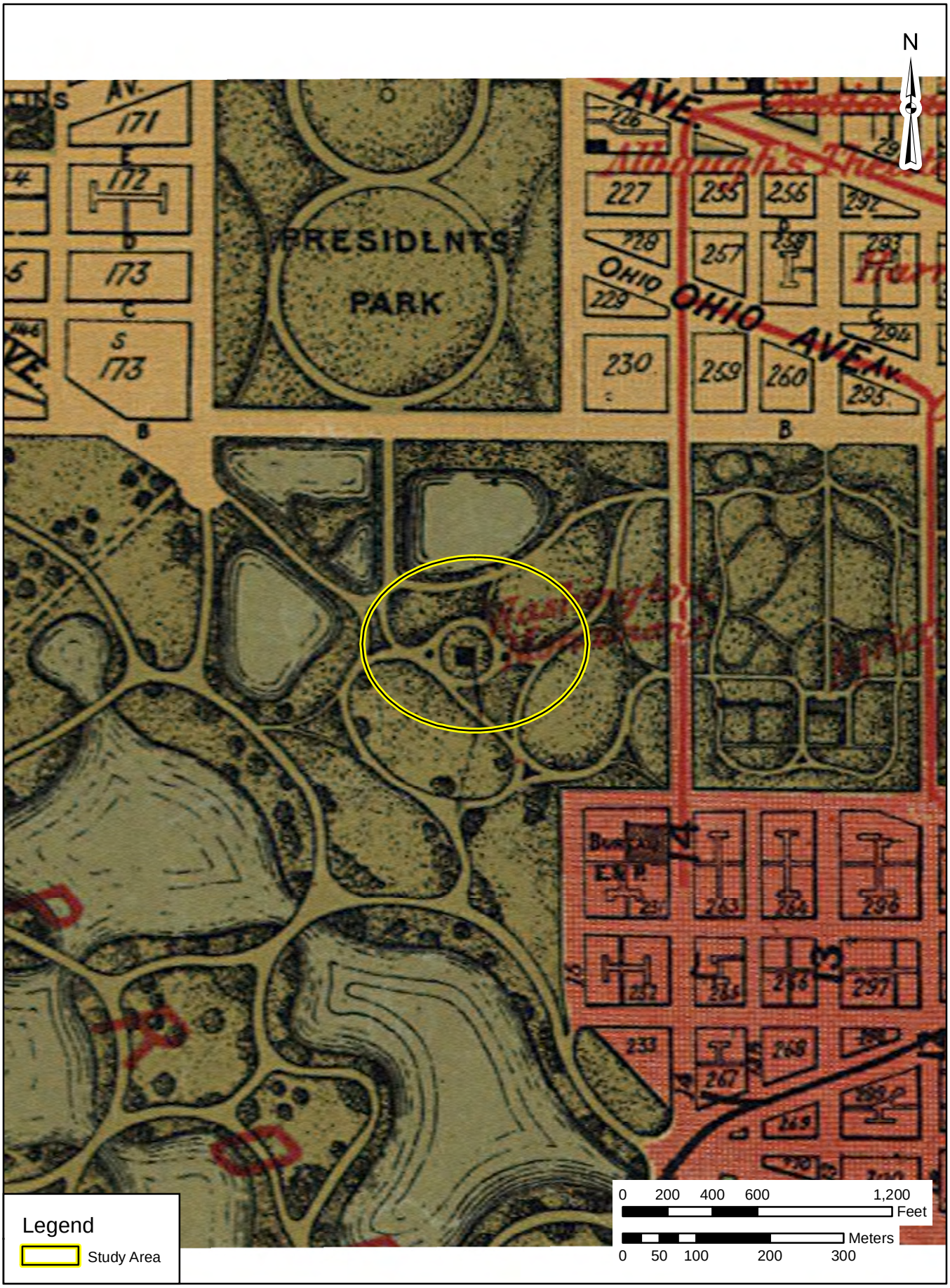

FIGURE 12: Washington Monument Study Area, 1887

SOURCE: Silversparre 1887

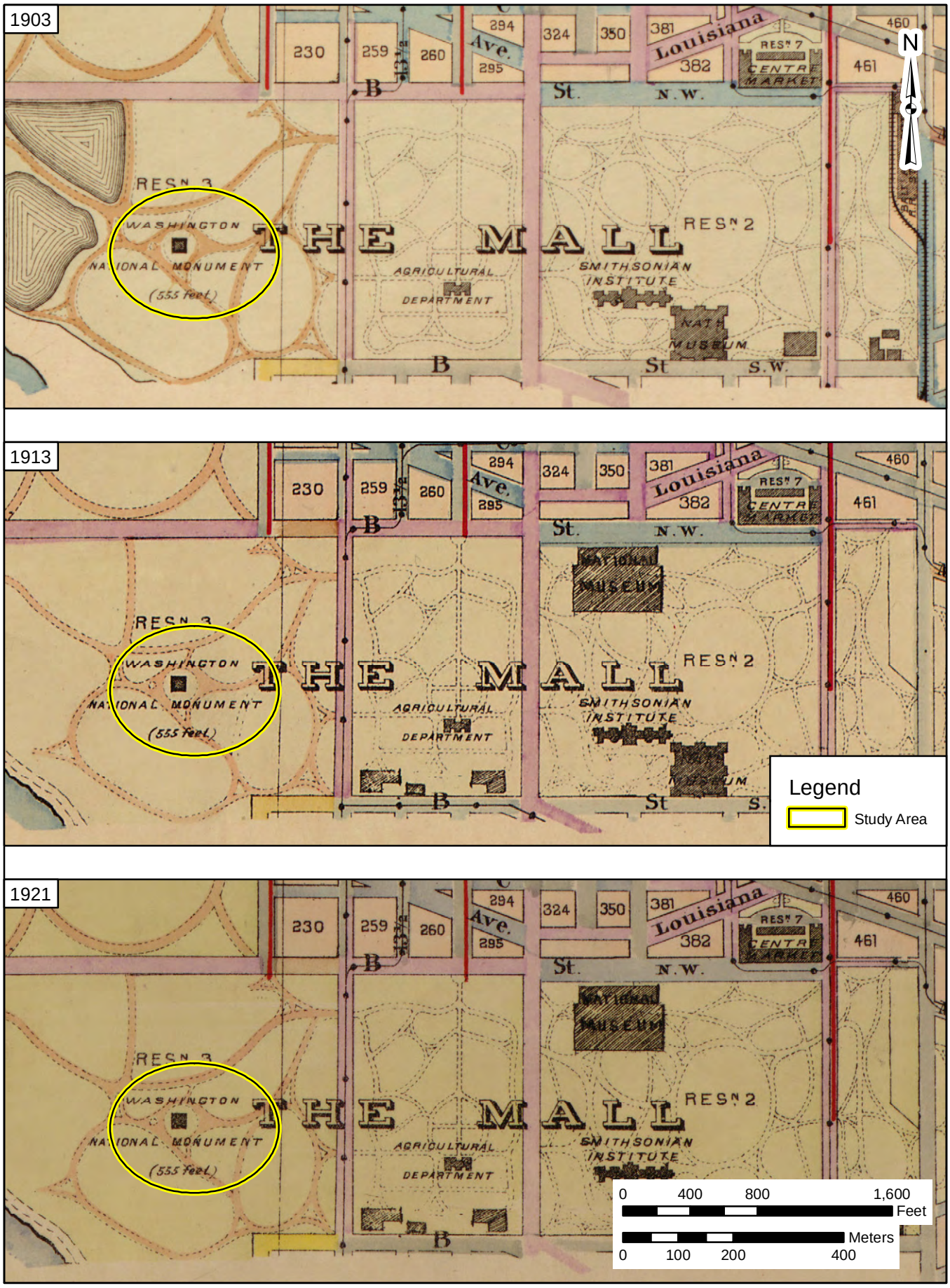

FIGURE 13: Washington Monument Study Area, 1903-1921

SOURCE: Baist 1903, 1913, 1921

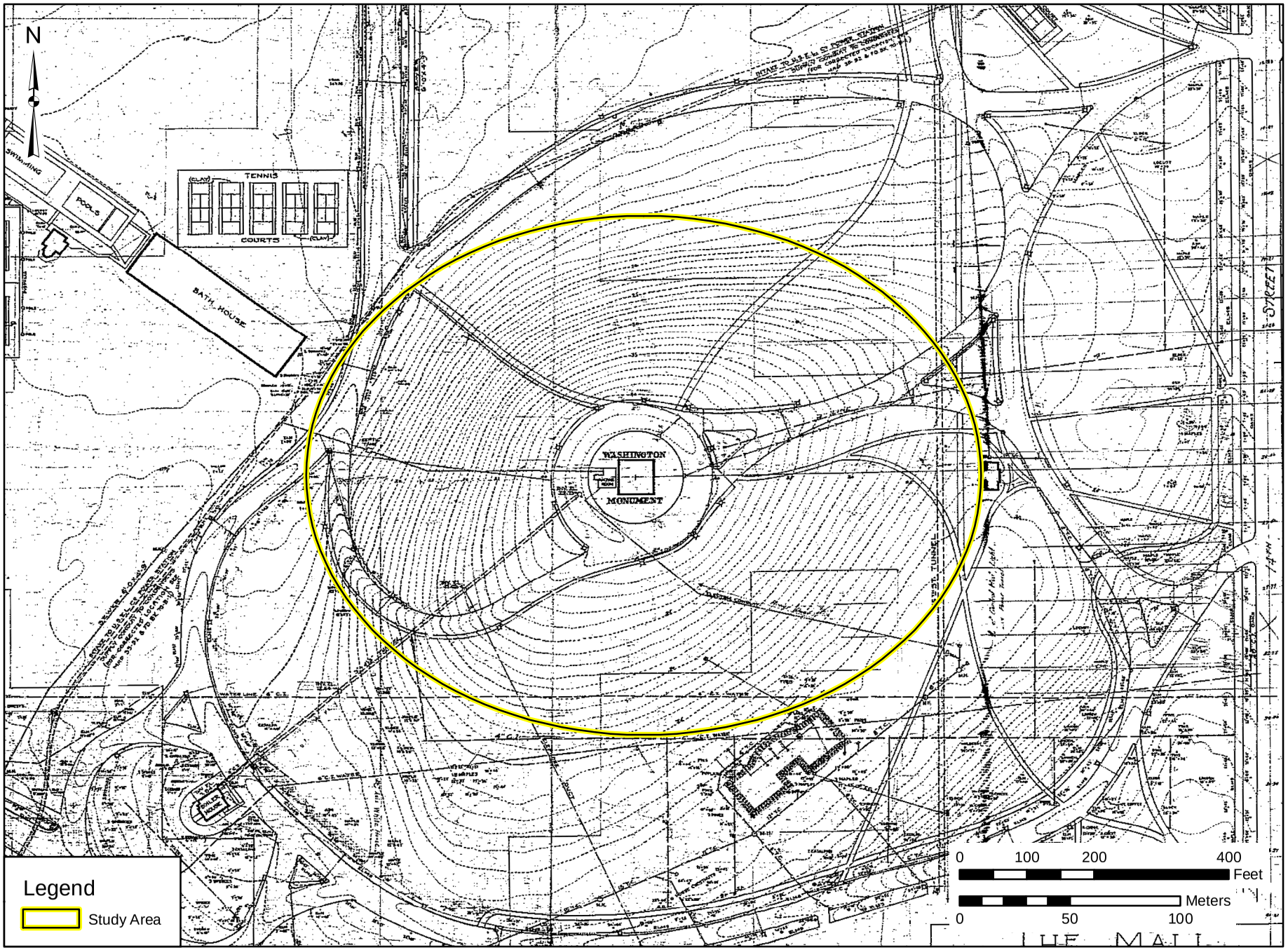

FIGURE 14: Washington Monument Study Area, 1930

SOURCE: OPB&G 1930

by the creation of new facilities on the low grounds in the northwest and northeast quadrants of the grounds. These included baseball diamonds, football and lacrosse fields, tennis courts, an archery range, a croquet court, a Tom Thumb golf course, and a swimming pool and bathhouse complex along the alignment of Virginia Avenue (see Figure 14). The automobile age brought increasing demands for upgrades to the vehicular circulation system and parking lots. During World War II a portion of the Monument Grounds was taken over by temporary military office buildings or "Tempos." Three Tempos (T-3, T-4, and T-5) were built on a 22.17-acre parcel west of the Monument (Figure 15), remaining in place until 1964.

Changes from the Mid-Twentieth Century to the Present, 1944 to 2011

The approach of the NPS's 50-year anniversary (Mission 66) and the nation's bicentennial celebration spawned new plans, concepts, and improvements to the grounds and realignment of the circulation system. The World War II Tempos were removed in 1964 and plans were made to replace the parking lot at 16th Street with the German-American Friendship Garden. Regrading of the western area of the Monument Grounds would have occurred after removal of the Tempos, giving the landscape its form as a low grassy knoll.

Heightened security concerns that followed the bombing of the embassies in Kenya and Tanzania, the bombing of the Alfred P. Murrah Federal Building in Oklahoma City, and the terrorist attacks of September 11, 2001, required new plans to protect the Monument. Creation of the present security zone around the Monument was completed in 2004-2006, including a new circulation system and a reshaping of the contours in the core of the Monument Grounds while maintaining the basic grassy knoll landscape concept.

EXPECTED POTENTIAL FOR ARCHEOLOGICAL RESOURCES

Available archival information indicates that a variety of archeological resources might be present within the Monument Grounds, ranging in age from the prehistoric period through the late nineteenth century. Although the site obviously contains a physical record of events that have occurred from the late nineteenth century through the present, resources must generally be more than 100 years old to be considered archeological properties.

Prehistoric occupation of the Monument Grounds is well established by the collection of Native American artifacts now held at the Smithsonian Institution. The variety of culturally diagnostic artifacts in this collection (see Figure 4) indicates episodic use of the south bank of Tiber Creek over thousands of years, so it should be expected that some evidence this Native American use of the landscape may be preserved somewhere within the Monument Grounds. These types of sites are most readily recognizable in the archeological record by stone tools or the waste debris associated with stone tool manufacture or rejuvenation. Cooking/heating areas are recognizable by concentrations of fire-cracked rock or burnt soil, and structural remains are occasionally recognizable by soil stains that result from rotting posts.

Colonial-era resources could include the remains of tenant houses, agricultural outbuildings, or slave quarters, although there is no specific information that would suggest the presence of these types of resources. These types of structures typically have very low archeological visibility and

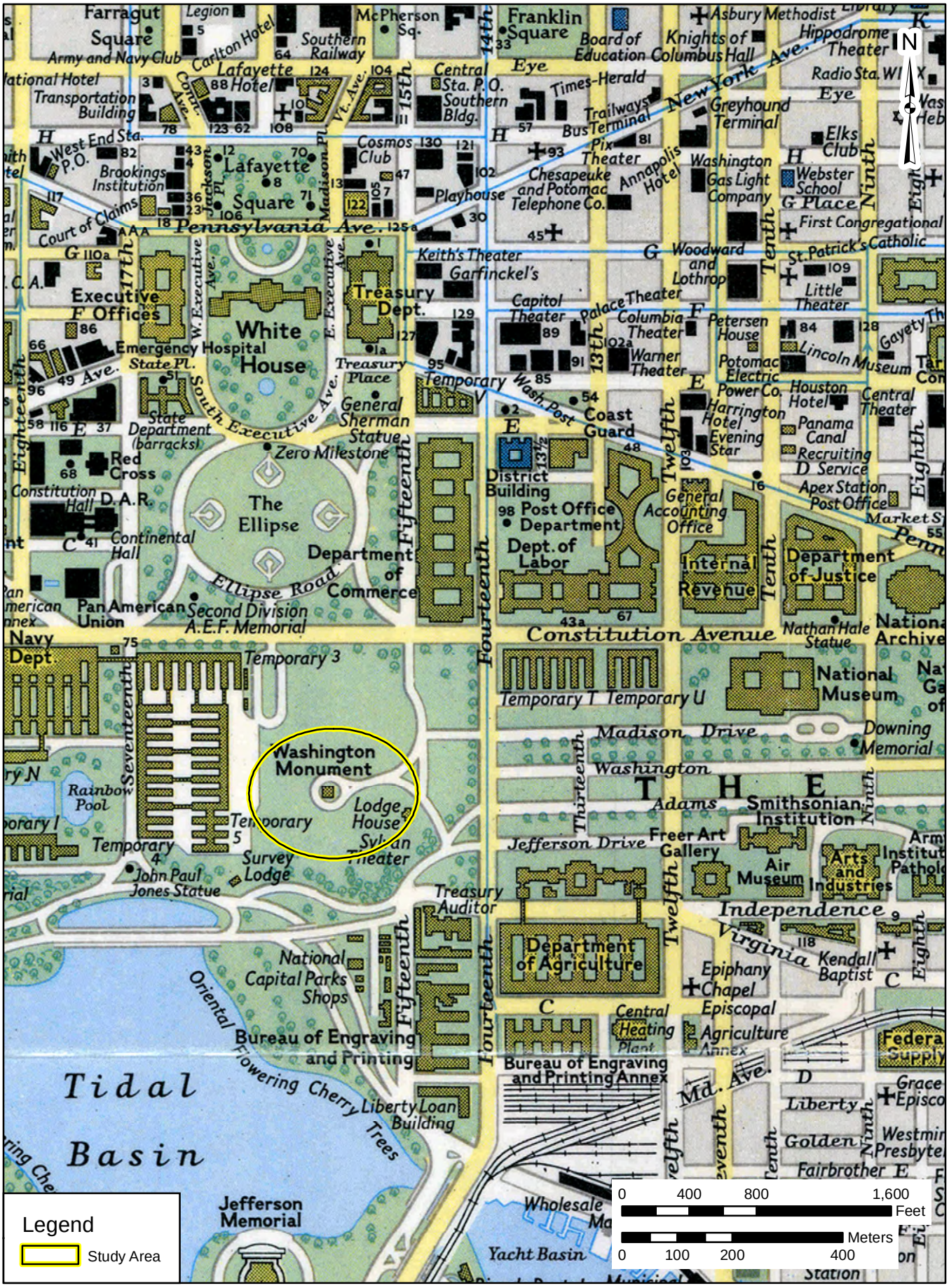

FIGURE 15: Washington Monument Study Area, 1948

SOURCE: National Geographic Society 1948

are often represented by a few nails or ceramic vessel fragments. Both prehistoric and colonial-era resources would be recognizable only in archeological contexts representative of the natural landscape or paleolandscape as it existed prior to development of the Monument Grounds.

As the Monument Grounds property has been in public ownership since the establishment of the City of Washington, it has a unique history that should be expressed in the archeological record. Construction of the Washington Monument brought many workmen, machines, and raw materials to the Monument Grounds, so it is possible that some recognizable remains of this activity might be present, which would be datable to the period from 1848 to 1888. The military use of the Monument Grounds during the Civil War included construction of barracks and structures associated with the cattle yard; archeological expressions of this use could include domestic refuse, the remains of simple frame structures (barracks), and the butchering debris ("offal") reported by a contemporary observer; other potential features of interest include sinks and pumps. Conversion of the natural landscape to its present contours involved the introduction of massive quantities of fill material, which would have taken many forms ranging from individual cartloads of household refuse to massive quantities of dredged silt from the Potomac River. Individual cartloads of refuse were recognizable during previous studies for the Ellipse Rehabilitation project (LeeDecker 2006) and the NMAAHC site on the Monument Grounds (LeeDecker et al. 2008). Episodes of development and landscaping of the Monument Grounds would be recognizable by pavement remnants, architectural remains of temporary structures, and soil columns that exhibit multiple discontinuities resulting from filling and grading episodes. Remnants of the historical circulation system, such as the gravel walkways and carriageways, might be recognizable if a distinctive paving material was used, such as crushed red shale.

Given the physical history of the Monument Grounds, the integrity of the landscape could be highly variable over relatively short distances. Immediately adjacent to the Monument, fill deposits from the first phase of landscaping (post-1880) would be expected. The underlying landscape would have been disturbed by activities related to construction and underpinning and reinforcement of the foundation. Utility line trenches would be expected throughout the Monument Grounds, concentrated along the historical circulation system and around the Monument itself.

SURVEY RESULTS

The field investigation was completed on June 23, 2011. Using a Geoprobe, 12 soil core borings were excavated to sample the study area, laid out on four transects along the cardinal directions (north, east, west, and south of the Monument) (Figure 16; Table 1). Modern and historical utility maps were reviewed prior to establishing the testing pattern, and a formal utility markout was requested. Of primary concern were the numerous irrigation lines throughout the grounds and a concentration of utilities that converge on the Monument itself. Other utility lines known to exist historically include gas and electric lines that served lamp posts along the historical carriageways, a water intake that served the PEPCO substation at the northeast corner of 14th Street and Constitution Avenue, and a tunnel southwest of the Monument. One difficulty was the lack of as-built drawings from the 2004-2006 security improvement program, which would have precisely located the most recent utility lines.

Three borings (1-3) were laid out on the north axis; however, one (WAMO-1) was not excavated because of a water supply line whose location could not be precisely determined. Five borings (4-8) were laid out on the east axis between the Monument and the Lodge. One (WAMO-7) was slightly offset from the transect to avoid a recent steam line that had been installed by the General Services Administration. Two borings (9-10) were laid out on the south axis, and three (11-13) on the west axis. The geoarcheological analysis of the borings is included as Appendix A.

The borings were advanced to depths ranging from 15 to 26 feet below ground surface (bgs). In all cases this was sufficient to reach the level were a buried natural landscape would have been present, given favorable preservation conditions. Although the testing confirmed that virtually all of the study area was covered by fill deposits, the results were somewhat surprising in that eight of the 12 borings contained an intact buried landscape surface. Fill depths ranged from roughly 6 to 20 feet, with greater depths in areas nearest the Monument. The buried surfaces were found at depths ranging from about 15 to 22 feet above mean sea level (amsl). These elevations depict the natural contours of the site as an elevated landform overlooking the confluence of Tiber Creek and the Potomac River, possibly cresting somewhat west of the Monument (Figure 17).

The buried natural landscape, represented by a plowed surface soil (Ap-horizon or plowzone), was typically characterized by a dark brown silt loam with evidence of plowing. In some cases the Ap-horizon soils had been slightly truncated, indicating minor landscape grading during the historic period. Three of the eight cores with Ap-horizons were very well preserved (WAMO-8, WAMO-9, and WAMO-10), which in itself is quite remarkable, given the site's history of landscaping and development. In Boring 9, about 180 feet south of the Monument, the buried A-horizon also contained cinders and whiteware ceramics, apparently reflecting the Monument's construction period, prior to the placement of terraces around the Monument's base. Other than these finds, only one other boring contained cultural material: a small fragment of shell[1] was recovered from the buried Ap-horizon in WAMO-11.

[1] The shell sample returned a radiocarbon date of 70±30 BP, calibrated (2 sigma range) to AD 1820 to 1910 and AD 1920 to beyond 1950 (Beta-302492; see Appendix B). The latter date range should be rejected, as the sample is from a context has been buried beneath post-1880 fill deposits. It is clear that the shell dates to the historic period and is not associated with the prehistoric occupation of the Monument Grounds.

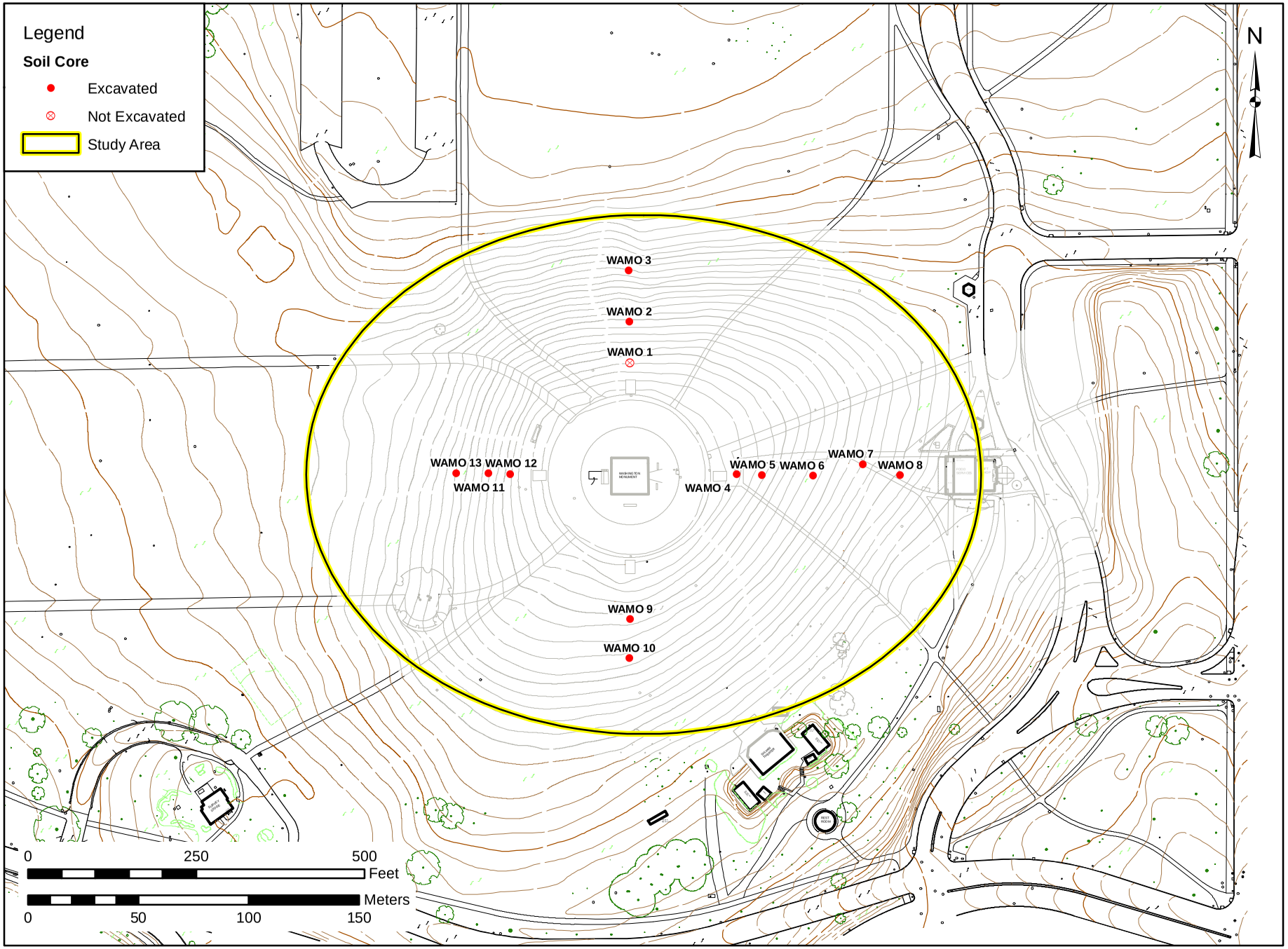

FIGURE 16: Location of Geoarcheological Borings

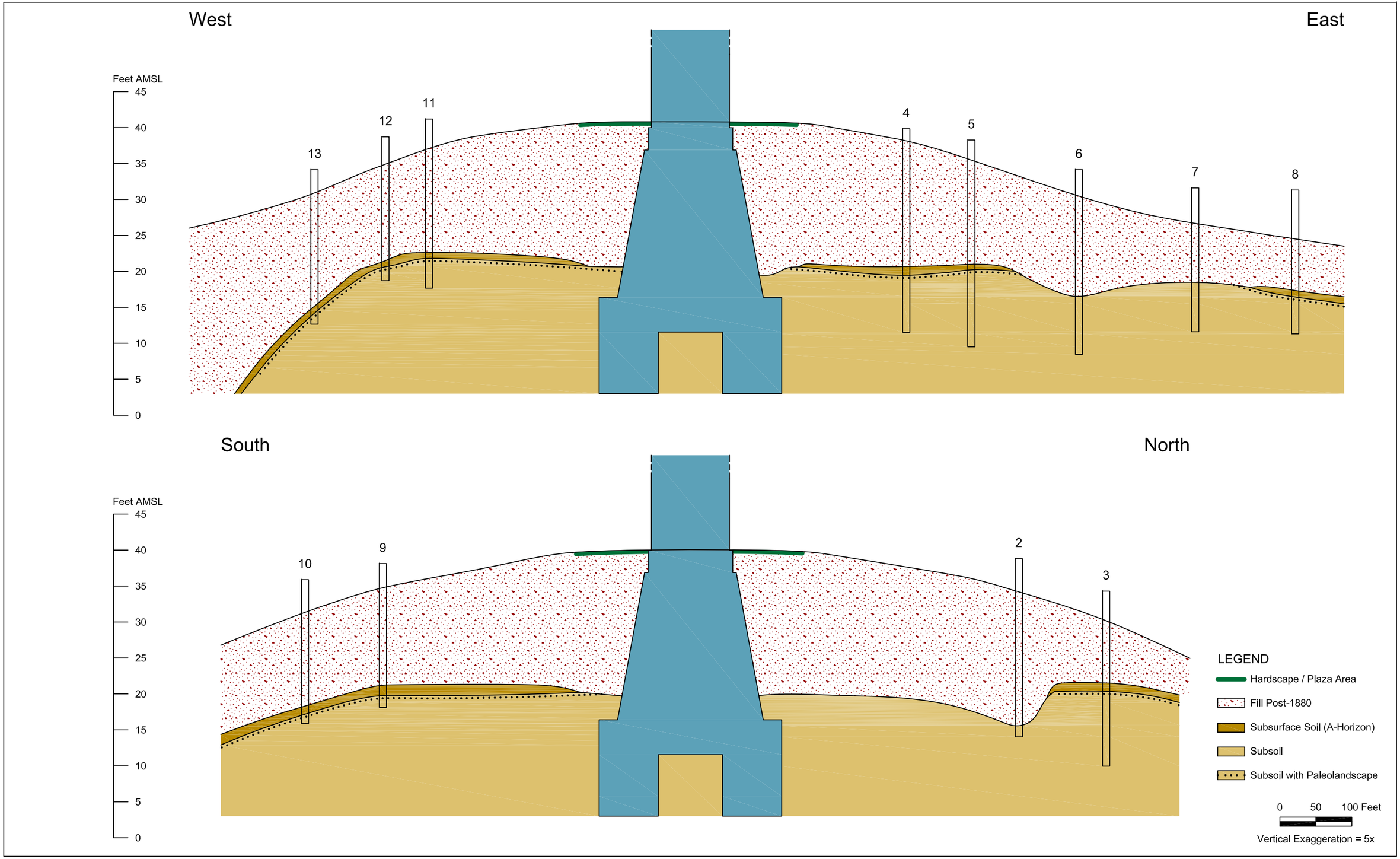

FIGURE 17: Reconstructed Stratigraphic Sections

Table 1: Summary of Geoarcheological Borings

BORING NO.	TOP ELEVATION (feet amsl)	DEPTH OF PROBE (feet bgs)	DEPTH OF FILL (FEET BGS)	ELEVATION OF AP-HORIZON (feet amsl)
WAMO-1	37	n/a	n/a	n/a
WAMO-2	34	20	18.7	n/a; truncated subsoil
WAMO-3	30	20	8.8	21.2
WAMO-4	37	26	17.6	19.4
WAMO-5	35	26	14.8	21.2
WAMO-6	30	26	14.0	n/a; truncated subsoil
WAMO-7	26	26	8.0	n/a; truncated subsoil
WAMO-8	23	15	6.2	16.8
WAMO-9	34	26	12.7	21.3
WAMO-10	31	20	13.0	18.0
WAMO-11	36	26	14.0	22.0
WAMO-12	34	26	12.8	n/a; truncated subsoil
WAMO-13	28	20	13.0	15.0

Aside from the preservation of a landscape that would have been available from prehistoric times through the late nineteenth century, the soil columns also showed evidence of an underlying loess deposit (wind-deposited silt), indicating that a more ancient landscape (paleolandscape) is present beneath the Ap-horizon. The loess deposit[2] is most likely associated with the Younger Dryas climatic episode, which dates to about 10,850 to 9550 BC. Comparable loess deposits were also documented in the National Mall Turf and Soil Reconstruction project (LeeDecker 2010).

[2] Beneath the Ap-horizon, all horizons of silt loam or silty clay loam texture are interpreted to be Younger Dryas loess. Some of the soils are a bit mixed by natural processes, and the resulting texture is loam. Soils underlying the loess are usually fine sandy loam, loam, or clay loam. The fine sandy loam horizons directly underling the loess could well be buried paleosurfaces that no longer exhibit the dark color of a "living" surface horizon (Wagner, personal communication 2011).

DISCUSSION AND MANAGEMENT RECOMMENDATIONS

DISCUSSION OF RESULTS

The survey results are discussed with regard to the specific research questions that guided this study.

- Does the study area contain areas of natural landscape associated with the bank of lower Tiber Creek?

A well-preserved natural landscape surface was identified in eight of the 12 borings excavated for this study. This surface is recognizable as a dark brown loam with evidence of plowing during the historic period. In some locations there was evidence of minor grading, but overall the survival of a buried landscape surface was quite unexpected, given the history of the site from 1848 onward. Beneath the Ap-horizon a second paleolandscape is likely buried beneath a loess deposit that formed during the Younger Dryas climatic episode.

- What is the likely level of integrity associated with potential prehistoric and historic archeological resources in subsurface contexts in the study area?

Prehistoric archeological resources, if present, could be expected to occur in association with the buried plowzone (Ap-horizon) or, much less likely, with the paleolandscape represented by the surface beneath the Younger Dryas loess. Archeological resources associated with the paleolandscape would be limited to those of the Paleoindian period, when population levels were very low. It is expected that remains of the Monument Grounds Site (51NW35), if present, would be located in the Ap-horizon, as its occupation dates to after the Younger-Dryas climatic episode.

Archeological resources associated with the upper landscape surface (Ap-horizon), if present, might exhibit a moderate level of integrity, diminished to some degree by the processes of historic-period cultivation and grading. The integrity of prehistoric resources associated with the underlying paleolandscape might be somewhat higher, given that this soil horizon might have suffered less from the impacts of historic-period cultivation, installation of utilities, and formal landscape development of the Monument Grounds.

- What effects have the processes of historic land use and formal landscaping of the Washington Monument Grounds had on landscapes that might contain significant archeological resources?

Historic land use processes have had surprisingly minor adverse impacts on the landscapes that could potentially contain archeological resources. The preservation of a buried landscape surface in eight of the 12 locations tested for this study was quite unexpected, as it had been generally assumed that the formal landscaping of the Monument Grounds would have resulted in widespread disturbance of the natural landscape. Clearly, this assumption is erroneous. In some cases historic-period grading has resulted in a loss of up to several feet of the natural landscape,

but in most cases fill deposits that date after 1880, when the first episode of filling was completed following completion of the Monument foundation, have essentially established a protective blanket over the study area.

- How extensive is the disturbance associated with existing utility lines in the study area?

Utility lines were consciously avoided in this study, and it is not possible to provide a comprehensive summary of all the historical and modern utility lines that have crossed the study area. The depth of the fill deposits — greater than 15 feet in the areas nearest the Monument — would suggest that many of the utility lines would not have disturbed the underlying natural soils, as most of the utilities were installed after 1880. The modern irrigation lines are the most extensive of all the utilities in the study area, and these are relatively shallow. Gas and electric lines are confined to relatively narrow corridors and may also not be deep enough to reach the underlying natural landscape.

MANAGEMENT RECOMMENDATIONS

In the context of compliance with Section 106 and the ongoing NEPA analysis, the results of this study point to the need for further consideration of *possible* effects of the project on *possible* archeological resources. The previously identified Monument Grounds Site (51NW35) is the resource of primary concern, but its location cannot be established with any accuracy. It would be associated with the buried A-horizon soil that was documented in eight of the 12 borings.

With the available data, it is impossible to establish the presence or location of any archeological resources in the study area, nor is it possible to assess potential effects of the undertaking. Various alternative project designs are presently in the conceptual stage, so details regarding footprints and associated ground disturbance are speculative. The project alternatives that would place the footprint of the new screening facility within the existing plaza area might be the most benign in terms of potential effects on archeological resources, provided that any required ground-disturbing activities are limited to perhaps the upper 15 feet, which would be within post-1880 fill deposits of no archeological interest. The “New Approach through the Landscape” alternative would involve some sort of below-grade concourse between the Monument and the Lodge, where the buried landscape was identified in Borings WAMO-4, WAMO-5, and WAMO-8. This option might require the greatest amount of subsurface excavation in areas that are not immediately adjacent to the Monument. If this option is chosen, more careful attention should be given to potential effects to archeological resources. Any recommended further work to establish the actual presence and condition of archeological resources in the study area should consider the depths below present grade at which archeological resources might exist as well the uncertainty of which project alternative will be implemented.

Beyond the question of whether or not archeological resources are present in the area of potential effects, another important question is to investigate the character of the paleolandscape and its spatial distribution in the District of Columbia. Episodes of eolioan deposition have been recognized throughout the Middle Atlantic Coastal Plain and beyond, typically during comparatively dry periods that are known to have occurred during the Holocene when

diminishing vegetative cover promoted the availability of parent material from sources such as exposed river bars or bare soil areas on the land.

Future archeological work would require the use of larger apertures to examine the natural soils that are covered by massive fill deposits. The study would require detailed documentation of soil profiles, preferably by the excavation of test trenches or by examination of excavations that would be opened during the construction phase of the project. Such a program could be initiated during the project planning phase or possibly be deferred until construction.

Selection of the preferred project alternative will likely focus on issues related to security requirements, esthetics and visual impacts, visitor experience, and park operations. Possible impacts on archeological resources will be a relatively minor concern. The scheduling and scoping of future archeological and geoarcheological work should be determined during the ongoing Section 106 consultations.

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APPENDIX A

GEOARCHEOLOGICAL ASSESSMENT REPORT

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GEOARCHAEOLOGICAL INTERPRETATIONS OF SOILS AROUND THE WASHINGTON MONUMENT IN WASHINGTON, D.C.

Submitted to
The Louis Berger Group, Inc.

By
Daniel P. Wagner, Ph.D.
Pedologist

July 11, 2011

Introduction and Methods

The following is a discussion of pedological and geoarcheological investigations on the grounds of the Washington Monument. The principal objective of the study was to ascertain whether any original, formerly inhabitable land surfaces still persist within the artificially sculpted topography of the site. Since the slopes leading up to the Monument are obviously elevated by introduced fill material, the possibility exists that original surfaces might be preserved beneath the fill at some locations. This in turn offers the prospect that buried cultural resources might also be present. Investigations were therefore directed toward examinations of soil features for indications of deposit types and intact natural land surfaces that may once have been available to former inhabitants of the area.

Interpretations are based on examinations of soil cores extracted by 12 Geoprobe borings made on June 24, 2011 and distributed in a cruciform pattern oriented on north-south and east-west axes. Soil columns were described to depths well below levels for which it was considered any cultural resource potential was possible, typically reaching into soils with ages ranging thousands of years into the Pleistocene. Examined soil materials were described employing standard pedological designations for soil horizons, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes. Logs for the borings are attached at the end of the report.

Results and Conclusions

As expected, each of the borings encountered deep deposits of earthen fill ranging in thickness from as much as 18 ft (Borings 2 and 4) near the Washington Monument to only about 6 ft at the greatest removal to the east (Boring 8). Natural strata underlying the fill can be broadly grouped into two categories based on degree of integrity of the buried original landscape. At some locations the original soils were truncated up to several feet prior to being covered by fill, but at most the buried original surfaces are either fully intact or have suffered only relatively minor disturbance.

Severely truncated soils were encountered in Borings 2, 6, 7, and 12. At each of these locations fill materials were in direct contact with lower subsoil horizons, and original surface horizons as well as varying amounts of the upper subsoil horizons were missing. Based on estimates of soil profile reconstruction the original soils were truncated by about 2 to as much as 4 feet. The remaining subsoil horizons are those of strongly developed Coastal Plain soils with argillic horizons indicative of ages extending well into the Pleistocene. Due to this antiquity most cultural materials that might originally have been present would have been confined to levels near the original surfaces, and with the destruction of these levels a corresponding destruction of cultural material also occurred.

At eight of the boring locations soils beneath the fill were found to be either fully or partially intact. Where fully intact there were clear indications of former tillage, and the buried

surfaces are identified as plow zones (Ap). At two locations (Borings 3 and 4) the soils had apparently suffered local grading to result in varying amounts of mixing of the original surface and upper subsoil materials (Figure A-1). This degree of mixing should be considered more than that typically resulting from agricultural tillage, but even with the comparatively greater loss of integrity any cultural materials should still be present. At three other locations (Borings 5, 11 and 13) original surfaces had been partially truncated so that only about the lower half of the surface horizon remains. Accordingly, some cultural materials are also likely to have been removed. It is, however, worth noting that in tilled or formerly tilled settings artifacts tend to be concentrated near or just below the base of the plow zone, so that in these partially truncated soils much of the cultural record may still be present.

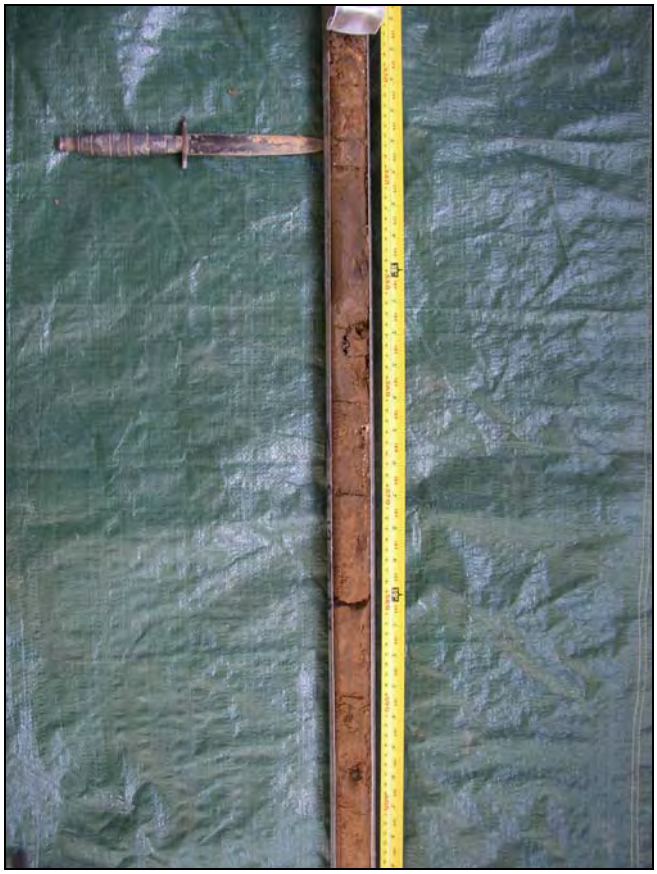


Figure A-1. The original surface horizon is present at the depth of 17.6 ft in Boring 4, but mixing with some subsoil material is suggestive of minor grading.

Almost miraculously, given both the extensively modified topography of the site as well as the employed methodology in which it is not uncommon for some sample loss to occur, soil profiles beneath the fill were found to be fully intact at three locations (Boring 8, 9 and 10). These soils all had preserved plow zones of about the half-foot thickness typically produced by animal-drawn equipment. Additionally, each profile had fully intact underlying horizonation including upper transitional subsoil horizons (BE) that indicate little soil loss due to tillage had occurred during earlier land usage (Figure A-2). These well preserved buried soils retain their full cultural resource potential.

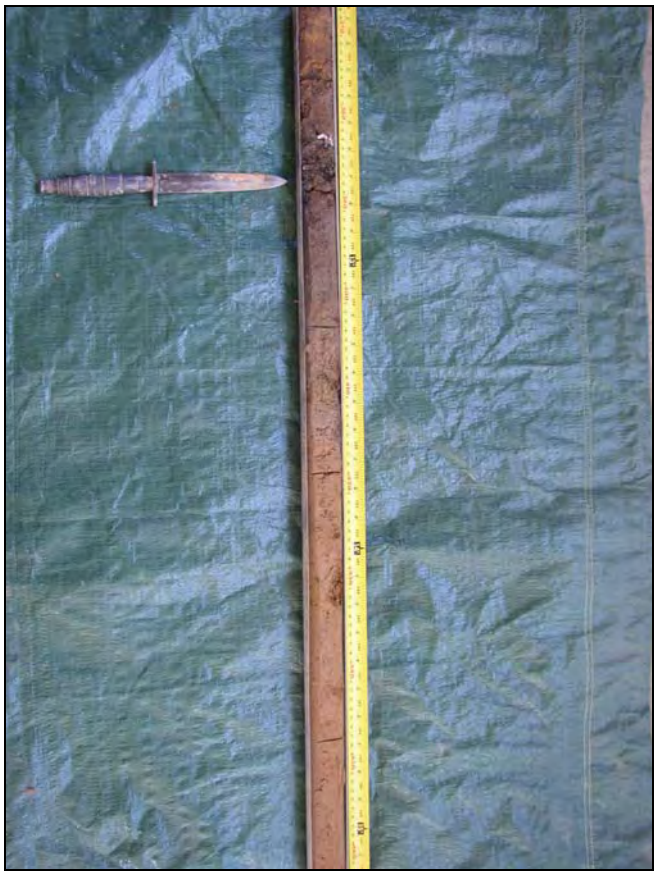


Figure A-2. The profile of Boring 9 is an example of a well-preserved original soil beneath 12.7 ft of fill. A thin layer of cinders and a small piece of white historic ceramic lie on top of the buried surface.

Another interesting aspect about the buried soils that are either fully or partially intact is that they are all bisequal. An upper sequum of about two feet thickness is formed in silty deposits consistent with a loessial (wind-blown silt) origin, and this silty soil in turn rests upon an earlier soil formed in somewhat sandier and much more strongly weathered Coastal Plain sediments. Soils with surficial loess mantles have a sporadic presence throughout the Coastal Plain portion of Washington, D.C. Based on age estimates suggested by degree of subsoil development these loessial soils appear to correlate with others in the Mid-Atlantic region that have been shown to have originated during the Younger Dryas cold reversal period. Since this climate episode occurred after the Paleoindian period, and indeed could well have had a significant role in its termination, there is some prospect for artifacts of this early era to occur beneath the loess blanket at the top of the underlying paleosol.

Interceptions of intact soils or estimated reconstructions of truncated soils allow for approximations of original surface elevations around Washington Monument. Some laxity of a foot or two must be accepted, again due to incomplete sampling in some of the core tubes; however, the numbers generally demonstrate a consistent trend. Given in Table 1, the data indicate that even without the fill the site chosen for the Monument was already higher than most

surrounding terrain. In the immediate vicinity of the Monument the original surface elevations were on the order of 19 to 22 ft, with the highest point on the original landscape just to the west of the Monument location. At the outermost boring locations slopes eventually tend to fall off several feet. This pattern is not apparent with the two northern borings, although declining elevation would certainly have occurred approaching Constitution Avenue where the former Tiber Creek once coursed. To the east the elevation tails off to about 17 ft, which matches that determined in another investigation made by this investigator and The Louis Berger Group in the block northeast of 15th Street. As an overall description, the landscape in the vicinity of the Monument appears to have been something a broad, nearly level to gently sloping upland. This is actually quite consistent with the topographic constraint necessary for the persistence of loessial soils, which on more sloping terrain are otherwise highly susceptible to deflation by natural erosional processes.

Table 1. Estimations of original surface elevations (ft) based on interceptions of buried surface horizons or likely reconstructions of truncated soil profiles.

Boring	Existing Elevation	Original Elevation (feet amsl)
WAMO-2	34	19
WAMO-3	30	21*
WAMO-4	37	19*
WAMO-5	35	20*
WAMO-6	30	20
WAMO-7	26	19
WAMO-8	23	17*
WAMO-9	34	21*
WAMO-10	31	18*
WAMO-11	36	22*
WAMO-12	34	23
WAMO-13	28	15*

*Buried surfaces

Descriptions for Core Borings

Depth (ft)	Pedologic Horizon (if present)	Characteristics
Boring 2 (elev. 34 ft)		
0 - 18.7		Mixed earthen fill
18.7 - 19.4	Bt	Dark yellowish brown (10YR 4/6) loam; soil truncated ~3 to 4 ft
19.4 -20.0+	BC	Strong brown (7.5YR 4/6) fine sandy loam
Boring 3 (elev. 30 ft)		
0 - 8.8		Mixed earthen fill
8.8 - 9.9	A/B	Dark brown (10YR 3/3) and strong brown (7.5YR 4/6) fine sandy loam to loam
9.9 - 10.5	Bt/A	Strong brown (7.5YR 4/6) and dark brown (10YR 3/3) loam; soil graded and locally mixed
10.5 - ~13	Bt	Strong brown (7.5YR 4/6) loam
~13 - 15.6	BC	Strong brown (7.5YR 4/6) fine sandy loam
19.4 - 20.0+	C	Stratified brown (7.5YR 4/4) loamy fine sand and strong brown (7.5YR 4/6) fine sandy loam
Boring 4 (elev. 37 ft)		
0 - 17.6		Mixed earthen fill
17.6 - 18.3	A/B	Dark brown (10YR 3/2) and brown (7.5YR 4/4) loam
18.3 - 18.8	B/A	Brown (7.5YR 4/4) and (10YR 4/3); loam; soil graded and locally mixed
18.8 - 20.0	BE	Brown (7.5YR 4/4) heavy fine sandy loam
20.0 - 24.0	Bt	Brown (7.5YR 4/4) loam
24.0 - 26.0+	BC	Strong brown (7.5YR 4/6) fine sandy loam
Boring 5 (elev. 35 ft)		
0 - 14.8		Mixed earthen fill
14.8 - 15.0	Ap	Dark brown (10YR 3/2) loam; shattered quartz above and possible 0.2 ft more A horizon above quartz; soil locally graded
15.0 - 17.0	Bt	Brown (7.5YR 4/4) loam to silt loam
17.0 - 18.4	BC	Strong brown (7.5YR 4/6) heavy fine sandy loam
18.4 - 20.0+	2Bt1	Strong brown (7.5YR 4/6) clay loam
20.0 - 23.0		No retrieval
23.0 - 26.0+	2Bt2	Strong brown (7.5YR 4/6) heavy fine sandy loam

Depth (ft)	Pedologic Horizon (if present)	Characteristics
Boring 6 (elev. 30 ft)		
0 - 14.0		Mixed earthen fill
14.0 - 15.7	Bt	Brown (7.5YR 4/4) loam to silt loam; soil truncated 3 to 4 ft
15.7 - 17.6	BC	Strong brown (7.5YR 4/6) fine sandy loam to loam
17.6 - 20.1	2Bt1	Strong brown (7.5YR 4/6) clay loam
20.1 - 23.0+	2Bt2	Strong brown (7.5YR 4/6) sandy clay loam
Boring 7 (elev. 26 ft)		
0 - 8.0		Mixed earthen fill
8.0 - 9.3	Bt	Brown (7.5YR 4/4) loam to silt loam; soil truncated 3 to 4 ft
9.3 - 12.8	BC	Strong brown (7.5YR 4/6) loam to sandy clay loam
12.8 - 16.0+	2Bt	Strong brown (7.5YR 4/6) clay loam
Boring 8 (elev. 23 ft)		
0 - 6.2		Mixed earthen fill
6.2 - 6.7	Ap	Brown (10YR 4/3) silt loam
6.7 - 7.4	BE	Brown (10YR 4/4 and 5/4) silt loam
7.4 - 8.4	Bt	Brown (7.5YR 4/4) silty clay loam; common, medium distinct mottles of light brownish gray (10YR 6/2)
8.4 - 10.6	2BC	Dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) fine sandy loam; common, medium distinct mottles of light brownish gray (10YR6/2)
10.6 - 12.0+	2Bt	Strong brown (7.5YR 5/6) heavy loam; common, medium distinct mottles of light brownish gray (10YR 6/2)
Boring 9 (elev. 34 ft)		
0 - 12.7		Mixed earthen fill
12.7 - 13.3	Ap	Dark brown (10YR 3/3) silt loam
13.3 - 13.7	BE	Brown (10YR 4/4 and 4/3) silt loam
13.7 - 14.7	Bt	Dark yellowish brown (10YR 4/6) to strong brown (7.5YR 4/6) heavy silt loam
14.7 - 16.0+	2Bt	Strong brown (7.5YR 4/6) loam to fine sandy loam

Depth (ft)	Pedologic Horizon (if present)	Characteristics
Boring 10 (elev. 31 ft)		
0 - 13.0		Mixed earthen fill
13.0 - 13.5	Ap	Dark brown (10YR 3/3) silt loam
13.5 - 13.9	BE	Brown (10YR 4/4 and 4/3) silt loam
13.9 - 14.0+	Bt	Dark yellowish brown (10YR 4/6) heavy silt loam; poor retrieval for the 12-16 ft tube
Boring 11 (elev. 36 ft)		
0 - 14.0		Mixed earthen fill
14.0 - 14.2	Ap	Dark brown (10YR 3/3) silt loam; truncated ~0.5 ft; oyster shell fragments at top
14.2 - 14.5	BE	Brown (10YR 4/4 and 4/3) silt loam
14.5 - 15.7	Bt	Dark yellowish brown (10YR 4/6) to strong brown (7.5YR 4/6) heavy silt loam
15.7 - 16.0+	2Bt	Strong brown (7.5YR 4/6) loam to fine sandy loam
Boring 12 (elev. 34 ft)		
0 - 12.8		Mixed earthen fill
12.8 - 16.0+	Bt	Strong brown (7.5YR 4/6) heavy sandy clay loam; soil truncated 2 to 3 ft
Boring 13 (elev. 28 ft)		
0 - 13.0		Mixed earthen fill
13.0 - 13.2	Ap	Dark brown (10YR 3/3) silt loam; truncated ~ 0.5 ft
13.2 - 13.4	BE	Brown (10YR 4/4) to dark yellowish brown (10YR 4/6) silt loam
13.4 - 14.1	Bt	Dark yellowish brown (10YR 4/6) heavy silt loam
14.7 - 16.0+	2Bt	Strong brown (7.5YR 4/6) loam to fine sandy loam

APPENDIX B

RADIOCARBON DATE REPORT

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Ms. Lynn LaMastra/Susan Butler — Report Date: 7/27/2011

The Louis Berger Group, Incorporated — Material Received: 7/15/2011

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 302492	70 +/- 30 BP	-2.0 o/oo	450 +/- 30 BP

SAMPLE : 4847-WAMO-11
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (shell): acid etch
2 SIGMA CALIBRATION : Cal AD 1820 to 1910 (Cal BP 130 to 40) AND Cal AD 1920 to beyond 1950 (Cal BP 30 to 0)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-2:Delta-R=0±0:Glob res=-200 to 500:lab. mult=1)

Laboratory number: **Beta-302492**

Conventional radiocarbon age: **450±30 BP**

(local reservoir correction not applied)

2 Sigma calibrated results[2]: (95% probability) **Cal AD 1820 to 1910 (Cal BP 130 to 40) and Cal AD 1920 to beyond 1950 (Cal BP 30 to 0)**

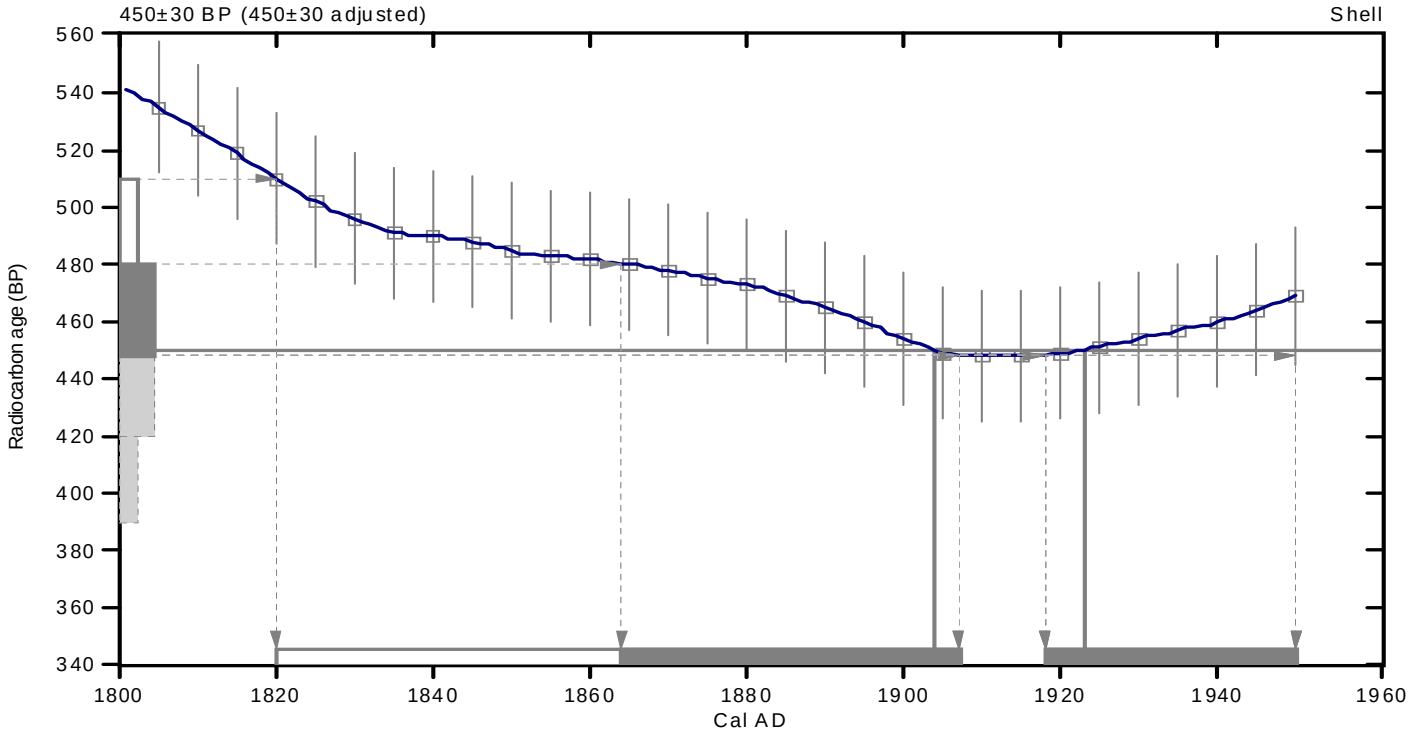
[2] 2 Sigma range being quoted is the maximum antiquity based on the minus 2 Sigma range

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1900 (Cal BP 50) and Cal AD 1920 (Cal BP 30)

1 Sigma calibrated results[3]: (68% probability) Cal AD 1860 to 1910 (Cal BP 90 to 40) and Cal AD 1920 to beyond 1950 (Cal BP 30 to 0)

[3] 1 Sigma range being quoted is the maximum antiquity based on the minus 1 Sigma range



References:

Database used

MARINE04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

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APPENDIX C

NADB 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

_____
_____
_____

4. UTM COORDINATES

Zone _____ Easting _____ Northing _____
Zone _____ Easting _____ Northing _____
Zone _____ Easting _____ Northing _____
Zone _____ Easting _____ Northing _____
Zone _____ Easting _____ Northing _____
Zone _____ Easting _____ Northing _____

Continuation, see 14.

5. AUTHORS Charles LeeDecker and Daniel P Wagner

6. YEAR 2011 _____ _____ _____

Year published.

7. TITLE Geoarcheological Investigation for the Washington Monument Visitor Screening Facility, National Mall and Memorial Parks, District of Columbia

7. 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/PUBLICATION
Follow the American Antiquity style guide for the type of publication circled.
The Louis Berger Group, Inc., Washington, DC

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 TOWN Washington, DC

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.

Washington Monument	[4]		[ ]		[ ]
Geomorphology	[1]		[ ]		[ ]
Younger Dryas	[7]		[ ]		[ ]
Paleolandscape	[1]		[ ]		[ ]
	[ ]		[ ]		[ ]
	[ ]		[ ]		[ ]
	[ ]		[ ]		[ ]
	[ ]		[ ]		[ ]

Continuation, see 14.

13. FEDERAL AGENCY National Park Service

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

FORM COMPLETED BY

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