National Park Service
U.S. Department of the Interior

George Washington Memorial Parkway
DC, MD, VA



Great Falls Park Visitor Center

Historic Structure Report •*2023*

100% Final Submission

US Department of the Interior • National Park Service • National Capital Area • Resource Stewardship and Science • Washington, DC

Historic Structure Report

Great Falls Park Visitor Center



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US Department of the Interior • National Park Service • National Capital Area • Resource Stewardship and Science • Washington, DC • 2022

Great Falls Park Visitor Center

9200 Old Dominion Drive, McLean VA

Historic structure report

Approved by:

Superintendent,
George Washington Memorial Parkway

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Cover Photo: Great Falls Visitor Center Courtyard. (CRTKL, 2021)

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Foreword

The Great Falls Park Visitor Center, opened in 1968, is one of the largest Mission 66 architectural efforts constructed in the National Capitol Region and embodies the form-making, circulation-dominated contextualism of that nation-wide program particularly well. This report provides a clear understanding of architect Kent Cooper's vision for the building and highlights how modifications have altered the form and function of the structure over the last half-century, information that will be vital to any future rehabilitation efforts.

We are pleased to make available this Historic Structure Report, part of ongoing efforts to provide comprehensible documentation for the historic structures of the George Washington Memorial Parkway.

A number of individuals contributed to the successful completion of this work, but we would particularly like to thank the following employees of the National Park Service; Laura Anderson of the Museum Resource Center, Steven Kattula of the George Washington Memorial Parkway, and Elizabeth Milnarik of the National Capital Regional Office. In addition Tim Kerr of Robinson and Associates, and Kirill Pivovarov of CRTKL contributed significantly to shaping this document.

We hope this study will prove valuable to park management and others in ongoing efforts to rehabilitate the Great Falls Park Visitor Center and to everyone in understanding and interpreting its history and contributions to mid-20th century cultural resources across the National Park Service. We are grateful for the cooperation of all those who helped make this document possible.

Charles Cuvelier

Superintendent

George Washington Memorial Parkway

2022

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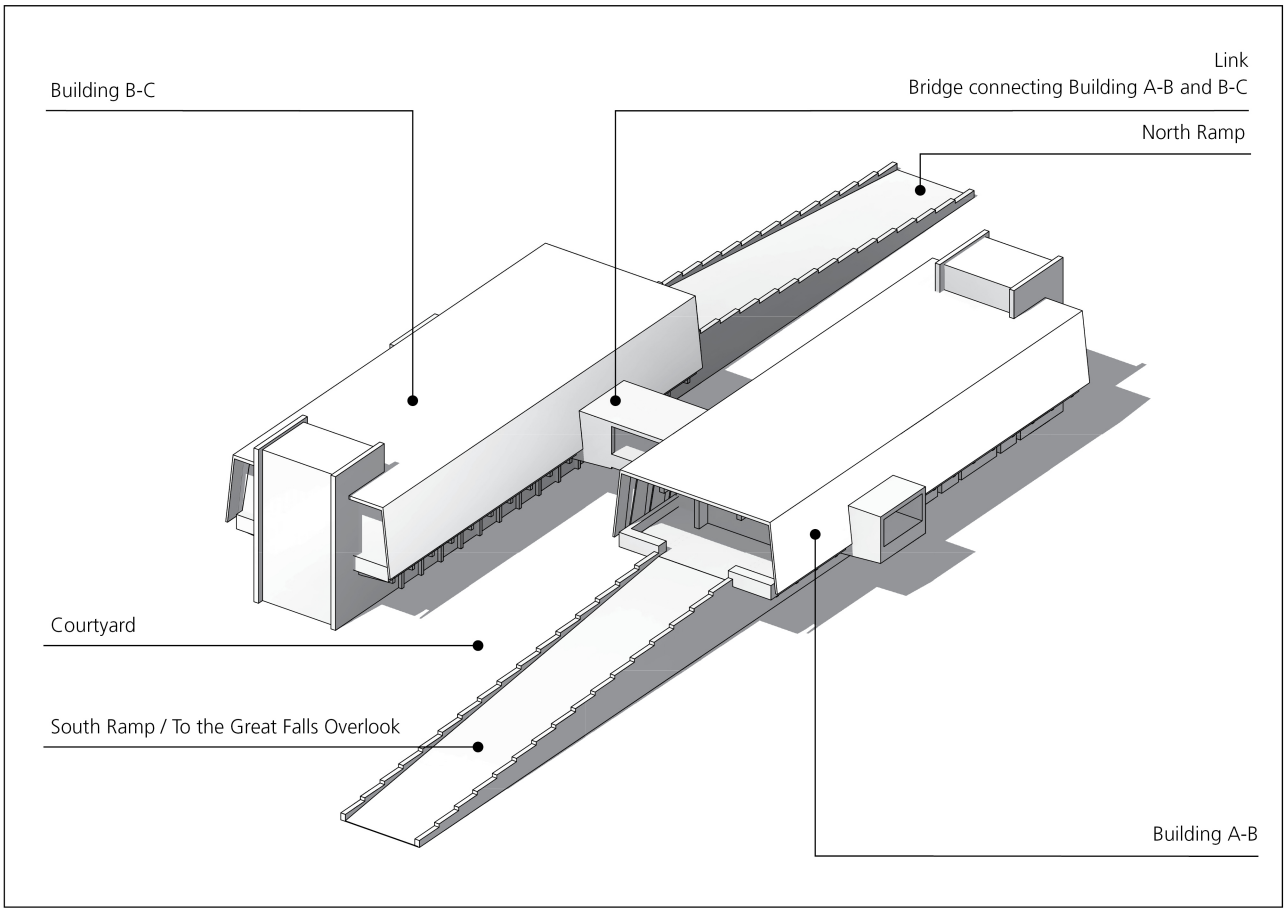


Figure 1. Great Falls Visitor Center Massing Diagram. (CRTKL, 2022)



Figure 2. Great Falls Visitor Center in 1969, looking north. South ramp at right. (MRCE)

Executive Summary

INTRODUCTION

The Visitor Center of Great Falls Park, a National Park Service (NPS) site in Virginia administered by the George Washington Memorial Parkway, was designed by Kent Cooper and Associates Architects and constructed in 1968, as part of the National Park Service's nationwide Mission 66 program to upgrade Park Service facilities and visitor access.

The Visitor Center is located between the Great Falls overlook on the Potomac River and the parking lot, adjacent to the historic Patowmack Canal and well-integrated with the surrounding landscape on the Virginia side of the falls. The original visitor experience was defined by the circulation of visitors from the parking lot, through the building spaces, and out toward the falls overlook, historic canal, and trails. The architectural concept was inspired by the imagery of two passing canal boats. This building is a fine example of American mid-century modern architecture and the National Park Service Mission 66 Program.

The Great Falls Park Visitor Center continues to retain its integrity as a historic resource. Certain modifications, driven by the program changes and accessibility upgrades, were made to the building during the last 20 years. Flooding is an ongoing concern at the site, due to the proximity of the Potomac River and heavy rainfall events, and the courtyard is currently undergoing work to address a continuing drainage challenge. Assessment of the site is not part of the scope of this report. The building is currently used for the visitor center public program, NPS administrative offices, and concessions. The building will retain the primary visitor center function, while NPS is considering potential changes and area adjustments for the other uses.

The purpose of the Historic Structure Report (HSR) for the Great Falls Park Visitor Center is to guide the preservation, rehabilitation, and repairs of the structure, and to serve as a preservation tool for potential future changes to the building program. This report provides documentary, graphic, and physical information about the building's history and existing conditions.

The National Register of Historic Places Nomination for the Great Falls Park Historic District considers the Visitor Center a contributing building. The National Register of Historic Places Nomination, completed in 2014, determined that the Visitor Center retains integrity to the period of significance, despite minor alterations and accessibility modifications.

RESEARCH CONDUCTED TO PRODUCE HSR

The National Park Service provided digital copies of documents and drawings at the beginning of the study. The documents included an environmental assessment and FONSI (Finding of No Significant Impact) for a General Management Plan for Great Falls Park, as well as a 2003 report on the visitor center's roof. The drawings included a complete 1966 set of the Visitor Center for Great Falls, Virginia, approved by Robert W. Andrew, acting chief of the National Capital Region's Division of Project Design, and by Regional Director T. Sutton Jett. The remaining drawings primarily documented projects after 1999. Additional primary research was undertaken in the George Washington Memorial Parkway (GWMP) archives at park headquarters. Early versions of the park's master plan were found among headquarters archives, as well as a 1965 report on archeological investigations at the visitor center site. Cultural Resources Specialist Megan Bailey provided a spreadsheet of digitized documents prior to the research site visit, from which approximately two dozen drawings were retrieved.

Research was also conducted in National Park Service textual, cartographic, and photographic records at the National Archives and Records Administration in College Park, Maryland. This research was undertaken both virtually and onsite as a result of restrictions resulting from the COVID 19 pandemic. The National Archives material held little of value related to the Great Falls Park Visitor Center. Most of the records there pre-dated the visitor center construction. More successful research was carried out in National Park Service records held at the Washington National Records Center (WNRC) in Suitland, Maryland. With the help of NPS Project Manager and Historical Architect Elizabeth Milnarik, records were requested from WNRC, and more than sixty boxes of documents covering the period between 1961 and 1971 were reviewed at National Capital Region Headquarters in Washington, D.C. These records consisted mainly of correspondence and reports originating from the offices of the National Capital

Region director, the superintendent of the George Washington Memorial Parkway, and Great Falls Park staff. Approximately a dozen boxes of material requested from the records center have not yet been delivered for review.

Ms. Milnarik also conducted research in uncatalogued materials housed at the National Park Service's Museum Resource Center (MRCE) in Landover, Maryland. Resources at the MRCE included photographs of the Great Falls Park Visitor Center under construction and as completed (including color photos), images of activities at the visitor center, a small number of reports focusing on Great Falls Park, and a study prepared by Kent Cooper & Associates titled "Theme in Generating Architectural Form," which includes the visitor center as an example.

The Design Team also drew on its own project files and library for additional primary and secondary material. Among these were additional drawings of the visitor center, documents related to the Mission 66 program for the National Capital Region, various National Park Service studies, landmark documentation for George Washington Memorial Parkway and Great Falls Park, and the 2021 Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia and the District of Columbia Parks of the National Capital Region of the National Park Service Multiple Property Documentation Form. The Design Team also contacted the American Institute of Architects regarding architect Kent Cooper and received his nomination package for election as a Fellow of the AIA, which took place in 1998. The package includes the most detailed compilation of Cooper's education and career that was found during research. Additional primary and secondary research on Great Falls Park, the visitor center, and Cooper was undertaken in online databases such as JSTOR, ProQuest, and the Washington Post Archive.

MAJOR RESEARCH FINDINGS

An important finding of the research is the close adherence of the plans for Great Falls Park to Mission 66 goals of efficient, controlled access to park resources that brings visitors by automobile directly to those resources while also protecting them. In addition, the research into Kent Cooper's career, identified early on as an important aspect of the HSR, has resulted in a deeper understanding of his education and influences, especially his time at Cranbrook Academy and in the office of Eero Saarinen & Associates, where he undertook important assignments related to the University of Chicago Law School Library and Dulles International Airport. Saarinen's expressionistic use of modern building materials – for instance, at what is now the TWA Flight Center at John F. Kennedy International Airport in New York City – seems to have influenced Cooper's design for the visitor center.

Review of the WNRC holdings resulted in the discovery of several important documents, including the specifications for construction of the visitor center sent out as part of the bidding process. Also important were a group of records related to the arbitration of disputes between Baldi Engineering Construction Company, contractor for building the visitor center, and the National Park Service. The documents shed light on the delay in opening the visitor center, as well as a change to the finish of the architectural concrete of the building after construction began.

The design team accessed records at the National Park Service's Museum Resource Center (MRCE), which holds a photographic archive of NPS properties. Several exterior construction photographs were discovered, as well as interior and exterior photos in the first decade after construction. Construction photographs were also found among the records at the WNRC. The 2008 Historic Resource Study of Great Falls Park includes a number of historical photographs, the source of which would appear to be the park itself, based on the study's bibliography. An effort was made to comb through the park archives, but except for photographs duplicated in the MRCE or WNRC holdings, those photographs have not been located. Interior photographs of the visitor center as it was originally constructed have not been found in any repository investigated, with the exception of one construction photograph showing the auditorium from WNRC and images of park activities located at MRCE.

MAJOR ISSUES IDENTIFIED

A summary of the building's features and component with the most Critical and Serious Issues and Deficiencies includes the following:

- One of the most important original character-defining design features was building circulation pattern integrating interior and exterior spaces as one cohesive experience. Over time, due to the changes in the Building program driven by an increase in NPS office space, the Visitor Center lost many circulation connections linking public interior and exterior spaces.

- The asphalt roof membrane is in poor condition and the roof drainage is not sloped to drain the roof completely. The main roof is to be replaced in 2023.

- The domestic water piping in the pump room is rusted, with signs of previous leakage and condensation. There is no backflow preventer and the pipe is uninsulated. There is no floor drain located near the service lines.

- Two of the three water heaters in the building show signs of rust and require replacement.

- The electric baseboard heaters, exhaust fans, and forced-air mechanical systems are aging, inefficient and should be replaced.

- There is no fire sprinkler system in the building. The existing fire alarm system does not meet code in several aspects and should be reviewed.

- The electrical system, lighting, emergency exit lighting and panelboards in the building are aging and require replacement.

RECOMMENDATION FOR TREATMENT AND/OR USE

Following the 22 November 2021 Planning Workshop with CRTKL, NPS/GWMP held a series of internal discussions, drawing in facilities, interpretation, and cultural resources staff to discuss the maintenance, use, and significance of the Great Falls Park Visitor Center. On February 23, 2022, NPS issued to CRTKL a memo with the direction regarding three potential Treatment Options. The Design Team used this NPS memo to inform the three proposed Treatment Options included in the 75% HSR Report Submission. Following the review of the 75% HSR Report, on July 7, 2022, NPS issued a memo with the direction regarding the selected Treatment Option. The Design Team used this NPS memo to inform the selected Treatment Option included in this report. The selected Treatment Option is Rehabilitation, as defined by the Secretary of the Interior's Standards for the Treatment of Historic Buildings.

The selected option includes complete replacement of the MEP (Mechanical Electrical and Plumbing) and Fire protection building systems. The structural treatment recommendations follow the architectural recommendations and generally do not include major structural alterations. The only notable exceptions are an option for a new passenger elevator that requires localized adjustment of the existing structure. Please see the Treatments Section of the Report for detailed descriptions.

The intent of the selected **Treatment Option** is to return the original ratio of public and private space and also enhance the design to improve visitor use and experience with bold "revitalization" of the original design. The main goal for the program and circulation adjustment is to fully restore and enhance the original building circulation pattern as follows (see Figures 3 and 4):

- Restore an open public cross circulation in the east-west direction on the ground floor connecting Buildings A-B and B-C with the adjacent outdoor spaces.
- Provide more public space on the ground floor for retail and vending. Integrate ground floor interior public space and courtyard space as one unified program system to enhance visitor experience.
- Provide space for the staffed concessions space serving prepared foods only. Remove existing concessions BOH outdoor area.

- Reconfigure Building A-B Ground Floor to include the following NPS office program:
    1. Restore original public lobby by relocating staff break room (approximately 120 - 150 sf, including a kitchenette and preferably natural light).
    2. Eight workstations
    3. Two private offices (in addition to the workstations).
    4. 1 accessible unisex toilet and locker room
- Reconnect second floor public space to the reclaimed original ground floor public lobby in the Building A-B. Restore original public stair.
- Provide ABAAS (Architectural Barriers Act Accessibility Standards) compliant passenger elevator to create a new public connection between Building B-C second level entrance and reclaimed ground floor public lobby.
- Restore the east-west public circulation on the second floor by relocating retail program and removing non-original ranger's desk.
- Treatment recommendations include discussion about improvement of building performance and also about reduction of the building's carbon footprint.

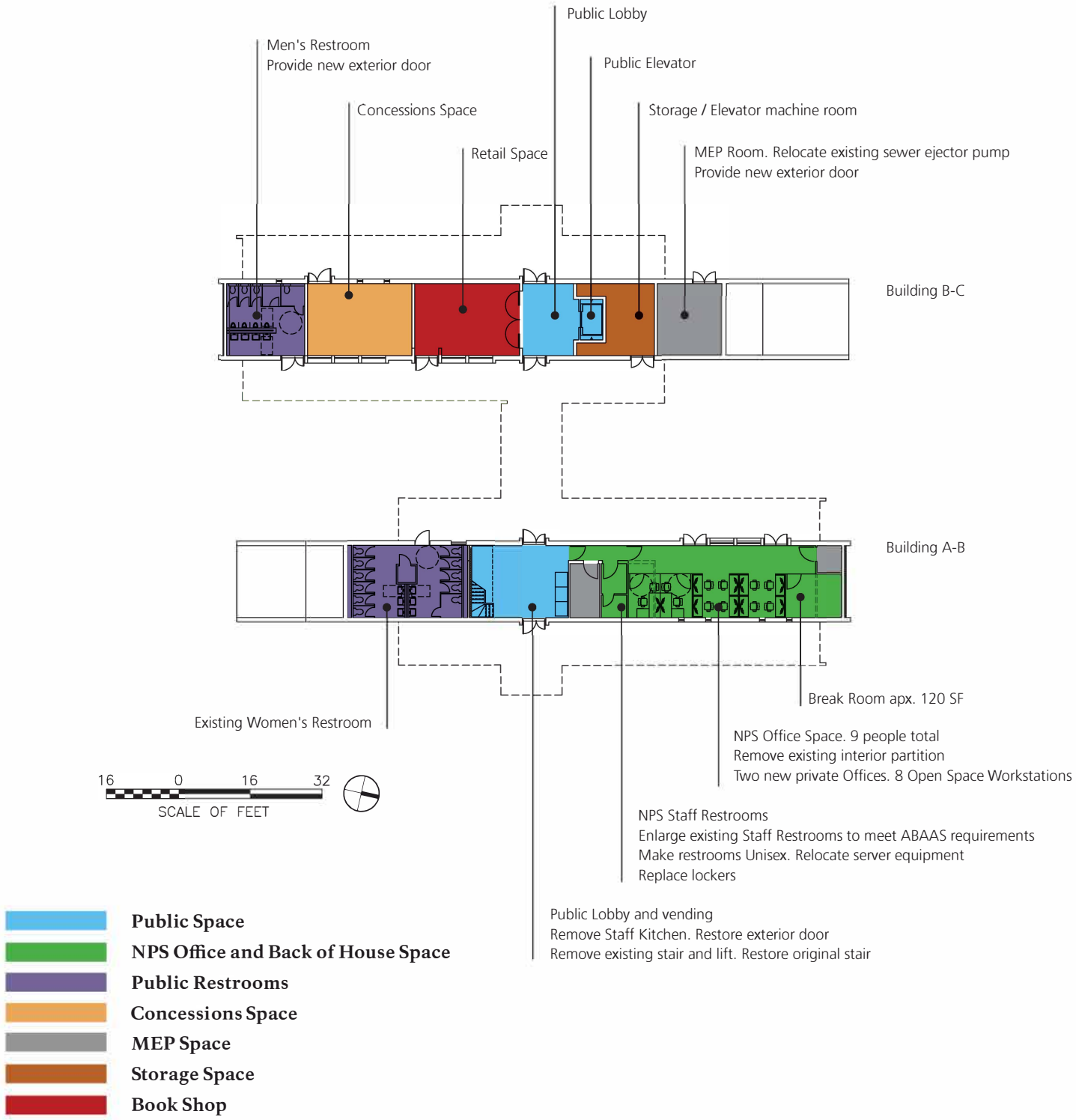


Figure 3. Treatment Recommendation First Floor Program Diagram. (CRTKL 2022)

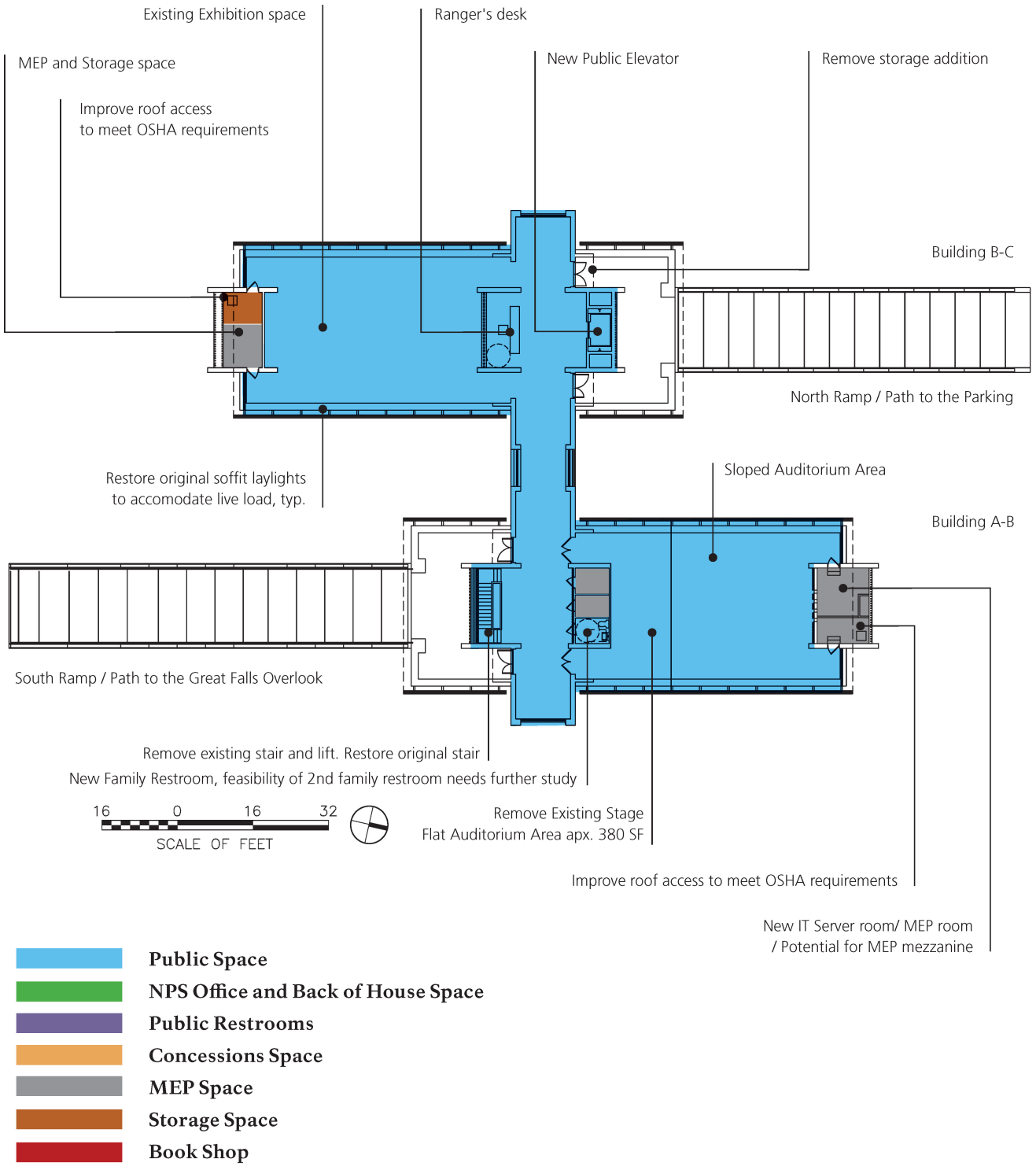


Figure 4. Treatment Recommendation Second Floor Program Diagram. (CRTKL 2022)

ADMINISTRATIVE DATA

Name and Location data:	Great Falls Visitor Center
Preferred structure name:	Great Falls Visitor Center
Other Historic Names Used:	Visitor Center for Great Falls, Virginia
Park:	Great Falls Park / GWMP
Structure State:	Virginia
NPS Region:	National Capital Region (NCR)
Administrative Unit:	George Washington Memorial Parkway
NPS Property Number:	26424
Cultural Resource Inventory System ID No.:	Not assigned
Square Feet:	11,500 square feet
National Register of Historic Places Status:	Entered - Documented
Date:	12/22/2014 Contributing feature
National Historic Landmark:	N/A
Significance:	Contributing
NR Information System No.:	14001079

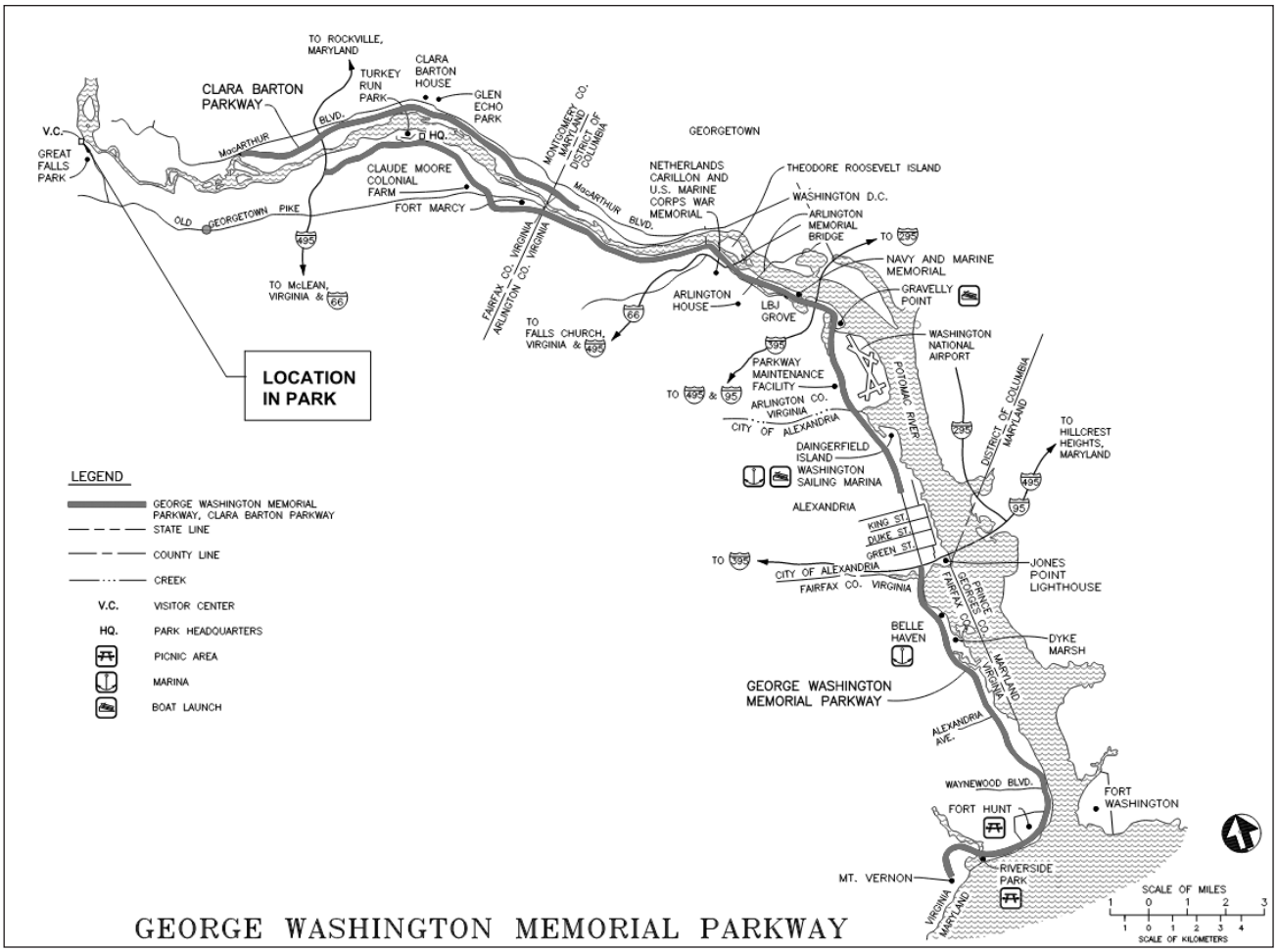


Figure 5. Great Falls Visitor Center location relative to the George Washington Memorial Parkway. (GWMP)

RELATED STUDIES

Mackintosh, Barry. "George Washington Memorial Parkway Administrative History." U.S. Department of the Interior, National Park Service, Park History Program, Washington, D.C., 1996.

Paula S. Reed & Associates, Inc. "Great Falls Park, Virginia, Historic Resource Study." U.S. Department of the Interior, National Park Service, George Washington Memorial Parkway, April 2008.

Robinson & Associates, Inc. "Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia and the District of Columbia Parks of the National Capital Region (now National Capital Area of Interior Region 1) of the National Park Service." U.S. Department of the Interior, National Park Service, National Capital Region, June 18, 2021.

Wallace, Edie, and Paula S. Reed. National Register of Historic Places Registration Form: Great Falls Park (Historic District). U.S. Department of the Interior, National Park Service, Washington, D.C., December 22, 2014.

Great Falls Park Visitor Center Access Path, Ramp and Courtyard Rehabilitation Environmental Assessment / Assessment of Effects. U.S. Department of the Interior, National Park Service, National Capital Region, May, 2010

CULTURAL RESOURCES DATA

The Patowmack Canal Historic District was added to the National Register of Historic Places on October 15, 1979. While the historic district includes the canal ruins immediately east of the Great Falls Park Visitor Center, the visitor center itself was excluded from the nomination. The canal was designated a National Historic Landmark on December 17, 1982. The Great Falls Park Historic District, encompassing all of the area within park boundaries, including the visitor center, was listed in the National Register on December 22, 2014. The visitor center was determined to be a contributing feature of the district. The nomination described it as nationally significant under Criterion C "as an exceptional example of Mission

66-modern architecture." The visitor center was also called out in the multiple property documentation form "Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the National Capital Region" (June 18, 2021) as one of several such buildings constructed in the region during the Mission 66 period. A National Register nomination for the building as individually eligible for the National Register under the guidelines listed in the multiple property documentation form, however, has not yet been attempted.

Under Criterion C, the period of significance is 1969, the year the building was completed and opened to the public.

RECOMMENDATIONS FOR DOCUMENTATION

Previous documentation (the Great Falls Historic District nomination and the Mission 66 multiple property documentation form) suggests that a National Register nomination of the visitor center as an individual historic resource is in order. Its status as a contributing building of the Great Falls Park Historic District, however, does afford it consideration as a historic property under the National Historic Preservation Act of 1966 (as amended). The landscape around the visitor center was not included in the scope for the historic structure report. Additional documentation that may be considered, therefore, is a cultural landscape inventory or a cultural landscape report for the visitor center area or Great Falls Park in its entirety.

This Historic Structure Report examines the history of use at Great Falls and focuses on the design and construction of the Great Falls Park Visitor Center. This study does not examine the history of segregation at the site. Going forward, the George Washington Memorial Parkway will undertake a study to examine how the building and site were used by diverse communities, and how the site and building may have facilitated or supported exclusionary practices and uses.

ABBREVIATIONS

ABBREVIATION	
ABAAS	Architectural Barriers Act Accessibility Standards
ACM	asbestos-containing materials
ADA/ABA	American Disability Act/Architectural Barriers Act
AHJ	Authority Having Jurisdiction
BOH	back of house
C&O	Chesapeake and Ohio
CMU	concrete masonry unit
DOAS	dedicated outside air systems
FCPA	Fairfax County Park Authority
FONSI	Finding of No Significant Impact
GF&OD RR	Great Falls and Old Dominion Railroad
GMP	General Management Plan
GWMP	George Washington Memorial Parkway
HVAC	Heating Ventilation and Air Conditioning
ICAP	Inventory Condition and Assessment Program
IGU	insulating glass unit
ksi	kilopounds or kips per square inch
LBP	lead-based paint
MEP	Mechanical Electrical Plumbing
MRCE	Museum Resource Center
MVL	mercury vapor lamps
NCP	National Capital Parks
NCPC	National Capital Planning Commission
NHPA	National Historic Preservation Act
NPS	National Park Service
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
PEPCO	Potomac Electric and Power Company
PLM	polarized light microscopy
psi	pounds per square inch
PTAC	packaged terminal air conditioning
T&G	tongue-and-groove
VRF	variable refrigerant flow (HVAC)
WNRC	Washington National Records Center
WSHP	water source heat pump
WWR	welded wire reinforcement

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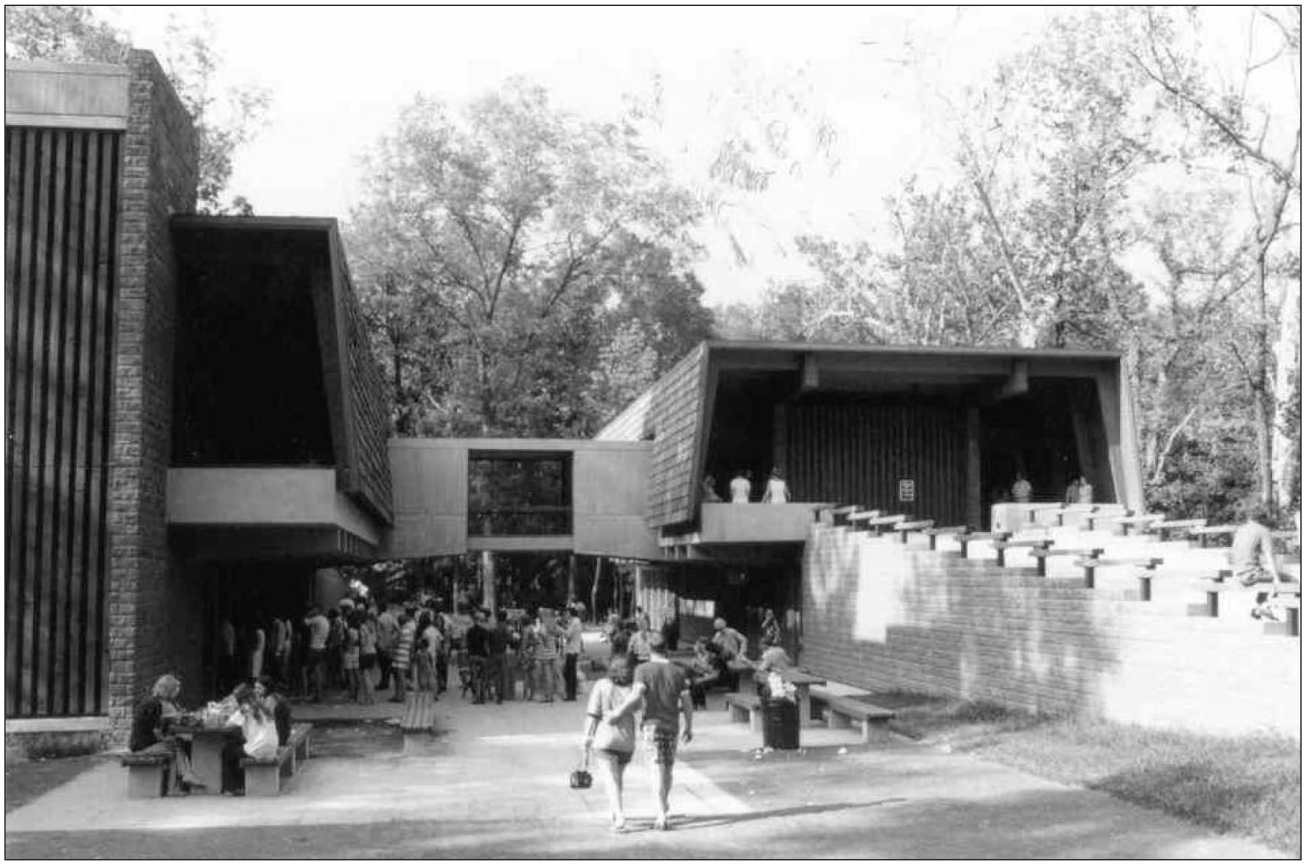
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Part I: Developmental History

Historical Background and Content
Chronology of Development and Use
Physical Description
Character Defining Features

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Chapter 1: Historical Background and Context

PREHISTORY THROUGH THE CANAL PERIOD

The Great Falls of the Potomac River are located on the Fall Line separating the Coastal Plain from the Piedmont Plateau in Virginia and Maryland. The Fall Line in Virginia marks the limits of ship travel on several of the state's rivers due to the difference in elevation between the top of the falls and their base – 76 feet over less than a mile at Great Falls – and the rapids caused by that sharp drop. The falls were formed during the Last Glacial Period in North America, which ended approximately 12,000 years ago. Sea level dropped significantly during this period causing the Potomac River to cut more deeply into its valley as its waters rushed eastward. Layers of hard rock at the falls resisted this erosion, but the force of the moving water fractured the rock in some places, eventually creating Great Falls as we know it today. As a result of this process, around 9,500 years ago, the formerly broad valley of the Potomac narrowed around the falls, with the small streams that had cut through softer rock and earth on the boundaries of the river losing their flow of water.[1] Since that time, the native peoples and immigrants that have passed through the area or made it their home have found the Great Falls to be many things: an obstacle to avoid or overcome, a rich, biologically diverse environment, a link in a riverine transportation network, a potential source of industrial and electrical power, a refuge for recreation and entertainment, a landscape of surpassing natural beauty, and a repository of information about our natural and cultural history.

There is little evidence of regular human occupation of the area including Great Falls Park during the Paleo-Indian Period (ca. 15,000-8,000 BCE), although mastodon and mammoth could be found there. Human use of the area during the Archaic Period (ca. 8,000-1,200 BCE) by nomadic hunting and gathering family groups is evident in the Native American archeological sites and artifacts found at locales across Great Falls Park. When the formerly cool and moist climate stabilized in a form that might be recognizable today during the Woodland Period (ca. 1,200 BCE-CE 1600), native peoples practiced subsistence agriculture in the Coastal Plain of the Potomac Valley, with hunting above the Fall Line. Evidence of Woodland period occupation exists throughout the park, and a site near Mine Run was occupied until approximately CE 900. Algonquian-speaking people established vil-

[1] John C. Reed, Jr., Robert S. Sigafoos, and George W. Fisher, The Geologic Story of Great Falls and the Potomac River Gorge, U.S. Geological Survey Bulletin 1471 (Washington, D.C.: U.S. Government Printing Office, 1980), 8-11; "The Great Falls of the Potomac, Montgomery County," Maryland Department of Natural Resources, Maryland Geological Survey website, http://www.mgs.md.gov/geology/geology_tour/great_falls.html, accessed November 20, 2021.

lages above and below the Fall Line by the sixteenth century, but abandoned the settlements above the falls when Susquehannocks extended their presence into the Upper Potomac Valley. The Fall Line thereby became a boundary between the Algonquian-speakers of the Coastal Plain and the Iroquoian-speaking Susquehannocks. English Captain John Smith sailed up the Potomac from Jamestown during his explorations of the region in 1608. He stopped at the head of the navigable river at Little Falls, then continued on foot to Great Falls. In his journals, he did not mention Native Americans residing in the Great Falls area By the middle of the seventeenth century, much of the native population along the Potomac had withdrawn in the face of European settlement.[2]

During the Colonial period, the area now encompassed by Great Falls Park was part of a proprietary of more than five million acres granted by King Charles II of England to seven favored members of the nobility. The proprietary later came into the hands of the Fairfax family, with Thomas, sixth Lord Fairfax, inheriting it in 1734. He came to live in Virginia in 1747. By that time, the land around the falls had begun to be patented and granted in parcels of various sizes. Unlike the Coastal Plain, farming above the Fall Line during this period focused less on tobacco and more on general agricultural production, with a growing emphasis on wheat. The streams and runs in the area provided power for the construction of mills to grind the grain produced by Piedmont planters.[3]

The Fairfax family still owned large tracts of land on the Virginia side of the falls in the second half of the eighteenth century. John Semple, who owned two iron forges, one at Harpers Ferry and one in Fairfax County, leased much of the land that is now the park from the Fairfaxes. In 1769, George Washington discussed with Semple improvements to the river that would facilitate transportation to western lands claimed by the British. Washington also became a member of a committee discussing river navigation in 1770. Delays in getting legislation authorizing proposed improvements through the Maryland and Virginia colonial legislatures, as well as the American Revolution, delayed any progress on this front. [4] In 1785, however, when the Patowmack Navigation Company was organized to improve transporta-

[2] Paula S. Reed & Associates, Inc., "Great Falls Park, Virginia, Historic Resource Study," U.S. Department of the Interior, National Park Service, George Washington Memorial Parkway, April 2008, 3-10; "Paleoindians 15,000-8,000 B.C."; "Late Woodland A.D. 900-1600," Virginia Department of Historic Resources, First People: The Early Indians of Virginia website, https://www.dhr.virginia.gov/first-people-the-early-indians-of-virginia.

[3] Paula S. Reed & Associates, Inc., 11-22.

[4] Ibid, 24-27.

tion on the river from Great Falls to Fort Cumberland (now Cumberland, Maryland), Washington was its president. The Mount Vernon Compact, an agreement between Maryland and Virginia on use of the water resources common to both states, was worked out at Washington's estate in March 1785. It set a precedent for agreements between states regarding their common boundaries, and its language was later echoed in the U.S. Constitution.[5]

The Patowmack Canal, designed by the Patowmack Navigation Company to skirt the falls to allow continuous river portage, was begun in 1785 at Seneca Falls, north of Great Falls. Work began on a channel and locks in what is now Great Falls Park in March 1786. Free, enslaved, and indentured laborers helped build the canal, which spurred the establishment of a town, Matildaville, by Henry "Light Horse Harry" Lee, an artillery commander during the American Revolution who later served as governor of Virginia and congressman. The town was chartered by the Commonwealth of Virginia in 1790, and most of the buildings were completed between 1793 and 1797. About half of the eighty lots in the town were sold, but by 1802, Matildaville was described only as "a few scattered buildings which form a kind of hamlet." Tax records in 1822 reported assessments on nine buildings. The Great Falls skirting canal opened in February 1802, with long, narrow boats called "sharpers" among the vessels navigating around the falls. (Figures 6 and 7) The Patowmack Navigation Company paid a dividend to its shareholders that same year. In the long term, however, the venture did not prove profitable. The company ended its operations in 1827, and the Chesapeake & Ohio Canal Company, which had received authorization to build a new Potomac canal from the U.S. Congress, absorbed its assets. When the C&O Canal Company determined to place the new canal entirely on the Maryland side of the Potomac in 1830, the Patowmack Canal was abandoned.[6]

UNREALIZED INDUSTRIAL PLANS AND THE TRANSITION TO RECREATION

After sixty years of consideration, planning, construction, and use as a canal property, the Great Falls Park area entered a period during which a number of uses were attempted, some more successful than others. In 1838, Albert Fairfax sold 761 acres of land in what is now the park to three men – Hall Neilson, Thomas ap C. Jones, and William A. Bradley – who sought to develop the land for industrial purposes. The Great Falls Manufacturing Company purchased the property from the three in 1854, but no manufacturing or milling facilities were constructed by either firm,

[5] Ibid, 31-36.

[6] Ibid, 35-45, 64-70. The quoted description of Matildaville can be found on page 54.

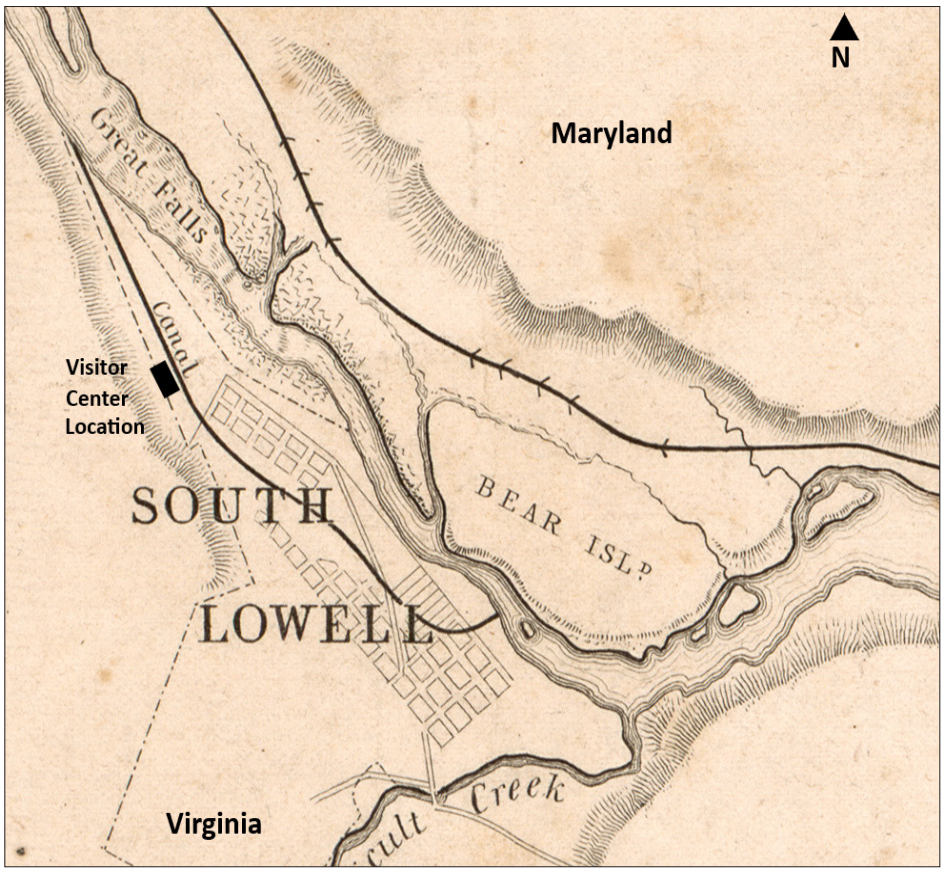


Figure 6. Detail of an 1839 map showing the Great Falls skirting canal with its southern end near Bear Island and its north end just above the falls. The map was prepared as part of a proposal for a manufacturing center on the site of the town of Matildaville, to be called South Lowell. (Library of Congress)

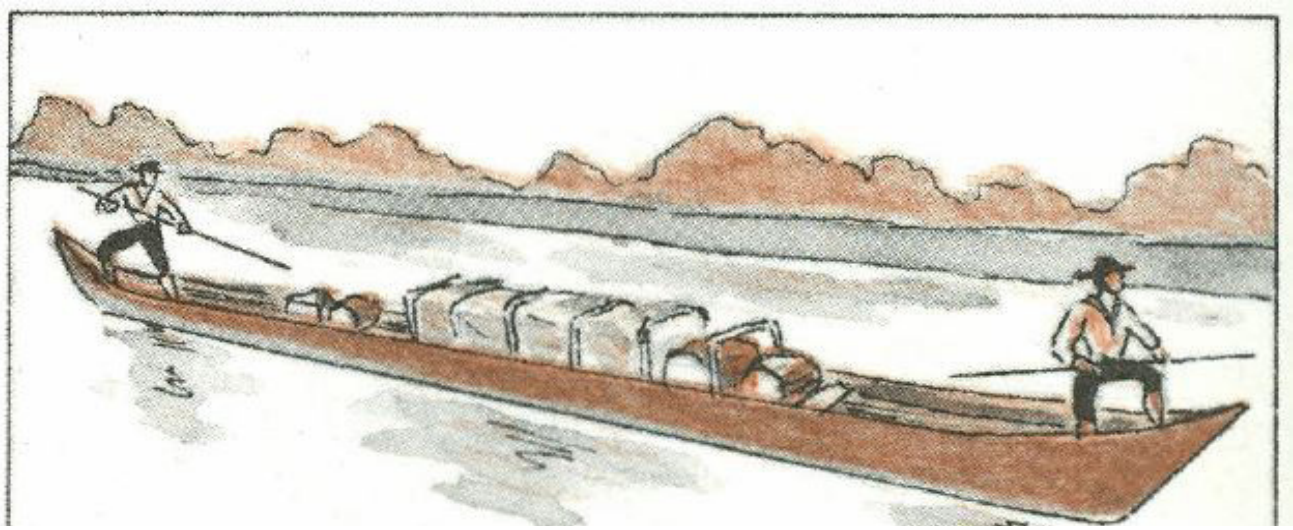


Figure 7. Floating down the Patowmack canal in the early nineteenth century were long boats known as sharpers due to their narrow prows and sterns. ("The Patowmack Canal at Great Falls, Virginia," Park and History Association, 1985)

in part due to litigation related to construction of the Maryland-side Washington Aqueduct dam just upstream from Great Falls and its pipeline to the Dalecarlia Reservoir on the border between the District of Columbia and Montgomery County. The social and economic disruption of the Civil War further damaged the viability of manufacturing on the Virginia side of Great Falls. On September 4, 1861, the Confederate army shelled U.S. military positions across the river in Maryland from the hills above what is now Great Falls Park. In October, however, Confederate leaders determined to withdraw to defensive positions to the west near Centreville. No other reports of military action during the Civil War in the area of what is now Great Falls Park were discovered during research for the HSR.[7]

Census records indicate that, during the late nineteenth century, the Great Falls area numbered farmers, farmhands, laborers, and domestic workers among its inhabitants. Several lived in buildings that had belonged to the Patowmack Navigation Company. The use of Great Falls as an escape from the workaday world could also be found during this period. In 1873, a newspaper article mentioned a party of eight spending two days fishing in the area, with their base a hotel run by William P. Dickey in what had formerly been a tavern in Matildaville. Dickey's Inn, as the property came to be known, served visitors to the area until 1950.[8]

Recreation and tourism proved to be the future of the Virginia side of the Potomac at Great Falls, although the power embodied in the rushing water continued to draw interest. In 1895, the Great Falls Manufacturing Company sold its property to the Great Falls Power Company, which planned a hydroelectric plant to generate power for the city of Washington. The plans included a new channel, as well as a powerhouse, on what is now park property. Nothing came of these efforts, however. Capitalizing on the falls as an attraction to visitors (Figure 8), the Great Falls & Old Dominion Railroad (GF&OD) built an electric rail line to the area, crossing the Potomac on the Aqueduct Bridge from Georgetown and running up to the falls on the Virginia side of the river.[9] The GF&OD leased two parcels of land from the Great Falls Power Company, including one of three acres on which the railroad company built an amusement park. Great Falls Park, as it was known, opened on

7 Paula S. Reed & Associates, 73-81; John Milner Associates, Inc., "Fairfax County Civil War Sites Inventory: Technical Report Version," prepared for the Fairfax County Park Authority, August 2002, 22-23.

8 Paula S. Reed & Associates, 91-94.

9 The The Aqueduct Bridge was originally constructed to allow boats on the Chesapeake & Ohio Canal to access the Alexandria Canal on the Virginia side of the Potomac River. It was later adapted to other uses, including carrying rail lines across the river.



Figure 8. Great Falls had been an attraction since the mid-nineteenth century. This photograph was taken in the 1920s. (Great Falls Park website, NPS)



Figure 9. The Great Falls & Old Dominion Railroad established Great Falls Park in 1906, with a train station on park grounds. (Great Falls Historical Society, ca. 1917)

July 4, 1906. The railroad entered the park along the current route of Old Dominion Drive. In addition to a station for the train, the amusement park featured a carousel, a dance pavilion, an observation tower, and the Great Falls Inn, giving the park two establishments where visitors could satisfy the appetites they had worked up. (Figure 9) All these features were located just south and southeast of the site of today's visitor center, on both sides of the canal bed. The area remained generally rural through the 1920s, with dairy farms, truck farms, and general agriculture occupying much of the land around the park.[10]

Great Falls Park continued to operate into the 1950s, despite numerous setbacks and obstacles. The Great Falls & Old Dominion Railroad (which had become part of the Washington & Old Dominion Railroad in 1911) stopped serving Great Falls in 1934, the victim of the Great Depression and the rapid increase in automobile use. A flood in 1936, the highest flood on record at Great Falls, damaged several buildings, which were later repaired. Fire consumed Dickey's Inn in 1950, as well as another mid-nineteenth-century building. The original carousel in the park was sold, then replaced in 1954. The Potomac Electric and Power Company, which had purchased the property of the Great Falls Power Company in 1947, sold Great Falls Park, encompassing 16 acres of land, to the Fairfax County Park Authority (FCPA) in 1952. The authority planned to condemn the property and build a new park to serve its quickly increasing number of residents. The population of Fairfax County had increased from 25,000 in 1930 to 100,000 in 1950, driven mostly by the increase in the size of the federal government's work force as a result of the New Deal and the U.S. entry into World War II.[11]

FEDERAL EFFORTS TO PRESERVE GREAT FALLS AND THE PATOWMACK CANAL

The 1901 Report of the Senate Park Commission (also known as the McMillan Commission, after its chairman, U.S. Senator James McMillan of Michigan) reimagined the park system of the District of Columbia. The commission's work focused on the central city planned by French-born architect and planner Peter (Pierre) Charles L'Enfant, especially the National Mall, but it also addressed areas outside the city limits with natural or historical significance, such as a proposed "Fort Drive," linking remnants of the Civil War defenses of Washington. The Great Falls of the Potomac also came under the commission's consideration. Landscape architect Frederick Law Olmsted, Jr., convinced the other three professional mem-

10 Paula S. Reed & Associates, 96-104, 114.
11 Ibid, 119, 123.

bers of the group (architects Daniel Burnham and Charles Follen McKim and sculptor Augustus Saint-Gaudens) to support a "Potomac Drive" to Great Falls in addition to a memorial highway to Mount Vernon.[12]

Few of the commission's recommendations were acted on immediately, but in 1928 Representative Louis C. Cramton of Michigan introduced legislation that prohibited permits for water power development between Rock Creek and a point four miles above Great Falls until Congress received studies related to various potential uses of the area. With those studies in hand, Cramton introduced a bill two years later that, among other things, included a provision for a George Washington Memorial Parkway on both sides of the Potomac River, incorporating the Mount Vernon Memorial Highway and stretching to a point above Great Falls. A southern branch on the Maryland side of the river would reach Fort Washington. Since the use of the falls to generate electricity was still considered desirable in some quarters, the bill was amended so as not to preclude power development. Senator Arthur Capper of Kansas, chairman of the Senate Committee on the District of Columbia, guided the legislation through the upper house of Congress, and the Capper-Cramton Act became law on May 29, 1930. The bill called for "the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac, the preservation of the historic Patowmack Canal, and the acquisition of that portion of the Chesapeake and Ohio Canal below Point of Rocks" (in Frederick County, Maryland). The act assigned responsibility for fulfilling its provisions to the Office of Public Buildings and Grounds in the U.S. Army Corps of Engineers. President Franklin Delano Roosevelt's Executive Order No. 6166, dated June 10, 1933, transferred that responsibility to the National Park Service (NPS), to be carried out by National Capital Parks, NPS' administrative unit in the national capital area.[13]

Thirty years passed before the federal government could follow through on the provision of the Capper-Cramton Act related to the Patowmack Canal and Great Falls. The federal government purchased the property of the C&O Canal Company in Maryland in 1938, but did not acquire the Great Falls, Virginia, land owned by PEPCO and the Fairfax County Park Authority due to questions over the wisdom of extending the George Washington Memorial Parkway to the falls. In 1951, PEPCO President R. Roy Dunn indicated that his company would preserve the land it

[12] Barry Mackintosh, "George Washington Memorial Parkway Administrative History," U.S. Department of the Interior, National Park Service, Park History Program, Washington, D.C., 1996, 7-9.

[13] Mackintosh, "George Washington Memorial Parkway Administrative History," 23-29. The quotation from the Capper-Cramton Act can be found on page 29.

owned until such time as the federal government could purchase it, although hydroelectric power was still considered a potentially significant resource in the post-World War II growth that the Washington area experienced. An appreciation of the natural, historical, and recreational importance of Great Falls, the C&O Canal, and the Patowmack Canal, however, continued to grow, helped by Supreme Court Justice William O. Douglas' hike along the entire length of the C&O Canal in 1954 and by a treatise advocating the preservation and recreational use of Great Falls, Virginia, prepared by Vienna resident C.J.S. Durham, the Nature Conservancy, the Wildlife Management Institute, and the Fairfax County Park Authority.[14]

The situation was resolved as the nation headed into a new decade. On March 25, 1960, PEPCO president Dunn and Secretary of the Interior Fred A. Seaton signed a memorandum of agreement authorizing the department to lease the PEPCO land, with an option to buy. Ultimately, the two parties agreed to a land swap. In exchange for 385 acres of federal land at Blue Ponds in Prince George's County, Maryland, and almost $1 million, the Interior Department received 790 acres of land at Great Falls in Fairfax County. The exchange required an act of Congress – Public Law 89-255, signed by President Lyndon Johnson on October 10, 1965. The swap was completed in November 1966, and a month later, Fairfax County donated its property at Great Falls – the 16 acres that had comprised the amusement park – to the federal government. With that donation, the boundaries of Great Falls Park, a unit of the National Park Service administered by George Washington Memorial Parkway, were complete.[15]

The parkway, however, would never reach the new park, succumbing to rising land costs and concerns over natural resources. The construction of the Central Intelligence Agency's Headquarters at Langley, Virginia, in 1957, which had helped spur construction of the parkway in that area, had also driven up real estate costs. A study of the parkway by former National Capital Park and Planning Commission planner Charles W. Eliot II concluded that its continuation beyond the Capital Beltway would damage the natural resources associated with the river's edge and recommended that the parkway not be extended. National Park Service Director Conrad Wirth supported this position. Congress also denied requests from the National Capital Planning Commission for funds to purchase property for a continuation of the parkway. Coupled with local opposition, this federal resistance stopped the parkway short of the extent outlined in the Capper-Cramton Act.[16]

14 Paula S. Reed & Associates, 123-125.
15 Ibid, 125-129.
16 Mackintosh, "George Washington Memorial Parkway Administrative History,"

THE NPS MISSION 66 PROGRAM AND GREAT FALLS PARK

Initial planning and development of Great Falls Park took place during the National Park Service's Mission 66 program. The Great Falls Park Visitor Center was designed at the tail end of Mission 66 and constructed during a succeeding initiative, known as "Parkscape, U.S.A," one goal of which was to complete projects begun but not finished during Mission 66.[17] NPS developed Mission 66 in the mid-1950s to eliminate an extensive maintenance backlog that dated to World War II and, simultaneously, to meet anticipated future requirements. Visitation to national parks had grown ever since the end of the war, from 22 million in 1946 to 56.5 million in 1955. That total was expected to rise to 80 million by 1966. The vast majority of these visitors were expected to arrive by automobile. To accommodate the increase and the manner in which they visited the parks, NPS Director Wirth conceived of a plan to upgrade his agency's facilities, developed it in coordination with the NPS central office in Washington, regional offices, and the parks themselves, and presented the framework to President Dwight D. Eisenhower and Congress in early 1956. Mission 66 initially called for $670 million in improvements to NPS sites across the country. The upgrades were designed both to facilitate access to natural and historic resources and to conserve them. The program included funds to construct more visitor facilities and overnight accommodations, to upgrade circulation and utilities, to improve interpretation, to hire more park staff and provide them with adequate housing, and to protect natural and historic assets. As passed by Congress and signed into law by Eisenhower, the program ultimately provided more than $1 billion over a ten-year period to upgrade National Park Service facilities in time for the fiftieth anniversary of the agency's founding in 1966.[18]

91-98, 115-116.

17 George B. Hartzog, Jr., replaced Conrad Wirth as NPS director in January 1964. The conservation movement in the United States had begun to gain momentum by this time, and NPS responded to the movement's philosophy and challenges with changes in agency priorities. In the early 1960s, after a review of the Mission 66 program midway through its planned duration, NPS began to shift its goals away from development of park resources and toward acquisition of vanishing wilderness areas and seashores. Much of the planned acquisition was accomplished under the Parkscape, U.S.A. program. See Carr, 323-326, and Richard West Sellars, Preserving Nature in the National Parks (New Haven, Connecticut: Yale University Press, 1997), ch. 6, https://www.nps.gov/parkhistory/online_books/sellars/chap6.htm, accessed November 23, 2021.

18 National Park Service, Mission 66: To Provide Adequate Protection and Development of the National Park System for Human Use (Washington, D.C.: U.S. Department of the Interior, National Park Service, 1956), 16-17; Sarah Allaback, Mission 66 Visitor Centers: The History of a Building Type (Washington, D.C.: U.S. Department of the Interior, National Park Service, 2000), 3-5; Conrad L. Wirth, Parks, Politics, and the People (Norman, Oklahoma: University of Oklahoma

In 1955, to determine park needs that would be funded under Mission 66, the National Park Service required each of its parks to prepare a "prospectus" outlining its current circumstances and needed improvements. National Capital Parks (NCP), the NPS unit that encompassed 780 individual sites and 45,000 acres of land in the District of Columbia and nearby counties of Maryland and Virginia, prepared its prospectus under the direction of Superintendent Edward J. Kelly. Two of the most pressing needs for the multiple parks under NCP's jurisdiction were for a central administration building to serve the region and additional visitor facilities throughout its many units.[19] In the Mission 66 era, one of the most important elements of the larger planning effort to address administrative needs and visitor services was the visitor center. As Sarah Allaback points out in *Mission 66 Visitor Centers: The History of a Building Type*, visitor centers were intended to accomplish multiple goals, including access to resources, control of visitor circulation, dissemination of information about the parks, and centralization of park operations. Stated goals of the Mission 66 program included removal of administrative facilities from the parks, other than those included in visitor centers, so as to prevent the degradation of park resources.[20]

A centralized location for both administrative and visitor services did not, however, satisfy the needs of National Capital Parks' widely scattered and diverse units. NCP's prospectus therefore proposed to centralize administrative functions in one building and to construct several smaller visitor centers to serve specific resource areas. The prospectus envisioned housing administrative functions in a "Park Operations Building" at an unspecified location. It also proposed "Nature Centers" for natural areas inadequately served by visitor facilities. Park areas designated to receive nature centers included Rock Creek Park, Fort Dupont Park, Fort Washington, Fort Hunt, Prince William Forest Park, and Catoctin Mountain Park. While it called for improvements to interpretive facilities at many historic sites, the prospectus proposed a visitor center only at the Washington Monument.[21]

NCP's prospectus also enumerated other desired improvements. It called for the addition of picnic areas, boat marinas, and boating and canoeing docks, as well as

Press, 1980), 238-254.

19 Cornelius W. Heine, A History of the National Capital Parks, U.S. Department of the Interior, National Park Service, National Capital Parks, 1953, http:www.cr.nps.gov/history /online_books/nace/adhi.htm, Introduction:1; III:1:1-2; III:3:1; "National Capital Parks Preliminary Prospectus" [Mission 66], n.d., Record Group 79, Records of the National Park Service, Finding Aid A1, Entry 2, Mission 66 Final Prospectus, 1955-60, box 14, National Archives, College Park, Maryland, 15-24.

20 Allaback, 22-35.

21 "Preliminary Prospectus," 15-18, 24-25.

additional camping facilities in Prince William Forest Park and Catoctin Mountain Park.[22] Circulation constituted a major category of physical improvements envisioned for National Capital Parks. The document stated that most park roads were forty or more years old, had not been designed to handle current speeds, and suffered from a lack of maintenance. In addition, the upgrade to visitor facilities would require improved roads and added parking for full utilization.[23]

The National Park Service ultimately accepted National Capital Parks' centralized approach to accommodating administrative needs and decentralized visitor services, as shown by its approval of NCP's Mission 66 program: on July 15, 1956, Interior Secretary Seaton announced that $70 million in upgrades to National Capital Parks under the Mission 66 program had been provided for by his department. In response to the preliminary prospectus, NPS Associate Director E.T. Scoyen wrote to Superintendent Kelly that "[i]t was recognized that some of the precepts which have governed the Mission 66 program for other National Park Service areas might not apply in the National Capital Parks due to their metropolitan aspects."[24]

Development of Great Falls Park is mentioned in the prospectus only in relation to completion of the George Washington Memorial Parkway, a high priority in the document. National Capital Parks put a $20 million price tag on constructing the parkway from Memorial Bridge to Great Falls, along with $200,000 for parking and access roads for recreation areas and $150,000 for picnic area development. The prospectus identified no specific development at Great Falls, Virginia, and the only buildings planned for the Virginia side of the parkway between Memorial Bridge and Great Falls were four comfort stations and a boating center. The boating center was destined for Georgetown (now the Thompson Boat Center). Ultimately, twelve comfort stations were built in the George Washington Memorial Parkway during the Mission 66 period, including one in Great Falls Park.[25]

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22 Greenbelt Park is not mentioned in the preliminary prospectus, although campgrounds and other improvements were constructed there with Mission 66 funding. Research for this study did not reveal the reason for this initial oversight.

23 "Preliminary Prospectus," 19-21.

24 National Park Service, "Secretary Seaton Announces $70,000,000 Program for National Capital Parks System" (press release), July 15, 1956; E.T. Scoyen, Associate Director, National Park Service, to Superintendent, National Capital Parks, March 5, 1956, Record Group 79, Records of the National Park Service, Finding Aid A1, Entry 1, Data from Part II of Mission 66, box 12, National Archives, College Park, Maryland; National Capital Parks Survey Team, "Survey Report on National Capital Parks to the Hon. Fred A. Seaton, Secretary of the Interior," February 30, 1957, 18, Finding Aid A1, Entry 2, Final Prospectuses, 1955-60, box 14, National Archives, College Park, Maryland.

25 "Preliminary Prospectus," 60-61; Quinn Evans Architects, "Mission 66 Comfort Stations in the National Capital Region and Maintenance

MISSION 66 AND "PARK SERVICE MODERN"

NPS director Wirth envisioned Mission 66 as a comprehensive program that would address the broad spectrum of National Park Service needs as the agency approached its fiftieth anniversary. To plan, design, and implement the program, NPS turned to the principles of architecture and landscape architecture as it was practiced in the mid-twentieth century, now referred to as Modernism. These principles, which included open floor plans for buildings and emphasis on circulation and control of functions, lent themselves readily to the resolution of the complex programmatic goals of the national parks in the 1950s, and an advantage of Modernism over traditional building methods was its economical construction. The use of prefabricated structural elements, steel, concrete, and glass – all mass-produced and therefore less expensive than the hand-produced elements of earlier architectures – made construction more economical and less time-consuming. Importantly, NPS did not adopt any particular school of Modern design. It did not, for example, embrace the International Style, which might be said to have been the most recognizable and most reproduced form of Modernism of the era. Rather, it was, as landscape architect and historian Ethan Carr has written, "the increased functionality and efficiency that could be achieved through modernist design, materials, and building technologies" that attracted NPS.[26]

If the National Park Service adopted Modern design principles primarily to solve planning challenges, it did not abandon aesthetic concerns. In fact, the use of Modern design tenets fit a new park aesthetic, in which park resources became the focus of design priorities, and park structures were intended to be unobtrusive. Earlier NPS design, often called "Park Service Rustic," had employed natural materials and was based on models, such as Swiss chalets, log cabins, or Indian adobe construction, associated with natural scenery and romantic conceptions of American history. Elements of the rustic aesthetic included the avoidance of rigid, straight lines, use of native materials, and the appearance of hand-tooled production. Rath-

Guidelines," prepared for the National Capital Region, National Park Service, September 2019, 11; [Monthly Report], George Washington Memorial Parkway, January 7, 1966; Accession no. 79-730001-MCL, box 2, folder D22, Washington National Records Center, Suitland, Maryland. This total includes all comfort stations during the Mission 66 period as defined by "National Register of Historic Places Multiple Property Documentation Form: Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia and the District of Columbia Parks of the National Capital Region of the National Park Service," which covers the years between 1945 and 1972.

[26] Ethan Carr, *Mission 66: Modernism and the National Park Dilemma* (Amherst, Massachusetts: University of Massachusetts Press, 2007), 142.

er than disappearing from view, rustic buildings and other built elements were integral parts of planned picturesque landscapes. NPS recognized that picturesque buildings and features, enlarged to accommodate expected increases in visitors to national parks would quickly overwhelm the natural landscapes that had been the reason for creating the parks in the first place. The slender columns, horizontal orientation, flat roofs, structural flexibility, and lack of ornamentation in Modern architecture and the simplicity of form and materials of landscape elements such as stairs, terraces, paths, and roadways, however, would allow built features to occupy a secondary role in park scenery. As Wirth told a conference of NPS design professionals in 1957, the Mission 66 construction "must fit the terrain and be inconspicuous."[27]

The most recognizable building type associated with Mission 66 was the visitor center. NPS constructed approximately one hundred visitor centers throughout the National Park System with Mission 66 funding. Designed, with a very few exceptions, in the Modern idiom – labeled "Park Service Modern" by architectural historian Sarah Allaback. As the name "visitor center" implies, the design of these buildings was based on many of the same concerns as shopping centers, which were also being developed at the time. In both, large numbers of people arrived

[27] Carr, 141; Linda Flint McClelland, *Building the National Parks* (Baltimore: Johns Hopkins University Press, 1998), 433-434.



Figure 10. The Antietam National Battlefield Visitor Center appears to be a single story tall because it is built into a hillside overlooking the battlefield. (Antietam National Battlefield, NPS)

by private automobile. The individuals needed to find efficient temporary storage for their automobiles and equally efficient transition to a pedestrian environment in which all services would be grouped together conveniently. As Carr points out, "the visitor center provided a control point and a center for arrival, orientation, and park interpretation. The new centers were strategically sited to intercept the flow of automobiles into and through a park. . . . Managing 'visitor flow' was the overwhelming reality of architectural design as well as park planning." As the hub through and around which park circulation progressed, the siting of visitor centers and their relationship to the park road system and parking areas required precise integration during the planning process.[28]

During Mission 66, National Park Service and consultant designers utilized the reduction in the visual presence of park buildings, enabled by Modernist architectural ideas and materials, to adapt key aspects of park interpretation, including viewsheds and vistas, into designs that helped visitors understand the park they were experiencing. In Carr's words, "the visitor center became a viewing platform, in which views from interior spaces, roof terraces, and adjacent outdoor terraces or amphitheaters were calculated as a flowing, sequential experience. The centers were buildings to see from, not to be seen."[29] While Mission 66 intended visitor centers to be unobtrusive, they often occupied prominent locations. Park planners generally focused on three potential sites: at park entrances, along a major park road (especially at an intersection), and at a major park destination. In parks where the visual experience of attractions by the visitor was paramount – such as a historic battlefield or a sublime natural feature – the last location was often chosen. [30]

An example of such a building can be seen at Antietam National Battlefield in Sharpsburg, Maryland. Consulting architect William Cramp Scheetz, Jr., in conjunction with the NPS Eastern Office of Design and Construction, designed the facility in 1961, and it opened a year later. The visitor center is built into the side of a hill so that visitors enter a one-story building, then climb to an observation room set back from the lower level so that it, too, appears to be one story in height. (Figure 10) An exhibit area beneath the observation room is below grade. The site is located near the center of the most important fighting at this Civil War battlefield and in close proximity to a public road for convenient visitor access. The Antietam visitor center was sited to provide an expansive view of the battlefield and its im-

[28] Allaback, 22-26; Carr, 137-155. The quotation can be found on page 144.
[29] Carr, 134-135, 144-150; Allaback, 23-24. The quotation from Carr is on page 149.
[30] Carr, 193-195.

portant locations.[31]

GREAT FALLS PARK VISITOR CENTER ARCHITECT KENT COOPER

William Kent Cooper was born on December 9, 1936, in Jamestown, New York, and raised in Williamsport, Pennsylvania (Figure 11). After graduating from Williamsport High School in 1944, he attended the University of Pennsylvania, from which he received a bachelor's degree in architecture in 1951. He then attended the Cranbrook Academy of Art in Bloomfield Hills, Michigan, receiving his master's degree in architecture in 1952. One of his teachers at Cranbrook was Eero Saarinen (1910-1961), the Finnish-born architect and son of Cranbrook's dean, Eliel Saarinen (1873-1950). Eliel Saarinen also designed several of the Cranbrook buildings, beginning in 1925. Cooper won the Lloyd Warren Fellowship-Paris Prize in architecture, awarded by the Beaux-Arts Institute of Design in New York, in 1953, enabling him to study at the Ecole des Beaux-Arts in Paris and to travel in Europe and North Africa.[32] He married Margaret Robb Shook in 1953, and she accompanied him on his fellowship travels. Shook received an undergraduate degree in engineering from the University of Alabama and met Cooper while studying for her master's degree in architecture and planning at Cranbrook. She later worked at Cooper's firm, Kent Cooper & Associates as well as practicing on her own.[33]

When he returned to the United States, Cooper began working for Eero Saarinen & Associates in Birmingham, Michigan, first as a designer and later as a project manager. With the Saarinen firm, where his associates included architects John Dinkeloo and Kevin Roche, he acted as the project manager for the University of Chi-



Figure 11. Architect Kent Cooper. (family photo)

[31] Robinson & Associates, Inc., "Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia and the District of Columbia Parks of the National Capital Region of the National Park Service," U.S. Department of the Interior, National Park Service, June 18, 2021, E:25-26.

[32] Kent Cooper, AIA Membership Application, July 15, 1961, and AIA Fellow Nomination, October 23, 1997, American Institute of Architects Archives, Washington, D.C.; Elizabeth Meredith Dowling, "Beaux-Arts Institute of Design," Grove Encyclopedia of American Art, vol.1, Joan M. Marter, editor (New York: Grove Press, 2011), 231-232.

[33] Bart Barnes, "Kent Cooper, architect who worked on Vietnam and Korean War memorials, dies at 91," *Washington Post*, February 17, 2018, https://www.washingtonpost.com/local/obituaries/kent-cooper-architect-who-worked-on-vietnam-and-korean-war-memorials-dies-at-91/2018/02/17/f9e3bb8a-1299-11e8-9065-e55346f6de81_story.html, accessed October 28, 2021; Inés Moisset, "Margaret Robb Shook Cooper, 1925-2012," *Un Día, Una Arquitecta Segunda Temporada* website, https://undiaunaarquitecta2-wordpress-com.translate.goog/2017/02/01/margaret-robb-shook-cooper-1925-2012/, accessed October 29, 2021.

cago Law School (Figure 12) and for Dulles International Airport. In 1984, Cooper returned to Chicago to expand on the original law school building, following the precedent of reinforced concrete structure and glass cladding set by his mentor. [34]

At Cranbrook, and later while working for Eero Saarinen, Cooper expanded on the Modernist principles of architecture he learned at Penn. Eliel Saarinen, Cooper said in a 1999 interview, emphasized the importance of context in urban design, fitting a modern building into the city plan, rather than isolating it from the city, as other European Modernists had done. "The Bauhaus didn't deal with contextualism at all," Cooper recalled in the interview. "I'm still an absolutely strong proponent of modernism per se," but, he said, he learned about designing with an understanding of a building's context at Cranbrook. The architect recalled that he had read an article stating that Modernism "was rooted in the triad of Vitruvius" – that is the group of concerns common to all architecture formulated by Vitruvius, a Roman architect of the first century BCE. The words have traditionally been translated as "commodity, firmness, and delight" – spatial accommodation, structural stability, and beauty. In the interview, Cooper emphatically stated that contextualism, which

[34] AIA Fellow Nomination, Section 2.1; W. Kent Cooper, "Building for the Law School: An Architect's View," *University of Chicago Law School Record* 30:1 (Fall 1984), 7-10.

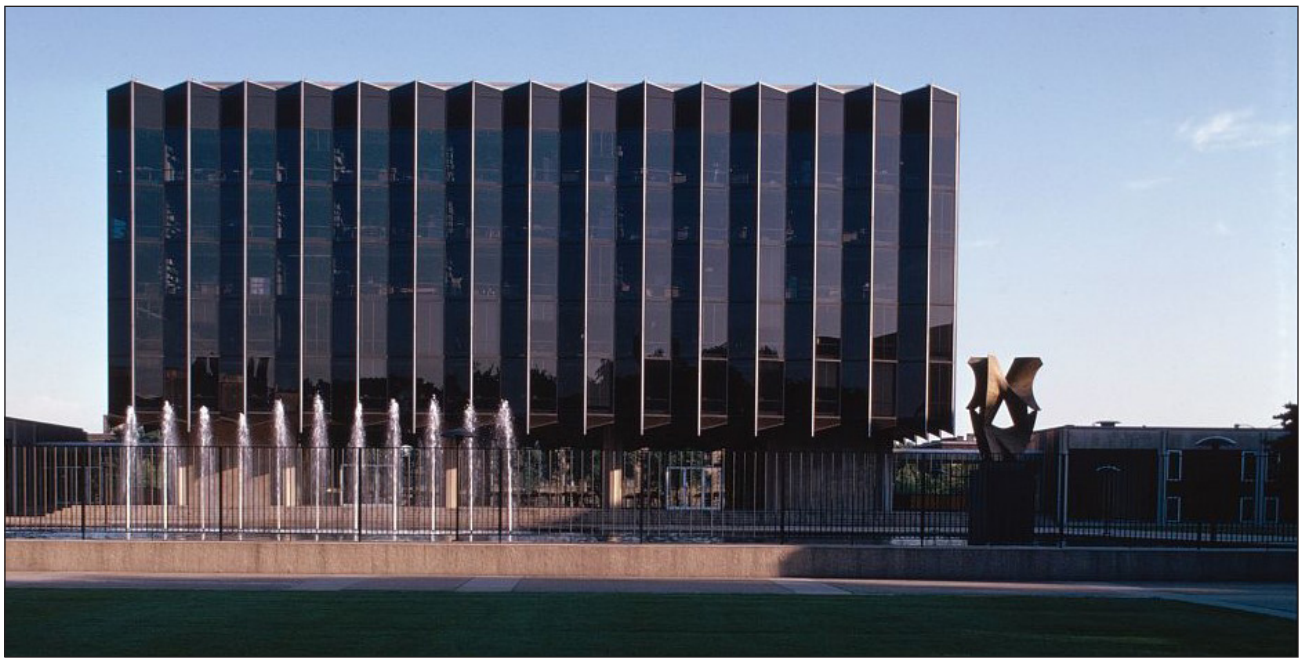


Figure 12. Cooper worked as project manager for the design of the University of Chicago Law School, seen here at the time of its completion in 1963. (Balthazar Korab Collection, Library of Congress)



Figure 13. Cooper carried the design of Dulles International Airport to completion after Eero Saarinen's death in 1961. (Wikimedia Commons)

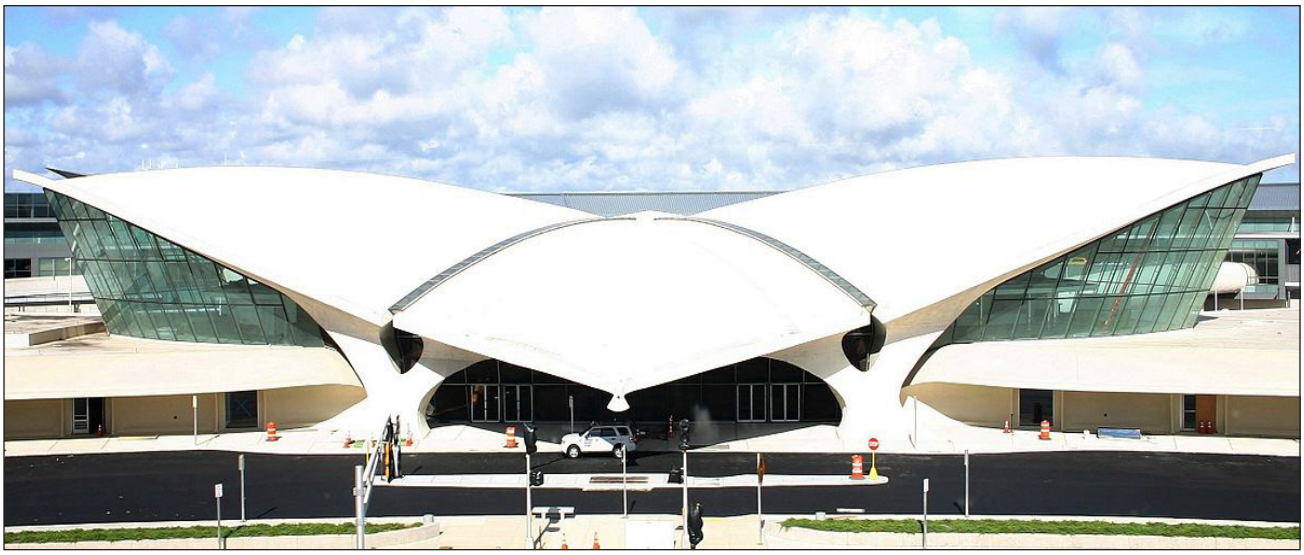


Figure 14. The bird-like forms of Eero Saarinen's TWA terminal at John F. Kennedy International Airport exploited the expressive possibilities of concrete. (Wikimedia Commons)

he learned from the Saarinens, needed to be added to that trio.[35]

Cooper also said of Eero Saarinen, "He didn't have a style, except that he was a modernist," and scholars agree that his buildings followed a range of forms – from the Miesian glass-and-steel General Motors Technical Institute, completed in 1955, to the swooping, concrete forms of his terminals at Dulles International Airport and John F. Kennedy International Airport, both completed in the early 1960s. (Figures 13 and 14) The airports used concrete to express, in futuristic forms, an optimism associated with the post-war years and the possibilities represented by jet air travel. In this, Saarinen explored the sculptural and expressive possibilities of concrete as revealed in Le Corbusier's Notre-Dame-du-Haut chapel in Ronchamp, France, from the first half of the 1950s.[36] (Figure 15)

Eero Saarinen died in 1961, and when Cooper completed his work on the Dulles airport in 1963, he formed his own firm in Washington, Kent Cooper & Associates, with eight to ten architects working under him. The commission for the Great Falls Park Visitor Center was one of the firm's early works. Research in National Park Service records has not clarified how Cooper became involved in the Great Falls Park Visitor Center design. The earliest reference to his participation is a set of preliminary drawings dated July 1965 and ascribed to "W. Kent Cooper, Architect," rather than Kent Cooper & Associates. (Figures 58 and 60)

Among other projects undertaken in these early years were designs for three churches in the Washington area. Cooper would continue to design churches throughout his career, winning an award from the local chapter of the American Institute of Architects for Pohick Church in 1984 and St. Timothy's Church in 1987. Cooper published a book in 1969 for church building committees on ways to generate designs for their religious buildings. His firm also designed residences, schools, and recreational facilities.[37]

Cooper contributed mightily to three of the most recognizable late-twentieth-century architectural projects in Washington, D.C., although he was not the conceptual designer on any of them. From 1966 until 1969, he acted as an architectural con-

35 Zachary M. Schrag, Interview with W. Kent Cooper, 10-13.

36 Peter Gössel and Gabriele Leuthäuser, *Architecture in the Twentieth Century* (Köln, Germany: Benedikt Taschen, 1991), 249-253; John M. Jacobus, Jr., "Saarinen, Eero," *Encyclopedia of Modern Architecture,* Gert Hatje, editor, (New York: Harry N. Abrams, 1964), 247-249; Henry-Russell Hitchcock, *Architecture: Nineteenth and Twentieth Centuries* (New Haven, Connecticut: Yale University Press, 1977), 523-524, 588-590; Kenneth Frampton, *Modern Architecture, a Critical History* (New York: Thames & Hudson, 1992),224-230.

37 AIA Fellow Nomination, Section 2.1.



Figure 15. Le Corbusier's chapel at Ronchamp was among the earliest to explore sculptural forms for architecture using concrete. (Wikimedia Commons)

sultant for the National Capital Transportation Agency, writing "an architectural master plan" (in his own words) for the entire subway system to ensure consistency of design from station to station. Cooper also pushed to hire a nationally known architect, considering what would become known as the Metro system to be as important as Dulles International Airport as a modern gateway to the city, as Union Station had been at the beginning of the twentieth century. He then served on the selection committee that chose Harry Weese as the system's architect. Cooper later translated Weese's vision into station-specific designs for the first two Metro stations, Gallery Place and Judiciary Square. (Figure 16) This work involved turning Weese's concept into working drawings, determining the geometry of vaults employing multiple radii in order for the structural design to be prepared, and the division and size of the coffers. [38]

[38] AIA Fellow Nomination, Section 2.1; Zachary M. Schrag, Interview with W. Kent

In 1982, by which time he had formed Cooper-Lecky Architects with William P. Lecky, Cooper embarked on executing the Vietnam Veterans Memorial, one of the most daring and important designs on the National Mall (Figure 17). Yale architecture student Maya Lin won the design competition for the project, but was not a licensed architect. Cooper-Lecky became the architects of record, and Lin was given a job in the office to see her conception realized. Cooper supervised the necessary drawings and site specifications and guided the design through review by the U.S. Commission of Fine Arts, as well as additions to the design in the form of a flag pole and statuary. Cooper's work at the Vietnam Veterans Memorial included doubling the size of the initial design to accommodate all 58,000 names to be included, helping to develop a new photo-engraving process for placing the names on the slabs, designing a plan for the flag pole and statuary, including reconfiguring the circulation to create a new entrance sequence. The Vietnam Veterans Memorial received both the Henry Bacon Medal for excellence in memorial architecture from the American Institute of Architects and the Presidential Design Award from the U.S. government. The latter prize honors projects that represent the highest standards of federal design.[39]

For the Korean War Veterans Memorial, Cooper-Lecky again acted as the architect of record, with the task of translating another competition-winning design, this time by four Penn State University professors, architects Veronica Burns Lucas, John Paul Lucas, and Don Alvaro Leon, and landscape architect Eliza Pennypacker Oberholtzer (doing business as Burns Lucas Leon Lucas). Cooper-Lecky was hired in 1988 to see the design through construction and began working with Burns Lucas Leon Lucas in May 1990. Disagreements arose over changes Cooper-Lecky sought to make in the design, including several requested by the Commission of Fine Arts and the project's sponsor, the Korean Veterans Memorial Advisory Board. Burns Lucas Leon Lucas eventually sued to stop the changes. When the lawsuit failed, the

Cooper, December 6, 1999, 3-5, 23-37, 50-51, Washington Metro Oral History Project Collection, 1975-2002, George Washington University Libraries, MS2214, Internet Archive, https://archive.org/details/ms2214_s02_transcript_kent_cooper, accessed October 27, 2021; Zachary M. Schrag, *The Great Society Subway* (Baltimore: Johns Hopkins University Press, 2006), 71, 87.

39 AIA Fellow Nomination, Sections 2.1, 2.2; Barnes, "Kent Cooper."



Figure 16. Judiciary Square Metro Station in 2007. This was one of the early stations Cooper translated from Harry Weese concept to built design. (Wikimedia Commons)



Figure 17. For the Vietnam Veterans Memorial on the National Mall, Cooper also transformed a conceptual design, by Maya Lin, into a completed construction. (Wikimedia Commons)

competition winners withdrew from the project. The built memorial, with sculpture by Frank Gaylord and landscape design by Henry Arnold, changed most of the original concept, including circulation, vegetation, and the design, size, and number of statues. It retained the concept's central element – a column of soldiers ascending a hill. The project was approved in 1992 and completed in 1995. With the siting of the Korean War Veterans Memorial on the opposite side of the Reflecting Pool from the Vietnam Veterans Memorial, Cooper created a spatial relationship between the two, encouraging visitors to consider the two memorials and the wars they were designed to recall together rather than separately.[40]

Cooper continued to design churches, schools, and recreational facilities as he executed these designs for prominent public projects by other designers. He also acted as an architectural consultant for the U.S. Commerce Department for world's fairs taking place in the United States from 1967 to 1984, and designed the Amazonia pavilion in the National Zoological Park in Washington in 1993. He designed a dining hall and a youth center at Andrews Air Force Base in Prince George's County, Maryland, in 1985 and 1997, respectively. For the Falls Church in Falls Church, Virginia, constructed originally in 1769, Cooper designed a new 800-seat nave connected to the original church. As a facade, the design employed "a traditional arcaded brick garden wall as a metaphor" in order to harmonize with the colonial building.[41] He was nominated as a Fellow of the American Institute of Architects in 1997, with supporting letters from architects Kevin Roche, Cesar Pelli, and Hugh Newell Jacobsen, as well as Charles Atherton, at the time the secretary of the Commission of Fine Arts. Cooper was awarded the honor in 1998. That same year he sold his interest in Cooper-Lecky Architects and continued to practice on his own. He spent much of the early twenty-first century reviewing designs for public projects in Washington as a member of the Committee of 100 for the Federal City, through which he also became involved in the National Mall Conservancy. He died on January 27, 2018, at the age of 91.[42]

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40 AIA Fellow Nomination, Section 2.1; Richard Guy Wilson, "The Past Is Present: J. Carter Brown and the Postmodern Era, 1971-2002," Civic Art: A Centennial History of the U.S. Commission of Fine Arts, Luebke, Thomas E., ed. (Washington, D.C.: U.S. Commission of Fine Arts, 2013), 384-387; Barnes, "Kent Cooper."; Roger K. Lewis, "War Memorial Design Symbol of Controversy," Washington Post, November 17, 1990, ProQuest Historical Newspapers website, accessed October 27, 2021.

41 AIA Fellow Nomination, Section 2.1.

42 AIA Fellow Nomination, Sections 2.2, 2.3; Barnes, "Kent Cooper"; Steve Davolt, "Edifice Rex," Washington Business Journal, November 8, 2004, Washington Business Journal website, https://www.bizjournals.com/washington/stories/2004/11/08/story8.html.

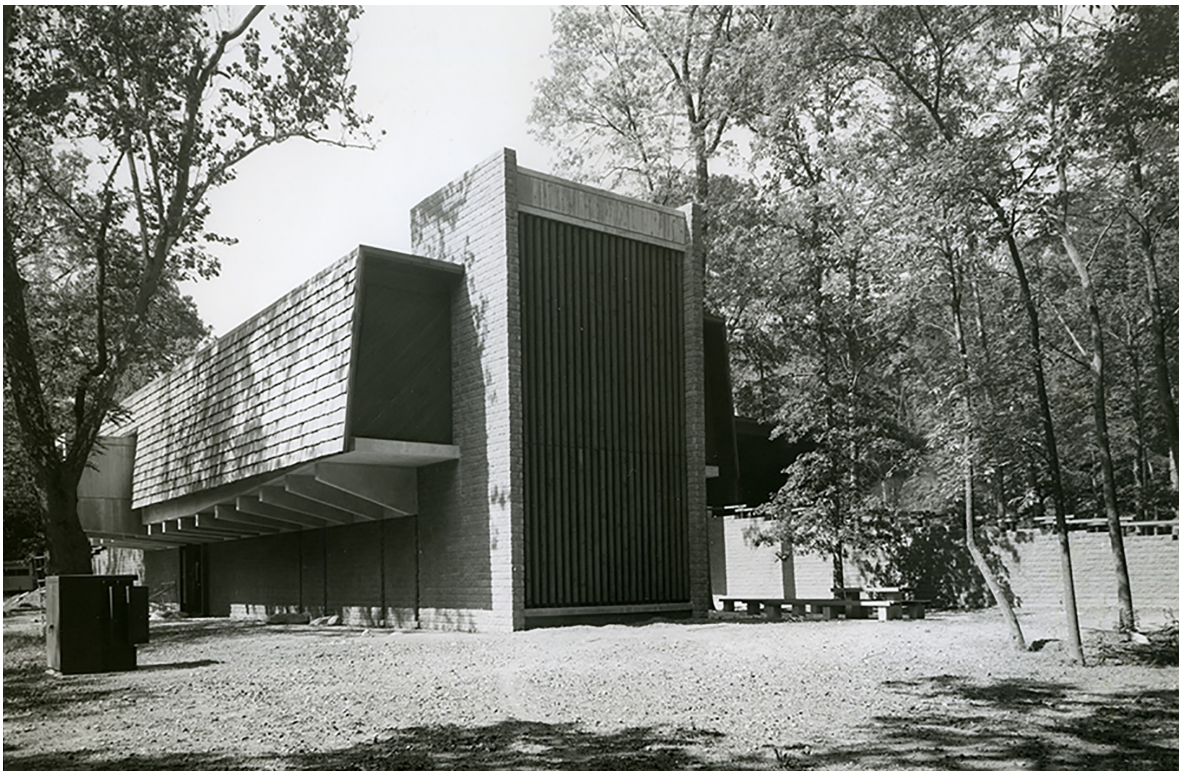


Figure 18. The Great Falls Park Visitor Center manifests many of the elements significant to Mission 66 architecture, as seen in this 1968 photograph of Building A-B – horizontal lines, modern construction materials such as structural concrete and concrete block, and natural materials and colors that allow the building to blend into the natural scenery around it. (MRCE)



Figure 19. Another character-defining feature of Mission 66 architecture is the use of unusual fenestration, as seen in this circa 1968 photograph of the observation window projecting from the east facade of Building A-B. (MRCE)

SIGNIFICANCE

The National Register of Historic Places documentation for Great Falls Park Historic District (designated December 22, 2014) identifies the visitor center as a building that contributes to the district's significance. According to the nomination, "The Great Falls Park Visitor Center is nationally significant under National Register Criterion C, and Criterion Consideration G, as an exceptional example of Mission 66 NPS-modern architecture. Designed by Washington D.C. architect Kent Cooper in 1965 and constructed in 1967, it followed the Mission 66 ideal of a modern visitor facility that blends the mission of the park with its styling to represent two canal boats."[43] The documentation identifies two periods of significance for the historic district: 6,000 BCE-900 CE for Native American use and 1750-1968 CE related to settlement, the Patowmack Canal, farming, the twentieth-century amusement park, and the national park.

The Great Falls Park Visitor Center is also called out for consideration as individually significant in the "Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia, and the District of Columbia Parks of the National Capital Region of the National Park Service Multiple Property Documentation Form (MPDF)" (June 18, 2021, draft). (Figures 18 and 19) While the MPDF does not determine eligibility for the National Register, it provides guidelines for determining such eligibility. Based on the research and survey conducted for this study, the Great Falls Park Visitor Center appears to satisfy the following guidelines for individual eligibility for the National Register at the state level:

- The visitor center should be one of the important precedents of the Mission 66 program (1945-1956), be one of the visitor centers originally planned and built as part of the Mission 66 program (1956-1966), or as part of the Parkscape, U.S.A. program (1966-1972). The property's period of significance should fall within the years 1945-1972.
- The visitor center should retain most, or all the physical characteristics described in the description of the property type. The visitor center should be a centralized facility that includes multiple visitor and administrative functions within a single architec-

[43] Edie Wallace and Paula S. Reed, National Register of Historic Places Registration Form: Great Falls Park (Historic District), U.S. Department of the Interior, National Park Service, Washington, D.C., December 22, 2014, 8:23.

tural floor plan or compound. Programming elements should include interpretive displays, space for slide shows and films, visitor contact, restrooms, and other services. The visitor center should be intended to serve the public by interpreting scenery, natural resources, and cultural sites, and should be a major point of visitor arrival, orientation, and service.

- The visitor center should possess physical integrity to the period of significance. The National Register requires that the integrity of a property be evident through historic qualities including location, design, setting, materials, workmanship, feeling, and association.

- The visitor center should embody distinctive characteristics of a type, period, or method of construction that represent high artistic values. Specifically, the visitor center should be a successful reflection of the principles of "Park Service Modern" style. These include the following:

  The building is sited in relation to an overall plan of "visitor flow" in the park, either near the park entrance, in route to a major park destination, or at a park destination.

  The building design emphasizes plan organization (the design of the floor plans). The floor plan organization allows segregation of public areas from administrative areas and emphasizes efficient "visitor flow" through the building itself. A central lobby space is often the arrival point, with trails or other park destinations often accessed as the visitor moves through the building.

  The building's program centralizes numerous park services, including information, interpretation, rest rooms, and administrative offices.

  The building makes use of the formal vocabulary and materials of contemporary modern architecture (1945-1972), including flat roofs, as well as other types of roofs, window walls (and other unorthodox fenestration), exposed steel supports, concrete and concrete block construction.

Overlapping functional spaces (free plans) are sometimes evident in the floor plan. Public areas are usually on one level, or on split levels, segregated from administrative areas.

Interior and exterior public spaces are integrated, often separated by windows, window walls, glass doors, or wooden doors with windows.

Entrances, exits, and other doorways often are wide, providing easy movement for crowds. Entrances are often sheltered by porches, ramadas, arcades, etc. Rest rooms are often nearby, with separate outdoor entrance.

The building emphasizes the visitor's experience of spatial procession. This sequence of spaces often features ramps, as well as significant views of park landscapes either from terraces or through large windows.

Siting of the visitor center near a landscape or an attraction to be interpreted sometimes allows interpretive programs to be extended into the visitor center itself.

The building's elevations create a mostly low-profile, horizontal effect.

The building "harmonizes" with its setting through horizontality of massing, color, and texture of materials. Use of textured concrete, concrete block, and stone veneers in facades gives the building a generally rough exterior texture, often featuring earth-toned colors.

The building footprint is often ell-shaped, rectangular around a central courtyard, or a variation on these themes.

Use of naturalistic planting partially screens building, utility areas, and parking, and repairs areas disturbed in construction. Planter boxes often define entrances.

> Outdoor spaces and site work, including parking lots, paths, amphitheaters, terraces, and patios are often incorporated into the visitor center complex.[44]

According to the National Capital Region Multiple Property Documentation, a visitor center can function as the central element in a Mission 66 historic district. Because the scope of this project was limited to the visitor center itself, this HSR does not evaluate the potential for a Great Falls Park Visitor Center historic district. As originally designed and constructed, however, the courtyard between Building A-B and Building B-C constituted an integral element of the Great Falls Visitor Center, although its evaluation is not included in the scope of this HSR.

As mentioned above, an eligible Mission 66 property should have been constructed between 1945 and 1972 to be eligible. The Great Falls Park Visitor Center satisfies this guideline. The National Register documentation states that construction on the visitor center was completed in 1967. Research for the historic structures report has determined that the building itself was not completed until 1968 and did not open until 1969. The HSR therefore suggests 1969 as the period of significance. It should be noted that this period of significance is based on the opening of the visitor center building itself, exclusive of its landscape, consideration of which was beyond the scope of this report.

[44] Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia, and the District of Columbia Parks of the National Capital Region (now National Capital Area of Interior Region 1) of the National Park Service Multiple Property Documentation Form (draft), National Park Service, Region 1, National Capital Area, June 18, 2021, F53-55.

CHAPTER 2: CHRONOLOGY OF DEVELOPMENT AND USE

TIMELINE

10,000 BCE End of the Last Glacial Age. The Great Falls of the Potomac River had been formed by this time.

ca. 900 CE Human occupation of a site on Mine Run in what is now Great Falls Park ceased.

ca. 1500 Algonquian-speaking native peoples inhabited villages in the coastal plain below the falls. Iroquoian-speaking Susquehannocks lived above the falls.

1608 English Captain John Smith and his crew explored the Potomac River up to Great Falls.

1649 King Charles II of England granted the Northern Neck proprietary, comprising more than five million acres of land between the Potomac and Rappahannock rivers (including the Great Falls area), to seven loyal supporters. At about this time, native peoples began to withdraw from the area in the face of European settlement.

1734 Thomas, sixth Lord Fairfax, inherited the Northern Neck propri-etary. He had the boundaries surveyed in 1736 and issued land grants through agents in the Virginia colony.

1769 George Washington discussed with iron forge owner John Semple potential improvements to the Potomac River to facilitate naviga-tion and open river transportation to the west.

1785 The Patowmack Navigation Company was organized to imple-ment improvements to the river, with Washington as its president.

The Mount Vernon Compact, an agreement between Virginia and Maryland on use of the Potomac River and other common water resources, was signed at Washington's estate.

Construction on the Patowmack Canal began at Seneca Falls.

1786	Construction began on the canal at Great Falls.
1793-1797	Buildings were constructed at Matildaville in what is now Great Falls Park. The town was planned by Henry "Light Horse Harry" Lee and chartered by the legislature of Virginia in 1790.
1802	The Patomack Canal was completed. The canal company issued its first and only dividend to stockholders this year.
1827	The Patomack Navigation Company ceased operations, its assets absorbed by the Chesapeake & Ohio Canal Company. At this time, four buildings remained standing in Matildaville.
1830	The C&O Canal Company determined to build a new canal entirely on the Maryland side of the river and abandoned the Patow-mack Canal.
1838	Albert Fairfax sold 761 acres of land to Hall Neilson, Thomas ap C. Jones, and William A. Bradley, who planned to use the falls as the source of power for running mills and other manufacturing operations.
1854	The Great Falls Manufacturing Company purchased the property from Neilson, Jones, and Bradley, but no manufacturing or milling facilities were constructed.
1861	On September 4, the Confederate army shelled U.S. military positions across the river in Maryland from a position on the hills above what is now Great Falls Park. In October, however, Con-federate leaders determined to withdraw to defensive positions to the west near Centreville. No other reports of military action in the area of what is now Great Falls Park during the Civil war were discovered during research for the HSR.
1873	A newspaper article reported a party of eight people fishing over a weekend at Great Falls and staying at what became known as Dickey's Inn, a former tavern in Matildaville.
1895	The Great Falls Manufacturing Company sold its property to the Great Falls Power Company, which planned a hydroelectric plant to serve Washington, D.C. The plans included a new channel, as well as a powerhouse, on what is now park property.

1901 The report of the Senate Park Commission, also known as the McMillan Commission, to Congress called for extensive development of parks within and outside the city of Washington. In addition to changes to the National Mall, a Mount Vernon Memorial Highway, and drive connecting Washington's Civil War Defenses, the report called for a "Potomac Drive" to Great Falls.

1906 On July 4, the Great Falls & Old Dominion Railroad (GF&OD RR) opened Great Falls Park, including a carousel, a dance pavilion, an observation tower, and the Great Falls Inn. These features were located within current park boundaries, south of the location of the visitor center. The railroad leased land from the power company for its railway from Georgetown and to construct the park.

1911 The GF&OD RR became part of the Washington & Old Dominion Railroad.

1930 On May 29, the Capper-Cramton Act was signed into law. The legislation called for "the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac, the preservation of the historic Patowmack Canal, and the acquisition of that portion of the Chesapeake and Ohio Canal below Point of Rocks" (Maryland).

1934 GF&OD RR stopped serving Great Falls Park as a result of the Great Depression and widespread use of automobiles for personal travel.

1936 The highest flood on record at Great Falls damaged park buildings, which were later repaired.

1947 The Potomac Electric and Power Company (PEPCO) purchased the property of the Great Falls Power Company, including what is now Great Falls Park.

1950 Fire consumed Dickey's Inn, ending more than three quarters of a century of service to Great Falls visitors.

1951 PEPCO President R. Roy Dunn pledged to preserve the land it owned in the Great Falls area until such time as the federal government could purchase it.

1954 PEPCO sold Great Falls Park, the former GF&OD RR property encompassing 16 acres of land, to the Fairfax County Park Authority (FCPA). The authority planned to condemn the property and build a new park to serve its rapidly increasing population.

1956 The Mission 66 program was endorsed by President Dwight Eisenhower and the U.S. Congress. Congress would appropriate more than $1 billion in improvements in the national parks through the Mission 66 program.

Interior Secretary Fred Seaton announced that $70 million in upgrades to National Capital Parks under the Mission 66 program had been provided for by his department. Projects to be funded included completion of George Washington Memorial Parkway from Mount Vernon to Great Falls, Virginia.

1958 A "Preliminary General Use Plan, Great Falls Park, Virginia," dated September 25, showed the area in which the visitor center would eventually be built scheduled for "intensive use." The intensive use area was planned for picnicking, concessions, and parking. Also shown are natural, camping, historic, and maintenance areas. The plan resulted from a conference between the Nature Conservancy, the National Capital Planning Commission (NCPC), the Fairfax County Park Authority, and the National Park Service (NPS).

1960 PEPCO president Dunn and Secretary of the Interior Fred A. Seaton signed a memorandum of agreement on March 25 authorizing the department to lease the PEPCO land, with an option to buy.

ca. 1961 A "Great Falls Park – Virginia, Development Program" produced by NPS called for a "Nature Center" for the park that would have included audiovisual capabilities, a lobby with an information area, exhibit space, a workshop, offices, as well as other park development. It was the first of several park planning documents outlining visitor facilities at Great Falls.

ca. 1964 A "Developed Area Package" was produced for Great Falls. The document included room functions, sizes, and square footages

for an "Expandable Visitor Contact Station." A working drawing for a parking area was approved by Robert W. Andrews, Acting Chief of the Division of Project Design for the National Capital Region of the National Park Service, on November 23.

1965

On October 8, National Capital Region Director T. Sutton Jett approved preliminary drawings of the Great Falls Park Visitor Center, prepared by W. Kent Cooper, Architect. The preliminary drawings consisted of floor plans, elevations, and a site plan, dated July 1965.

On October 10, President Lyndon Johnson signed Public Law 89-255, which authorized the Department of the Interior to exchange 385 acres of federal land at Blue Ponds in Prince George's County, Maryland, with PEPCO, along with a payment of almost $1 million, for 790 acres of land at Great Falls in Fairfax County.

Archeological investigations of the current site of the visitor center were conducted on December 14. No evidence of previous buildings or habitation was found.

1966

Edward S. Peetz of the NPS Office of Resource Planning, forwarded an incomplete brief master plan for Great Falls Park to the superintendent of the George Washington Memorial Parkway, noting that other personnel would need to finish the master plan because the original authors "are no longer available" due to NPS reorganization. Additional master planning documents were produced in September 1967 and July 1969.

Andrews approved drawings for the visitor center on June 1. Kent Cooper & Associates, James Madison Cutts (structural engineer), and Smith and Lee-Thorp (structural and mechanical engineers) were responsible for the design.

On October 26, 1966, R.R. Ayers, the president of Government Services, Inc., the concessioner for the National Capital Region, informed National Park Service Director George Hartzog, Jr., that his Board of Trustees had authorized an investment of $100,000 to be used in the construction of the visitor center.

On November 17, the land swap between PEPCO and the Interior Department was completed. In December, the Fairfax County Park Authority donated the former Great Falls Park property, comprising 16 acres, to the federal government.

At the end of December, the National Park Service announced that a contract for $323,000 had been awarded to Baldi Construction Engineering, Inc., of Bladensburg, Maryland, to build the visitor center.

1967 Construction of the visitor center began in early January.

In June, forms for concrete work in Building A-B were removed, revealing staining on the surface. Nearly a year passed before the staining problem was resolved in the two buildings.

1968 The National Park Service accepted the visitor center building from Baldi Construction Engineering on July 15. There remained a punch list of more than a hundred items to be resolved by Baldi before the visitor center would be ready for service.

1969 Work, including landscaping, replacement of glass in windows and doors, and removal of obsolete buildings took place in the first half of the year. The visitor center opened the week of July 7-11.

1981 Drawings for repairs to visitor center roof framing were prepared.

1988 The visitor center was reroofed.

1999 Regional Director Terry Carlstrom approved drawings for the renovation of the visitor center's HVAC system. The work planned the rehabilitation of the existing HVAC system at the top of the visitor center's end towers.

2003 A survey report by Dewberry Design Group and Dewberry LLC was prepared for the replacement of the existing structural system and covering of the visitor center roof. The report formed the basis of changes to the roof system implemented in 2022. The visitor center's HVAC system was converted from a heat pump split system (both first and second floors), utilizing building cross ventilation via a system of controlled intakes and exhaust fans,

to an RTU-based, ducted heat pump system on the second floor and various split system heat pump units on the first. The original cross ventilation system was abandoned. A survey report by Dewberry Design Group and Dewberry LLC was prepared for the replacement of the existing structural system and covering of the visitor center roof. The report formed the basis of changes to the roof system implemented in 2022.

2006 Plans were prepared for a fire detection system and an intrusion detection system in the visitor center.

2007 Drawings for revised exhibits, a new front desk, and altered gift shop space were prepared and later implemented.

Drawings illustrating changes to existing doorways to comply with ABAAS regulations were prepared and later implemented.

2008 Drawings were prepared for modification of the original stair in building A-B of the visitor center to accommodate a platform lift to comply with ABAAS regulations.

2011 The north ramp was altered to comply with ABAAS regulations.

ca. 2012 The restrooms were altered to comply with ABAAS regulations and to increase capacity. The work included moving the men's restroom to former concession and storage space on the first floor of building B-C and expanding the women's restroom into space vacated in building A-B.

2014 On December 22, the Great Falls Park Historic District was listed in the National Register of Historic Places. The visitor center was determined to be a contributing building.

2022 A project was begun to replace the HVAC equipment and built-up roofing and to improve roof drainage. The project generally follows the intent of the 2003 report by Dewberry Design Group. The work will place new HVAC equipment on the tower roofs of both buildings, replacing the equipment formerly below the tower roofs.

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ORIGINAL DESIGN AND CONSTRUCTION, 1961-1966

The first project mentioned in Secretary Seaton's July 1956 announcement of Mission 66 funding for National Capital Parks was "Completion of the George Washington Memorial Parkway from Mount Vernon to Great Falls on the Virginia shore, and from Great Falls to Fort Washington on the Maryland side of the Potomac River."[45] Additional recreational facilities, needed to accommodate the growing population of the Washington metropolitan area, were planned along with the parkway. The 1930 Capper-Cramton Act had provided for not only construction of the roadway, but also "the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac, the preservation of the historic Patowmack Canal, and the acquisition of that portion of the Chesapeake and Ohio Canal below Point of Rocks" (Maryland). Mission 66 funding went some way toward fulfilling those provisions, appropriations for which were not made at the time of the act's passage.[46]

While not specifically related to Mission 66, a "Preliminary General Use Plan" for Great Falls Park had been prepared by September 1958. (Figure 59) The plan resulted from a conference between the Nature Conservancy, the National Capital Planning Commission, the Fairfax County Park Authority, and the National Park Service. It showed the park divided into five areas: natural, camping, historic, maintenance, and intensive use. The ruins of the Patowmack Canal itself constituted the historic portion of the park, with the intensive use area lying on both sides of the canal in the vicinity of what is now the visitor center. The legend for the plan indicates that activities in the intensive use area included picnicking, concessions, and parking.[47] The plan does not make clear who was responsible for its development, and, at the time, the park was not under NPS jurisdiction. It likely represents an agreement among the interested parties as to how Great Falls Park was to be treated in general – as a place where recreational, historical, and scenic interests would all be served.

NPS appears to have begun detailed planning for the development of Great Falls Park shortly after the 1960 agreement between PEPCO and the Interior Depart-

45 Department of the Interior Information Service, "Secretary Seaton Announces $70,000,000 Program for National Capital Parks System," 2, Record Group 79, Records of the National Park Service, Finding Aid A1, Entry 1, Data from Part II of Mission 66, box 12, July 15, 1956, National Archives, College Park, Maryland.

46 Mackintosh, "George Washington Memorial Parkway Administrative History," 29.

47 "Preliminary General Use Plan, Great Falls Park, Virginia," drawing no. 850_80615 (digitized plan), September 25, 1958, George Washington Memorial Parkway Archives, George Washington Memorial Parkway Headquarters.

ment providing for federal leasing of the utility's land had been reached. A "Great Falls Park – Virginia, Development Program," circa 1961, calls for a "Nature Center" for the park that would have included audiovisual capabilities, a lobby with an information area, exhibit space, a workshop, and offices to accommodate four people (including the U.S. Park Police). The development program envisioned other park development, such as two "wash houses" with toilets, four combination picnic shelter/comfort stations, and a concession building. The document shows that some of the facilities would be based on existing precedents. The nature center was to follow the example of a Mission 66 project at Rock Creek Park, while the concession facility was to be similar to the Little Hatchet Tavern at Mount Vernon. In Rock Creek Park, NCR had transformed an existing 1936 residence into a low-slung Park Service Modern building to house its nature center. The reference to this building in the development plan may suggest that regional planners intended to modify one of the existing buildings in Great Falls Park for its nature center. A "Proposed Programming" schedule for the work at Great Falls, which would also have included preservation of the canal and locks, stabilization of the ruins of Matildaville, utilities, an access road and parking lot, camping and picnic areas, an amphitheater, bridle and walking trails, and falls overlooks, would have begun in 1962 and been completed in 1972.[48]

The conception of the visitor facilities at Great Falls Park continued to change over the next few years. NCR considered a visitor contact station for Great Falls Park, according to the region's 1964 annual report. A contact station was a smaller affair than a visitor center. The Mission 66-era contact station at Prince William Forest Park included an office, storage, and restrooms, but not exhibit or auditorium space as do the Rock Creek Park Nature Center and typical Mission 66 visitor centers.[49] The 1964 annual report covered the fiscal year, which ended on June 30. Six months later, the Park, Recreation, and Open Space Committee of the National Capital Planning Commission recommended that the commission approve the National

[48] "Great Falls Park – Virginia, Development Program," undated (ca. 1961), "Proposed Programming for Great Falls, Virginia," undated (ca. 1961), Accession no. 79-64B0901, box 8, folder 1, Great Falls Park 1961-1963, Washington National Records Center, Suitland, Maryland; Robinson & Associates, Inc., National Register of Historic Places Multiple Property Documentation Form: Mission 66-Era Visitor Centers, Administration Buildings, and Public Use Areas in the Maryland, Virginia, West Virginia and the District of Columbia Parks of the National Capital Region of the National Park Service. U.S. Department of the Interior, National Park Service, June 18, 2021, E23.

[49] National Capital Region, National Park Service. "1964 Annual Report," 26, Accession no. 79-68A3201, box 3, folder 52, Washington National Records Center, Suitland, Maryland; Robinson & Associates, E38.

Capital Region's Fiscal Year 1966 Capital Improvement Program, which included $50,000 for construction of an "Expansion of Visitor Contact Station to provide Concessioner Facilities."[50] The entry in the NCPC document might suggest that the visitor contact station mentioned in the 1964 annual report had already been built and was now planned for expansion. That seems not to have been the case, however, as a weekly report from NCR Director Nash Castro from August 1968 indicates that park personnel were located at that time in a nearby maintenance building. It does not seem likely that the NPS officials would have abandoned a contact station built three or four years earlier for temporary quarters while the visitor center was being constructed.[51]

NPS also prepared a "Developed Area Package" for Great Falls Park at about this time. The package constituted part of a master plan for George Washington Memorial Parkway and covered such information as existing means of access to the Great Falls Park area, visitor characteristics from 1958 to 1963, applicable legislation, and other data. Included in the document was a table of information related to an "Expandable Visitor Center Station, including Police Facilities." The table itemized room uses, dimensions, and square footage, as well as construction costs. Room functions included a lobby, an information facility, an assembly room, public restrooms, staff offices and restrooms, a storeroom, a workshop, and an efficiency apartment, among other uses. The facility would have totaled 4,168 square feet. No information is given on its potential location.[52]

A slightly different idea of the new facility, however, was in place by the time an "Interpretive Prospectus for Great Falls Park, Virginia," was being circulated in February 1965. At the end of the document, after describing such aspects of the park as its significance, the history of its acquisition by the National Park Service, the types of media that would be involved in interpretation, and the kind of exhibits planned,

50 National Capital Planning Commission. "Fiscal Year 1966 Capital Improvement Program, National Capital Region – National Park Service, Report of the Park, Recreation, and Open Space Committee," December 3, 1964, 1, Accession no. 79-68A3201, box 2, folder 5, Washington National Records Center, Suitland, Maryland.

51 Nash Castro, Director, National Capital Region, to Director, National Park Service, Weekly Report, August 5, 1968, 4, Accession no. 79-72A6215, box 4, folder A2623, Washington National Records Center, Suitland, Maryland.

52 National Capital Office, National Park Service, Division of Design and Construction, "Parking Area Plan," drawing no. 850_80827, November 23, 1964 (digitized plan); "George Washington Memorial Parkway Master Plan, Great Falls, Virginia, Developed Area Package," n.d., George Washington Memorial Parkway Archives, George Washington Memorial Parkway Headquarters. It is thought that the Developed Area Package dates to 1964 since the last visitor statistics cited in the document date from 1963.



Figure 20. Visitors walk along the Patomack Canal next to Building A-B in 1969. Looking southwest. (MRCE)

the prospectus identified the requirements for the building itself, which it called a visitor center – the first time that term is used in relation to Great Falls Park in documents reviewed for the HSR. The requirements included "an exhibit room, information office, staff office, audiovisual programming room, restrooms, storeroom and workroom. If administrative offices are planned for the Park, these should be incorporated in the public contact building."[53] The prospectus made a further recommendation that became part of the visitor center as built. Due to the potential for flooding in the area, the prospectus states, "[i]t might be considered desirable to provide elevated floors in the visitor center in order to protect the building and its contents, in which case thought should be given to the use of ramps instead of stairs to public rooms in the visitor center. This would also facilitate use by handicapped persons."[54] The prospectus included room dimensions (30 by 50 feet for the exhibit room, 30 by 54 feet for the assembly hall), total area (5,745 square feet), and cost estimates ($143,625 for the building, $256,400 for the building along with exhibits and park trails).

This concern for the accessibility of the building by those unable to use stairs was prescient, but not outside the professional mainstream in the 1960s. In 1961 the American National Standards Institute issued standard A117.1, "Accessibility and Usable Buildings and Facilities," which provided guidance on how to design for those with accessibility issues. In 1968, two years after Cooper had established the site design, which did depend upon ramps for circulation, the Architectural Barriers Act became law, an act that required accessibility in all new and altered federal buildings. The Great Falls Park Visitor Center opened less than a year after the passage of the act.

No mention is made of concessions in the facility described in the prospectus, and it states that administrative functions should be placed in a separate visitor contact station. The vision for the visitor center defined in the interpretive prospectus, then, does not coincide with the archetypal Mission 66 visitor center described by Sarah Allaback, which, as we have seen, combined these functions in a single building to reduce the footprint of such facilities. The path from the various ideas floated for visitor facilities at Great Falls Park to the Park Service Modern building that was ul-

[53] William Hendricks and Charles H. McCormick, National Capital Region. "Interpretive Prospectus for Great Falls Park, Virginia," February 1965, 22, Accession no. 79-72A6215, box 19, folder D3414; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Weekly Report, April 13, 1969, accession no. 79-75-24, box 3 Washington National Records Center, Suitland, Maryland.

[54] "Interpretive Prospectus", 22.

timately built is not clear from research conducted for the HSR. It might, however, be inferred from NPS planning processes at the time. As would be typical during the Mission 66 period, NPS produced a master plan for Great Falls Park (as early as spring 1964), but the document remained incomplete as late as the end of May 1966. Documents related to the implementation of the master plan were reviewed by various NPS offices beyond the regional level. NCR Director T. Sutton Jett approved the interpretive prospectus, which was produced by the region, "for Distribution" on February 18, 1965, and the chiefs of the region's interpretive services branch and division of interpretation, as well as the assistant regional director for conservation, interpretation, and use, had already signed off on it.[55] The document and its assumptions on the nature of the visitor center would then have been distributed outside the region. Correspondence reviewed for the HSR indicates that aspects of NCR plans for Great Falls were reviewed by the Eastern Planning and Service Center in Philadelphia, the Washington Planning and Service Center, and other branches of the NPS central office in Washington. It would seem likely that, in the course of the reviews and subsequent discussions of plans for Great Falls Park, the planning logic of the Mission 66 program was applied to the proposed visitor facilities at Great Falls – the result being a decision to house all the visitor facilities in one building that also included park staff.

This decision must have come shortly after the distribution of the interpretive prospectus because the earliest drawings for the visitor center found in research were produced just six months later. Dated July 1965, and prepared by "W. Kent Cooper, Architect," the drawings show the facility much as it was ultimately built. (Figure 60) Neither the date nor the circumstances surrounding NPS' hiring of Cooper was found in materials reviewed for the HSR. His work on Dulles International Airport would likely have given him some notoriety in the Washington area, and he had been a member of the local chapter of the American Institute of Architects since 1961, which would likely have made his name familiar in the architecture circles of the metropolitan area. But the specific reasons NPS chose Cooper for the job remain unclear.

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[55] Raymond L. Freeman, Assistant Regional Director, Resource Planning, NCR, to Thomas B. O'Dea, Potomac Electric and Power Company, May 1, 1964, accession no. 79-68A3201, box 16, folder 18, Washington National Records Center, Suitland, Maryland; "Master Plan Brief for Great Falls Park, Virginia," 3-5, attached to Edward S. Peetz, Chief, Office of Resource Planning, Washington Planning and Service Center, to Superintendent, George Washington Memorial Parkway, May 26, 1966, George Washington Memorial Parkway Archives, George Washington Memorial Parkway Headquarters. The circa 1964 master plan was not discovered during research, only the cover letter from Freeman to O'Dea.

Robert W. Andrews, Acting Chief of the Division of Project Design for the National Capital Region, approved working drawings prepared by Kent Cooper & Associates, James Madison Cutts (structural engineer), and Smith and Lee-Thorp (structural and mechanical engineers) on June 1, 1966.[56] (Figures 61-65) In September, Cooper sent Walter Roth of the Washington Planning and Service Center a list of changes to the construction drawings resulting from his firm's review of the group approved in June so that bid documents could be revised if Roth thought that was necessary.[57]

An issue being resolved while Cooper and his firm turned the July 1965 preliminary drawings into working drawings was construction financing. Government Services, Inc. (GSI), a private concessioner whose operations in the federal parks of the Nation's Capital dated back to 1927, would be the concessioner for the new visitor center, by virtue of its contract with the region. In an undated letter, NCR Director Jett wrote to GSI's president, R.R. Ayers, requesting that the company provide $100,000 "to assist the Government [to] finance this project."[58] Ayers wrote on October 4, 1965, to NPS Director George Hartzog, Jr., that GSI's trustees had voted "to appropriate a sum not in excess of $100,000 to assist the Park in the cost of its construction," provided that the National Park Service was able to find the remaining funds.[59] NPS funding appears to have been in place a year later because Ayers wrote to Jett on October 26, 1966, that the Government Services Board of Trustees had authorized an investment of $100,000 to be used in the construction of the visi-

[56] The career of structural engineer James Madison Cutts in the Washington, D.C., area has lasted more than fifty years. He began his own firm in 1964, having received degrees from Columbia University and the University of Maryland. He has provided structural engineering expertise for nearly all the building types found in the metropolitan area, including commercial buildings hotels, hospitals, schools, churches, parking garages, zoological parks, museum, and embassies. The Washington Convention Center, National Public Radio Building, and Thurgood Marshall Federal Judiciary Office Buildings are numbered among his new construction projects, while he worked on restoration projects at the White House, Mount Vernon, the Jefferson and Lincoln memorials, the Treasury Building, and the Washington Monument. ("Outstanding Achievement Award Past Recipients: James Madison Cutts, PE," Structural Engineers Association-Metropolitan Washington website, https://www.seamw.org, accessed March 12, 2022.

[57] W. Kent Cooper to Walter Roth, Architecture Division, Washington Planning and Service Center, September 23, 1966, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

[58] T. Sutton Jett, Director, National Capital Region, National Park Service, to R.M. (sic) Ayers, President, Government Services, Inc., n.d.; accession no. 79-68A3201, box 14, folder 34, Washington National Records Center, Suitland, Maryland.

[59] R.R. Ayers, President, Government Services, Inc., to George B. Hartzog, Jr., Director, National Park Service, October 4, 1965, accession no. 79-68A3201, box 14, folder 34, Washington National Records Center, Suitland, Maryland.

tor center. Enclosed with the letter was a check for $20,000, the first of five equal payments to be made.[60] Construction funding seems to have been pulled from other aspects of the visitor center project, with $60,000 having been redirected from exhibit design and fabrication for construction of the building, according to NCR's chief of interpretation and resource management, Chester Harris.[61] The National Capital Region let a construction contract to Baldi Construction Engineering Company of Bladensburg, Maryland, on November 4, just over a week after receiving GSI's first check.[62]

The National Capital Region issued a press release for construction of the Great Falls Park Visitor Center on December 28, 1966. Carolyn Hughes and Wolf Von Eckardt followed with a glowing review of the design (as depicted in a model) in the Washington Post the next day. Cooper had drafted the press release and sent it to Walter Roth on November 22.[63] The publicity occasioned the release of strong feelings in letters from individuals and resolutions of local organizations that criticized the visitor center in several ways. Virginia congressmen William L. Scott and Joel T. Broyhill, as well as Virginia Senator Harry F. Byrd, Jr., involved themselves in the issue, impelled by some of their constituents, and sought Secretary of the Interior Stewart Udall's stance on the situation.[64] The National Capital Planning Commission complained that the design had not been submitted to it for review, as was re-

60 R.R. Ayers, President, Government Services, Inc., to T. Sutton Jett, Director, National Capital Region, October 26, 1966, Accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

61 Chet [Chester] Harris, Regional Chief, Division of Interpretation and Resources Management, NCR, to Chief, Division of Interpretation and Visitor Services, WASO, January 16, 1967, Accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

62 "Construction Contract, contract no. 14-10-0028-3071, November 4, 1966, included in "Specifications for the Construction of a Visitor Center at Great Falls Virginia Res. 404V, Fairfax County, Virginia," Contract no. 14-10-0028-3071, National Capital Region, National Park Service, September 2, 1966, Accession no. 79-72A6215, box 29, Washington National Records Center, Suitland, Maryland.

63 National Capital Region, National Park Service. News Release: Visitor Center at Great Falls, Virginia, to be Constructed, December 28, 1966; W. Kent Cooper to Walter Roth, Architecture Division, Washington Planning and Service Center, November 22, 1966, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland; Carolyn Hughes and Wolf Von Eckardt, "U.S. to Build Great Falls Visitor Center," Washington Post, December 29, 1966, A1, ProQuest Historical Newspapers website, accessed November 1, 2021.

64 H. Graham Morison, Chairman, Great Falls Conservation Council, to Udall, February 9, 1967; Senator Harry F. Byrd, Jr., to Stewart Udall, Secretary of the Interior, March 16, 1967; Doris Kidder, President, Northern Virginia Conservation Council, to Floyd Taylor, Superintendent, George Washington Memorial Parkway, March 29, 1967; accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

quired by law.[65] Opponents of the visitor center criticized the building's placement (too close to the canal remains) and design (inappropriate for a historical park the significance of which dated to the early republic, too large, use of concrete block rather than native stone). They also criticized what they considered a lack of transparency on the part of NPS as the design was being developed. Several wrote that the announcement that the construction contract had been let was the first time that they had heard of the project.

The Department of the Interior, the National Park Service, and the National Capital Region were consistent in their responses to these criticisms. On the lack of transparency, all three stated that the project followed standard federal practices for design and review of new buildings and procurement of professional services. On the design itself, the government agencies essentially reiterated the principles of the Mission 66 program – deference to park features, protection of resources, arrival by automobile and easy access to important park elements, and the economies of using modern materials. A letter from Udall to Byrd covered all these elements. On April 21, 1967, the secretary wrote that that "[t]he choice of a modernistic design was with purpose and not accidental" and that the building was intended to defer to the "natural, geologic, and recreational features of the park. . . . [W]e would never want to deprive the visitor of this unforgettable experience through man's attempt to excel nature" with a striking building. The modernization of facilities also justified another change in the park that had been criticized - the demolition of the Great Falls Inn, which had been in operation in the park for decades. Fond memories of the inn's $1.25 dinners of black bass or fried chicken may have fueled these critiques, but NPS officials consistently responded that the inn was in poor condition and its location "astride" the canal was intrusive. Food service, meanwhile, had always been included in visitor center plans. In the siting of the visitor center, "[f]ull consideration was given to the protection of the natural as well as historic scene to assure the maximum conservation of the woodland setting and to provide for the normal flow of visitors from the permanently established parking lots to and through the center and onto the overlooks at the falls." The use of concrete block

[65] Charles H. Conrad, Executive Director, National Capital Planning Commission, to T. Sutton Jett, Director, National Capital Region, January 10, 1967; Robert C. Horne, Associate Regional Director, National Capital Region, to Conrad, January 16, 1967, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland. Horne reminded Conrad that NCR had submitted an earlier version of the project to NCPC in January 1964 (identified as a visitor contact station) and that NCPC's approvl letter did not ask to review further development. No other correspondence between NCPC and NCR on the visitor center was found in research.

instead of stone, he wrote, was a "budgetary necessity," the price of stone being four times higher than that of concrete block.[66] The "controversy," such as it was, began at about the time construction got started in early January 1967 but appeared to be over by the end of April, based on the dates of letters reviewed for the HSR.

NPS staff also had concerns about aspects of the design, although these concerns focused on practical details rather than the overall concept of the building. George Washington Memorial Parkway Superintendent Floyd B. Taylor summed up several of these concerns in a letter to the Washington Planning and Service Center written October 1, 1967. One group of comments centered on concerns about the visitor center windows. Both the large windows in the south end of the exhibition space in Building B-C and the laylights in the roof overhang in the Building A-B auditorium were thought likely to allow too much light into those spaces to allow their intended purposes to be accomplished. The large windows on the west wall of the office area on the first floor of Building A-B was considered to have the potential to present privacy issues on busy days, the superintendent also wrote. He suggested draperies for all three circumstances. Alternatively, Venetian blinds might be used in the office area and opaque panels in the auditorium.[67]

CONSTRUCTION AND OPENING, 1967-1969

Baldi Construction Engineering, Inc., began building the visitor as soon as the new year started. A site meeting on January 3, 1967, between NPS, Baldi, and Kent Cooper & Associates (including William P. Lecky, who would later become Cooper's business partner) addressed the ability of the soil to support the designed building, means of removing standing water from the building site, and potential issues with the bedrock on which the footings would be placed. There was concern that the bedrock was not as extensive as had been thought, which might mean grade beams, spread footings, piers, or other solutions would be required.[68] The location of the building was, in fact, moved after this meeting. The footprint was nudged 14 feet to the north and rotated 4 feet to the east so that it did not rest on a rock outcropping

66 Stewart Udall, Secretary of the Interior, to Senator Harry F. Byrd, Jr., April 21, 1967, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

67 Floyd B. Taylor, Superintendent, George Washington Memorial Parkway, to Washington Planning and Service Center, October 11, 1967, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

68 William P. Lecky, Kent Cooper & Associates. "Great Falls Visitors Center – Site Meeting Number Two, January 3, 1967" (minutes), January 4, 1967, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland.

at the southwest corner, which would have required additional, expensive excavation.[69]

Two days later, the participants met again to discuss an issue that would ultimately cause nearly a year's delay in the completion of the visitor center. The specifications for the building's construction called for "Plywood Formed Concrete" and "Vertical Formboarded Concrete" on "areas exposed to public view," with the exception of interior floor slabs. In areas not exposed to public view, the architectural concrete was planned to have a smooth finish. The specifications also give instructions for curing the concrete and for removal of the forms. In the January 5 meeting, the architects discussed methods for the concrete construction, especially the wood forms, "as they concern major areas or elements of the design."[70] As built, however, the board-formed concrete was plagued by problems, especially staining, but also honeycombing, cracking, and other superficial defects. Baldi received blame for the defects, although the company defended itself in letters to NPS, stating it had followed the instructions in the specifications, as well as those given by the architects in meetings. Baldi also stated that it had used the prescribed lubricant between the forms and the concrete to ease their removal. The staining problems were noticed in June 1967 in Building A-B after the forms were removed. Baldi, after consultation with NPS and Cooper's firm, tried several methods to fix the problem, including grinding and sandblasting the stains off and covering them in various ways. Concrete refinishing experts were brought in in September 1967, after which Baldi attempted to resolve the problem by first sandblasting a section of concrete to "open the pores," followed by "bagging," in which a mixture of cement and sand was wiped over the surface. This method was approved for Building A-B only on November 11, 1967. The treatment was undertaken on the concrete beams and ceilings of Building A-B in November and December 1967. However, the treatment "substantially changed the texture of the architectural concrete finish and was costly and, therefore, not completely satisfactory" to NPS, the architects, or Baldi. When the same problems occurred in Building B-C, other methods were attempted, including chemical solutions (recommended by the Virginia Concrete

[69] Robert G. Cooper, Chief, Division of Contract Administration and Construction Contracting Officer, "Findings of Fact and Decision of the Contracting Officer: Construction of a Visitor Center at Great Falls, Virginia," July 26, 1968, 4, accession no. 79-72A6215, box 29, folder D42-3071, Washington National Records Center, Suitland, Maryland.

[70] William P. Lecky, Kent Cooper & Associates. "Great Falls Visitors Center – Site Meeting Number Three, January 5, 1967" (minutes), January 6, 1967, accession no. 79-72A6215, box 19, folder D3415, Washington National Records Center, Suitland, Maryland; "Specifications for the Construction of a Visitor Center," 2-9 – 2-10.

Corporation, the Portland Cement Institute, and Georgia-Pacific Corporation). A masonry water sealant (Thoroseal) was also applied to a sample section of a concrete exterior beam, but these approaches were rejected by NPS on March 5, 1968. The sandblasting and bagging method was attempted on a sample section later in March and approved in April for all areas of both buildings. The refinishing was completed by the end of May 1968. Finishing the interior commenced in June and was completed in July. NPS officials from the Washington Planning and Service Center and George Washington Memorial Parkway, accompanied by representatives from Baldi, inspected the visitor center on July 15, 16, and 18, and accepted the building from the contractor as of July 15, 1968.[71]

Acceptance of the building came with a punch list of more than a hundred items requiring completion or repair for which Baldi was responsible. Many of the items involved cleaning areas of the building, completing touch-up work, or minor repairs. Three-quarters of the items were mechanical or electrical deficiencies, including heater units that did not work, unsatisfactory installation of insulation and flashing, and loose wiring.[72] An ongoing issue had been the location of electrical outlets in the exhibition room. After several changes in their planned location made by the NPS Museum Branch, Baldi had put them in the wrong place. Negotiations over the responsibility for the incorrect placement was one of the factors that extended the completion date of the building by several more months. A review of the contracting procedures used for the visitor center construction, particularly the acceptance of the building with a large list of items still to be performed, found no

[71] Herman M. Braude, [attorney for Baldi Construction Engineering], to Ray G. Martinez, Contracting Officer, National Park Service, Offer of Settlement on Outstanding Claims, November 19, 1971; Supplemental Agreement between the Department of the Interior, National Park Service, Eastern Service Center, and Baldi Construction Engineering, December 14, 1971, 3-5, accession no. 79-72A6215, box 29, folder D42-3071; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Items for Inclusion in weekly report to the Director, July 18, 1968, accession no. 79-72A6215, box 4, folder A2615, Washington National Records Center, Suitland, Maryland. The quotations in this section can be found in Braude to Martinez, November 19, 1971.

[72] Robert J. Shelley, Acting Chief, Division of Contract Administration and Construction, to Baldi Construction, "Letter of Acceptance," July 23, 1968, accession no. 79-72A6215, box 29, folder D42-3071, Washington National Records Center, Suitland, Maryland. Construction problems and delays in completion of the building led to several legal actions by Baldi Construction Engineering to recoup losses resulting from late charges, required repairs, and changes to the contracted work that the construction company blamed on the National Park Service. Several of Baldi's suits were dismissed, but arbitration also led to compromise settlements. Ultimately, Baldi received $327,217.40 for their work at Great Falls; the original contract was worth $323,824. Documents related to these issues can be found in three folders (all labeled D42-3071) that are part of accession no. 79-72A6215, box 29, at the Washington National Records Center.

fault with the contracting officer's decisions.[73]

The review, completed in August 1969, concluded that the delays in finishing the building "apparently did not cause concern in the Region as the Superintendent's office advised that the delay gave them the excuse not to activate the facility until the summer" of 1969.[74] One reason for this lack of concern may have been timing. The building was accepted by NPS in the middle of July, but it remained unusable until Baldi resolved the punch list items. This appears to have taken several months. Visitor statistics indicated steep declines in winter visitation; it was therefore not necessary to rush the opening. Other aspects of the visitor center, however, remained to be completed as well. Staff offices and the auditorium had not been furnished by the end of October 1968, when Associate Regional Director Russell Dickenson and GWMP Superintendent Taylor visited the site for the purpose of determining furnishing requirements.[75] At a staff meeting earlier in October, Taylor had commented that the opening of the visitor center was being postponed until the spring, but that it might not open until July 1, 1969.[76] Although Taylor didn't explain the potential delays, they may have resulted from the need for landscaping around the visitor center and for razing the buildings associated with Great Falls Park when it was run by Fairfax County. A site improvements drawing produced by the Design and Construction Office of the NPS's Washington Planning and Service Center was approved on January 28, 1969, and $47,000 appropriated for its implementation.[77] In his weekly report of March 10, 1969, Taylor reported that efforts had been made to improve drainage around the visitor center prior to construction of a road to access the concessions area. The area immediately surrounding the visitor center still needed to be landscaped, seeded and sodded. The razing of the obsolete buildings "is scheduled for immediate attention," the report noted. In April, work crews salvaged sod from the construction of the Filene Center at Wolf Trap Farm Park, which was used to cover the former FCPA parking area adjacent to the visitor cen-

73 Acting Assistant Director, Design and Construction, to Regional Director, National Capital Region, Subject: Review of Contracting Procedure Related to the Great Falls, Virginia Visitor Center, August 25, 1969, 1, accession no. 79-75-24, box 5, Washington National Records Center, Suitland, Maryland.

74 Ibid., 2.

75 Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Items for Inclusion in weekly report to the Director, October 28, 1968, accession no. 79-72A6215, box 4, folder A2615, Washington National Records Center, Suitland, Maryland.

76 Minutes of Staff Meeting, George Washington Memorial Parkway, October 1, 1968, accession no. 79-72A6215, box 5, folder A4031, Washington National Records Center, Suitland, Maryland.

77 William Rosenberg, Deputy Assistant Director, Design and Construction, to Director, NCR, February 21, 1969, Accession no. 79-75-24, box 15, folder D3415, Washington National Records Center, Suitland, Maryland.

ter. The concessions situation in the building was still being considered at the end of April.[78]

During the week of June 15-21, 1969, the George Washington Memorial Parkway maintenance staff planned to "wreck and remove the Old Inn" (the Great Falls Inn), install curbs and gutters, and backfill and grade service roads and trails. The inn was removed and the site restored with the exception of seeding during that week. The chief of park maintenance, John Curran, also planned for his staff to "clean up Visitors Center."[79] This work suggests imminent opening, and, indeed, the NCR director's report to the NPS director for the week of July 7-11 stated, "During the week the Visitor Center and Concessions at Great Falls Park opened quietly and without incident."[80]

THE GREAT FALLS VISITOR CENTER AS ORIGINALLY BUILT

When it opened in July 1969, the Great Falls Park Visitor Center consisted of two two-story buildings aligned parallel to each other on a north-south axis and linked on the second floor by a reinforced concrete bridge. Labeled in the drawings as A-B on the east and B-C on the west, the two buildings were slightly offset from each other along the axis, so that A-B was slightly farther south than B-C. The second floors of each building were wider than the lower floors, resulting in a broad overhang on both sides of both buildings. A tower was located at the end of each building (on the north for A-B and on the south for B-C). Primary doors pierced the facades on the ends of the building opposite the towers (south for A-B, north for B-C). Located on the second floor, they were reached by concrete-paved ramps with railings consisting of metal posts topped by wood planks that doubled as benches. The open space between the two buildings was landscaped with plantings, benches, picnic tables, and native rocks to form a common courtyard.

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78 Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Items for inclusion in weekly report to the Director, March 10, 1969; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Weekly Report, April 4, 1969; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Weekly Report, April 28, 1969, accession no. 79-75-24, box 3, Washington National Records Center, Suitland, Maryland.

79 John J. Curran, Chief of Park Maintenance, to Superintendent, GWMP, Weekly Activity June 15th through 21st, June 12, 1969; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Weekly Report, June 23 , 1969, accession no. 79-75-24, box 3, Washington National Records Center, Suitland, Maryland.

80 Director, National Capital Region, to NPS Director, Weekly Report to the Director, July 7-11, 1969, July 10, 1969, accession no. 79-75-24, box 3, Washington National Records Center, Suitland, Maryland.

The first-floor facades of both buildings were constructed of "rough textured concrete blocks of the same color as the stone locks in the nearby Potowmack Canal," as described in the Washington Post review of the building plans prior to construction.[81] The drawings identified them as "split blocks." The reinforced concrete structure of the buildings could be seen at the top of the first floor walls, with smooth-textured concrete beams extending outward to support the second floor overhangs. The smooth surface of the structural concrete constituted a change in texture from Cooper's planned board-formed concrete. The change resulted from the solution to staining on the surface of the original concrete, which involved sandblasting the stained surface and "bagging" the concrete to create a new surface. This solution was used on exposed reinforced concrete in both buildings. On each building, Cooper's design employed a faux mansard roof to disguise a flat built-up roof with a slight parapet. The split cedar shingles of the steeply pitched slopes of the faux mansard roofs thereby functioned as the upper floors' exterior walls. At the base of the roof, glass panes filled the openings between the roof and the wall, allowing additional light to filter into the second floor of each building.

On the west elevation of Building A-B, facing the courtyard, double-leaved, glass-and-wood doors filled two openings accessing park offices and one leading to the lobby. Windowless metal doors accessed the restrooms. Two fixed, two-pane, metal-and-glass windows illuminated park offices (flanked by the two-leaved doors).

The north elevation of Building A-B consisted of the overhang of the second floor and the two-story tower that extended above the roof. Vertically oriented grilles, composed of 4-inch by 4-inch, stained wood members separated by 4-inch gaps, surfaced the tower, flanked by the narrow ends of the split block walls. The second-floor overhangs of Building A-B were filled with angled, stained wood siding.

Four vertical windows pierced the east elevation of Building A-B, providing natural light on the interior. The strips of glass were as wide as, and aligned beneath, the reinforced concrete ribs supporting the second-floor overhangs. The placement of windows beneath the supporting ribs was a sly reminder that the building's walls did not support its floors or roof. Cooper's two-dimensional glass "post" below a structural beam embodied the humor that was a feature of the Postmodern architecture of the time. The east facade also included a concrete projection with a fixed, plate glass observation window on the second floor corresponding to the cross axis created by the second-floor bridge. On the first floor beneath the projection, a two-

[81] Hughes and Von Eckardt. The remaining description of the building as originally constructed is derived from the June 1, 1966, drawings and survey observations.

leaved, wood and glass door aligned with the lobby door beneath the bridge on the west facade, representing the cross axis on the first floor.

On the south side of A-B, doors occupied the overhangs on the second floor, with a wood grille between. The ramp accessing these doors hid the lower floor.

Building B-C's elevations resembled but did not replicate those of Building A-B. This resulted from differences in programming of the two buildings – for instance, offices on the ground floor in building A-B, dining facilities in Building B-C.

On the east elevation of Building B-C, three two-leaved doors on the first floor provided access to the dining and vending area and a storage room. Wood and glass doors filled the openings into the dining and vending area; windowless metal doors closed the storage room. The northern door to the dining-vending area was aligned along the east-west axis beneath the bridge. The windows on the east façade of B-C – a set of three lighting the kitchen and a pair illuminating the dining-vending area – were each made up of a glass pane above a panel of vertical wood boards with a wood counter in between.

The south facade of B-C mimicked the north facade of A-B, with the exception of employing plate glass windows in the second-floor overhangs on either side of the tower, rather than the angled wood siding used in A-B to keep light out of auditorium.

The west facade of Building B-C also mirrored the east facade of A-B with slight differences. Building B-C included three of the narrow vertical windows, whereas Building A-B employed four, and a two-leaved metal door opened into the kitchen area on the south, allowing supplies to be moved in and trash to be moved out. The west facade of Building B-C also included a second-floor concrete projection with observation window. A two-leaved glass and wood door on the first floor was located directly beneath the projection.

Building B-C's north façade, like the south façae of Building A-B, consisted of doors in the overhangs on the second floor, with a wood grille between.

Like other Mission 66 visitor centers, the Great Falls facility's functions were strictly separated by building and floor. In Building A-B, park offices occupied the north end of the first floor, separated from restrooms on the south by a lobby and stair. Storage, dining area, and a kitchen took up the first floor space in Building B-C. On the second floor, Building A-B held a lobby and auditorium, with a projection room on the north side of the auditorium and stage on the south. Exhibit space occupied

most of the second floor in Building B-C, with an information desk located on the north, near the entrance. The circulation pattern in the building was intended to control visitor flow, as was typical in Mission 66 visitor centers. Visitors traveled along Old Dominion Drive west of the visitor center and parked in a paved area immediately northwest of the facility. They entered the visitor center from the ramp on the north side of Building B-C close to the southeast corner of the parking area. After receiving orientation at the information area, the ideal visitor entered the exhibition space to learn about the park. The visitor then crossed the bridge to the auditorium in Building A-B to view an audiovisual program about the park and exited the visitor center through either of the paired doors on the south side of A-B. The south ramp from Building A-B ended near a footbridge over the canal ruins and led toward an overlook at the falls. The cross axis on the first floor allowed visitors to access the courtyard, the concession area, or the restrooms; to re-enter Building A-B; or to go directly to the canal ruins. The stair in the lobby of building A-B allowed the visitor to exit or re-enter the planned visitor flow. The siting and design of the visitor center thereby followed Mission 66 precepts of bringing visitors efficiently from access road to parking area to visitor facility, which oriented visitors to the park's chief attractions and then deposited them near those attractions.

First-floor interior finishes in the visitor center were utilitarian. The public restrooms in Building A-B featured polyurethane floors with colored opaque chips, vinyl baseboards, painted concrete block walls, and plaster ceilings. Park offices featured vinyl asbestos floors, vinyl baseboards, painted concrete block walls, and concrete ceilings. Staff restrooms featured vinyl asbestos floors, vinyl baseboards, painted concrete block walls, and plaster ceilings. In the corridor along the staff area, a vinyl asbestos floor, vinyl baseboard, painted concrete block walls, and concrete ceiling were used.

In Building B-C, the kitchen and dining area were finished with polyurethane floors with colored with opaque chips, vinyl baseboards, painted concrete block walls, and concrete ceilings. The storage areas consisted of concrete floors and ceilings and painted concrete block walls. Rectangular fluorescent lights provided artificial illumination on the first floor.

The lobby and stair in Building A-B provided a transition from the humble materials of the first floor to a palette similar to the visitor center's exterior on the second floor. While the lobby floor was covered in polyurethane, stained wood grilles and split concrete blocks surfaced the walls. Like their counterparts on the exterior tower walls, the vertically oriented grilles were composed of 4-inch by 4-inch,

stained wood members. On the interior and at the entrances to the visitor center, the vertical members were 2 inches apart, rather than the 4-inch gap of the tower walls. The stair itself displayed Modern stylishness in its open wood treads and single concrete stringer. The stair railing, along with the railing facing the stair hall on the second floor, consisted of 3/8-inch by 1 ½-inch steel balusters with a 2-inch by 4-inch oak handrail.

As the main public spaces, the second floors of both buildings received a greater degree of decorative treatment, like the stair generally using the same palette found on the exterior. A concrete bench bordered the east and west walls of both the exhibition space and the auditorium, and the walls and ceilings consisted of stained, horizontal, wood planks supported by wood ribs. The ceilings in the auditorium and the exhibition area were higher than anywhere else in the visitor center – 14 feet versus 9 feet. The floors of the public spaces were surfaced in polyurethane, with concrete used in utility areas. An exception was the auditorium, which according to the finish schedule for the room, had both concrete and stained wood flooring (perhaps referring to the wood floor of the stage). The north end wall of the auditorium was surfaced in cork panels on either side of the projection room to dampen sound, while the projection room's south wall was lined with a typical stained wood grille. The north wall of a storage area in Building B-C, corresponding to the location of the projection room in Building A-B, received the same wood grille treatment, but the flanking walls held large plate glass windows to illuminate the exhibits.

The same palette of materials was used in the cross axis between the two buildings. Polyurethane covered the concrete floors. The walls were concrete in the observation window projections and in the bridge, and stained wood grilles between split concrete block walls at the auditorium and stair hall in Building A-B and on both sides of the information desk in Building B-C. The concrete walls of the bridge have a board-formed surface, the only example of this finishing technique planned by Cooper that remains. The ceiling of the cross-axis was smooth concrete; above the space between the auditorium and the stair hall and above the information desk, however, rectangular openings in the concrete allowed views into the wood ceiling above. Artificial light was provided on both the interior of the second floor and in the courtyard through the use of cylindrical, metal lights attached to the ceiling or the underside of the concrete structure.

Splitting the building into two parts "broke down what would have been disturbing bulk" (11,500 square feet), according to the Washington Post. In addition to its horizontality, the cedar shingles, and the stone-colored split concrete blocks, that

design choice enabled the visitor center to recede sensitively into its surroundings, another Mission 66 design goal. "The building is so well hidden in the woods," Carolyn Hughes and Wolf Von Eckardt wrote in the Post, "that it can hardly be seen from a distance, even in winter."[82] While something of an exaggeration, the comment accurately describes one of the ways in which Cooper absorbed Mission 66 principles into his design.

Another aspect of Cooper's design, as it was executed, relates to a sense of context. The two parallel buildings have been likened to canal boats. "The ramps leading to the building are suggestive of the changes in elevation as one would approach a lock," Cooper told George Washington Memorial Park Cultural Resources Manager Matt Virta in 2007, "and the splitting of pedestrian circulation at the top of the ramp to left doors and right doors was reminiscent of walking along the 'gunwales'/edges of a canal boat."[83] This referential aspect of the visitor center design might seem unusual for Cooper, who, throughout his long and varied career, remained a Modernist, exploiting the possibilities of contemporary materials and construction techniques to accomplish structural, programmatic, and spatial goals in an economical manner. In conversations with Zachary Schrag, conducted while the George Washington University professor researched a book on the Washington Metro system, Cooper revealed his Modernist principles, displaying a detailed knowledge, for instance, of the advantages of and problems with various types of concrete, aggregate, and finishing techniques employed in his projects at Dulles Airport and the Metro system. In addition, he conveyed his sense of the place of Modernism in American architecture.[84] But those conversations also disclosed an appreciation of historical buildings and their usefulness as precedents for modern design, an appreciation of context he ascribed to his work with Eero Saarinen but may also derive from his Beaux-Arts training and travels in Europe. This vein in Cooper's thought, and in his designs, can be seen in his remarks on Saarinen's terminal at Dulles. "It had the spirit of flight in it, and it had the colonnade of ancient Rome," he told Schrag. "It was a Burnham design on one hand – the City Beautiful – and yet it was an engineering tour de force."[85]

The visitor center design displays this understanding of instances in Saarinen's work that functioned referentially and metaphorically while relying on modern construction techniques to fulfill its required program. Postmodernism's interest

82 Hughes and Von Eckardt.
83 Paula S. Reed & Associates, 134, 142. The quotation from Cooper can be found on page 134.
84 Schrag, Interview with Cooper, 22ff., 52 ff.
85 Schrag, Interview with Cooper, 9-10.

in contextuality might also have played a part. The division of the visitor center into two horizontally oriented wings through the use of structural concrete disguised its bulk, satisfying Mission 66 design principles, and created open spaces, accomplishing programmatic requirements for an auditorium and exhibit hall, while at the same time referencing the shape of and movement around canal boats that had plied the channel located just a few feet from the building. In 1970, shortly after the Great Falls Park Visitor Center opened, Cooper and his office formalized these ideas on designing for context in a publication called *The Use of Theme in Generating Architectural Form*, which was supported by a grant from the National Endowment for the Arts. The process of generating architectural form through the use of theme, or "message content," was based on three concepts: space as a means of evoking a particular response in the observer; analogy of architectural form to images from the observer's prior experience that can create "a deeper understanding of the design"; and articulation of function, which can affect the observer's orientation to and perception of design.[86] Cooper used the Great Falls Park Visitor Center as a case study for this process, noting how it embodied all three concepts. The canal lock and boat imagery was a non-architectural analogy that helped to generate its exterior form; the center's "through circulation" exemplified the "kinetic expression" of its space; and the exhibit and auditorium wings expressed its two dominant functions.[87] (Figures 21 and 22)

ALTERATIONS AND REPAIRS IN THE LATE TWENTIETH CENTURY

A few changes were made to the visitor center prior to its opening. Specifications for the replacement of plate glass with tempered glass at the Great Falls Park Visitor Center were published on December 19, 1968. When staff of the successful contractor, Kalmia Construction Company, of Beltsville, Maryland, arrived to complete the work in March, they discovered that two of the eleven doors in which plate glass was to be replaced had been vandalized and boarded up. The NCR director's weekly reports indicate that the vandalism took place the week before March 10. Kalmia asked for the boards to be removed so that the work could be completed. The work took place in April 1969 and was accepted by NPS as of May 15. Glass in two windows was also replaced, but with polished plate glass because tempered glass of the size required could not be procured.[88]

[86] Kent Cooper & Associates, Architects, The Use of Theme in Generating Architectural Form [Washington: 1970], 10.

[87] Ibid., 24.

[88] H.L. Bryant, Kalmia Construction Company, to Contracting Officer, Washington

In the fall of 1969, the superintendent of the George Washington Memorial Parkway wrote to the National Capital Region director to explain problems with the exhibits that had existed since the visitor center opened. The problems included the use of a poor quality photograph in one exhibit, poor graphic display, and problems with the lighting of exhibits. It was also thought that a device stating the time of the next program in the auditorium would be useful. A February 1970 meeting at the visitor center with NPS staff from the Washington Office, the Museum Laboratory, National Capital Region, and George Washington Memorial Parkway found further room for improvement, including reducing "distractions" in the arrangement of exhibits and the addition of more interesting specimens. The participants concluded that the improvements could be made without great expense. Other improvements planned for Building B-C included the construction of built-in wood cabinets in the information area to replace the metal cabinets that the original drawings called for. Anne Massey of the Washington Planning and Service Center was scheduled to complete drawings for the cabinets, which would be fabricated at the NCR's Brentwood Shops in Washington. While planned, no information was found in research confirming completion of the work on either the exhibits or the cabinetry. One improvement to the interpretive facilities that was made was completing the installation of audiovisual equipment, which had not been finished when the park opened. It remained incomplete until December 1971, when a technician from the Harpers Ferry Center came to Great Falls.[89]

While it is clear that changes have taken place in the building since its original construction and the early post-opening years, very little documentation of these changes was found during research for the HSR. Six annual reports for the George Washington Memorial Parkway held in the National Park Service records at the National Archives and Records Administration in College Park, Maryland, were

Planning and Service Center, February 13, 1969; Bryant to Contracting Officer, April 2, 1969; Robert J. Shelley, Acting Chief, Division of Contract Administration and Construction, National Capital Region, to Kalmia Construction Company, May 26, 1969, accession no. 79-75-24, box 18, folder 9, Washington National Records Center, Suitland, Maryland; Superintendent, George Washington Memorial Parkway, to Regional Director, Subject: Items for inclusion in weekly report to the Director, March 10, 1969, 2.

89 Donald F. Benson, Chief Architect, Washington Service and Planning Center, to Associate Regional Director, National Capital Region, October 10, 1969; Floyd B. Taylor, Superintendent, George Washington Memorial Parkway, to Regional Director, October 21, 1969; Manus J. Fish, Jr., Acting Director, NCP, to Superintendent, GWMP, Dec. 10 1971, accession no. 79-75-24, box 15, folder D3415; Ernst T. Christensen, Interpretive Park Planner, to General Superintendent, National Capital Parks, February 25, 1970, accession no. 79-75-24, box 19, Washington National Records Center, Suitland, Maryland.

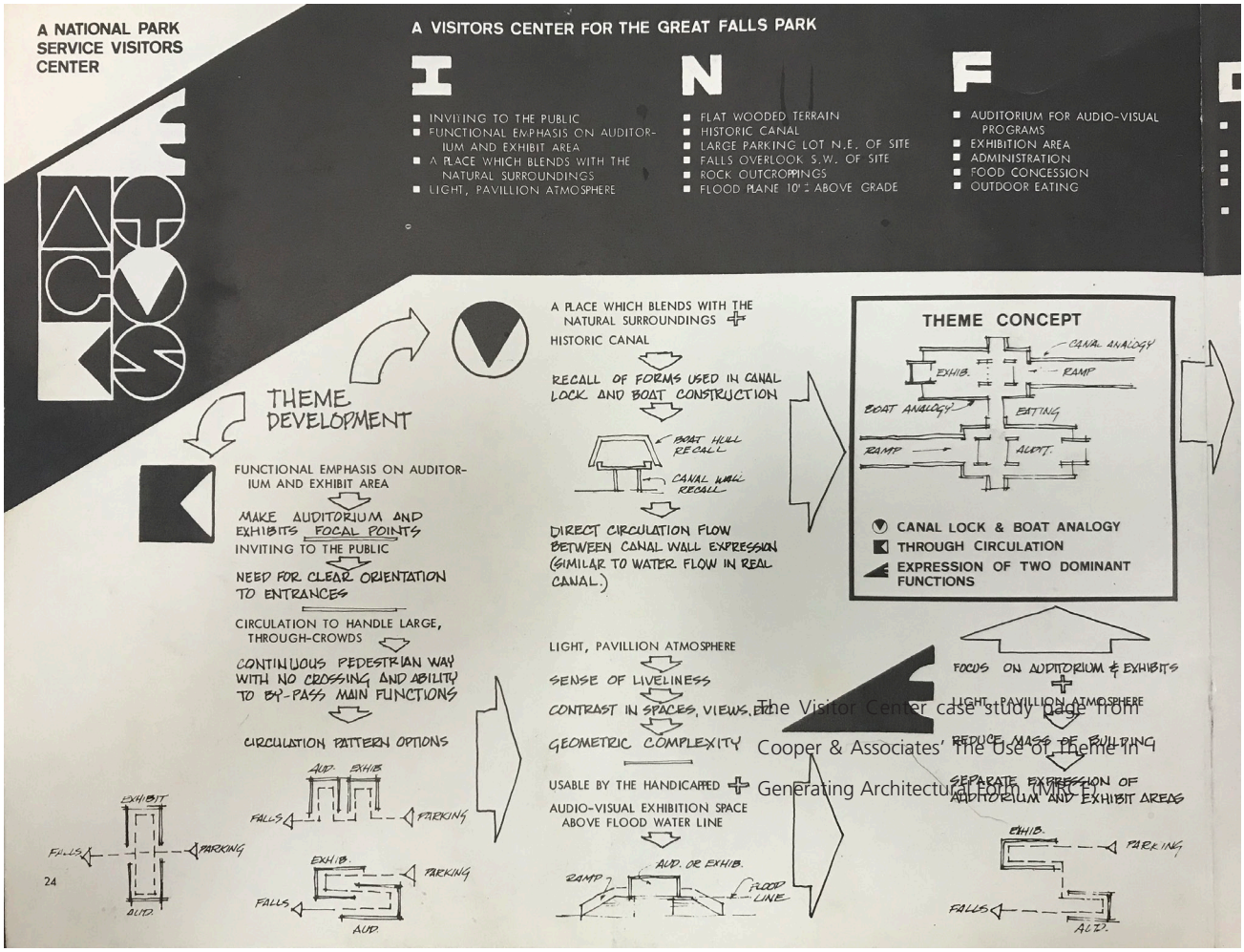


Figure 21. The Visitor Center case study page from Cooper & Associates' *The Use of Theme in Generating Architectural Form.* (MRCE)

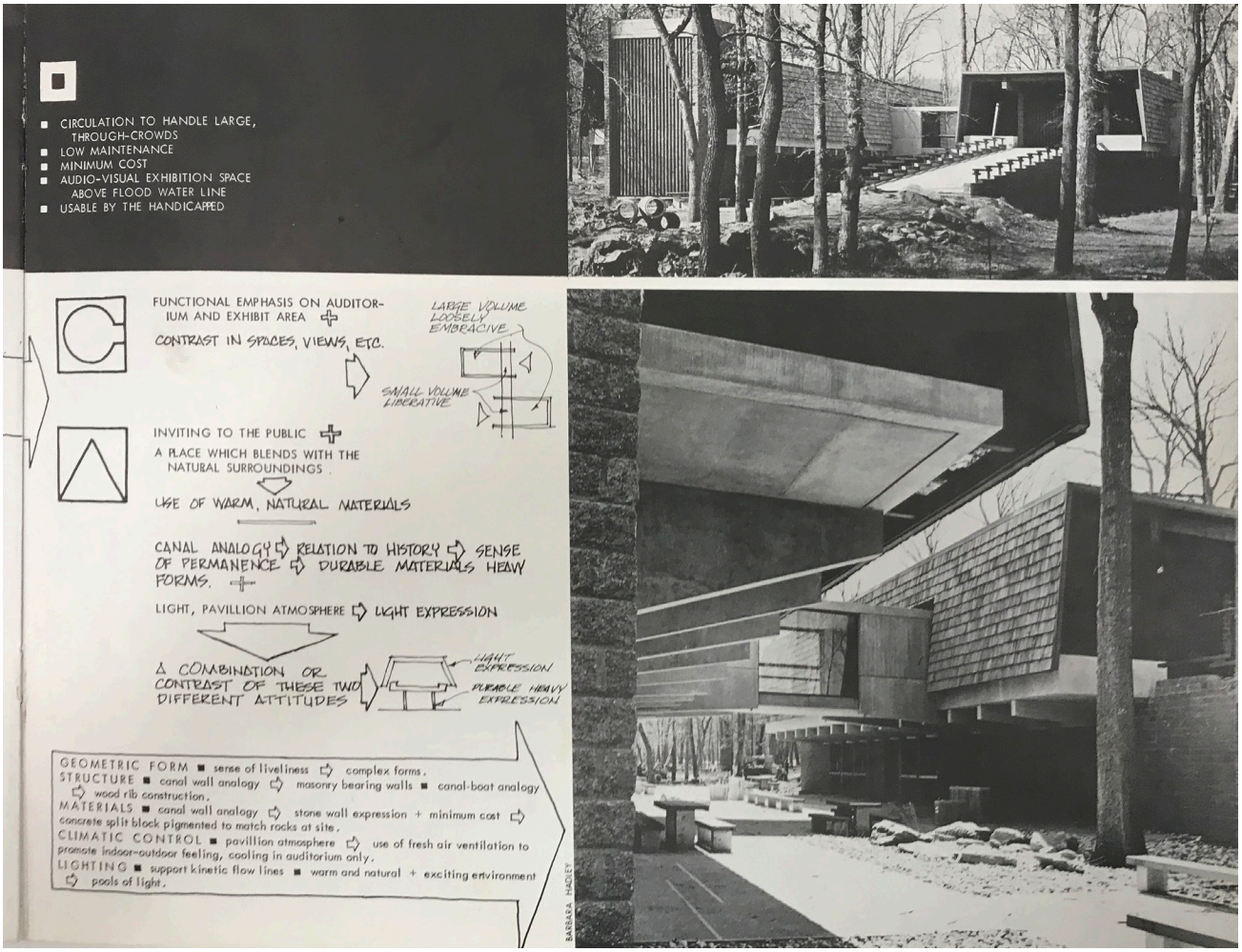


Figure 22. The Visitor Center case study page from Cooper & Associates' *The Use of Theme in Generating Architectural Form.* (MRCE)

discovered in the research, covering the years 1980, 1983, 1987, 1988, 1990, and 1993. Alterations mentioned in the documentary record include moving the sales counter run by the Parks and History Association in 1980. Neither the former nor the new counter location was mentioned in the annual report. In 1988, the visitor center was reroofed, according to an entry in a list of "major improvement/construction projects" in the annual report for that year. No details on the work were provided. In the fall of 1993, a water pipe that served as the major distribution line to the visitor center was repaired.[90]

Drawings for other planned repairs were discovered during research, although implementation of the proposed work was not confirmed. In June 1981, drawings were prepared for repairs to the roof framing system of the visitor center. The 1980 annual report noted that "structural defects" in the visitor center were being monitored by the maintenance staff, which inspected "building movement gauges on a bi-weekly basis" and reported the results to the office of Professional Design Services.[91] The 1981 drawings included repairs to column bases, removal and repair of the insulated glass used in the laylights of the roof overhangs, and strengthening of the joints both at the top of the faux mansard roof where the horizontal and vertical roof planes meet and where the roof extends beyond the visitor center walls (location of laylights). The drawings were prepared by Shri G. Athavale of Trans Systems Corporation in Vienna, Virginia.[92]

Drawings dated July 1999, produced by the Maintenance and Design Branch of the National Capital Area, National Park Service, outlined changes to the visitor center's heating, ventilation, and air-conditioning system. The drawings proposed locating HVAC units on the roof of the tower at the end of each building. A hatch, closed with galvanized sheet metal hatch would be installed on each roof to access the HVAC equipment. The plan required new ductwork from the rooftop units through the buildings. The work was to be completed in two phases. Building B-C would receive its new equipment in the first phase, Building A-B in the second.[93]

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90 George Washington Memorial Parkway, "Annual Report – 1980," March 6, 1981, 13; "Annual Report – 1988," n.p.; "Annual Report – 1993, n.p., Records of the National Park Service, Record Group 79, entry P17, box 23, National Archives and Records Administration, College Park, Maryland.

91 "Annual Report – 1980," 14.

92 Shri G. Athavale, "Repairs to Visitor's Center Roof Frame System, Great Falls Park Virginia," six drawings, June 18, 1981, National Park Service, National Capital Region.

93 Maintenance and Design Branch of the National Capital Area, "Visitor Center HVAC Renovation, Great Falls Virginia," six drawings, July 1999, National Park Service, National Capital Region.

THE 2007 GENERAL MANAGEMENT PLAN AND ABAAS COMPLIANCE

George Washington Memorial Parkway began the process to produce a General Management Plan (GMP) for Great Falls Park in September 2002, undertaken by an internal planning team that identified and considered means to address concerns related to park resources and facilities. Public input was also sought. The plan was intended to guide management of the park for ten to fifteen years for annual visitation by approximately 500,000 people. Issues identified related to the visitor center included inadequate public restrooms and compliance with accessibility standards. The park team prepared alternative management scenarios and revised them to internal and public comments. A draft management plan and environmental impact statement regarding the alternatives was distributed for review by public agencies, interested organizations, and citizens in June 2005. After comment review and revision, the Final General Management Plan/Environmental Impact Statement was released in the fall of 2007. The preferred management alternative called for relocating park offices from the visitor center to a new facility that would accommodate both maintenance and operations, as well as rehabilitation of the vacated office space for use as classrooms and exhibit space. The preferred alternative also called for accessibility modifications and for reconfiguration of the interior of the visitor center for more efficient use.[94]

As the General Management Plan process proceeded, certain repairs to the building were planned. This included a survey report from 2003 by Dewberry Design Group and Dewberry LLC for the replacement of the existing, leaking roof system and recovering of the visitor center roof, and 2006 plans for fire detection and intrusion detection systems. The 2006 plans depict what is labeled as a "lunch room" in the lobby area of Building A-B containing the stair. Since the lunch room is not shown in the 2003 survey report, it would appear to have been installed between those two dates. The roofing document recommended built up roofing, additional roof drains, and steeper roof slopes. That work was being carried out at the time of the 90 percent draft.[95]

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94 George Washington Memorial Parkway, "Great Falls Park, Fairfax County, Virginia, General Management Plan/Environmental Impact Statement: Summary," Fall 2007, 4-8, National Park Service, Electronic Technical Information Center website, https://pubs.etic.nps.gov/.

95 Dewberry Design Group Inc. and Dewberry LLC, "Existing Roof Replacement and Roof Structural System Survey Report for Great Falls Visitor Center, Great Falls, Virginia," prepared for the National Park Service, National Capital Region, July 1, 2003, 3-4, George Washington Memorial Parkway; U.S. Park Police, Office of Physical Security, "Fire Detection System," and "Intrusion Detection System"

The General Management Plan itself generated several changes to the building. These included alterations to visitor center circulation, drawings for which were prepared in April 2007. (Figures 66-67) A doorway was cut in the center of the north façade of Building B-C and filled with symmetrical, double-leaved, glass and metal doors that made the entrance to the visitor center more visible and complied with the Architectural Barriers Act Accessibility Standards (ABAAS) in both design and dimensions. The work required the removal of sections of the original wood grilles inside and outside the north façade wall, as well as in the north and south walls of original information desk area. A new desk was built along the eastern split block wall of the information area (oriented north-south, rather than east-west as in the original configuration). A new bookstore was placed in the observation window projection west of the information desk. The space between the original west door on the north façade and the ramp was enclosed as storage space to serve the bookstore. As a result, the original double-leaved wood and glass entrance door on the west now accesses that storage area.

Changes were also made other doors. In Building B-C, these included the door to the dining-vending area on the first floor and the eastern door on the north façade of the second floor. In Building A-B, it included the door to the stair on the first floor and both doors in the south façade on the second floor. In all these cases, the original doors were replaced with two-leaved, stained wood and glass doors with the leaves of unequal sizes, creating larger, ABAAS-compliant openings. The glass in the new doors was tempered. The other doors remained unchanged.[96]

In June 2008, drawings were prepared for modification of the original stair in building A-B to accommodate a platform lift to comply with ABAAS regulations, and the work was subsequently carried out. (Figures 68-69) The contractor salvaged the treads and railings for reuse in a reconfigured stair, and the original concrete stair stringer beam was replaced with a steel stringer. The horizontal concrete beam at the second floor, the wood south face of the stair wall, and the split concrete block walls were retained. The stair used winder treads to accommodate a stair run made shorter by the placement of the elevator in the southwest corner of the lobby. A layer of textured rubber has been added to the treads, perhaps during the reconfiguration of the stair, altering the original wood finish planned by Cooper. The location

(drawings), May 12, 2006, George Washington Memorial Parkway.

96 George Washington Memorial Parkway, "Great Falls Park Visitor Center Access Path Ramp and Courtyard Rehabilitation: Environmental Assessment/Assessment of Effects," May 2010, 7-8, George Washington Memorial Parkway; National Park Service, Branch Technical Services, "Door Modifications," drawing no. 855-81137, April 007, George Washington Memorial Parkway.

of the platform lift permanently closed the original interior door to the restrooms.[97]

The north ramp providing access to Building B-C was modified in 2011 to comply with ABAAS guidelines. (Figures70-71) The project also included alterations to the path from the parking area to the ramp and the courtyard. The work removed and replaced the original railings on both sides of the ramp, constructed two landings, replaced pavement, and inserted an internal railing. On the west side of the ramp, the internal railing prevents use of the benches incorporated into the original railing design. The south ramp exiting Building A-B was not modified, thereby maintaining its original design and materials, while also protecting the nearby Patowmack Canal remains, which would have been impacted by the enlarged access way. [98]

The final ABAAS compliance work undertaken at the visitor center involved the expansion of restroom facilities while making them accessible. The 2007 General Management plan had noted both the inadequacy of restroom capacity during peak visitation periods and lack of accessibility.[99] To increase restroom capacity, the park moved the men's restroom from the first floor of Building A-B (south of the stair lobby area) to Building B-C, where it occupied a portion of the former dining-vending area and a space designated for vending storage in the original plans. (The dining area had already been converted to office space by that time, although the date of the conversion is not certain.) The women's restroom was then expanded into the space vacated by the men's room. The conversion of the dining area and storage room to a restroom did not demolish existing walls or ceilings. It did add a wall that decreased the space of the former dining area and closed the exterior door in the west wall of Building B-C that had been part of the cross axis Cooper had created to complement the dominant north-south axis of the visitor center. Alterations to Building A-B included removal of the interior wall and doors that created a corridor by which the restrooms could be reached from the lobby. (The door to the lobby had already been closed by the placement of a platform lift in the southwest corner of the lobby.) Both newly configured toilet rooms included accessible facilities.[100]

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97 National Park Service, Branch Technical Services, "Great Falls Park Visitor Center Elevator/Lift and Stair Modification," (drawings), June 2008, George Washington Memorial Parkway.

98 National Park Service, Branch Technical Services, "Great Falls Park Access to Visitor Center," drawing no. 850-82029, November 2010, George Washington Memorial Parkway.

99 "General Management Plan/Environmental Impact Statement: Summary," 7.

100 Louis Berger Group, "ADA Accessibility to Restrooms, Great Falls Park" (plumbing); Louis Berger Group, "ADA Accessibility to Restrooms, Great Falls Park" (mechanical), June 1 2012, George Washington Memorial Parkway.

Kent Cooper, in a 2007 conversation with George Washington Memorial Parkway Cultural Resources Program Manager Matt Virta, related that he understood the reasons for making the accessibility changes and considered his design intent to be sturdy enough to withstand them.[101] The effect of the changes, however, has been to interrupt circulation in some places and to obscure, if not prevent, an understanding of the circulation pattern that Cooper developed to provide control of visitor flow, while also facilitating flexibility within that flow, and to evoke aspects of moving around in a canal boat. (Figures 72-73) The approach ramp from the north remains in place, but one of the original doors (on the west) has been covered over, reducing visitors' capacity to imagine moving along the edges of the canal boat, as one would have done in the nineteenth century. The goods in the bookstore occupying the observation window projection in the west wall of Building B-C and the new information desk impede views of the cross axis on the second floor. The cross axis has been blocked on the first floor, with the west door closed as part of the restroom renovations and the east door closed with the creation (at an unknown date) of a staff kitchen area in the former lobby. The changes to the stair lobby on the first floor of A-B have eliminated any public purpose from the space. Given the ramps, and the need for assistance using the lift, the stair lobby has become primarily useful only to staff.

[101] Matt Virta, George Washington Memorial Parkway Cultural Resources Program Manager, communication with the authors, February 15, 2022.

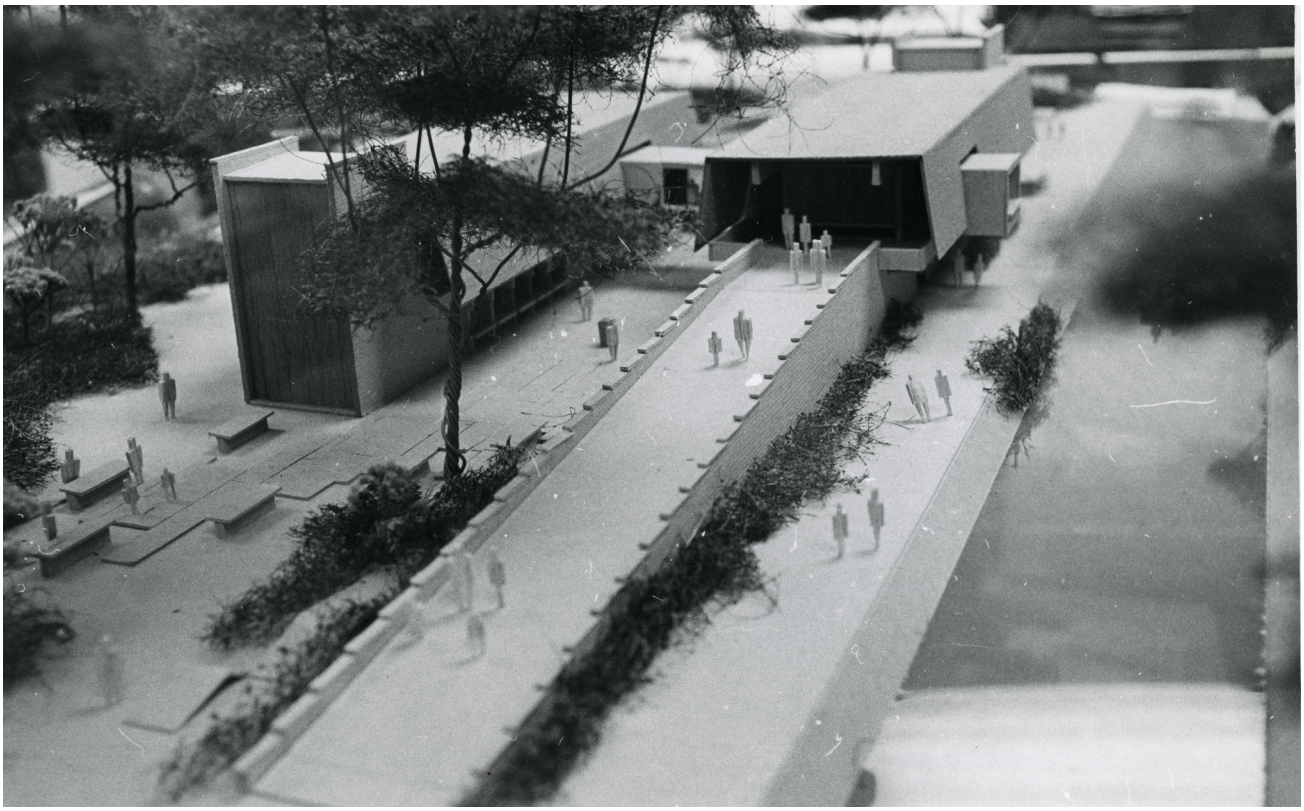


Figure 23. Original Design Model, Circa 1965. (MRCE)



Figure 24. Great Falls Visitor Center Construction Site in 1967. (MRCE)



Figure 25. Great Falls Visitor Center Construction Site in 1967. (MRCE)



Figure 26. Great Falls Visitor Center Construction Site in 1967 looking north, the Patomack Canal at right. (MRCE)



Figure 27. Great Falls Visitor Center Construction Site in 1967, looking south. (MRCE)



Figure 28. Great Falls Visitor Center Construction Site in 1967, looking northeast toward South ramp. (MRCE)



Figure 29. Great Falls Visitor Center Construction Site in 1967, looking southeast. (MRCE)



Figure 30. Concrete pour on Building B-C, Great Falls Visitor Center Construction Site in 1967. (MRCE)



Figure 31. North ramp of Great Falls Visitor Center Construction Site in 1968, looking southeast. (MRCE)



Figure 32. Great Falls Visitor Center Construction Site in 1968 looking northwest, the South ramp is in the foreground. (MRCE)



Figure 33. Building B-C of Great Falls Visitor Center Construction Site in 1968, looking north. (MRCE)



Figure 34. Building B-C of Great Falls Visitor Center Construction Site in 1968, looking southeast. (MRCE)



Figure 35. Great Falls Visitor Center Construction Site in 1968, looking northwest, the South ramp is on the right. (MRCE)



Figure 36. North ramp during construction, Great Falls Visitor Center Construction Site in 1968, looking southeast. (MRCE)



Figure 37. Great Falls Visitor Center in 1969, looking north. Note the patch of lawn along the South ramp. (MRCE)



Figure 38. Great Falls Visitor Center in 1969, looking north from picnic area. Building B-C on the left, Building A-B and South ramp on the right. (MRCE)



Figure 39. Great Falls Visitor Center in 1969, view of North ramp. Looking southeast. (MRCE)



Figure 40. Great Falls Visitor Center in 2021, view of North ramp. Looking southeast. (CRTKL, 2021)



Figure 41. Great Falls Visitor Center Construction Site in 1968, looking north. (MRCE)



Figure 42. Great Falls Visitor Center in 2021, looking north. (CRTKL, 2021)



Figure 43. Great Falls Visitor Center Construction Site in 1968, courtyard view looking south. Building B-C is on the right. (MRCE)



Figure 44. Great Falls Visitor Center in 2021, courtyard view looking south. Building B-C is on the right. (CRTKL, 2021)



Figure 45. Great Falls Visitor Center in 2010, view of main entrance approach to North ramp from parking lot, before 2010 North ramp/ABAAS alteration. (Environmental Assessment, NPS)



Figure 46. Great Falls Visitor Center in 2021, view of main entrance approach to North ramp from parking lot, after 2010 North ramp/ABAAS alteration. (CRTKL, 2021)



Figure 47. Art exhibit at Visitor Center, courtyard looking north with South ramp to the right, 1971. (MRCE)



Figure 48. Visitors on South Ramp, 1974. Looking north. (MRCE)



Figure 49. Building B-C (left) and Building A-B (right), circa 1969. Looking north. Note the patch of lawn along the South ramp. (MRCE)



Figure 50. The courtyard between the two buildings, looking northwest at the east façade of Building B-C with the concession windows, from the South ramp of Building A-B, circa 1969. (MRCE)



Figure 51. Original Information Desk, 1974. (MRCE).



Figure 52. The exhibit hall in Building B-C in 1974, looking northwest. (MRCE)



Figure 53. The information area in Building B-C in 1982, looking at the original wood screen wall to the south. The wall separated the inormation area from the exhibit room. (MRCE)



Figure 54. Original auditorium stage, Junior Rangers program event, summer 1996, prior to stage relocation. (MRCE)



Figure 55. Looking northwest at the south ramp from Building A-B, with Building B-C to the left, 1973.



Figure 56. The Flood of 1996, aerial photo of the Great Falls Visitor Center and Potomac River, January 1996. (MRCE)



Figure 57. During the Flood of 1996, view toward Building A-B looking southeast, January 1996. (MRCE).

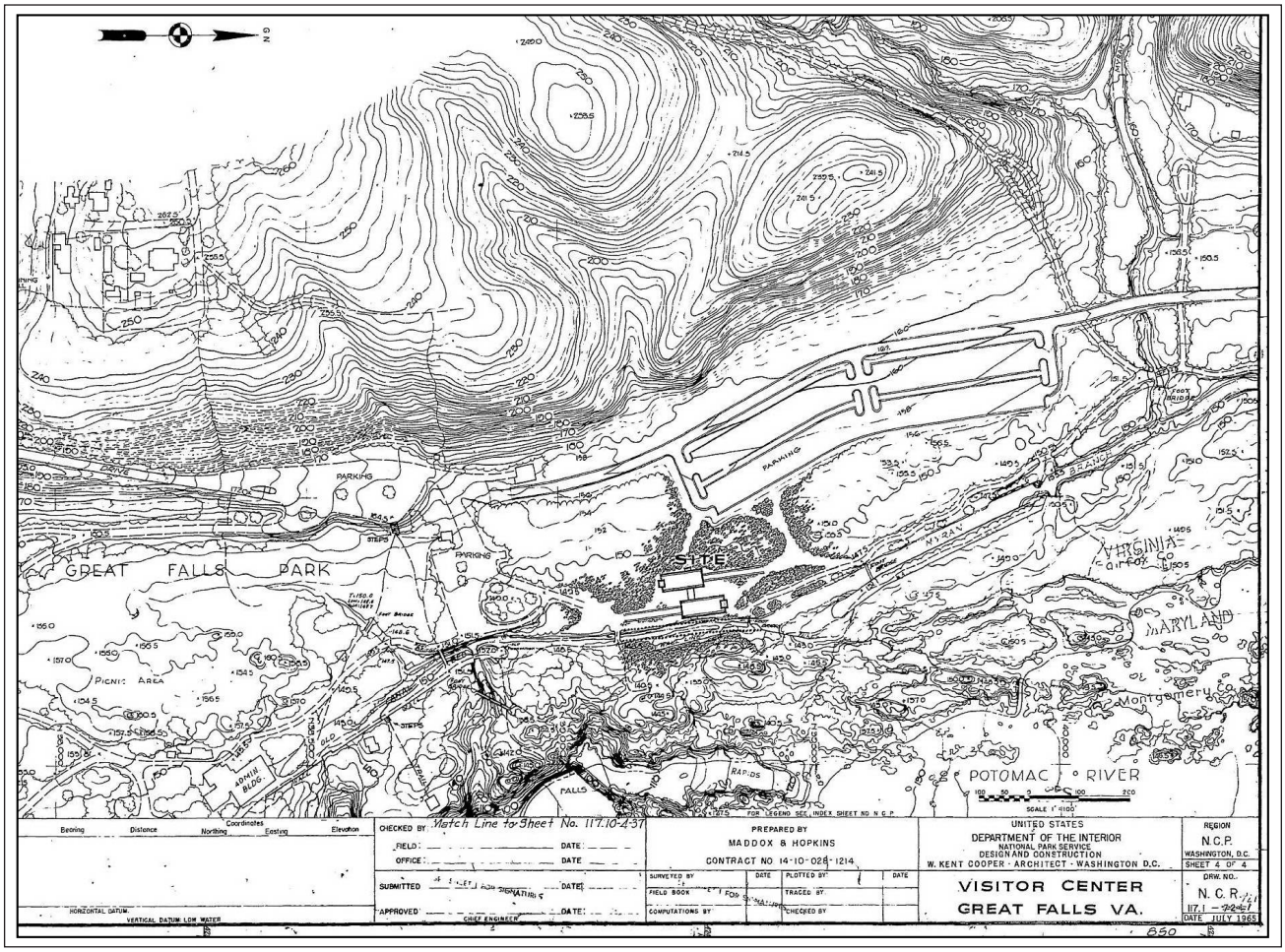


Figure 58. Architect's Site plan for the Great Falls Visitor Center, 1965. (NCR#850_81721)

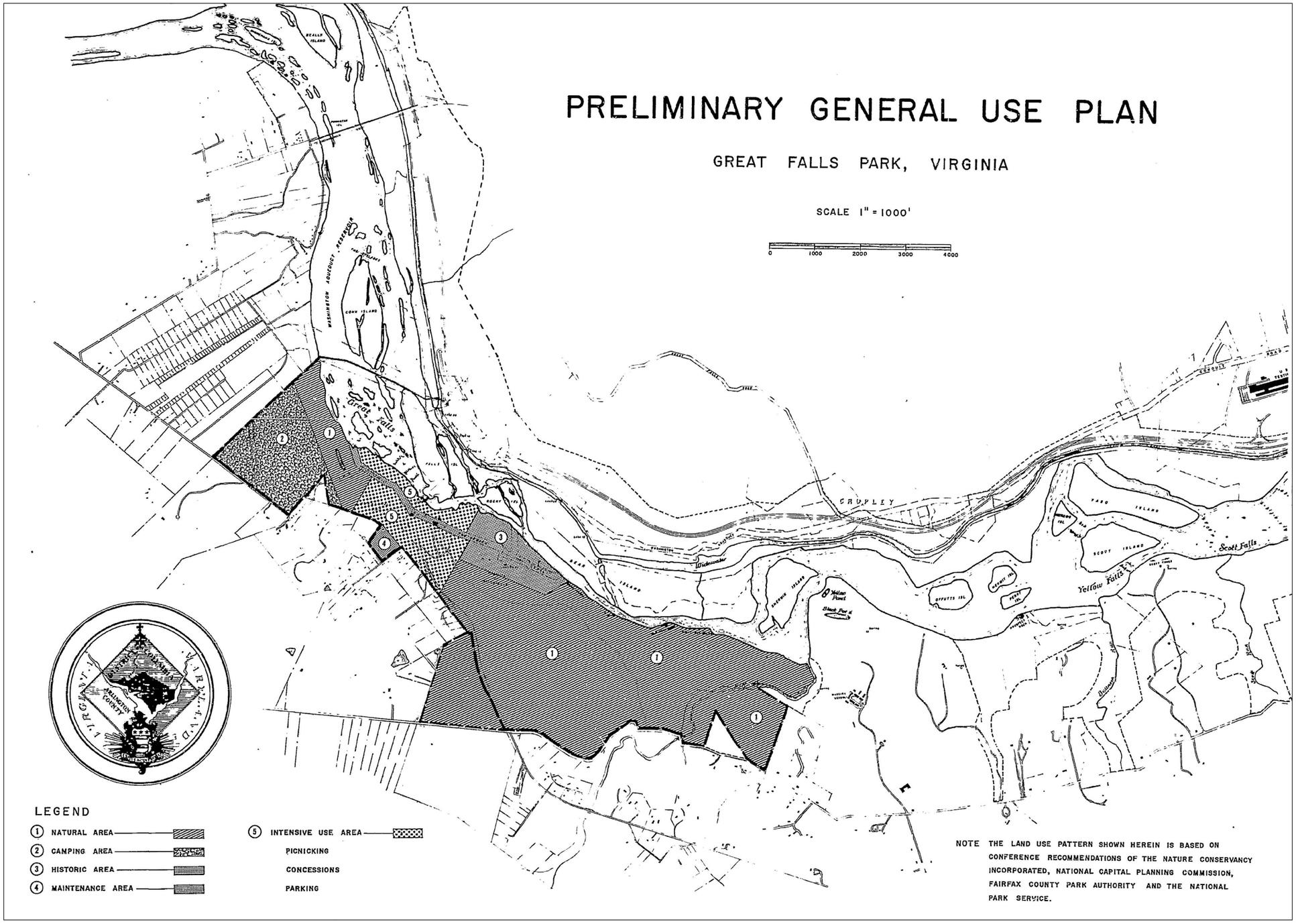


Figure 59. The Preliminary General Use Plan for Great Falls, dated September 25, 1958. (George Washington Memorial Parkway Archives)

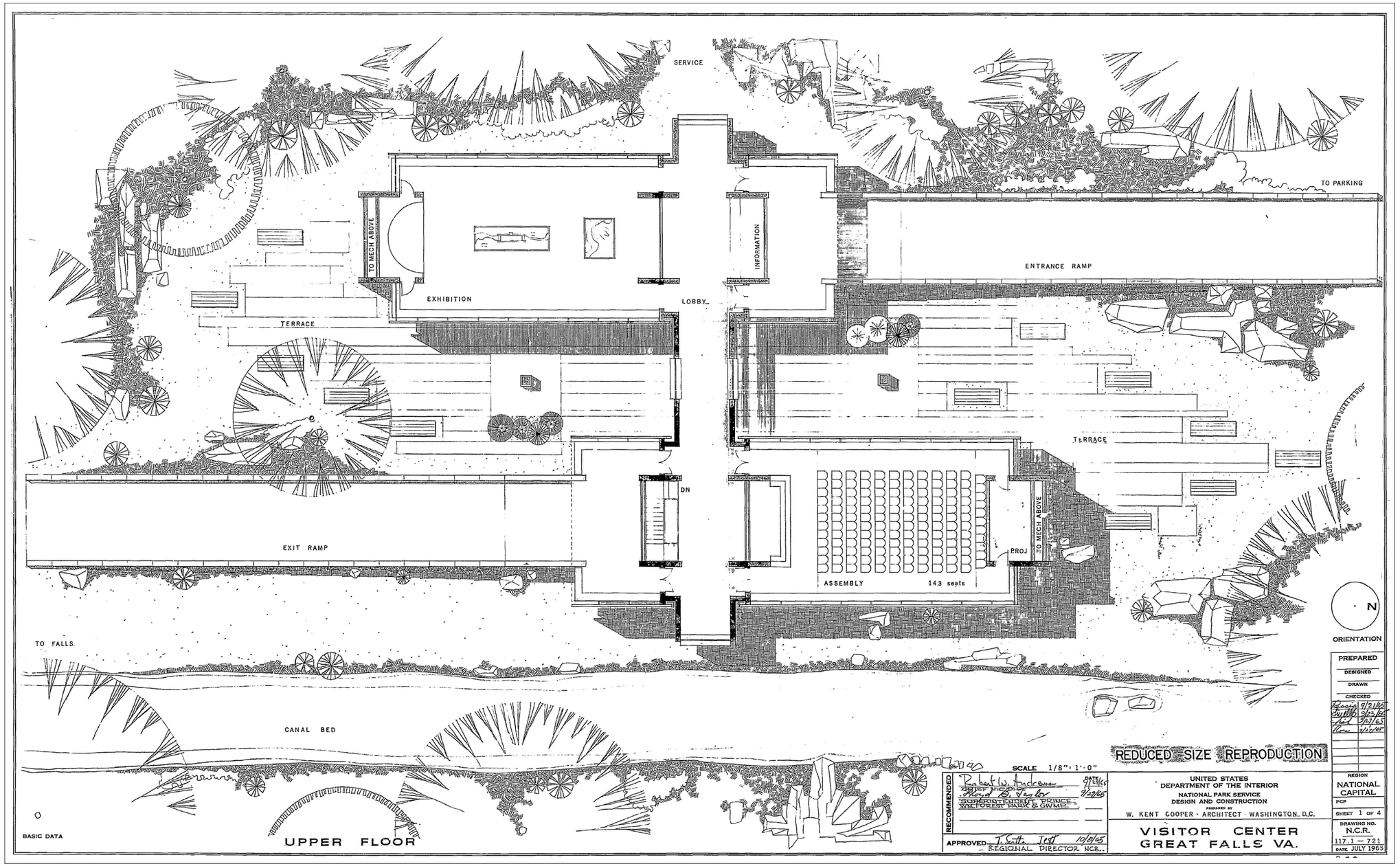


Figure 60. Second-floor plan of the Visitor Center, July 1965. Building B-C with North Ramp is at top of page, Building A-B and South Ramp below. (NPS, Electronic Technical Information Center website)

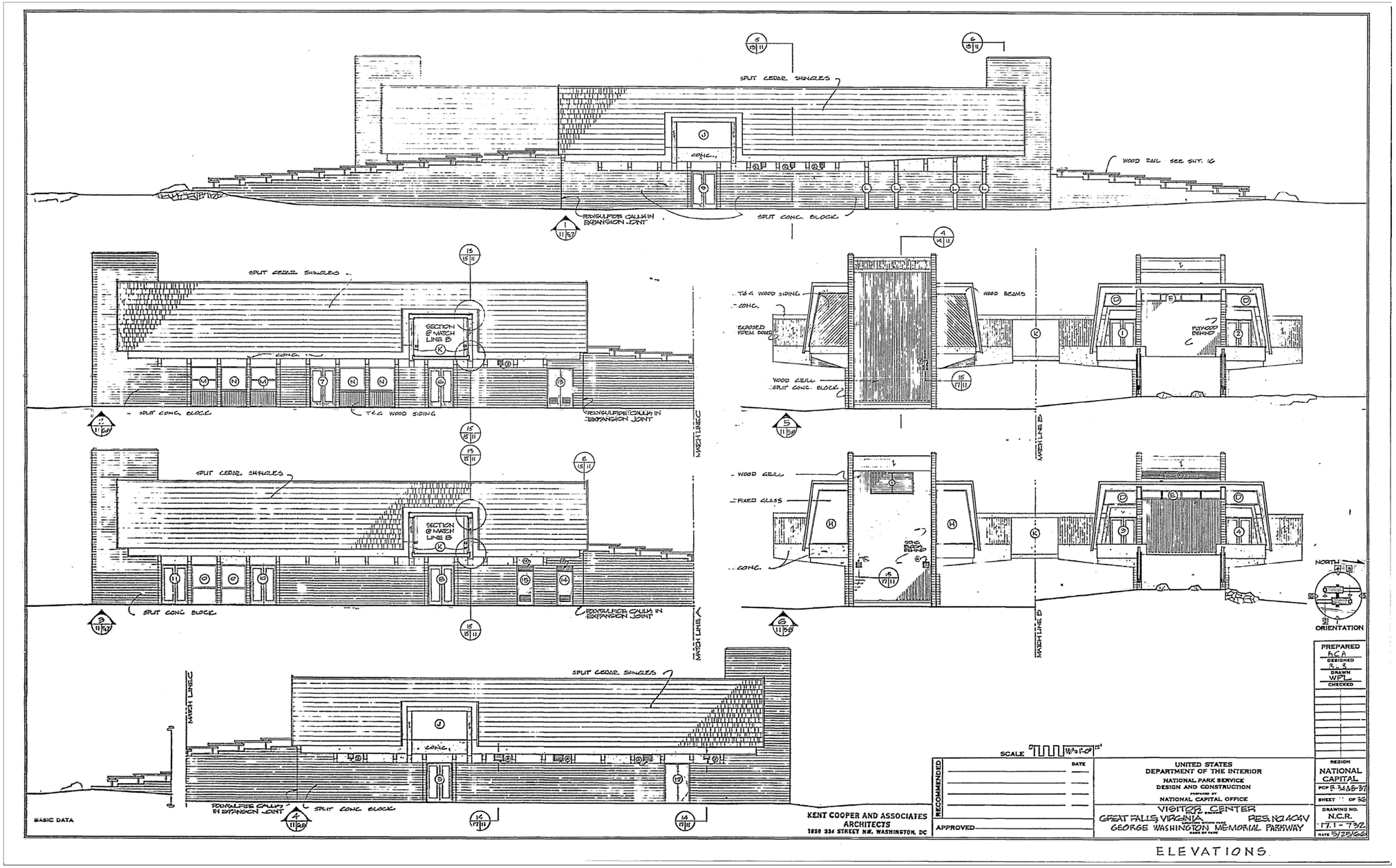


Figure 61. Visitor Center elevations, approved June 1, 1966. (George Washington Memorial Parkway Archives)

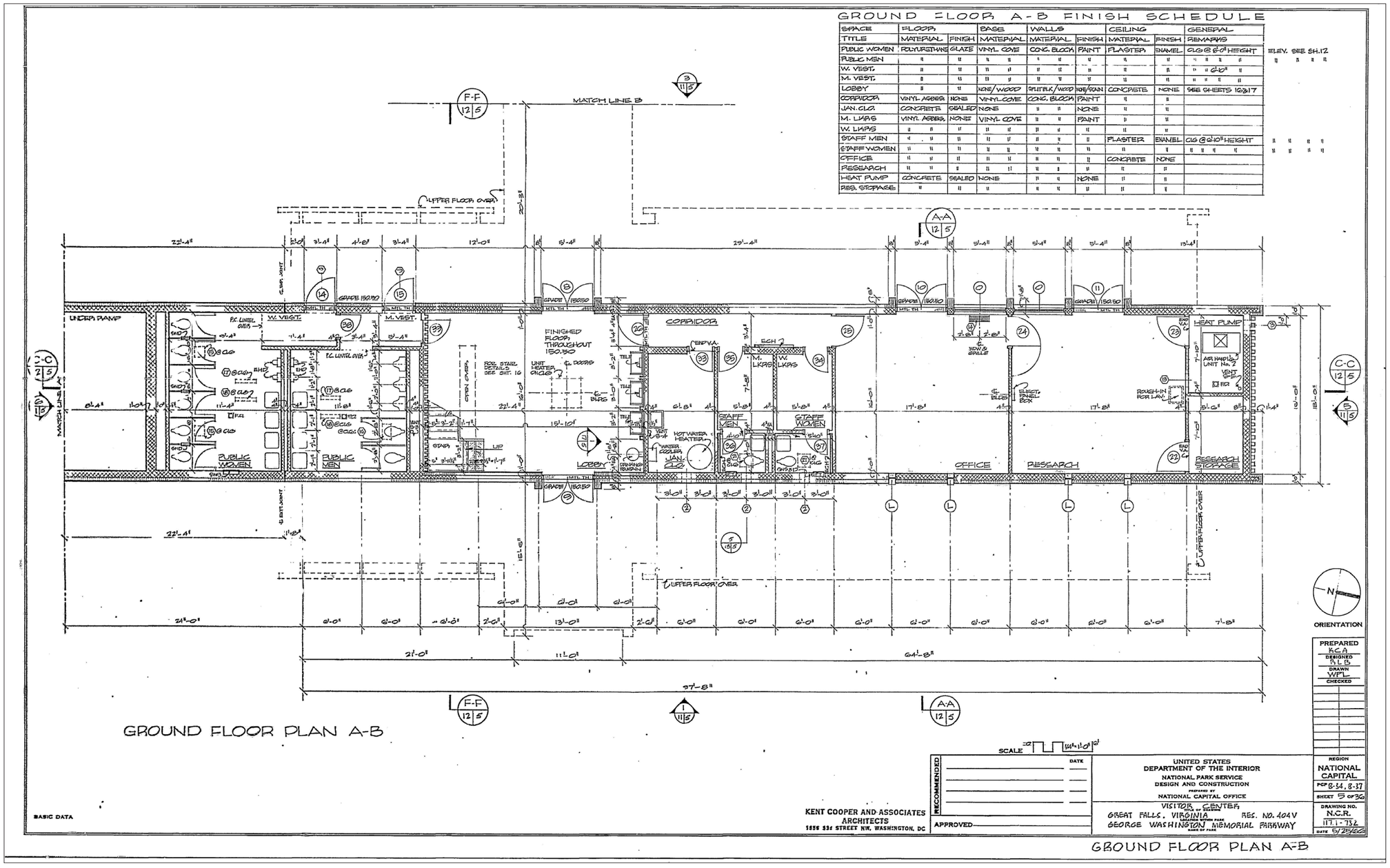


Figure 62. Building A-B, Original Design Documents, First Floor Plan, June 1, 1966. (George Washington Memorial Parkway Archives)

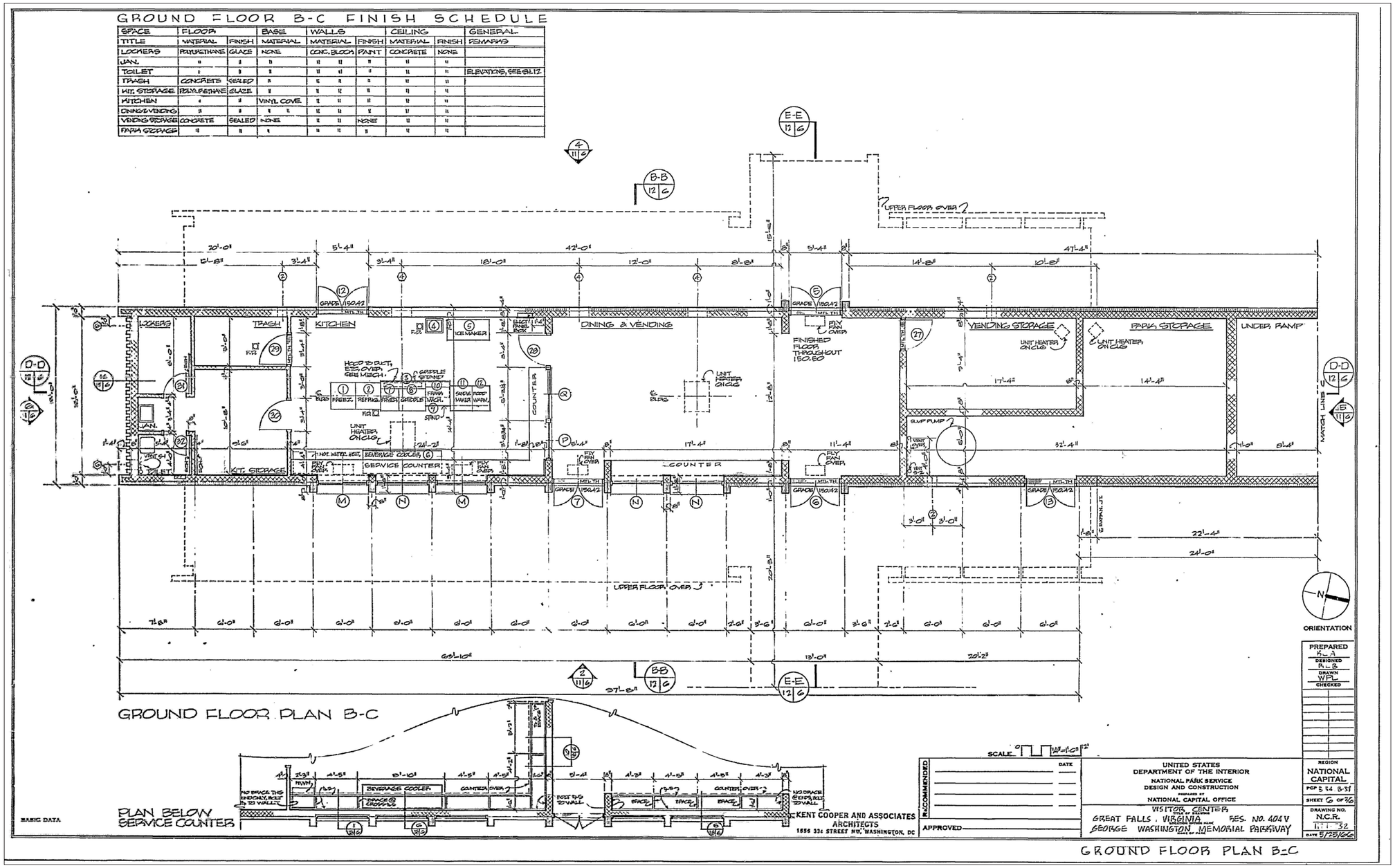


Figure 63. Figure Description Building B-C, Original Design Documents, First Floor Plan, June 1, 1966. (George Washington Memorial Parkway Archives)

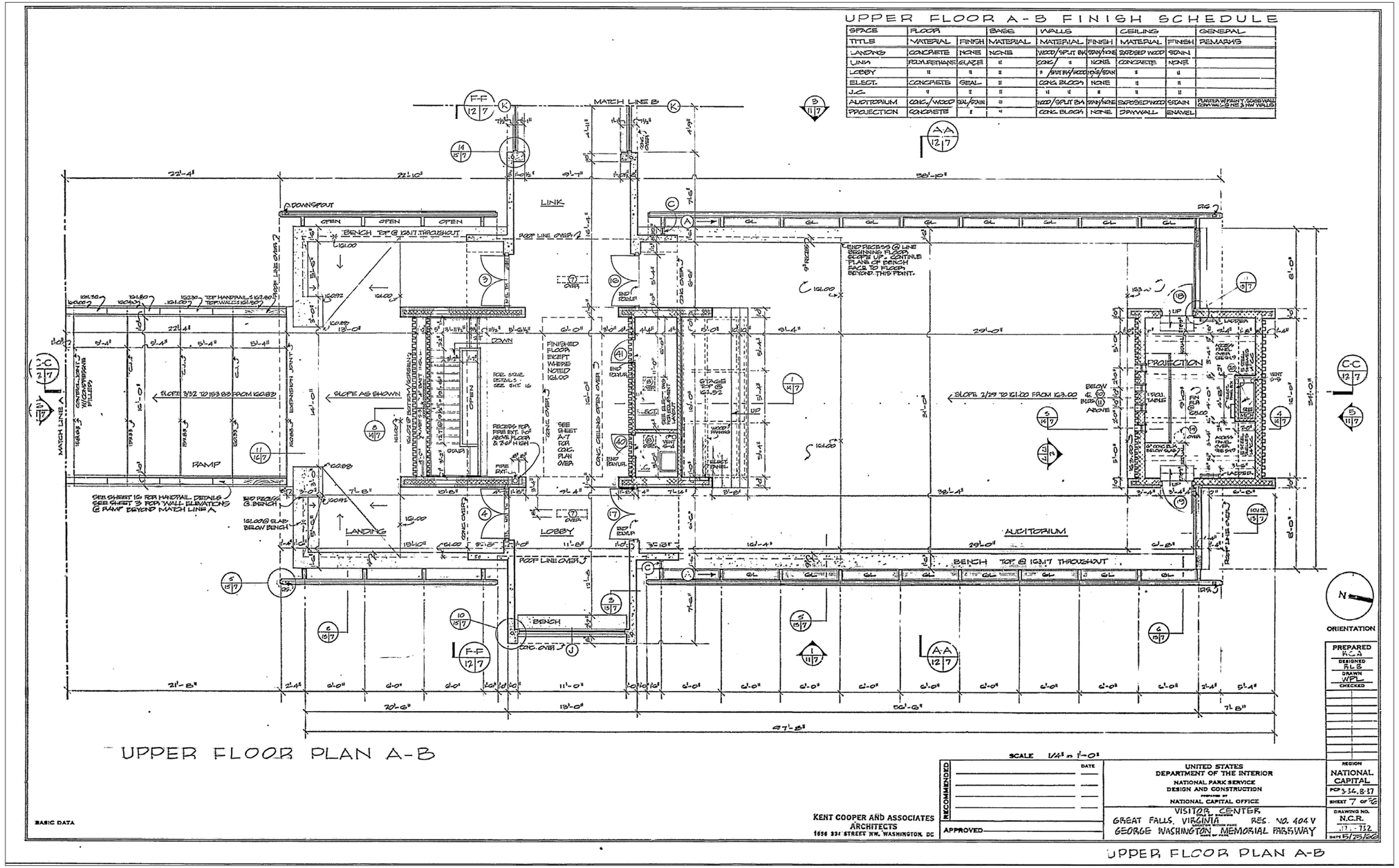


Figure 64. Building A-B, Original Design Documents, Second Floor Plan, June 1, 1966. (George Washington Memorial Parkway Archives)

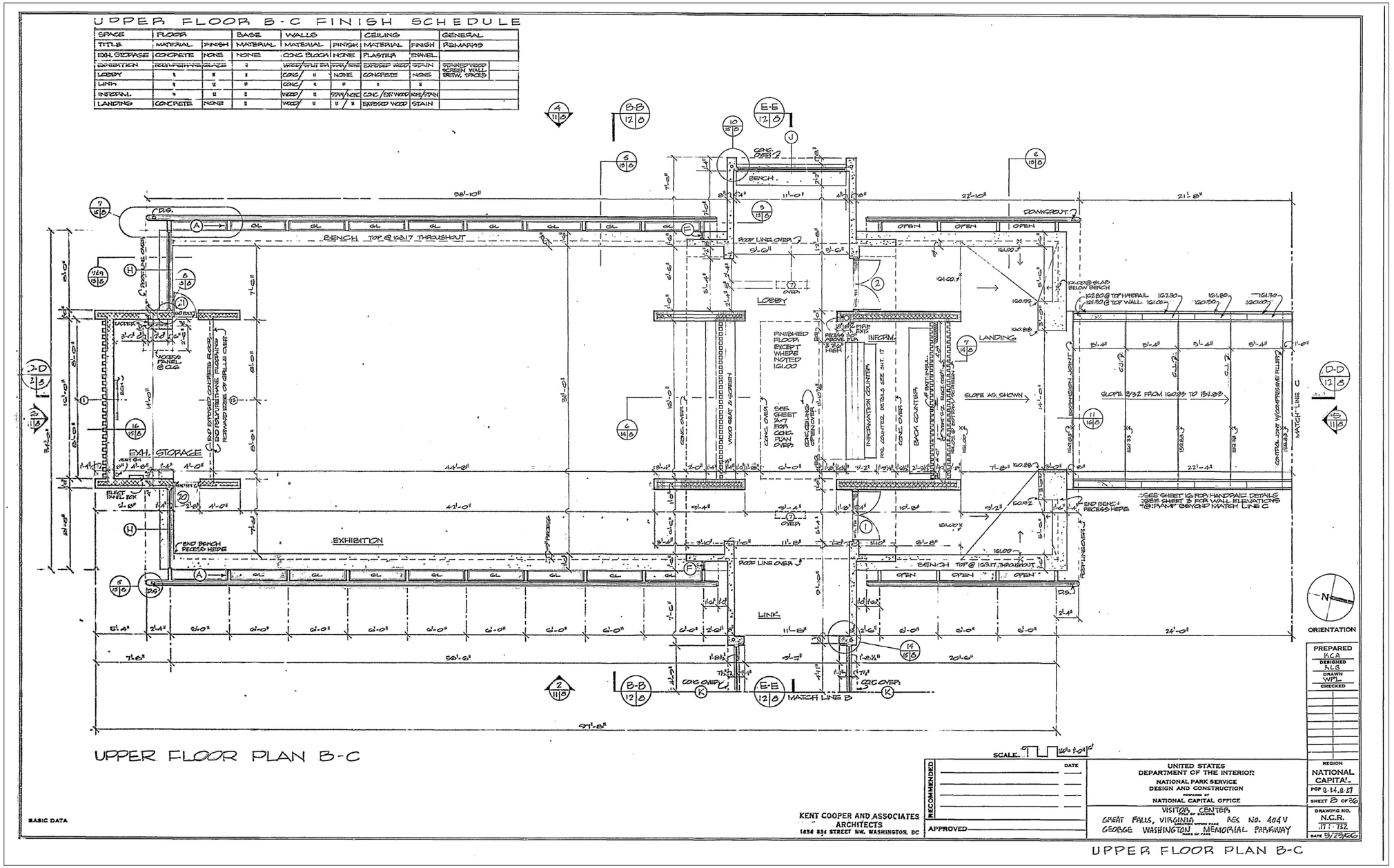


Figure 65. Building B-C, Original Design Documents, Second Floor Plan, June 1, 1966. (George Washington Memorial Parkway Archives)

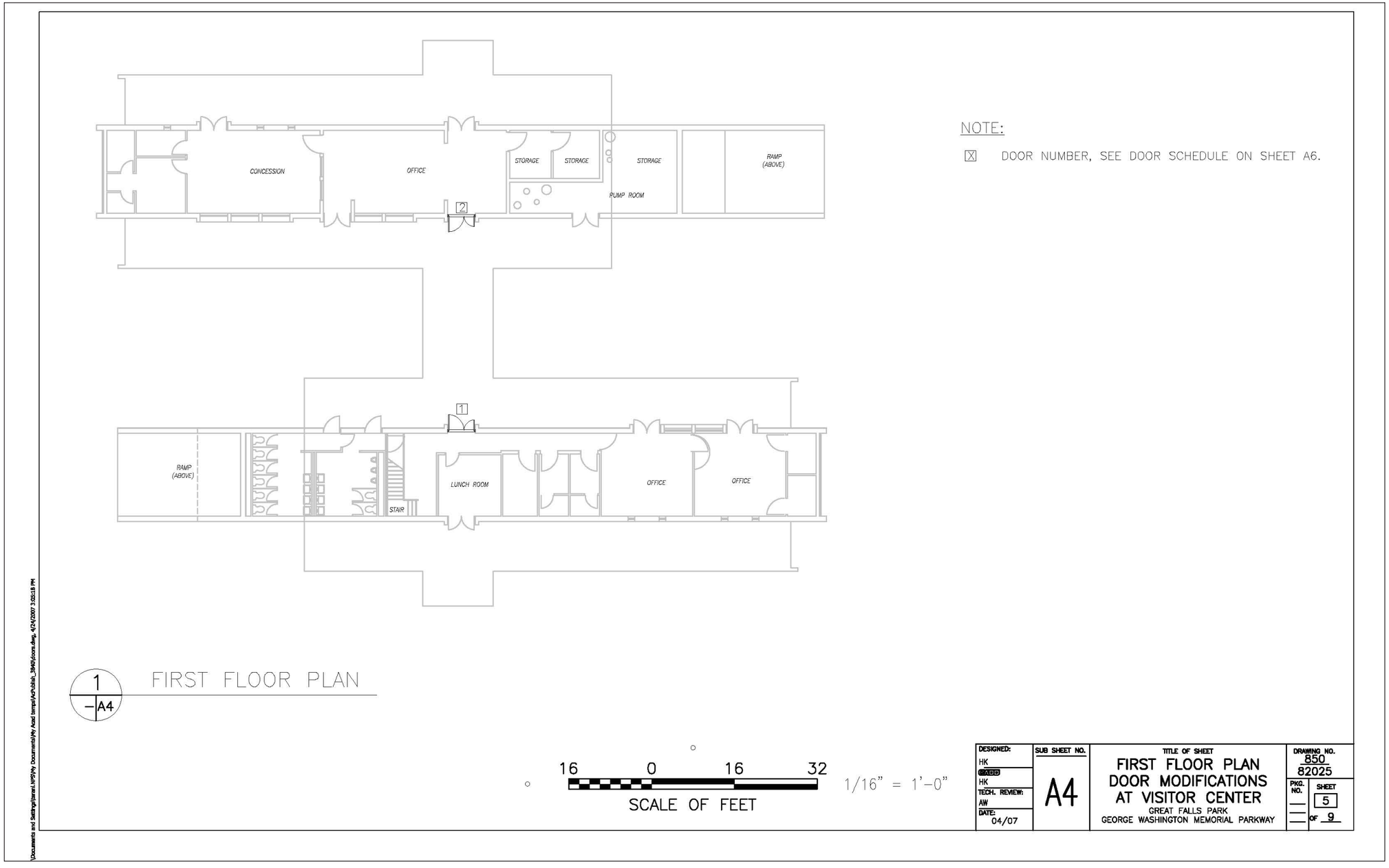


Figure 66. Door Modifications, First Floor, April 2007. (George Washington Memorial Parkway Archives)

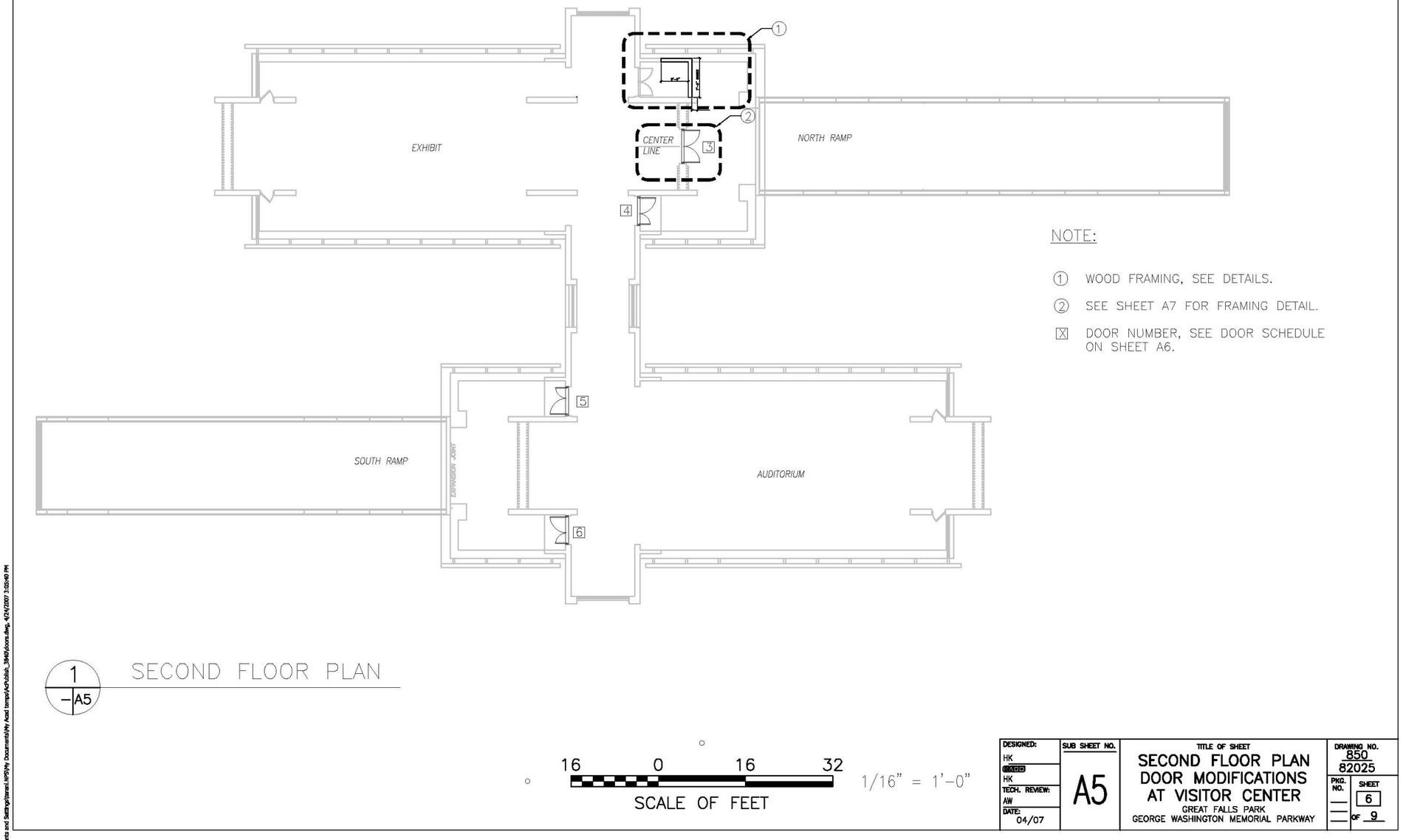


Figure 67. Door Modifications, Second Floor, April 2007. (George Washington Memorial Parkway Archives)

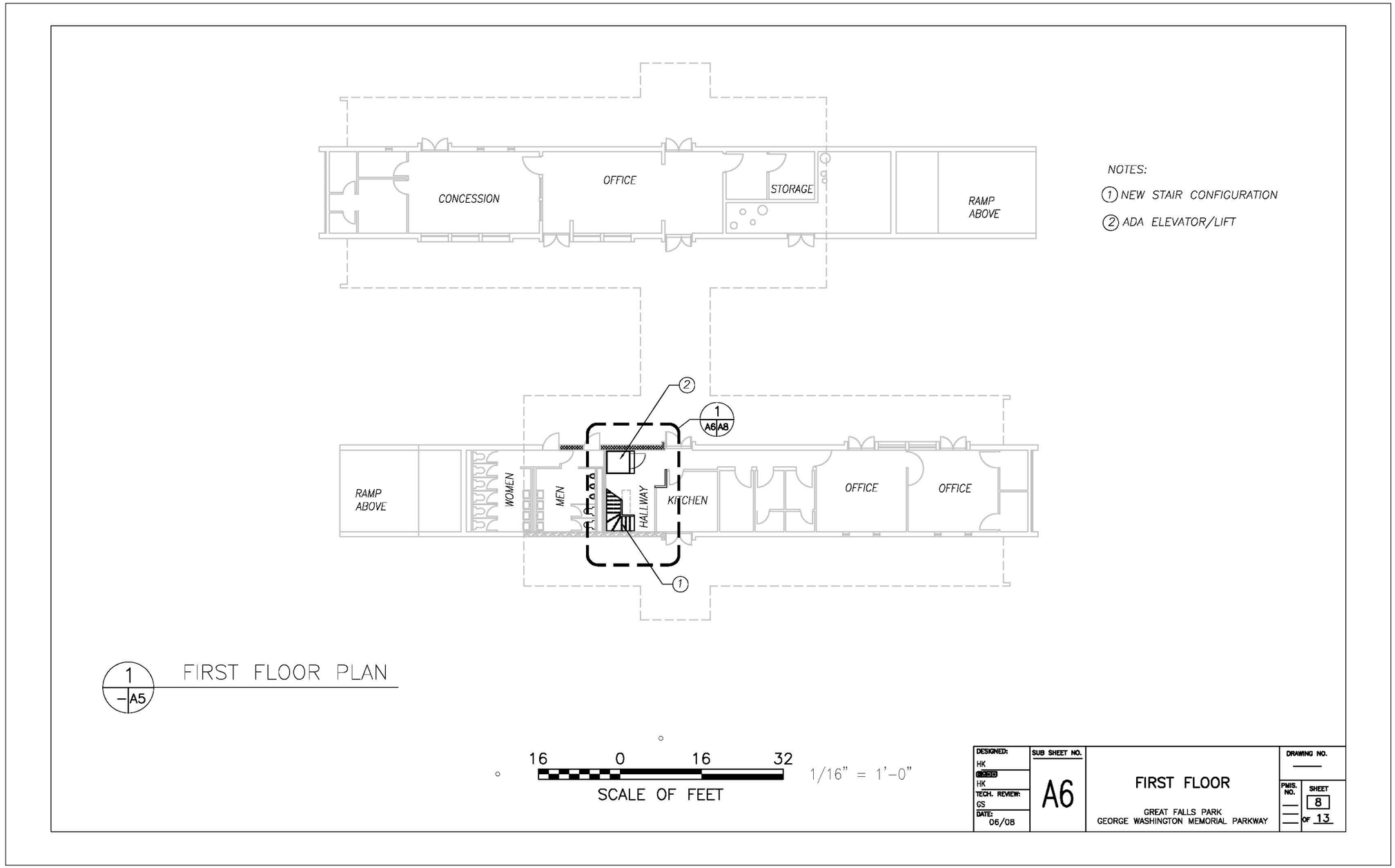


Figure 68. Elevator/Lift and Stair Modifications, first floor plan, June 2008. (George Washington Memorial Parkway Archives)

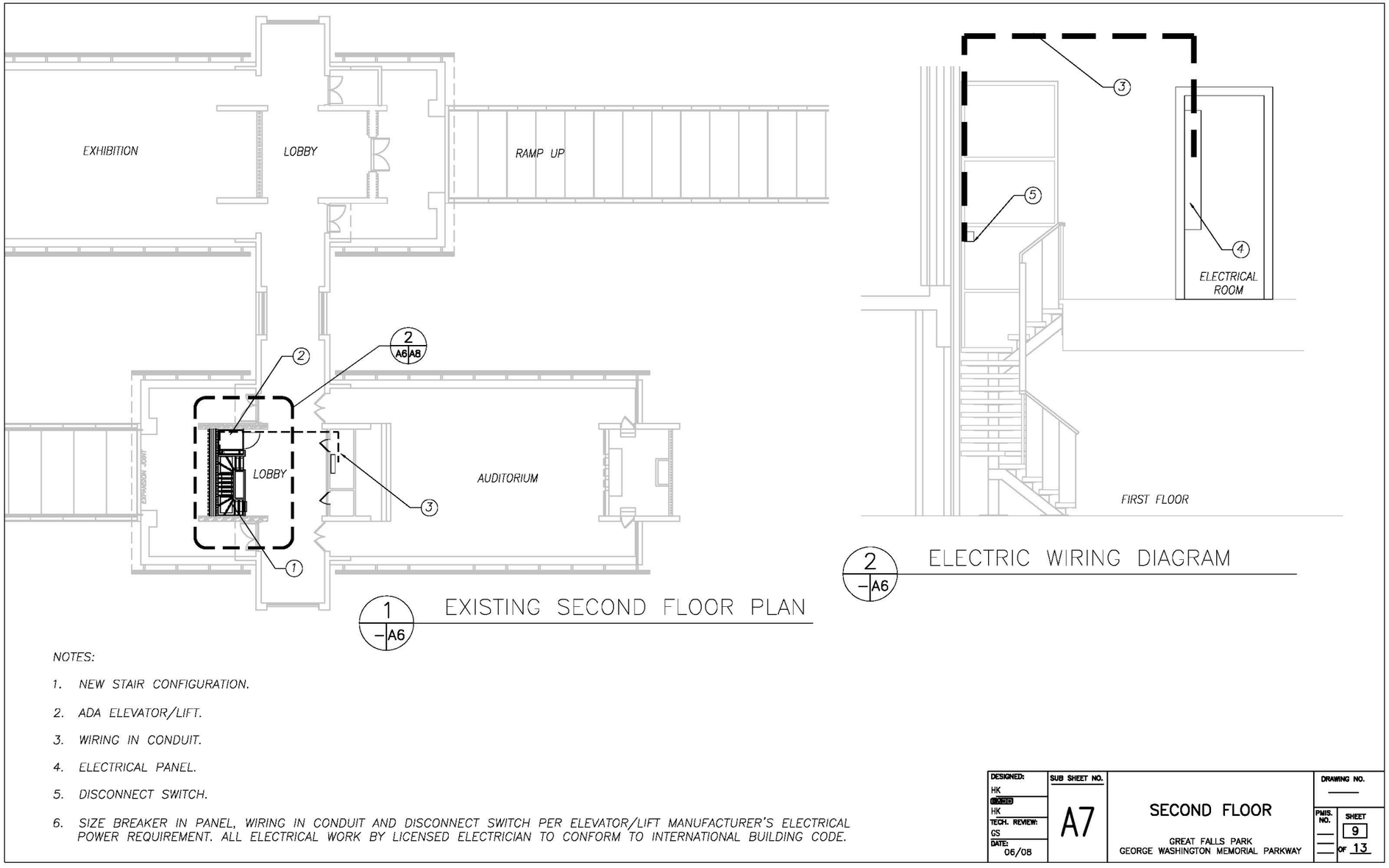


Figure 69. Elevator/Lift and Stair Modifications, second floor plan, June 2008. (George Washington Memorial Parkway Archives)

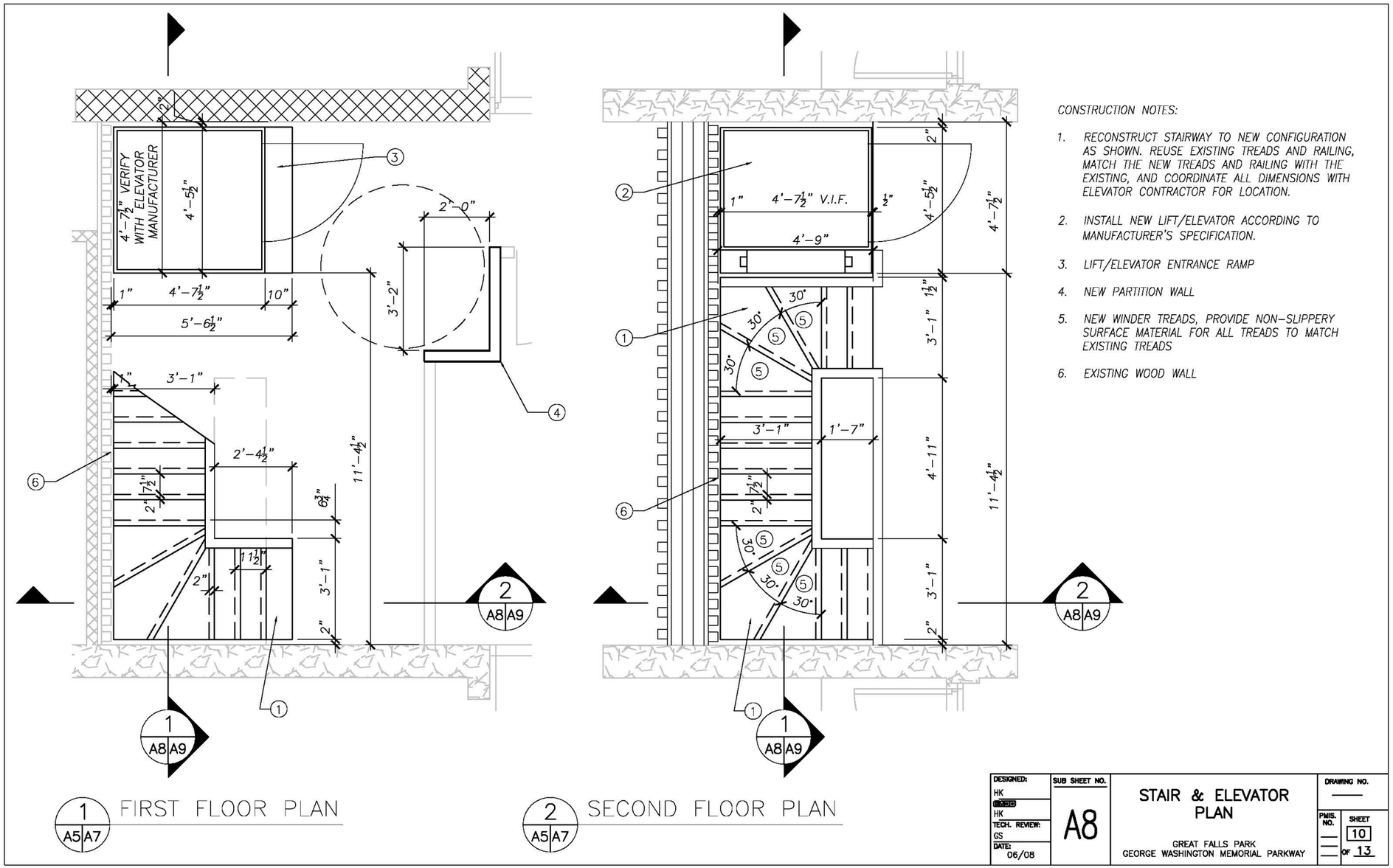


Figure 70. Elevator/Lift and Stair Modifications, elevator-stair plan, June 2008. (George Washington Memorial Parkway Archives)

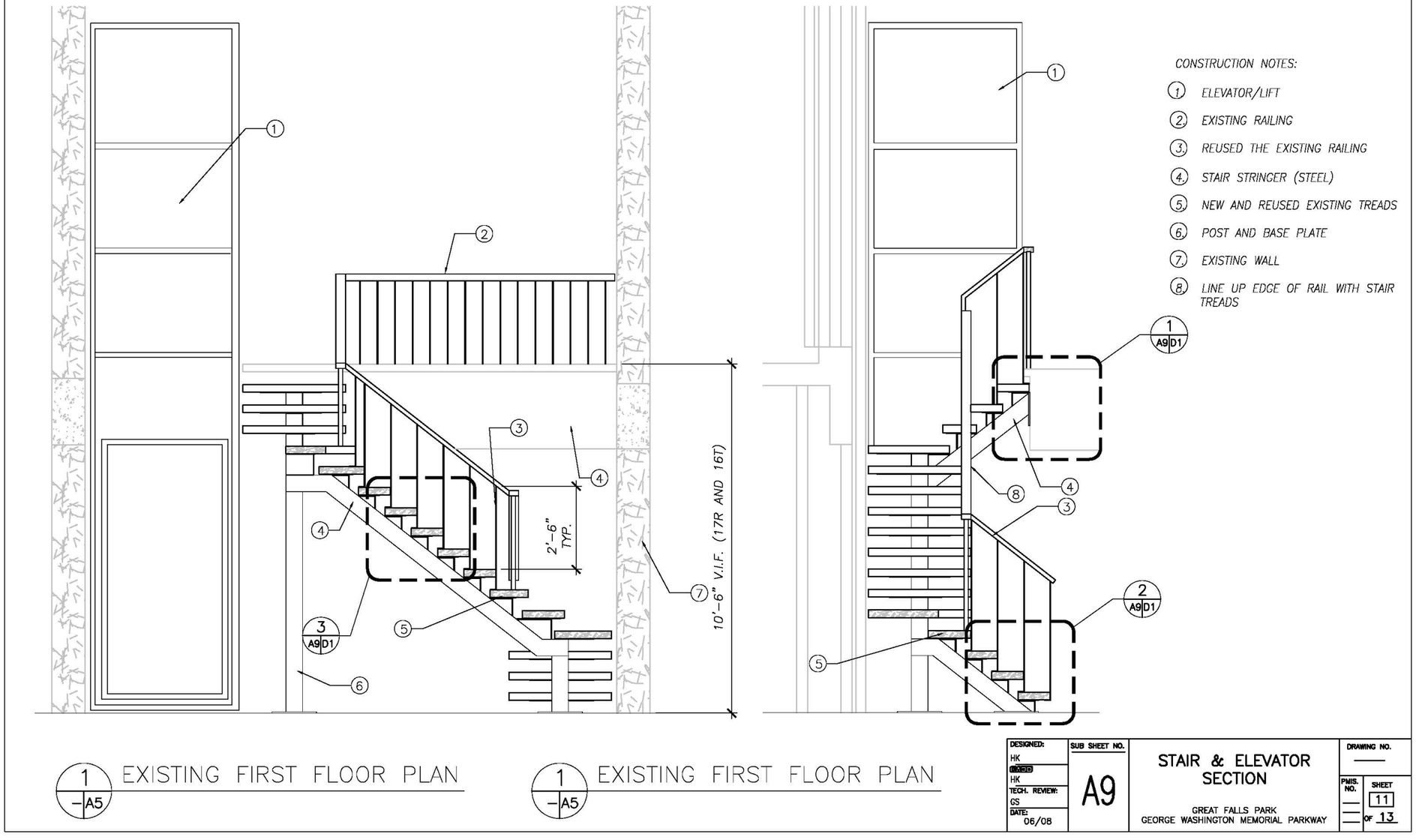


Figure 71. Elevator/Lift and Stair Modifications, elevator-stair section, June 2008. (George Washington Memorial Parkway Archives)

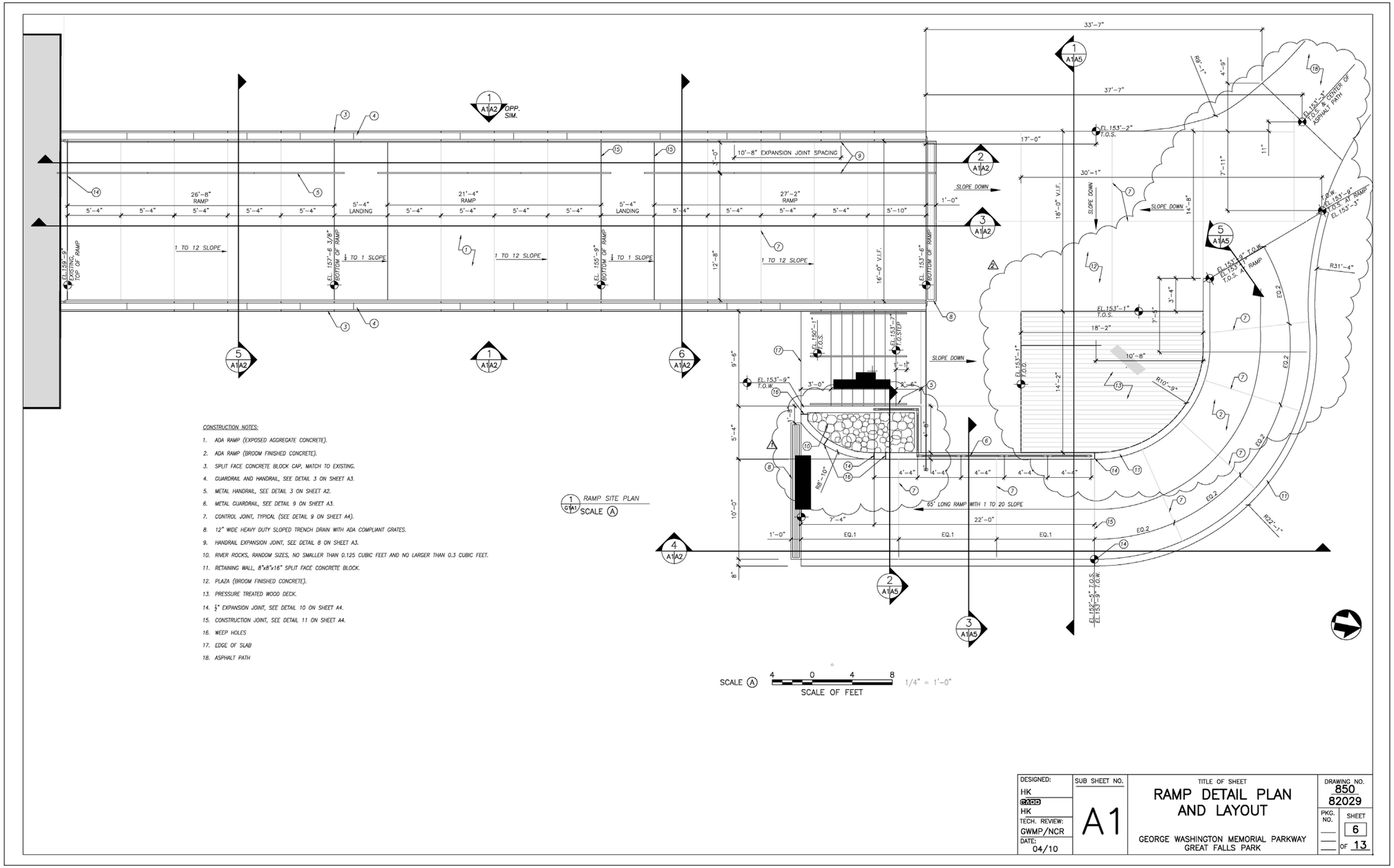
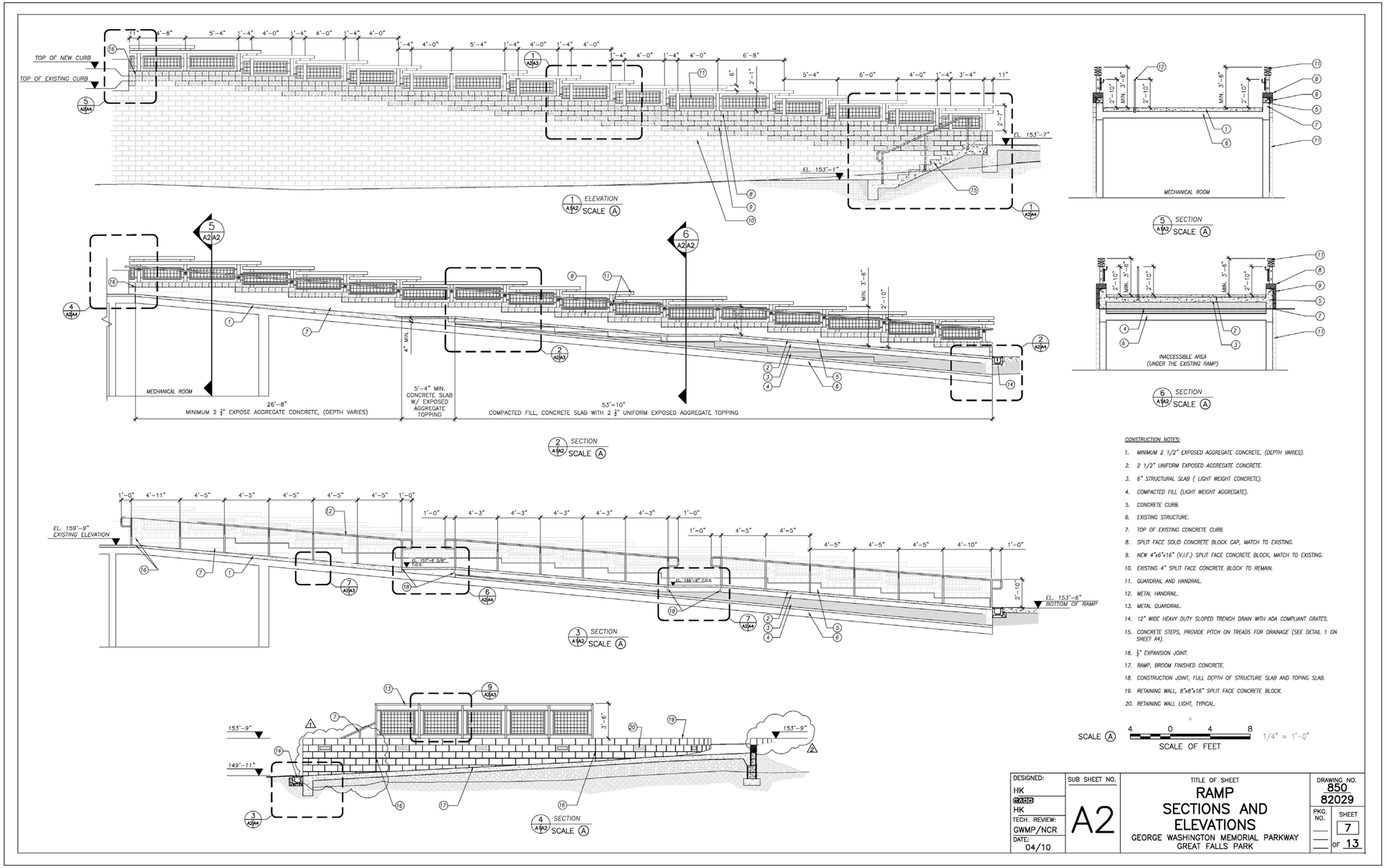


Figure 72. Great Falls Park Access to Visitor Center, ramp detail plan and layout, November 2010 (George Washington Memorial Parkway Archives)



CONSTRUCTION NOTES:

1. MINIMUM 2 1/2" EXPOSED AGGREGATE CONCRETE, (DEPTH VARIES).
2. 2 1/2" UNIFORM EXPOSED AGGREGATE CONCRETE.
3. 6" STRUCTURAL SLAB (LIGHT WEIGHT CONCRETE).
4. COMPACTED FILL (LIGHT WEIGHT AGGREGATE).
5. CONCRETE CURB.
6. EXISTING STRUCTURE.
7. TOP OF EXISTING CONCRETE CURB.
8. SPLIT FACE SOLID CONCRETE BLOCK CAP, MATCH TO EXISTING.
9. NEW 4"x6"x16" (V.I.F.) SPLIT FACE CONCRETE BLOCK, MATCH TO EXISTING.
10. EXISTING 4" SPLIT FACE CONCRETE BLOCK TO REMAIN.
11. GUARDRAIL AND HANDRAIL.
12. METAL HANDRAIL.
13. METAL GUARDRAIL.
14. 12" WIDE HEAVY DUTY SLOPED TRENCH DRAIN WITH ADA COMPLIANT GRATES.
15. CONCRETE STEPS, PROVIDE PITCH ON TREADS FOR DRAINAGE (SEE DETAIL 1 ON SHEET A4).
16. ½" EXPANSION JOINT.
17. RAMP, BROOM FINISHED CONCRETE.
18. CONSTRUCTION JOINT, FULL DEPTH OF STRUCTURE SLAB AND TOPING SLAB.
19. RETAINING WALL, 8"x8"x16" SPLIT FACE CONCRETE BLOCK.
20. RETAINING WALL LIGHT, TYPICAL.

SCALE A 4 0 4 8 SCALE OF FEET 1/4" = 1'-0"

DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
HK	A2	RAMP SECTIONS AND ELEVATIONS	850 82029
DRAWN: HK		GEORGE WASHINGTON MEMORIAL PARKWAY GREAT FALLS PARK	PKG. NO. — — —
TECH. REVIEW: GWMP/NCR			SHEET 7 OF 13
DATE: 04/10			

Figure 73. Great Falls Park Access to Visitor Center, ramp sections and elevations, November 2010 (George Washington Memorial Parkway)

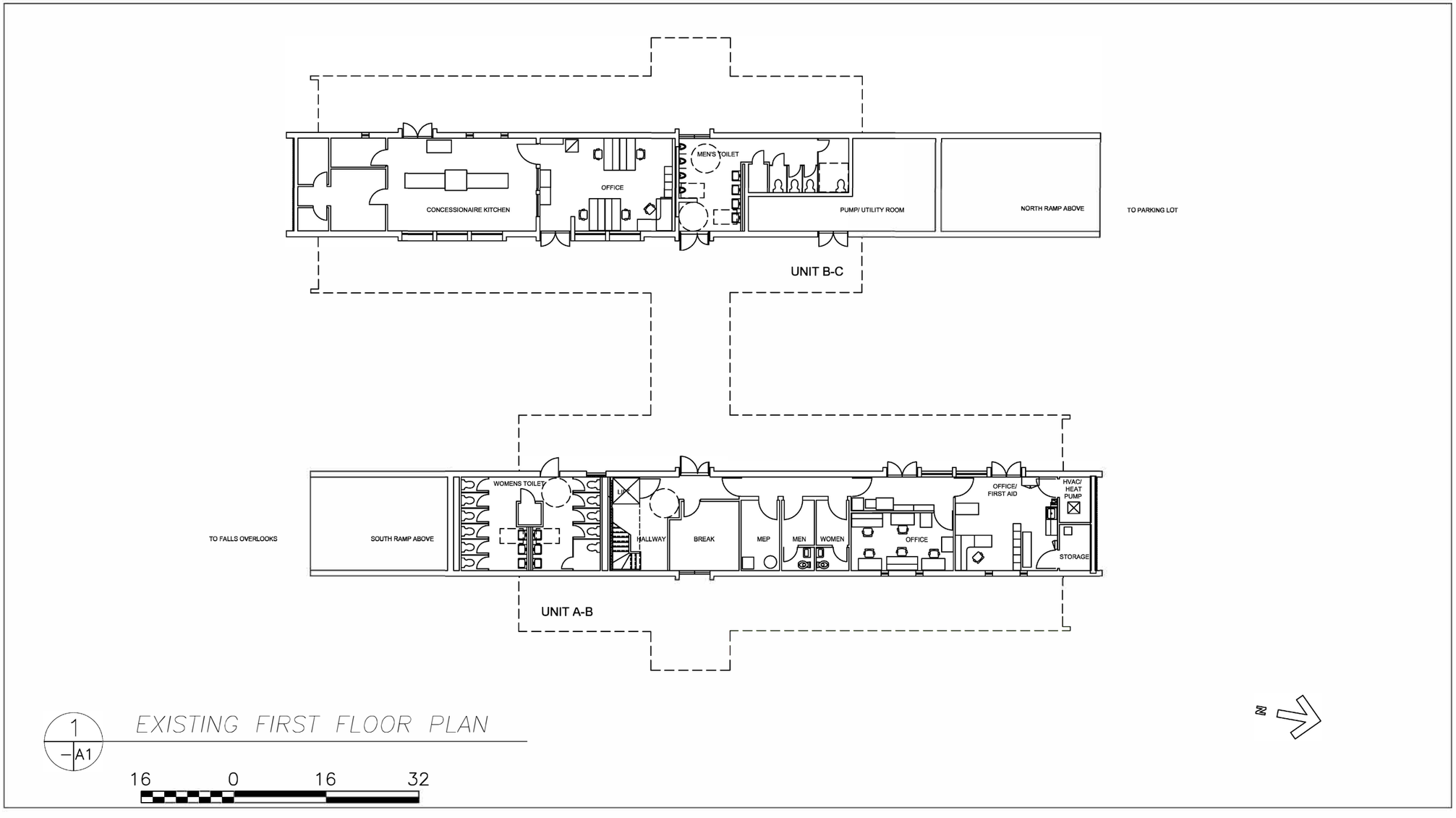


Figure 74. Great Falls Visitor Center, Current First Floor Plan, 2021.



Figure 75. Great Falls Visitor Center, Current Second Floor Plan, 2021.

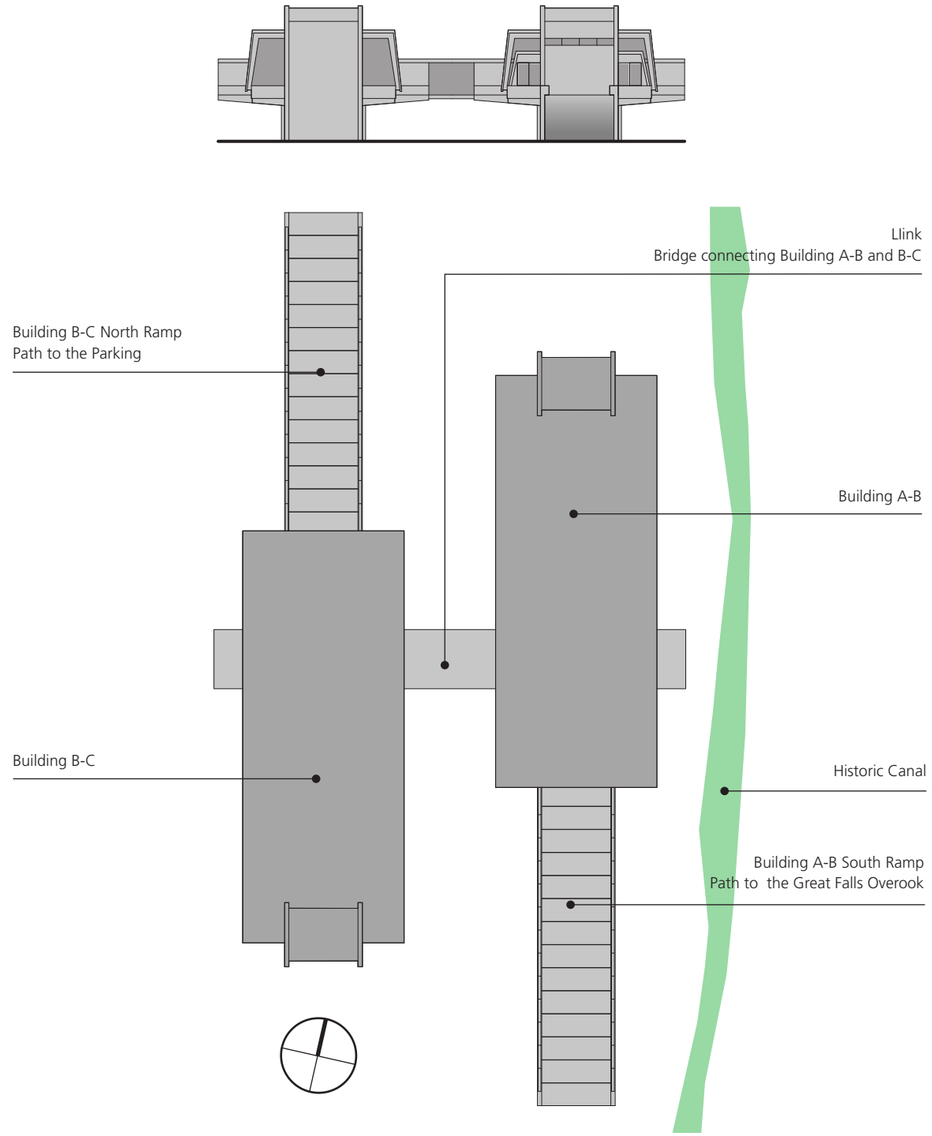


Figure 76. Great Falls Park Visitor Center Roof Plan and South Elevation Diagrams. (CRTKL, 2022)

Chapter 3: Physical Description

The Great Falls Park Visitor Center is located about a mile from the turn off Old Georgetown Pike onto Old Dominion Drive, the state-owned road that brings visitors into the park. Two parking areas are located along Old Dominion Drive to the northwest of the Visitor Center and one to the south. Immediately east of the Visitor Center are the ruins of the Patowmack Canal. The Great Falls of the Potomac River lie farther to the east, just beyond a stand of trees.

The Visitor Center consists of two two-story buildings aligned parallel to each other on a north-south axis, creating a courtyard between (Figures 76 and 77). They are linked on the second floor by a reinforced concrete bridge (Figure 78). Building A-B is the eastern unit of the pair, next to the canal, with Building B-C on the west, close to the road. The two buildings are slightly offset from each other along the axis, so that A-B is slightly farther south than B-C. The second floors of each building are wider than the lower floors, resulting in a broad overhang on both sides of each building. A tower is located at the end of each building (on the north for A-B and on the south for B-C). Primary doors pierce the facades on the ends of the buildings opposite the towers. Located on the second floor, they are reached by concrete-paved ramps. Both buildings have faux mansard roofs with low parapets that hide flat, built-up roofs.

ARCHITECTURAL DESCRIPTION / BUILDING A-B EXTERIOR

Building A-B consists of a reinforced concrete structure with the first floor exterior walls, the walls of the tower, and the side walls of the ramp composed of blue-gray, split concrete blocks (Figure 79). The exterior walls at the ground floor are contiguous with the adjacent ramp walls and maintain the appearance and running bond pattern of the ramp walls (Figure 80). Split-face CMU (concrete masonry unit) is also used on accent walls flanking either side of the main entrances on the second floor (Figure 83) and outward-facing walls of the mechanical roof penthouses on the southern portion of Building B-C and northern portion of Building A-B (Figures 81 and 82). The exterior CMU walls typically consist of either 4-inch split-face CMU over 8-inch smooth-faced CMU with the smooth interior side painted, or they are made of 4-inch smooth-faced CMU set between 4-inch split-faced CMU, so that both interior and exterior have a split-faced finish. The exterior mortar is similar in color to the matrix of the split-face CMU (Figure 79). Split wood shakes clad the cantilevered portion of east and west second-floor exterior walls of both buildings (Figure 81). The split wood shake



Figure 77. Building A-B (right) and Building B-C (left), linked by a second-floor bridge, comprise the Great Falls Park Visitor Center. (CRTKL, 2021)



Figure 78. The Visitor Center's concrete structure extends between the buildings to form a bridge. (CRTKL, 2021)



Figure 79. Exterior elevations of Building A-B show the reinforced concrete structure between the split concrete block of the first floor and the cedar shingle cladding of the second floor. The structural slope of the auditorium floor is expressed on the building exterior. (R&A, 2021)



Figure 80. An observation room, integral to the structure, projects from the east façade of Building A-B. (CRTKL, 2021)

wall assembly also continues past the building wall and encloses the sides of the awning roof above the elevated terraces at the top of the ramps on the second floor. The walls are battered at 9.5° such that they are wider at the base. The shakes are shingle-lapped and appear generally uniform in size, cut, and color, with the grains oriented vertically and parallel. According to the original drawings, the shakes have approximately 11 inches of exposure and are installed over roofing felt, plywood sheathing, and wood battens with foil-faced batt insulation between battens. The wood battens are attached to tongue-and-groove wood decking, which is exposed on the interior face (Figure 90).

The north elevation of the cantilevered portion of Building A-B is clad with diagonally oriented 1x tongue-and-groove siding (Figure 81). According to the original drawings, the diagonal siding is mounted over building paper, plywood sheathing, foil-faced batt between wood studs, and interior sheathing. This feature is not present on Building B-C, which has glazing on the corresponding elevation.

At the top of the split wood shake walls, soldered copper roof flashing covers the top of the wood shakes and wall framing below. Copper scuppers, leaders, and downspouts are set within the wall framing behind the wood shakes and discharge water at the base of the cantilevered wall from the second story onto the ground floor courtyard. Narrow soffits are formed between the base of the battered walls and the cantilevered second-floor concrete slabs. At the soffits, batt insulation is set between plywood boards on the exterior (painted to match the wood shakes, with plate glass on the interior, set into the tongue-and-groove board and adjacent concrete “bench” (Figure 90). The batt insulation and plywood soffit panels are not original; Detail 6 on Sheet 15 of the original drawings shows that these narrow soffits were originally filled with only plate glass (Figure 125). Prior to the insulation and plywood installation, the light fixtures recessed into the adjacent concrete “bench” would have illuminated the courtyard below.

The smooth-textured, light gray concrete of the structure can be seen between the two levels of cladding and in the beams that support the overhang. This concrete structure projects from the west elevation on the second floor to form the bridge linking Building A-B with Building B-C. The exposed concrete is light gray in color and generally trowel finished and smooth, with no exposed aggregate. Portions of the bridge and second-floor projecting bays have subtle imprints of vertically oriented board forms . The bottom of the bridge walls taper slightly towards

the middle of the bridge, giving it a slight appearance of an arch. The exposed concrete beams below the cantilevered second floor also taper (Figure 81). The elevated link between the two buildings is also expressed as a projection from the second floor on the east façade, creating an observation area with a window. Building B-C has a similar observation area on its west side. The observation areas and bridge form a secondary east-west axis across the Visitor Center's dominant north-south axis (Figure 80).

The west elevation of Building A-B faces the courtyard (Figure 81). On the first floor are five door openings and two fixed windows. Two of the doors–double-leaf, with leaves of equal size, made of stained wood with glass panels–are located near the north end of the facade and flank the wall-height, fixed, metal-framed windows. They illuminate National Park Service offices. The doors and window frames are original, but they now hold translucent glass, whereas the original glass was clear. It is not known whether the existing glass is the original and was frosted or if the original glass was replaced. Two windowless metal doors are located at the south end of the facade. They originally accessed the men's and women's restrooms. When the men's room was moved to Building B-C in 2012 and the women's room expanded, the men's room door (on the north) was closed. Between the two pairs of doors is the opening that accesses the first floor of Building A-B from the courtyard. The opening is now filled with a wood and glass, double-leaf door with leaves of unequal size. It was installed in 2007.

The north elevation of Building A-B comprises the tower flanked by the second floor overhangs (Figure 82). In the tower, a stained wood grille is contained within the split block exterior walls, with a horizontal concrete band at the top of the grille. At the time of the building survey (October 2021), antennas and HVAC equipment were visible above the band of concrete . The north walls of the overhanging second floor consist of angled, stained wood boards held within a frame formed by the concrete floor structure, the faux mansard roof, and the exterior building wall. The concrete construction of the observation area and the bridge can be seen projecting beyond the second floor walls of the north elevation.

On the east elevation, Building A-B consists of the first floor split concrete block walls, the second floor cedar shingle cladding, and the concrete structure, supporting beams, and projecting observation area (Figure 80). On the ground floor beneath the second-floor observation window, an original door opening has been



Figure 81. Five doors and two fixed windows pierce the west façade of Building A-B first floor. (R&A, 2021)



Figure 82. The north façade of Building A-B includes the tower, the second floor overhang, and the observation room and bridge projections. (R&A, 2021)



Figure 83. A concrete ramp leads to doors on the south elevation of Building A-B. (R&A, 2021)



Figure 84. A corridor along the west wall provides circulation in the office area on the first floor of Building A-B. (R&A, 2021)



Figure 85. In Building A-B the original glass panels in wood frames above partition walls help light staff restrooms. (R&A, 2021)



Figure 86. The original exterior door opening at Building A-B first floor was infilled when public lobby space was converted into a staff kitchen. (CRTKL, 2021)



Figure 87. The original exterior door opening at Building A-B first floor was infilled when public lobby space was converted into a staff kitchen. (CRTKL, 2021)



Figure 88. Building B-C first floor. The current men's restroom was built in 2012. The original double-leaf, wood and glass door on the west remains in place. (R&A, 2021)



Figure 89. Building A-B, first floor, NPS administrative office space. The original window openings are aligned with structural beams above. (CRTKL, 2021)



Figure 90. Building A-B. Original laylight along the perimeter walls inside auditorium space was covered with insulation and plywood. Building B-C has the identical modified conditon in the exhibit hall. (CRTKL, 2021)

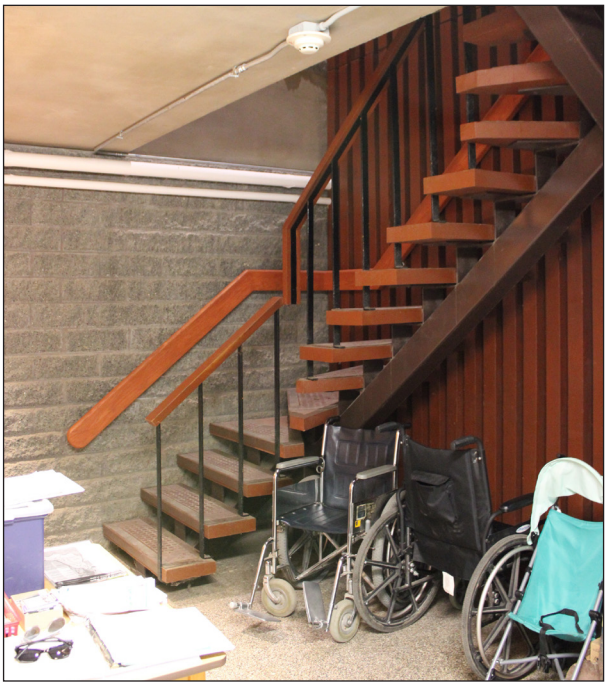


Figure 91. Building A-B. Split concrete block faces the east wall of the stair hall (former public lobby), while a wood grille covers the south wall. (R&A, 2021)

closed by a pair of clear glass aluminum-framed casement windows within a partition of vertically oriented, painted wood boards (Figures 86-87). An HVAC register is located at the bottom of the partition. Four vertical, clear glass windows at the north end of the east façade light first floor offices in the building. Each is located under one of the supporting concrete beams.

An exposed aggregate, concrete-paved ramp forms the base of the south elevation of Building A-B. The ramp remains in its original configuration and includes the original metal post and wood plank railing (Figure 83). At the top of the ramp, low concrete sills on either side frame views of the wood grille contained within split block walls at the center of the façade. A painted metal sign for the Great Falls Visitor Center is located at the center of the grille, with smaller signs slightly below and to the west. To either side of the center section of the facade, doors in the overhangs are recessed from the plane of the grille, passage to them sheltered by the wood ribs and horizontal boards that are part of the faux mansard roof. The wood features give way to concrete just before the doors. The south façade of Building A-B remains consistent with Cooper's original design, arranged to evoke a nineteenth century canal boat and movement along its gunwales. The doors themselves are 2007 replacements of the original double-leaf wood and glass doors, now composed of leaves of unequal sizes.

ARCHITECTURAL DESCRIPTION / BUILDING A-B INTERIOR

FIRST FLOOR

The interior of Building A-B's first floor is divided into offices on the north, the stair and lift in the center, and women's restroom on the south. The staff area on the north consists of a corridor along the west wall, with storage, first aid station, offices, staff restrooms, a utility room, and a staff kitchen (from north to south) on the east (Figure 84). The office area was originally open, but has been altered to include a single-loaded glazed corridor on the west. Partitions to create the kitchen took over part of what had been the public lobby and stair hall. The kitchen stands opposite the entrance to the lobby from the courtyard.

Floors in the storage areas are concrete, while the floors in the original office area have a coating over the concrete, worn almost through in several places. The outer wall of the office area and corridor, as well as original interior partitions, are constructed of painted concrete block with vinyl baseboards. The interior faces of two doors and two windows are located in the west wall at the north end of the office

area, with the four vertical windows in the north end of the east wall. The concrete block partitions along the east side of the corridor (where the staff restrooms and utility room are located) reach the bottom of the reinforced concrete beams supporting the ceiling. A fixed glass panel held by a wood frame fills the space between the beams (Figure 85). There are three windowless wood doors in metal frames spaced along the corridor, and the doors to the storage areas are also wood. The structural concrete ceiling, now painted, is visible in the offices, while the staff restrooms have plaster ceilings. The walls of the kitchen area are surfaced on the corridor/stair hall sides in stained wood. Rectangular fluorescent light fixtures hang from the ceiling of the original office space.

The floor of the lobby/stair area consists of a pebbled coating over the original concrete base. The platform lift itself is located in the southwest corner of the stair hall. The east and west walls of the space are surfaced in split concrete block of the same type used on the exterior, and the south wall is faced with a wood grille (Figure 91). The grilles consist of vertical, 4-inch by 4-inch, stained wood members separated by 2-inch gaps. The north wall is the partition added to create the staff kitchen. The stair itself has a steel stringer beam, reused original treads with no risers, and a railing composed of slender metal balusters with flat, stained wood handrails. A layer of textured rubber has been added to the treads, altering the original wood finish. Wood handrails were also added against the east and south walls, probably as part of the reconfiguration of the stairs. Winders turn the southeast corner of the stair on the first floor and the southwest corner on the second floor, replacing the landings in the original stair.

The restrooms were reconfigured for use as an expanded women's room in 2012, with parts of interior partitions and a door that had originally separated the men's restroom from the women's room removed. The floor has a pebbled coating over concrete, with painted concrete block walls. Ceramic tile covers the lower portion of the walls. A dropped ceiling hides the chases and machinery of the ventilation system.

SECOND FLOOR

The upper level interior space of Building A-B is broken into two main parts. An auditorium is located on the north, a circulation area to the south.

In the auditorium, a stage is located on the south, with a projection room on the north. The stage was moved forward in 2014 to create a storage area behind it. Split block walls are located on the east and west, containing the utility closets accessed

from the lobby and a portion of the storage area, with a wood door on the east and wood walls on both sides marking the more recent construction. Three wood steps rise from the floor to the wood deck of the stage (Figure 95). For the projection room, the south wall is covered with a wood grille framed between split block walls (Figure 97). The east and west walls of the projection room are composed of split concrete blocks and wood doors. Interior walls are painted concrete block with concrete floor and ceiling.

The floor of the auditorium slopes upward from south to north, beginning just in front of the stage (Figures 95-97). The 1966 drawings for the Visitor Center define the slope as 2 feet over 29 feet. The concrete floor is covered with carpet squares. Five wood benches, installed in 1968, provide seating, as does a concrete bench on the east and west sides of the auditorium. Walls consist of stained wood ribs and horizontal stained wood boards, and the ceiling continues this finish. Cylindrical lights are attached to the ceiling – two in each space bordered by the wood ribs – and the brown-painted, metal chases of the HVAC system are also attached to the ceiling, on the outside of the longitudinal wood beams. The rear walls flanking the projection room are covered in cork panels.

Outside the auditorium on the south is the lobby/stair hall. The stair hall is located against the south wall, flanked by doors to the exterior on the east and west. The lobby continues to an observation area on the east and across the bridge to the west – part of the cross-axial corridor linking Building A-B with Building B-C. The Visitor Center was designed so that visitors could reach the auditorium from Building B-C on this cross axis or from the courtyard through the stair hall. The doors on the south provided egress from the auditorium's programs, leading via the south ramp to the canal ruins and the falls.

The floor of the stair hall/lobby area is covered with a recent, pebbled coating. Both the north and south walls are surfaced with typical wood grilles framed by split concrete block walls (Figure 92). Two doors are disguised by the wood grille on the north wall; they access utility closets. East and west of the split block walls on the north are double-leaf wood doors that open into the auditorium (Figure 93). The stair is located against the south wall of this lobby, and the lift rises from the ground floor in the southwest corner of the stair hall (Figure 94). The railing across the stair hall consists of 3/8-inch by 1 ½-inch metal balusters and a plain wood hand rail, anchored into a wood beam; it forms the boundary between the stair hall and the lobby. The railing is likely a shortened version of the original. The door openings on

either side of the stair are filled with double wood doors with leaves of unequal size, which replaced the original doors in 2007. The lobby's ceiling is made of concrete, with a rectangular opening in the center providing a view up into its wood structure. Cylindrical lights are attached to the concrete ceiling, and spotlights attached above the opening illuminate a map on the north wall.

The observation area on the east is surfaced with concrete on the floor, north and south walls, and ceiling. A concrete bench is located on the lower part of the east wall, with a large rectangular, fixed window above.

ARCHITECTURAL DESCRIPTION / BUILDING B-C EXTERIOR

Like Building A-B, Building B-C consists of a reinforced concrete structure with the first floor exterior walls, the side walls of the tower, and the side walls of the ramp composed of blue-gray, split concrete blocks (Figure 98). The faux mansard roof that shields the second floor is clad in cedar shingles. The smooth-textured, light gray concrete of the structure can be seen between the two types of cladding and in the beams that support the overhang. This concrete structure projects from the second floor on the east to form the bridge linking Building A-B with Building B-C. It also projects from the second floor on the west façade to create an observation area with a west-facing window (Figure 99).

The east elevation of Building B-C faces the courtyard (Figure 98). The interior space is divided, from north to south, into storage and pump room, men's restrooms, office space, and kitchen area. Paired, windowless metal doors on the north of the new restroom provide access to the pump room and storage area (Figure 101). South of the storage and pump room are two doorways with two sets of windows between them. The openings are framed by projecting, split concrete block "columns." The first doorway, to the men's restroom, holds double-leaf wood doors with leaves of unequal size and translucent glass panes, replacing the original doors as part of the 2012 conversion of part of the dining area and part of the vending storage area into the men's restroom. A wood bulletin board, closed with a pair of wood and glass doors, is located on the wall south of the men's restroom door. The second doorway provides access to what originally constituted the dining area (now office space). The doorway holds original, double-leaf, wood and glass doors, with leaves of equal size. The two window openings between the doors retain their original configurations of wood panels below and fixed glass panes above. South of the office space are three windows lighting the concession kitchen area. They



Figure 92. Building A-B north wall of the second floor stair hall/lobby is faced with a decorative wood grille that disguises two doors. (R&A, 2021)



Figure 93. Double-leaf wood doors on either side of Building A-B lobby's north wall open into the auditorium. (R&A, 2021)

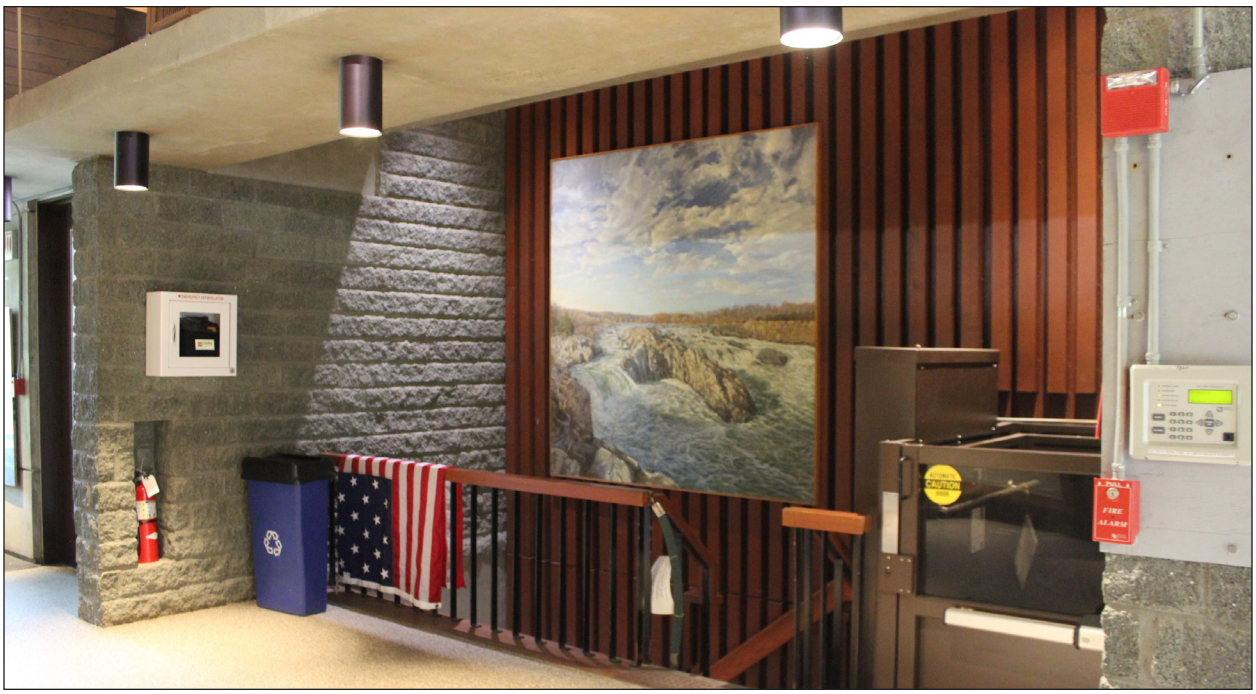


Figure 94. The stair railing and platform lift can be seen in front of the south wall of Building A-B stair hall/lobby. (R&A, 2021)



Figure 95. The back wall of the stage in the auditorium was moved forward in 2014. (R&A, 2021)



Figure 96. A concrete low concrete "bench" runs along the wood walls on the east and west sides of the auditorium. (R&A, 2021)



Figure 97. Wood benches and wood walls and ceiling articulate the auditorium. (CRTKL, 2021)



Figure 98. Like Building A-B, the reinforced concrete structure, split concrete block first floor walls, and second floor cedar shingle cladding characterize Building B-C. (CRTKL, 2021)



Figure 99. An observation area projects from the west façade of Building B-C. (R&A, 2021)



Figure 100. Three doors and five fixed windows pierce the west first floor façade of Building B-C. Three windows at the south end of the facade are part of the concession service area. (R&A, 2021)



Figure 101. The modified wood doors now access the men's restroom. The metal doors open into the pump room. (R&A, 2021)



Figure 102. Building B-C. Open plenum space above the concrete ceiling slab of the bridge.(CRTKL, 2021)



Figure 103. The main entrance doors to Building B-C were cut through the wood grille that acted as the rear wall of the information desk in the original design. (CRTKL, 2021)



Figure 104. The south elevation of Building B-C includes the tower, the second floor overhang, the bridge, and the west observation area. (R&A, 2021)



Figure 105. Split concrete block walls on the first floor and cedar shingles on the second floor make up the primary cladding of Building B-C's west façade. (R&A, 2021)



Figure 106. The ramp on the north side of Building B-C has been altered to include new railings as well as hand rails. (R&A, 2021)



Figure 107. A non-original double-leaf wood and glass door now provides access to Building B-C on the north façade. The original west entry was modified to add a gift shop storage space. (CRTKL, 2021)



Figure 108. A double-leaf door with leaves of unequal size is now located in the recessed opening on the east side of Building B-C's north façade. (R&A, 2021)



Figure 109. The west entrance recess now contains gift shop closet infill enclosed by a wood grille wall. (CRTKL, 2021)



Figure 110. Two of Building B-C's east windows can be seen from the kitchen. (R&A, 2021)



Figure 111. The NPS office area in Building B-C has a coated concrete floor, painted concrete block walls, and a structural concrete ceiling. This space used be a public concession area. (R&A, 2021)



Figure 112. An exhibit is located in front of the storage space on the south end of the exhibition hall. (R&A, 2021)



Figure 113. The concrete "benches" and laminated wood purlin/post framing, wall boards, and ceiling in the exhibit space match those features in the auditorium in Building B-C. (R&A, 2021)



Figure 114. The exterior surfaces of the bridge consist of concrete walls and floor, with fixed windows at the center of the north and south elevations. (R&A, 2021)



Figure 115. The interior surfaces of the bridge include a pebbled coating on the floor, concrete walls on either side of the windows, and a concrete ceiling. (R&A, 2021)

Figure 116. Foundation plan & typical detail, excerpt from original 1966 structural drawings

retain their lower panels of vertical wood boards (now painted) and wood counter, but the glass panes above are now covered with non-original, roll-down shutters (Figure 100).

The south elevation of Building B-C comprises the tower flanked by the second floor overhangs (Figure 104). In the tower, a stained wood grille is contained within the split block exterior walls, with a horizontal concrete band at the top of the grille. HVAC equipment is visible above the band of concrete. Unlike the end walls of the overhanging second floor of Building A-B, which consist of angled, stained wood boards held within a frame formed by the concrete floor structure, the faux mansard roof, and the exterior building wall, the south end walls of Building B-C's overhangs are filled with glass panels with the same frame. The concrete construction of the observation area on the west and of the bridge on the east can be seen beyond the second floor walls.

On the west, Building B-C's facade consists of split concrete block walls on the first floor, cedar shingles on the faux mansard roof of the second floor, and the concrete of the floor structure, supporting beams, and projecting observation area (Figures 99 and 105). On the ground floor beneath the observation area, the original double-leaf, wood and glass doors (now with translucent glass) remain in place, although they are no longer used. A doorway in the west wall of the kitchen area is filled with a double-leaf door. Three vertical windows like those on the east elevation of Building A-B help illuminate the kitchen area.

A concrete-paved ramp forms the base of the north elevation of Building B-C (Figure 106). As the primary route into and out of the Visitor Center, the ramp was altered for greater accessibility in 2010. The work included adjusting the slope and adding a landing at the midpoint of the ramp to satisfy ABAAS requirements. The wood planks on metal posts that constituted the original railings of the ramp were replaced with a similar configuration, although the metal posts were taller and metal panels were placed in the space between the wood planks and the stepped side walls. In addition, round, metal handrails were attached to the new railings, and a separate interior metal hand rail was constructed near the west side wall.

The second floor north façade also differs from its original appearance as a result of accessibility, circulation, and other changes. Low concrete sills still support the wood grille contained within split block walls at the center of the façade, but the grille now holds a pair of wood and glass doors, installed as part of the 2007 door project (Figure 107). A painted metal sign for the Great Falls Visitor Center is locat-

ed above the doors, with smaller signs below and to the east. The recessed double door on the east now holds wood and glass leaves of unequal size, while a stained wood grille now closes the recess on the west, creating storage space on the interior (Figure 108 and 109). The flag display rope rigging is attached to the underside of the roof above exterior entry area.

ARCHITECTURAL DESCRIPTION / BUILDING B-C INTERIOR

FIRST FLOOR

As mentioned, the interior of Building B-C's first floor is divided, from north to south, into a pump room and storage area, men's restrooms, office space, and the kitchen area. The pump room and storage on the north show the original condition of the ground floor of the building before finishes were applied – concrete floors, concrete block walls, and structural concrete ceiling, none of which has been painted.

The men's restroom has a pebbled coating over the concrete floor. The upper part of the concrete block walls are painted, the lower part covered with ceramic tiles. A dropped ceiling hides the chases and machinery of the ventilation system. The original wood and glass doors on the west wall that formed part of the cross axial circulation remain in place. They are now blocked by a urinal divider.

The office area in Building B-C has a coated concrete floor, three original painted concrete block walls, and a structural concrete ceiling (Figure 111). (The north concrete block wall was built as part of the 2012 restroom project.) Rectangular fluorescent lights are hung from the ceiling. HVAC chases also hang from the ceiling. The office is lit by two windows on the east and is accessed by the original double-leaf, wood and glass door in the east wall.

The kitchen floors have a smooth coating, its walls are of painted concrete block, and the painted concrete structure forms the ceiling, from which are suspended rectangular fluorescent lights. A waist-high, laminate counter runs along the north and east walls. Two of the three east windows are visible, including the sliding lower panel in the service window, while the third is covered with pressboard (Figure 110). Metal kitchen appliances, counters, and storage are located in the center of the room. Double doors are located in the southwest corner with two vertical windows to the north. South of the kitchen itself are storage spaces and a toilet still in the arrangement shown in the original drawings. Floors are concrete, walls painted concrete block, with structural concrete for the ceiling. One of the rooms on the



Figure 117. Backside of the split wood shake wall assembly as viewed from the second-floor terrace. (SGH, 2021)



Figure 118. Diagonally oriented tongue-and-groove siding cladding the cantilevered portion of the north elevation of Building A-B. (SGH, 2021)



Figure 119. Overall view of the mechanical roof overrun on the southern portion of Building B-C. (CRTKL, 2021)



Figure 120. Ornamental wood post "grilles" over CMU block on the north elevation of Building A-B. (SGH, 2021)



Figure 122. Interior view of the full-height window on the north elevation of the bridge. (SGH, 2021)



Figure 123. Interior view of the half-height window on the west elevation projecting bay. (SGH, 2021)



Figure 121. Exterior view of the intersection between the bridge and the second-floor wood shake wall assembly creating a narrow soffit clad with translucent plastic panels. (SGH, 2021)



Figure 124. Interior view of the trapezoidal full-height window in the exhibition space on the south elevation. (SGH, 2021)

west is illuminated by a vertical window.

SECOND FLOOR

The upper level interior space of Building B-C is broken into two main parts – an information desk area just inside the doors on the north and the exhibit area to the south. The double-leaf entrance door added in 2012 is located in the center of the north wall (Figure 103). The information desk remains in the area reserved for that purpose when the Visitor Center was originally constructed, but the area is now much changed. The north wall now containing the entrance door was once the back wall of the information desk and faced with a typical wood grille. The original south wall of the area, also faced with a wood grille, has been removed, with four sections of split block wall that had flanked the wood grilles remaining in place. The arrangement creates a straight path from the entrance doors to the exhibit area. The recently built information desk itself is located on the east, along the southeast split block wall and across what had been part of the east-west corridor. The floor of this area, as well as in the rest of the exhibit area, is a pebbled coating over concrete, and above the information area is a concrete ceiling with a rectangular opening offering a view of the roof structure, as in the corresponding location in Building A-B. Cylindrical lights as well as track lighting attached to the ceiling illuminate the space.

West of the information desk is a small gift shop occupying what had been the observation area (Figure123). The original, double-leaf, wood and glass, west entrance door is located in the north wall of the gift shop, opening into a storage area. Carpet covers the gift shop floor; concrete makes up the walls and ceiling. The west wall consists of the large rectangular window with a section of concrete bench below. East of the information desk is the bridge connecting Building B-C to Building A-B. A 2012 replacement door – double-leaf, glass and wood, with leaves of unequal size – is located in the original east doorway.

The exhibit arrangement was completed in 2008 within the exhibit hall as originally built. A storage area is located within the tower at the south end of the exhibit space. The east and west walls of the storage space are faced with split concrete blocks, and a wood door provides access. An exhibit blocks views of the original wood grille that faced the north wall of the storage area. The windows that constitute the south walls on either side of the storage area provide natural light to the exhibition hall (Figures 112 and 124). As in the auditorium in Building A-B, walls consist of stained wood ribs and horizontal stained wood boards, and the ceiling continues this finish. Cylindrical lights are attached to the ceiling, as are the brown-painted,

metal chases of the HVAC system, on the outside of the longitudinal wood beams. A concrete bench runs along both sides of the exhibit area. Exhibits occupy much of the surface space – on the floor, the benches, and the walls.

ARCHITECTURAL DESCRIPTION / BRIDGE EXTERIOR

The north and south elevations of the bridge consist of smooth-textured concrete walls on either side of a two-pane fixed window in a metal frame (Figure 114). The undersides of the walls flanking the windows follow the lines of the beams that support the second-floor overhangs. The underside of the bridge itself is its structural concrete floor. The bridge includes metal flashing (not original) on the concrete lintels above the windows and a built-up roof.

ARCHITECTURAL DESCRIPTION / BRIDGE INTERIOR

The bridge is part of the cross axis running between Buildings A-B and B-C and shares the pebbled floor covering of the rest of this corridor. Concrete walls flank the windows on the north and south, and the interior ceiling surface is also concrete (Figure 115 and 122). Board-formed concrete columns stand on each side of the two windows. Light fixtures (not original) are located on the ceiling, and the bridge space is also used for exhibits.

ARCHITECTURAL DESCRIPTION / WINDOWS

FIRST FLOOR

The windows on the first floor appear to be original with painted wood frames and single-pane glass with the exception of one replacement casement window on the east elevation of the Building A-B, which replaces a pair of doors (Figures 86 -87).

The west elevation of the Building A-B faces the courtyard and features two adjacent full-height single-pane wood-framed fixed windows set between columns (Figure 134), while the east facade of the Building B-C has two adjacent half-height single-pane wood-framed fixed windows set in punched openings above tongue-and-groove vertical wood siding (Figure 135). Half-height rolling counter shutters have since replaced two sliding operable windows and one fixed window at the concession service counter on the west building, also over tongue-and-groove vertical wood siding. A post-applied privacy film has been installed on the full-height windows on the Building A-B adjacent to administrative spaces.

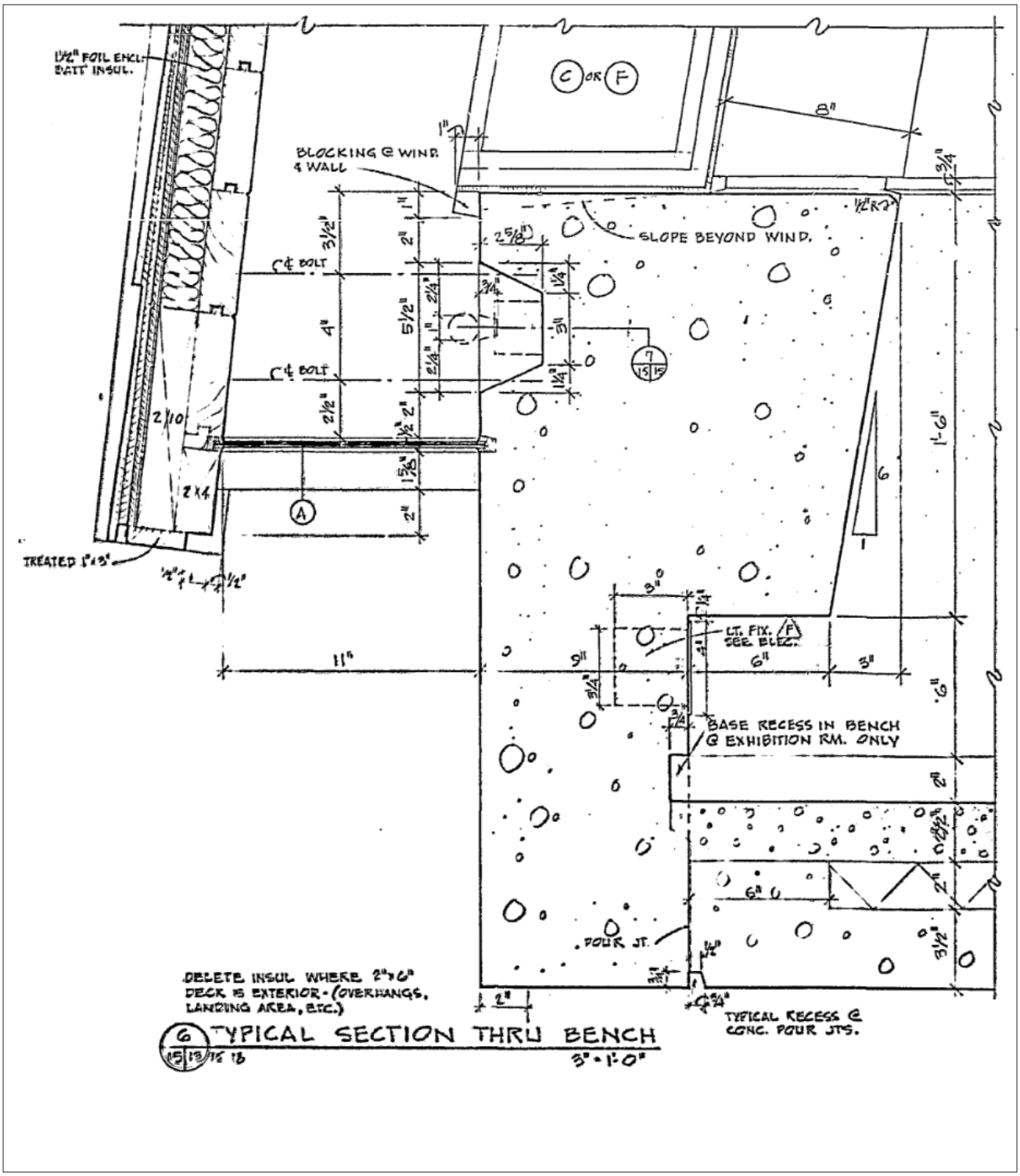


Figure 125. Section detail excerpt from the 1966 original drawings showing the cedar shake wall assembly, plate glass soffit, and concrete "bench". (NPS)

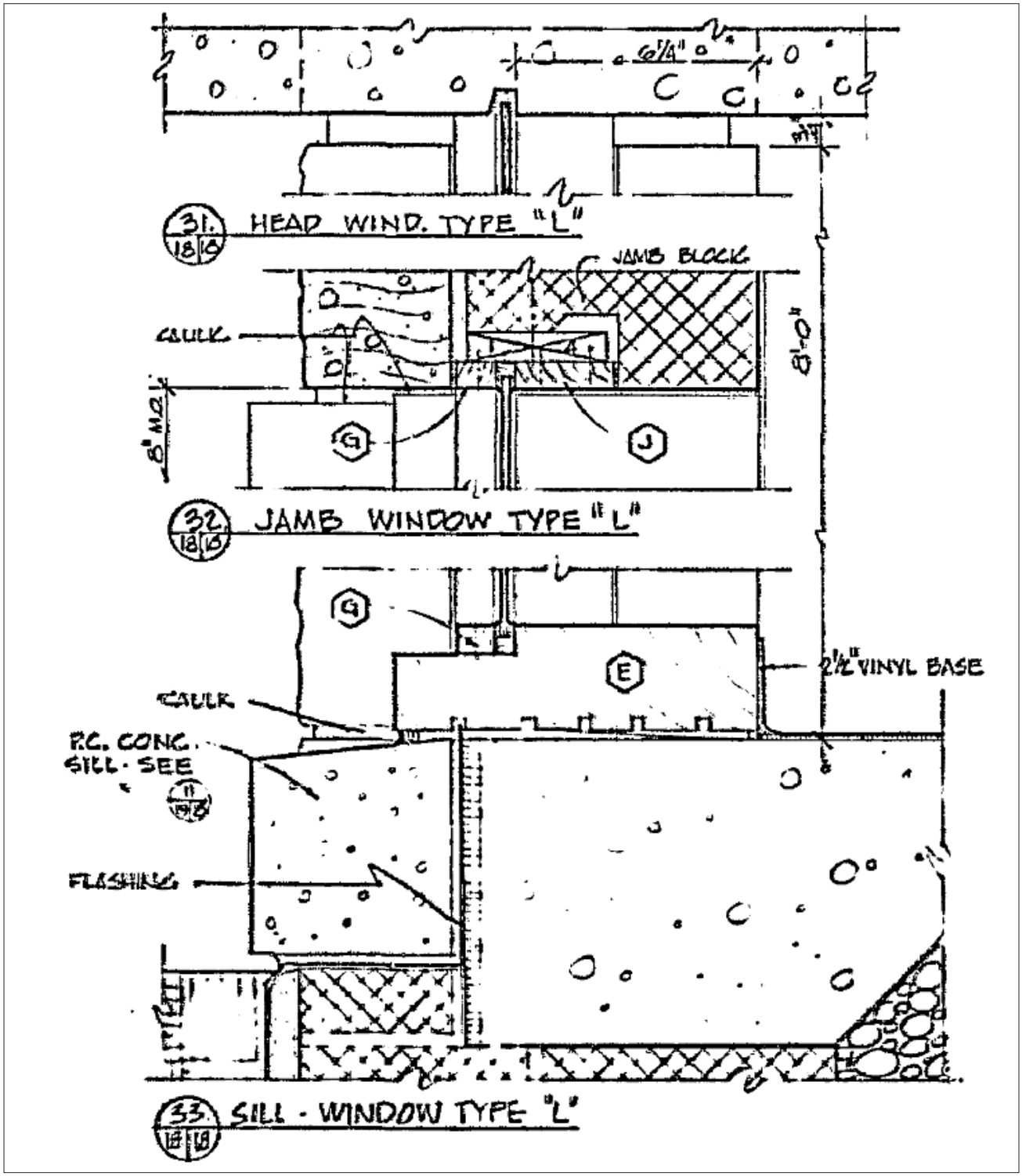


Figure 126. Section detail excerpt from the 1966 original drawings showing the head, jamb, and sill detail for the narrow east elevation windows. (NPS)

The east elevation of Building A-B has four 8 inch wide, full-height single-pane wood-framed windows situated directly below each exposed concrete soffit beam (Figure 136). The glass pane of the narrow windows appears to be set within the concrete beam above (i.e., the window has no head mullion), the wood jamb mullions are set within the CMU wall behind the split-faced block, and the wood sill mullion is set atop a concrete curb (Figure 126). Beneath the second-floor exposed concrete projecting bay, a half-height aluminum-framed single-pane casement window over a packaged terminal air conditioning (PTAC) unit has since replaced a door on the east elevation of Building A-B (Figure 133). The PTAC unit is set within an opening in tongue-and-groove vertical siding. There are no windows on the west elevation of Building B-C facing Old Dominion Drive, as the ground floor currently serves as support space.

SECOND FLOOR

The second floor features a combination of full-height windows, half-height windows, clerestory windows, and soffit glazing with a mix of single-panes of glass, insulating glass units (IGU's), and translucent plastic panels.

The clerestory windows are located on the northern portion of Building B-C and the southern portion of Building A-B, on the walls directly above and surrounding the main entrances. The clerestory windows appear to be original with single panes of glass either captured in the wood mullions or directly set into the adjacent materials, including the concrete wall. Where the second-story overhang intersects with the bridge, the soffit is clad with translucent plastic panels (Figure 121).

At the narrow soffits between the battered walls and cantilevered second-floor concrete slabs, plate glass is visible on the interior (Figure 125), set into the tongue-and-groove board and adjacent concrete "bench", but the glass has since been covered with plywood on the exterior (Figure 137).

Both the north and south elevations of the enclosed bridge have one full-height window, 9 ft – 6 in. wide by 7 ft – 10 in. tall centered along the elevation (Figure 132). These windows consist of aluminum-framed mullions capturing a single pane of glass with rubber gaskets.

The east and west elevations of the second-floor projecting bay feature 11 ft wide by 5 ft – 10 in. tall wall-to-wall half-height aluminum-framed IGUs (Figures 133).

The south elevation of the second-floor cantilever on Building B-C features full-height and wall-to-wall trapezoidal windows within the Visitor Center exhibition space (Figures 119). The trapezoidal windows are aluminum-framed IGUs and measure approximately 8 ft wide at the base and are 10 ft – 4 in. tall. Analogous windows are not present on Building A-B. All the second-floor aluminum-framed windows are replacements of the original wood-framed windows and are sealed to the surrounding concrete, CMU, or wood members.

ARCHITECTURAL DESCRIPTION / DOORS

FIRST FLOOR

The west elevation of Building A-B faces the courtyard and features three sets of double doors and two single leaf doors (Figures 129 and 134). The east elevation of Building B-C has three sets of double doors facing the courtyard (Figures 135). The double doors of Building A-B are wood framed with wood stiles and single pane glass infill panels. A privacy film has been post-applied on all the double door glass panels on Building A-B adjacent to administrative spaces, although we could not find project documentation stating the date of application. Both single leaf doors facing the courtyard on Building A-B are hollow metal doors below louvers. Two of the double doors on Building B-C are similarly wood framed with wood stiles capturing single pane glass infill panels. Of those, only the men's restroom doors have a privacy film applied to the glass after the original construction. The other double door with glass panels uses interior blinds for privacy. On both buildings, the doors directly under the bridge which face the courtyard have asymmetrical leaves (with one leaf 36 inches wide); project documentation indicates these doors replaced originally symmetrical doors in 2007 (Figure 129) to improve accessibility. The third set of double doors on the west building leads to storage space and consists of metal doors with grills near the bottom for ventilation and do not appear to be original. We did not find documentation citing the replacement of the west building storage door.

The west elevation of Building B-C has two sets of double-leaf doors: a wood-framed door with wood stiles and single pane glass infill panels under the second-floor projecting bay (Figure 127), and solid core double doors leading from the concession kitchen to fenced exterior back-of-house space (Figure 128). A post-applied privacy film has also been installed on the double-leaf door glass panels on the west-most elevation. These doors no longer serve as circulation after the



Figure 127. Door under the second-floor projecting bay on the west elevation of the Building B-C. (SGH, 2021)



Figure 128. Door leading from the kitchen to the fenced exterior on the west elevation of the west Building B-C. (SGH, 2021)



Figure 129. West elevation of Building A-B with double- and single- leaf doors. (SGH, 2021)



Figure 130. Double-leaf door leading to mechanical room on the east elevation of Building B-C. (SGH, 2021)



Figure 131. South elevation of Building A-B with two doors on either side of the South ramp. (SGH, 2021)



Figure 132. Overall view of the bridge with exposed concrete slabs and large window. (SGH, 2021)



Figure 133. Overall view of the projecting bay on the east elevation of Building A-B with exposed concrete slabs and overlook window. (SGH, 2021)



Figure 134. West elevation of Building A-B with two full-height windows set between two double-leaf doors. (SGH, 2021)



Figure 135. East elevation of Building B-C with half-height windows set between two double-leaf doors and half-height rolling counter shutters over tongue-and-groove vertical wood siding. (SGH, 2021)



Figure 136. East elevation of Building A-B with four 8-inch wide full-height windows. (SGH, 2021)



Figure 137. View from the underside of the cedar shake wall assembly of a concealed downspout and plywood covering the narrow soffit. (SGH, 2021)

restroom renovation located the men's restroom behind them (Figures 88 and 127). The east elevation of Building A-B, facing the canal ruins and path to falls, has no doors.

All of the existing ground floor double doors with glass panels appear original except for the doors directly under the bridge with asymmetrical leaves. Opaque doors have been updated to hollow metal doors instead of solid core wood doors. The original double door on the east-most elevation has been replaced with a casement window over a PTAC unit (Figure 133).

SECOND FLOOR

The ramps lead to second floor entrances on the north elevation of Building B-C and the south elevation of Building A-B. On Building A-B, two wood-framed double doors with wood stiles and glass infill panels are located to either side of the ramp on the second-floor terrace, recessed under the roof overhang (Figure 131). The door leaves are asymmetrical and were installed in 2007 to improve accessibility, replacing the original symmetrical double doors. There are also two wood-framed double doors on the north elevation of Building B-C; however, also in 2007, one of the doors had been relocated from its original recessed location right of the ramp (when viewed from the exterior) to align with the center of the ramp (Figure 107). The original door to the right of the ramp remains on the interior but has been enclosed within a small storage room expansion also from 2007 which is clad with vertical wood grilles, now aligning the wall on the right side with the center door. The door to the left of the ramp (when viewed from the exterior) has asymmetrical leaves and, like those on the south elevation, has also replaced the symmetrical double doors in the same location.

ARCHITECTURAL DESCRIPTION / ROOF

MAIN ROOFS

Both buildings are covered with a low-slope roofing assembly consisting of built-up modified-bitumen roofing with a granule-faced cap sheet over rigid insulation and a tongue-and-groove wood deck (Figure 138). The deck serves as the interior finished ceiling. The rigid insulation is tapered, generally forms a ridge in the center of the roof, and slopes to the east and west sides of each building. Large crickets along the perimeter of the roof direct water to scuppers with downleaders which are concealed within the battered wood shake wall assembly. The roofing mem-

brane overlaps a soldered copper edge stop flashing around the perimeter of the roof (Figure 139). The field of the roofs has only a few vent pipe penetrations. The roofing materials are not original and were most likely installed after completion of the Existing Roof Replacement and Roof Structural System Survey Report prepared by Dewberry Design Group Inc. & Dewberry LLC dated 1 July 2003.

MECHANICAL PENTHOUSES

Both the A-B and B-C Buildings have a single mechanical penthouse (Figure 141), and each penthouse contains mechanical equipment and a roof hatch, which was last replaced in 1999 (Figure142). Roofing on the penthouses consists of a modified bituminous material, likely organized in a similar fashion as the main roofs.

A ladder on each penthouse provides access down to the main roof of each building. The existing ladder and roof access hatch configurations of both buildings do not meet OSHA's current safety requirements, and are finished with lead-based paint. The mechanical penthouse walls and parapets are constructed of either CMU or cast-in-place exposed-aggregate concrete. Some of the mechanical penthouse parapets are covered with copper coping. Around the penthouse, the roofing membrane turns up the walls or parapets and is overlapped by a surface-sealed copper counter flashing which is secured with fasteners through a termination bar (Figure 144). The south-facing wall of Building's A-B mechanical penthouse features a metal louver (Figure 143) whereas the analogous location on the north-facing wall of the west building's mechanical penthouse has copper plates butt-sealed to the rough opening . The penthouse roof is drained through copper scuppers and downspouts that discharge onto the main roofs (Figure 143).

BRIDGE AND PROJECTING BAYS

The roof of the bridge and second-floor projecting bays are covered with the same roofing materials as the main roofs (Figure 145). These roofs slope to internal drains, four on the bridge and two on each second-floor projecting bays, which are covered with dome leaf strainers. Piping and conduit communicate utilities between the two buildings on top of the bridge which are set onto the exterior of the roof with non-penetrating pipe supports. The conduit and pipes turn up the battered wood shake walls before penetrating the building enclosure. Like the adjacent buildings, the roofing membrane on the bridge and projecting bays overlaps a soldered copper edge stop around the perimeter.



Figure 140. View of the roof-mounted antennas on Building A-B. (CRTKL, 2021)



Figure 141. View of the mechanical roof overrun on Building B-C. (SGH, 2021)



Figure 138. Overall view of low-slope built-up modified-bitumen roofing assembly on Building A-B. The adjacent tree is interfering with the roof and needs to be trimmed. (SGH, 2021)



Figure 139. Roofing membrane overlapping a soldered copper perimeter edge stop flashing. (SGH, 2021)



Figure 142. View of the roof hatch on the mechanical roof overrun and copper counter flashing around the parapet. The configuration of the hatch is in conflict with OSHA requirements. (SGH, 2021)



Figure 143. Metal louver on the south-facing wall of Building's A-B mechanical roof overrun. (SGH, 2021)



Figure 144. Copper plates on the north-facing wall of Building's B-C mechanical roof overrun. (SGH, 2021)



Figure 145. Overall view of the bridge roof. (SGH, 2021)

ARCHITECTURAL DESCRIPTION / ACCESSIBILITY SUMMARY

SUMMARY

The Visitor Center does provide a level of universal accessibility. However, currently the facility does not meet certain specific requirements of Architectural Barriers Act Accessibility Standards (ABAAS).

The Park has over the years identified a range of accessibility compliance issues at the Great Falls Park Visitor Center. Several significant modifications were completed in the last 20 years to prioritize and address these issues with the aim of implementing solutions that are in keeping with the Secretary of the Interior's Standards for Historic Properties. Modifications were made to create at least one accessible entrance route to visitor spaces as well as to restrooms, to provide greater accessibility for staff, and to increase capacity of public restrooms. These modifications included entrance door alterations, the reconfiguration of the stair to accommodate a platform lift, North entrance ramp renovation, and public restroom expansion. Refer to the Chapter 2 section, 2007 Management Plan and Compliance with ABAAS Regulations, for additional description of modifications made to meet ABAAS requirements.

While significant advances were made toward creating an accessible entrance route to visitor spaces and to restrooms, some issues were not fully addressed, while certain deficiencies re-emerged due to aging, deterioration, erosion, and maintenance challenges. Currently the facility has a number of accessible routes that are not in full compliance. The deficiencies that remain are noted below and involve door and threshold requirements, signage, the single accessible route into the building, the accessible route connecting main entry and public restrooms, and the platform lift for staff that is occasionally used for visitors but requires assistance.

EXTERIOR RAMPS

The Visitor Center was designed with two main ramps at each of its entrances as the primary circulation route to the public exhibit and auditorium spaces on the second floor (Figures 146 and 147). Both were originally designed with a 3:32 slope (9.375%), which is steeper than the 1:12 minimum slope (8.333%) that the current code requires for accessible ramps. As designed, each ramp was more than 75’-8” long and provided just one landing about halfway up the run. The North ramp was modified in 2010 along with the path to the courtyard area to make it accessible. The ramp was lengthened to reduce the slope, add additional landings to

its lengthy run, and install accessible handrails. The height of the ramp guard rails was increased to comply with the most recent life safety and ADA/ABA code. These modifications also included a new stair on grade and a curved ramp connecting the bottom of the building entrance ramp to the courtyard, where the first floor public restrooms are accessed (Figure 152). Erosion at the bottom edge of the curved ramp since its construction in 2010 has created a change in elevation of more than 2 inches on the eastern side (Figure 148). This condition should be corrected to meet accessible route requirements.

The South ramp has not been modified to address accessibility. Because lengthening the ramp to reduce slope would have an adverse impact on the historic Patowmack Canal, adjacent trail, and visual aesthetic of the Visitor Center, the Park decided not to carry forward this option, according to the NPS 2010 Environmental Assessment report for the accessibility modifications project. The slope is not the only accessibility issue of the South ramp, however. Spalling and cracking of the ramp surface as it has reached the end of its life cycle, as well as erosion at the bottom create tripping hazards. The wood guard rail on both sides of the ramp, made of painted 4x6 lumber, is too low in height to meet modern guard rail Code standards. While not expressly in the scope of this report, the South ramp is part of the main circulation route for visitors and is a required life safety exit for the second floor (Figure 147).

DOORS AND THRESHOLDS

The main entrance doors were altered at the north entrance. One of the two pairs of doors at this entrance has an automatic door opener which works only from the inside of the building (Figures 150 and 151). The power assist button outside is not fully operational, so the unit needs repair or replacement.

All doors into the building were surveyed and all required more than the minimum 5 lbs of force to open. Most required between 10-17 lbs to open (push or pull), with the men's restroom doors particularly difficult to open, at well over 20 lbs of force required (Figure 154). The power assist or automatic openers with activation buttons for men's and women's restroom doors are recommended.

Other than the pair of entrance doors at the North ramp, the majority of doors into the building exceed the maximum threshold height requirements (Figure 153). While most doors were installed prior to the 1991 ADA Standards went into effect, a few have been replaced or modified since then, including the doors into the men's



Figure 146. The North ramp is the single accessible route into the visitor center, Building B-C. (CRTKL, 2021)



Figure 147. Bottom of South ramp, Building A-B. (CRTKL, 2021)



Figure 148. Bottom of accessible ramp shows erosion. (CRTKL, 2021)



Figure 149. The route to the public restrooms through the courtyard. (CRTKL, 2021)



Figure 150. Interior view of entrance door on accessible route into the visitor center. (CRTKL, 2021)



Figure 151. Entrance door on accessible route into the visitor center, at the top of the North ramp. (CRTKL, 2021)



Figure 152. View from Building B-C roof of North ramp and accessibility route improvements. (CRTKL, 2021)



Figure 153. The door threshold of the women's restroom accessed through the courtyard. (CRTKL ,2021)



Figure 154. The entrance to the men's restroom accessed through the courtyard. (CRTKL, 2021)

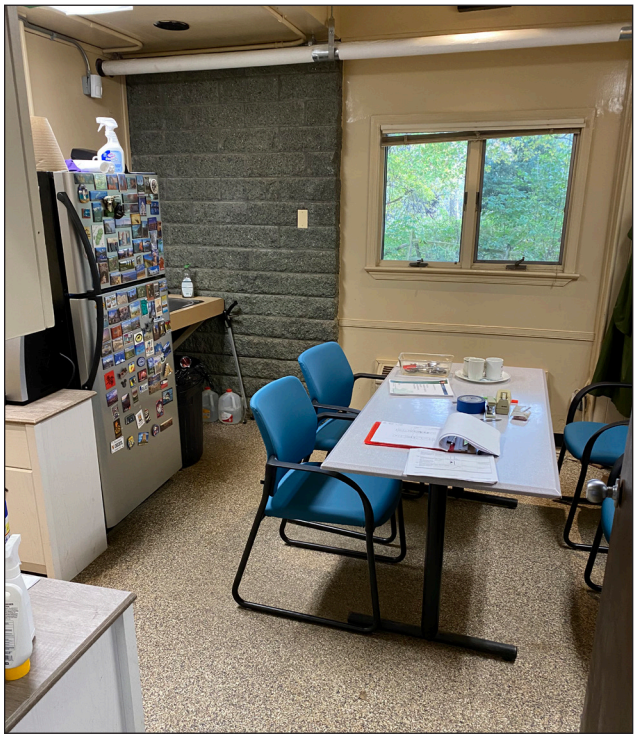


Figure 155. Staff kitchen area on first floor of Building A-B. (CRTKL, 2021)



Figure 156. Platform lift access as seen from the first floor office area. (CRTKL, 2021)



Figure 157. The first floor lobby at the platform lift currently has shelving within the required clearance for accessibility. (CRTKL, 2021)



Figure 158. The modified stair in Building A-B which reused parts of the original stair. (CRTKL, 2021)

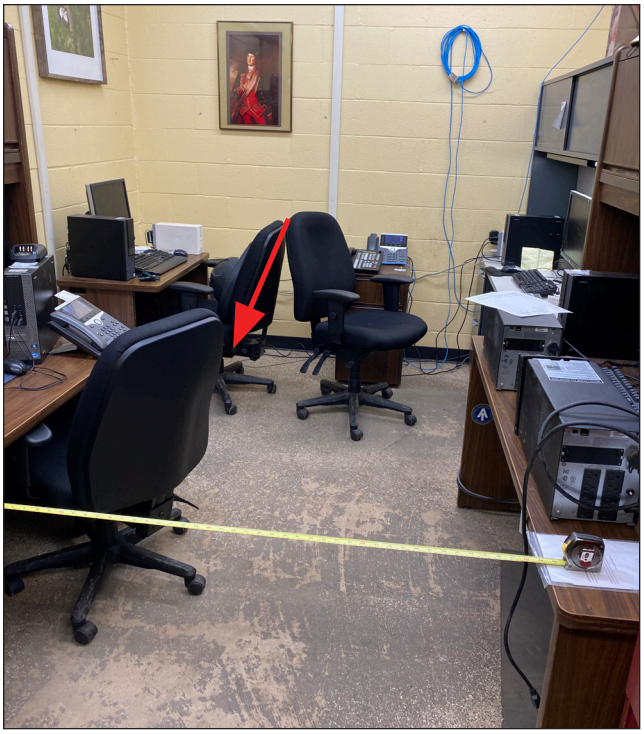


Figure 159. The office areas do not provide accessible clearance. (CRTKL, 2021)



Figure 160. The office area doors do not have accessible door hardware. (CRTKL, 2021)



Figure 161. The route to the public restrooms through the courtyard. (CRTKL, 2021)

restroom off the courtyard. The 1991 ADA Standards required door thresholds to be no more than 1/4 inch high, or no more than 1/2 to 3/4 inches high if the top 1/4 to 1/2 inches, respectively, is bevelled no more than 1:2. Most doors into and out of the building from the courtyard have thresholds that do not meet this standard.

Most doors used by visitors and exterior doors used by staff have accessible lever door handles. None of the interior doors in the first floor office areas have accessible handles (Figure 160). The staff restrooms/ locker rooms are not ADA accessible.

STAIRWELL

The stairwell in Building A-B, currently used exclusively for NPS staff, was reduced in size in 2008 to accommodate a platform lift. The stair was modified to reduce the impact on the historic fabric and does not meet the current ADA/ABA requirements. While original treads and handrails were reused, the landings were converted into winder treads, and the original handrails are different heights and do not meet minimum ABAAS or IBC (International Building Code) standards of graspability (Figure 158).

PLATFORM LIFT

The platform lift was installed in response to the needs of an employee who used a wheelchair. Currently, the lift is only used occasionally as needed for visitors who cannot manage the ramp. The lift cannot be used by visitors without assistance from an NPS staff member. Also, the interior dimensions of the lift do not comply with the code minimum of 36 in. x 48 in. (lift interior measures 33 in. x 49.5 in.). However, the size of the lift was constrained by the need to share limited space with the modified stair and to not impede the historic fabric of the Visitor Center, according to the NPS 2010 Environmental Assessment (Figure 156).

At the lower level where the platform lift is accessed, a shelving unit and temporary storage in the hallway space are currently obstructing the required ADA/ABA maneuvering clearance dimensions (Figure 157).

OFFICE, STAFF KITCHEN, LOCKER ROOMS, RESTROOMS

NPS Office space layout does not meet ADA/ABA standards for disabled access (Figure 159). The staff kitchen was added prior to 2003 in the former first floor public lobby space. The current layout does not meet ADA/ABA standards for disabled access. Significantly, it does not provide required turnaround clearance, counter height, access clearances, or meet reach requirements (Figure 155).

The staff locker rooms and restrooms are original fabric. The restrooms are accessed through the locker rooms which are too narrow to meet current ABA/ADA clearance requirements . The men's locker room is not currently used as a locker room but as the IT closet /storage and contains electronic equipment.

LIGHTING LEVELS

The Design Team observed disrepair of the exterior courtyard lights. Many lights mounted along the first level building facades are broken or missing bulbs. Several light fixtures are missing. The courtyard currently lacks proper light levels required by the Code and Accessibility requirements.

The Design Team visually observed existing interior light levels but did not conduct specific field light measurements. Many interior spaces appeared to have low light levels that may not meet Code and ABAAS requirements. Further investigations are needed to confirm if interior light levels will meet Code and future programmatic needs. Low light levels should be addressed by innovative solutions to maximize daylighting where possible.

SIGNAGE

The Visitor Center does not have signage indicating the accessible route into the building. There is currently no sign at the South ramp providing direction to the accessible route available at the north ramp, nor is there currently a sign directing visitors to the main entrance of the building at the top of the North ramp, or hours of operation. Signage should be provided to address this, not only for disabled access, but to indicate where the main entrance to the building is located for visitors approaching from the south side of the building. Permanent signage should be provided at both ramps and the main entrance with restroom locations.

The Visitor Center also has limited signage designating permanent rooms and spaces not likely to change over time, which is required by ABAAS. The signs that exist generally lack tactile characters or Braille, and many are not mounted in locations consistent with ADA requirements.

COURTYARD

The route leading from the second-floor building entrance of Building B-C to the public restrooms is not currently ABAAS compliant due to ongoing erosion of the courtyard. (Figures 148 and 161).

MECHANICAL SYSTEMS DESCRIPTION

Other than the mechanical systems, most of the MEP systems at the Great Falls Visitor Center are part of the original building construction. Some upgrades have been performed since 2010, notably the replacement of the main mechanical rooftop units, split systems serving offices and lockers, and the addition of restroom exhaust fans.

The auditorium and exhibition room are each served by their own 10-ton rooftop unit. According to the facility's staff, these units cannot maintain temperature or humidity in the spaces they serve and have been infrequently maintained and serviced. The units also have single-stage compressors that are sized for the maximum capacity which means they are oversized for the demand much of the year (outside of full occupancy at peak outside air temperatures).

An electrical floor heating coil system, embedded in the concrete of the exhibition room in 1969, has been abandoned in place and its condition is unknown.

The first floor office is conditioned by a 3-ton Split System Heat Pump. The condensing unit is located on the roof of the building while a ducted air handling unit is located in a mechanical closet inside the ground floor office. The unit was manufactured in 2014 and is in fair working condition. The unit is oversized for the small office, cycles on and off frequently, which causes wear and tear to the unit compressor, and creates humidity and comfort issues in the office. The insulation on the refrigerant piping on the roof is also torn.

The women's public restroom is conditioned by a 1-ton Liebert unit (mini-mate) and exhausted by an above ceiling exhaust fan. The air conditioning unit was manufactured in 2014 and is located near the door and cycles on/off frequently, causing temperature and humidity issues in the room. The Liebert mini-mate is meant for computer room applications and is overdesigned (and sized) for the first floor restroom.

The men's restroom is conditioned by a ductless split system ceiling cassette and is exhausted by an above ceiling exhaust fan that discharges to the outside. The intake louver that provides makeup air into the room is blocked with debris, and this is putting the men's restroom under negative pressure.

The corridor, men's, and women's restrooms are heated by electric baseboards and exhausted by a common plenum fan that discharges to the exterior wall. Both baseboards appeared in fair working condition.

The staff kitchen is cooled by a thru-wall air conditioning unit and heated by a ceiling-mounted electric heater. Both units appear to be in fair condition.

The first floor locker room is conditioned by a 3-ton Split System Heat Pump. The condensing unit is located on the first floor outside the building, while a ducted air handling unit is located inside the room (exposed). The room is also exhausted by a wall-mounted exhaust fan that discharges to the exterior wall. The unit was manufactured in 2013 and is in fair working condition. The unit is oversized for the small space, cycles on and off frequently, which causes wear and tear to the unit compressor, and creates humidity and comfort issues in the room.

The ground floor kitchen is conditioned by a 5-ton Split System Heat Pump. The condensing unit is located on the ground floor outside the building while the fan coil unit is located in the room (exposed). Cooking equipment is exhausted by a tubular/grease exhaust fan that discharges to the exterior wall. The split system age is unknown but the unit is in poor condition and seems to be inoperable.

The concession kitchen is equipped with two overhead air curtain fans. The age of the equipment is unknown, and the fans appear to be inoperable.

ELECTRICAL SYSTEM DESCRIPTION

The existing facility is served by a single pad-mount transformer located near the northeast corner of the building. The main service transformer is owned and maintained by Dominion Virginia Power Company. Two electrical services terminated in the main electrical room on the second floor. One service feeds an 800A distribution panelboard and the other service serves kitchen loads. Both electrical services are being metered by the utility. One service terminates in a Federal Pacific distribution panelboard rated at 800, 208Y/120V, 3-phase, 4-wire. Fused switches in the distribution panelboard provide overcurrent protection for branch circuit panelboards. The size for the kitchen is rated at 200A, 240V.

The electrical distribution equipment is in poor condition. The components are mostly of the original vintage manufactured by Federal Pacific which is no longer in operation and spare parts availability is of real concern.

Lighting fixtures and controls are generally in poor to marginal condition. The majority of lighting fixtures are beyond their useful service life and are of the older inefficient fluorescent and/or incandescent types. Some lighting fixtures are missing wrap-around acrylic lenses. Exterior lighting fixtures are similarly in poor condition; some fixtures are not in operation and the outdoor lighting control system is inoperable.

Emergency lighting is provided by battery-backed lighting fixtures. They are not installed throughout the facility as required by code for the path of egress. The existing emergency lighting units are not in operation. The battery-backed exit signs are also not working.

There are inadequate duplex receptacles in office areas. Power strips are used to serve multiple pieces of equipment and extension cords create tripping hazards.

The branch circuit panelboards serving the kitchen are in poor condition and are original to the building construction.

PLUMBING SYSTEM

The existing buildings are served by a duplex sewage ejector pump with a 4-inch sanitary sewer discharge and a 3-inch domestic water service. The incoming domestic water service is a 3-inch water line entering the building at the first floor at the pump/storage room (Building B-C) with a 2-inch domestic water meter. The existing buildings are not provided with a fire protection system.

The existing domestic water piping in the pump/storage room is in poor condition. Valves are rusted, and signs of previous leakage and condensation are noticeable. The existing water service is not provided with a backflow preventer, and the pipe is not insulated. A floor drain is not provided near the domestic water service as required by code.

The entire plumbing system, in both buildings, is connected to the duplex sewage ejector pump located in the pump/storage room (Building A-B). The 4-inch discharged drainpipe is pumped to the street's main sewer line. An odor of sewer gas was prevalent in the room, maybe due to a failing gasket.

There are three domestic electric water heaters. Water heater #1, which is 38 gallons with a 1-gallon expansion tank, is located in the pump/storage room and serves the men's public restroom. The water heater was installed in 2020 and is in good condition. Water heater #2 (no date), which is 50 gallons with an expansion tank, is located in the kitchen storage room and serves the kitchen. The water heater is floor-mounted and shows signs of rust. Water heater #3 (dated January 13, 2013), which is also 50 gallons with recirculating hot water pump without an expansion tank, is located in a storage room serving the women's restroom, two staff restrooms, and the lounge sink. This water heater is floor-mounted and shows signs of rust.

The existing plumbing fixtures are not the water saver types (low flow water fixtures). Staff toilets are provided with floor-mounted manual flush valves. Wall hung lavatories are provided with metering faucets. Pipes and 'P' traps under the lavatories are not insulated.

The concession kitchen is provided with a three-compartment sink, one hand sink, and an ice maker. The fixtures are not installed per today's plumbing and health codes as pipes are installed in the walking areas and can cause potential tripping hazards.

The roof drains are not provided with domes and the roof structures do not have proper sloping to the low points. The lower roof connecting the two buildings requires maintenance to remove leaves and tree debris. The roof drains appear to be in fair condition and sized adequately. See Appendix D for Roof Drains and Rain Leaders Sizing calculations.

LIFE SAFETY DESCRIPTION

FIRST FLOOR

At the first floor level, Building B-C, the west half of the structure, consists of concession kitchen, an office, a public men's restroom, and a pump room. These areas, outside of the men's restroom, are not open to the public. The kitchen and office have a single-leaf door between them. The kitchen has a double-leaf exit door that exits to the rear of the building. The office has a double door to the exterior (to the courtyard between buildings), but this door is labeled 'NO EXIT', forcing office occupants to egress through the kitchen. The men's restroom has a single-leaf door to the exterior courtyard with no exit sign. The pump room has a double-leaf door to the exterior courtyard with no exit sign. It is believed that the original design intent was that the exterior courtyard not be used for egress purposes. The rationale for not including the courtyard as an egress path is not known.

Building A-B, the east half of the structure, consists of two office spaces, staff restrooms and locker rooms, a staff kitchen, an interior stair to the second floor and a public women's restroom. These areas, other than the public women's restroom, are not open to the public. The office spaces are connected to each other through single-leaf doors, and the south office is connected to a corridor that serves as access to the staff restrooms and utility room. The corridor opens onto a hallway that serves as access to the staff kitchen, interior stair, and a door to the exterior courtyard without an exit sign. Each office area has a door to the exterior courtyard without an exit sign. The women's public restroom has a single-leaf door to the exterior courtyard without an exit sign.

SECOND FLOOR

At the second floor level, Building B-C, the west half of the structure consists of a lobby, bookstore, and exhibit area. All areas are open to one another. The main entrances and exits to the second floor are two double doors that exit to the exterior, each with exit signs. The east and west portions of the building are connected via a bridge.

The east half of the second floor consists of a lobby area, two electrical closets, an interior stair to the first floor, and an auditorium which consists of a seating area, a

storage closet, and a projector room. The lobby area has two doors to the exterior with exit signs. These doors are exit doors. However, as these doors lack panic hardware, they do not provide a compliant exiting path during normal operations. The electrical closet and janitor's closet open to the lobby, as does the interior stair and auditorium. The interior stair is not enclosed. The auditorium has two sets of double doors that open to the lobby, each with exit signs. The storage closet opens into the seating area with one single-leaf door. The projector room opens into the seating area with two single-leaf doors, although one door is blocked for access.

EXTERIOR DOORS

Many doors do not meet Life Safety Requirements. The Design Team observed several conditions that are not permitted:

- Exterior exit doors, which lack panic bars, are provided with locking hardware that could prevent people from exiting.
- Exit door in concession area has one leaf blocked, an exit sign that is not illuminated, and contains locking hardware.
- Several doors to the exterior are not provided with exit signs. In addition, the exterior door in the office next to the concession space is labeled 'NO EXIT'.
- In areas with more than 100 persons, the exit doors are required to have panic bars. The second floor has an occupant load over 100 persons, but the exterior exit doors do not have panic bars.
- As only the North ramp has a fully compliant ADA/ABA ramp, only the two exit doors on the north facade are interpreted as egress doors, and they are right next to each other. However, when more than one exit is required, the two exits shall be remote.

FIRE PROTECTION SYSTEMS DESCRIPTION

The building is currently not protected by sprinklers. The Authority Having Jurisdiction (AHJ has determined that any significant rehabilitation will include the installation of a fire sprinkler system.

FIRE ALARM SYSTEM

The fire alarm system serving the building is fed from a Silent Knight IntelliKnight Model 5820XL control panel, located in an electrical closet on the east half of the first floor. The system contains annunciators located on the first and second floor, audible and visual notification appliances throughout, manual pull stations at most exterior doors, detection in most rooms throughout, and duct detectors. For detection, smoke detectors are most commonly used, and heat detectors are used when smoke detection may not be feasible.

HAZARDOUS MATERIALS SURVEY REPORT

SUMMARY

Aerosol Monitoring & Analysis, Inc. (AMA) was contracted to perform a hazardous materials survey of the accessible interior and exterior areas at the Great Falls Visitor Center in McLean, Virginia. No sub-grade assessments were conducted during this investigation. The purpose of the investigation was to identify potential hazardous materials such as asbestos-containing materials (ACM), lead-based paint (LBP), lead-containing surface coatings, and fluorescent fixtures containing mercury vapor lamps (MVL) and polychlorinated biphenyls (PCB) within the building. On October 25 and 26, 2021, AMA staff were on site to identify and evaluate ACMs, LBP, lead surface coatings, MVLs, and PCBs. See Appendix B for a full Hazardous Materials Survey Report.

ASBESTOS-CONTAINING MATERIALS

AMA collected forty eight (48) bulk samples of suspect ACMs, which were identified throughout the accessible interior and exterior areas of the building. Of the 48 bulk samples collected, five (5) were identified as containing greater than or equal to one percent (>1%) asbestos by polarized light microscopy (PLM) analysis. The Environmental Protection Agency (EPA) and the Commonwealth of Virginia have determined that materials containing >1% asbestos are considered asbestos containing materials and must be treated as such. Based on the results of the investigation, the following materials were found to be asbestos containing by laboratory analysis and/or assumption:

- Mudded pipe fitting insulation
- Expansion joint caulk
- Fire door (assumed ACM)

LEAD-BASED PAINT

Sixty-five (65) surfaces finished with suspect lead-based paint (LBP) were tested during the screening with the use of a NITON model XLP 300 x-ray fluorescence spectrum analyzer (XRF). Eight (8) of the surfaces tested were determined to

contain >1.0 milligram of lead per square centimeter (mg/cm2) of surface area tested, the amount defined as a lead-containing substance according to the EPA and Commonwealth of Virginia. Refer to Table II at the end of the report for a listing of positive LBP components. In general, the following building components were finished with lead based paint and/or lead surface coatings:

- Structural steel
- Metal ladders
- Ceramic/porcelain sinks
- Metal stair spindles
- Yellow concrete floor stripe

POLYCHLORINATED BIPHENYL'S

Small capacitors and fluorescent light ballasts manufactured after 1978 have been labeled "NO PCB's" by the manufacturers. Prior to 1978, small capacitors and fluorescent light ballasts were not labeled as to whether they contained PCBs; therefore, all unlabeled capacitors and ballasts are assumed to contain PCBs.

AMA performed a visual evaluation of representative light fixture ballasts utilizing a random selection method. Any ballast absent of the "No PCB's" label is assumed to contain PCBs. Based on this assessment, AMA did not identify any PCB-containing light ballasts in the building. As some ballasts were inaccessible at the time of the inspection, each light fixture should be inspected and appropriately disposed of during renovation/ demolition activities. AMA identified approximately 44 light ballasts throughout the building.

MERCURY VAPOR LAMPS

Reportable quantities of mercury are often found in fluorescent lamps. Based on the observations at the site, it was determined that there are approximately 88 fluorescent lamps or bulbs. It should be assumed that these lamps have mercury levels requiring proper removal and waste disposal.

STRUCTURAL DESCRIPTION SUMMARY

The Great Falls Park Visitor Center was built in 1966 and consists of two building structures and a bridge linking them. The buildings house exhibition space, an auditorium, a concession stand, park restrooms and park staff offices. The structures are an unusual combination of typical wood, concrete masonry and cast-in-place concrete construction. The roof structure is a wood framed structure sitting on interior walls and an exterior sloped purlin through a steeply mitered joint. The elevated level is a cast-in-place concrete slab sitting on walls. All walls are concrete masonry units and some sections stop at the underside of the elevated slab where others extend up to the main roof level. Foundations are continuous wall footings sitting on rock which are assumed to vary in elevation (Figure 162). The structure has had several minor renovations and mechanical upgrades since its construction but very few changes to the original structure have been made. A structural roof repair drawing package was developed in 1981 and included repair details for the wood roof structure, but these repairs were not performed. A concurrent project at the visitor center is revising exterior grading and site design, including site drainage, though no specific details have been shared at this time.

The structure generally appears to be performing well with several notable structural items. None of the conditions observed appear to be of immediate concern, however monitoring or maintenance type repairs are recommended.

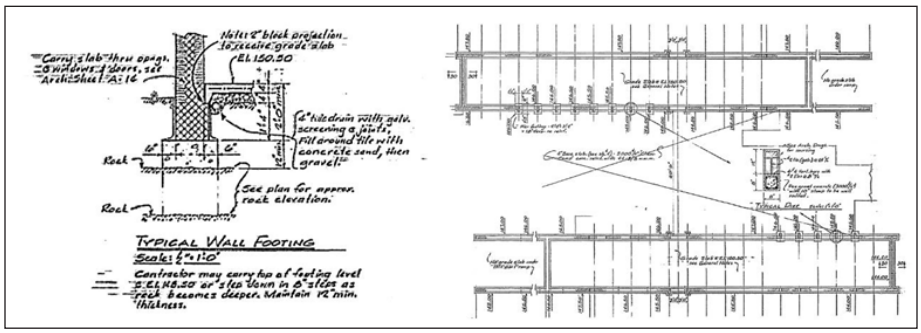


Figure 162. Foundation plan & typical detail, excerpt from original 1966 structural drawings.

STRUCTURAL DESCRIPTION / FOUNDATIONS

The foundations are a cast-in-place concrete wall footing continuous below the load bearing CMU walls. There are additional CMU walls that are interior on the ground level which are partition walls and therefore do not have wall footings. The foundations were intended to sit on rock per the original typical detail and the original plan gave estimated footing depths to rock. Typical wall foundation construction is unreinforced 1'-9" wide by twelve inch deep minimum, 2.5 ksi (kilopounds per square inch) concrete.

The existing slab on grade is four inches of concrete reinforced with welded wire reinforcement (WWR) over a polyvinyl chloride (PVC) sheet, a four inch washed stone layer and 2'-0"+ of fill, assuming the excavation was level over the building pad . The original structural detail for the typical wall footing (see Figure 162) shows a two inch ledge in the CMU for the slab on grade to turn down and sit on. This ledge should prevent settlement of the slab on grade, however two inches is an unusually small dimension for this purpose. The typical detail also shows a four inch drain tile around the perimeter of the exterior wall which if working properly should prevent ground water from percolating up through the slab on grade. Typical slab-on-grade construction is four inch normal weight 2.5 ksi concrete slab with WWR 6x6 8/8 reinforcement.

STRUCTURAL DESCRIPTION / WALLS

The walls are all load bearing masonry, composed of a combination of backup CMU and exposed split CMU with a textured finish. Some walls are used structurally; however the CMU assembly and material properties don't seem to be specified on the structural drawings. The structural plans show only the load bearing walls (Figures 162 and 163). The typical architectural wall sections show a twelve inch nominal wall assembly made up of an eight inch light weight concrete block and a four inch split CMU block with a textured surface on the exposed to view surface (Figure 163). The structural drawings don't indicate any reinforcing of the CMU block. The architectural sections only indicate that the CMU block is solid and has joint reinforcing at 2'-0" on center vertically. Based on these details it is expected that the block wall is likely a solid unreinforced masonry wall with joint reinforcing to make the different wythes of the CMU act compositely. The elevated slab extends beyond the walls from the ground level so above the first floor there is an exposed to view surface of the wall on both sides. This wall assembly consists of four inch split CMU block with a textured

surface, a four inch split CMU block and another four inch split CMU block with a textured surface. The walls align from the ground level to the first level but are interrupted by the first floor framing. Typical first floor wall construction is twelve inch unreinforced solid light weight concrete masonry units. Note that joint reinforcing is located at 2'-0" o.c. (on-center) and spaced vertically (Figure 163).

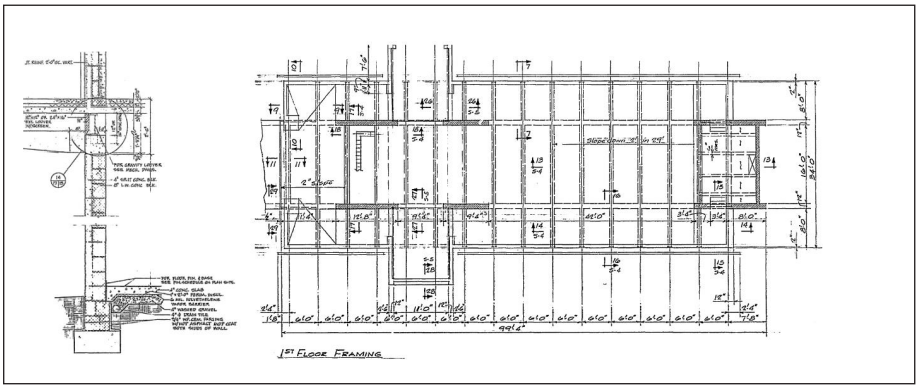


Figure 163. Typical architectural wall section and first floor Structural Plan showing walls continuing up to main roof level from original structural drawings. (Silman, 2021)

STRUCTURAL DESCRIPTION / FLOOR FRAMING

The elevated floor level is a one-way concrete slab spanning between rib beams spaced at 6'-0" o.c. typically (see Figure 164). The rib beams span 16'-0" between the ground level masonry walls and cantilever 8'-0" on each side. The concrete is a 115 pcf (pounds per cubic foot) light weight concrete with a 3,000 psi compressive strength for all floor framing elements. The slab is typically 3-1/2 inches thick with a draped wire mesh reinforcing, however at the auditorium it is thicker based on the slope of the slab and alignment with rib beams. All floors appear to have a topping assembly of two inches of insulation above the structural slab and a 2-1/2 inch light weight topping that is also reinforced with wire mesh. Typical slab construction is 3-1/2 inch light weight 3,000 psi (pounds per square inch) concrete one-way slab with 4x4 6/6 wire mesh.

The rib beams vary in depth depending on location and elevation of the slab surface and are typically 8 inches wide. The beams typically have two #7 reinforcing bars at the bottom, two to four #4 side face reinforcing bars based on depth and two #9 top bars. Stirrups are #3 tied stirrups at eight to twelve inches on center, depending on location.

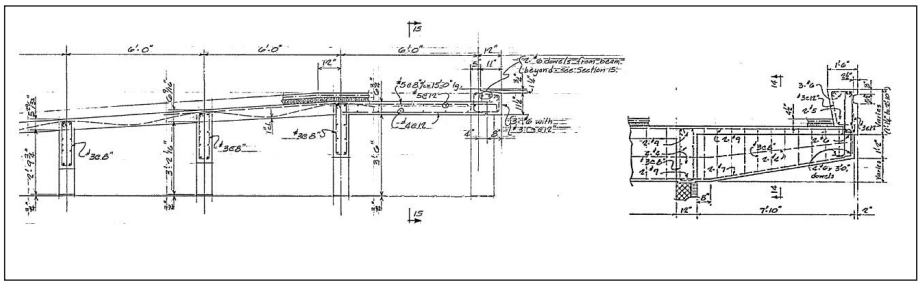


Figure 164. Floor slab structural sections from original 1966 structural drawings.

The typical rib beam is eight inches wide by 2'-0" to 4'-0" deep 3,000 psi light weight concrete with varying reinforcing.

There is an elevated concrete bridge structure connecting the two buildings (Figure 165). The bridge structure consists of a concrete floor and roof slab between the typical rib beams. The bridge slabs are six inches thick and reinforced with deformed bar. The bridge floor slab construction is six inch light weight three ksi

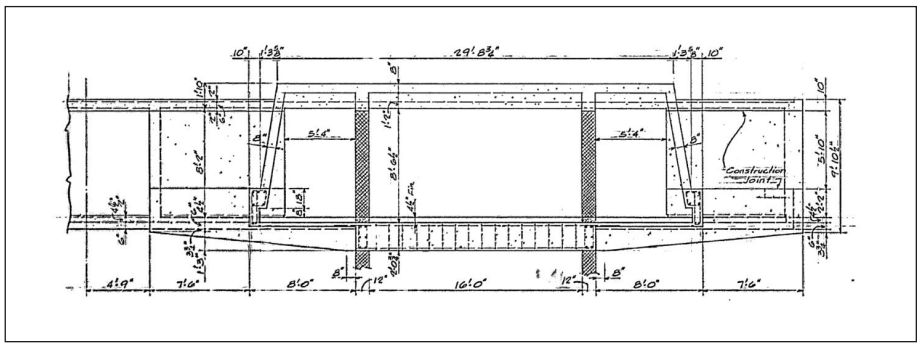


Figure 165. Structural section through link bridge from original 1966 structural drawings

concrete with #5 reinforcing bars at eight inches on center, each way bottom bars and #4 reinforcing bars at twelve inches on center transverse top bars.

STRUCTURAL DESCRIPTION / ROOF FRAMING

The roof is framed with sawn lumber purlins spanning between the walls and extending out to a steeply mitered vertical purlin/post member (Figure 166). The vertical purlin/post member is connected to a slab edge up-turned beam with cast-in threaded inserts to to bolt it in place (Figure 167). Typical purlin construction is 4x16 sawn lumber, Douglas Fir with a bending value of 1,900 psi.

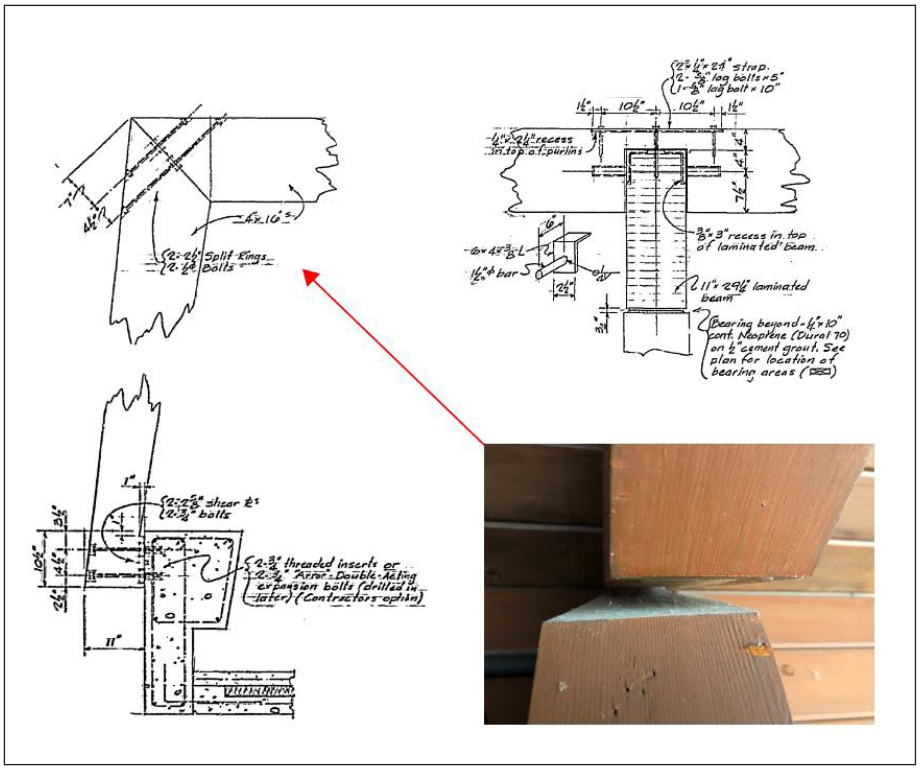


Figure 166. Structural section, original structural details, and photo of existing miter connection. (Silman, 2021)

A typical laminated beam at Great Falls Visitor Center varies in size, but is typically approximately a 11x29 inch Douglas Fir member with a bending value of 2,900 psi, a shear value of 165 psi, and a modulus of elasticity of 1,800 ksi.

The roof deck is a two inch thick by six inch wide tongue-and-groove plank slab installed in a random layup method that spans 6'-0" typically between purlins (Figure 167). There is a two inch insulation layer above the deck and plywood sheathing is applied on top of the deck before the roofing. The lighting in the auditorium that is not part of the track-lighting appears like it may have wiring above the deck in the insulation layer based on not seeing any wiring to the lights. Typical roof deck construction is 2"x6" tongue-and-groove plank installed in random layup method, Western Red Cedar.

Through the document review a 1981 drawing package titled “Repair to Visitor Center Roof Framing System” was found. This package developed repair details for the miter connection and the purlin/post connection to the first floor slab; however, per Silman’s field verification, these repairs have not been implemented. The drawing set also indicates what the existing condition was in 1981 (Figure 168).

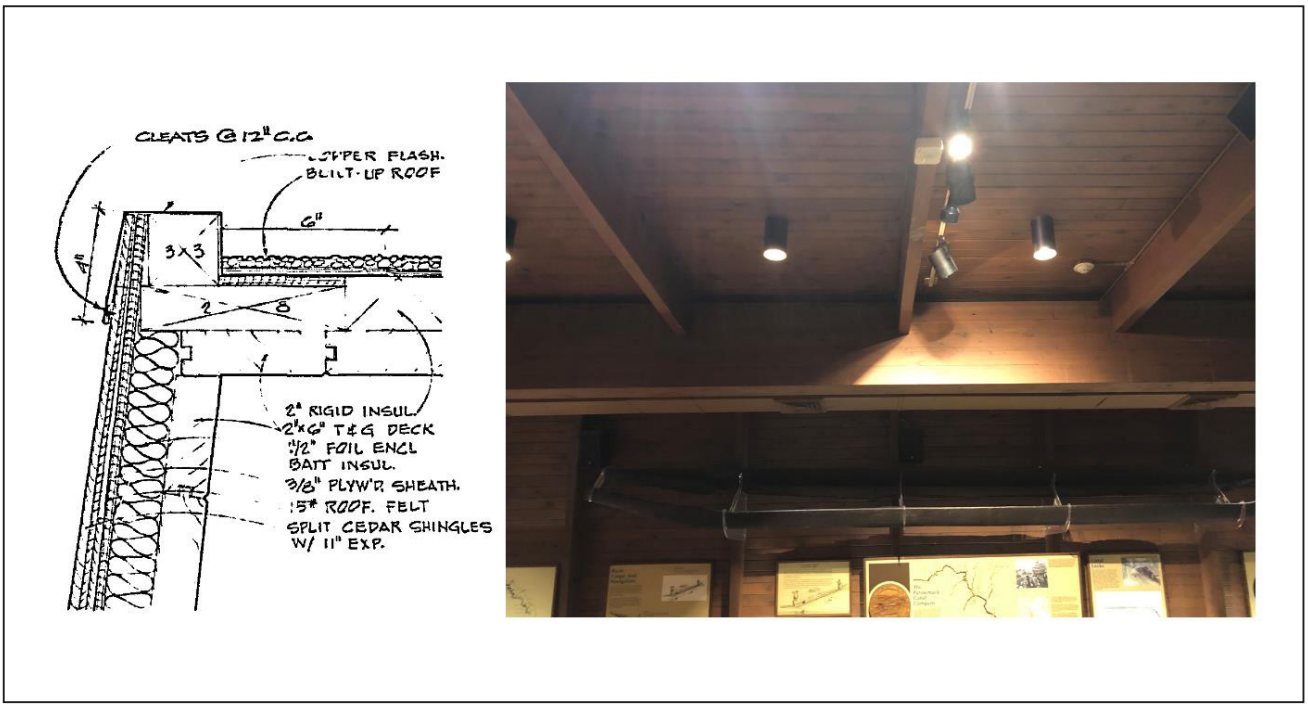


Figure 167. Architectural roofing assembly section from original 1966 structural drawings, and photo of existing connection condition. (Silman, 2021)

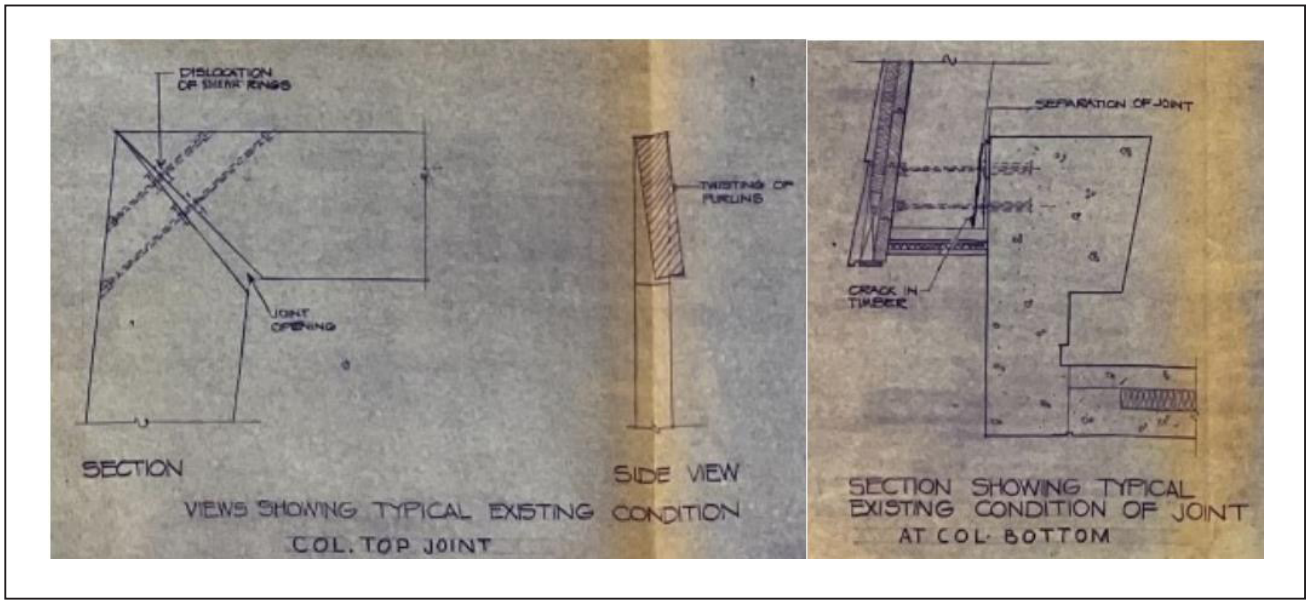


Figure 168. 1981 Structural repair drawings show condition of framing elements in 1981. (National Park Service)

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Chapter 4: Character Defining Features

This chapter compiles a list of features of the Great Falls Park Visitor Center that convey its significance and manifest the distinctive qualities of Mission 66 architecture and the visitor center's period of significance (1968). The chapter also includes a discussion of the building's integrity according to National Register of Historic Places standards.

PLAN

The plan of the visitor center included breaking down the building's functions into two units (A-B and B-C) placed parallel to each other and connected with a second floor bridge. Within this arrangement, architect Kent Cooper created a plan that worked on both the first and second floors, based on a dominant north-south orientation, with a secondary east-west axis. These features of the building plan have remained constant since construction was completed.

MASSING

As was characteristic of Mission 66 architecture in the National Park Service, the visitor center consists of two low, horizontally oriented masses designed to visually diminish the building's bulk so as not to detract from the park's primary attractions (the ruins of the Patowmack Canal and the Great Falls of the Potomac River) or the surrounding natural scenery. No additions have been made to the visitor center that diverge from the original massing.

CIRCULATION

Mission 66 planners considered circulation, both through the park and through buildings such as visitor centers, of primary importance in dealing with the increasing number of visitors to national parks that began in the 1950s. Visitor centers were frequently placed near a primary park road and in close proximity to a park's primary attractions. Within the buildings, designers took advantage of the capacities of modern building materials to produce open plans that suited the efficient movement of people through space that the National Park Service sought in its Mission 66-era construction.

The Great Falls Park Visitor Center as designed satisfied all these design goals. Placed between the primary park road (Old Dominion Drive) and the park's most important assets (the canal and Great Falls), the visitor center accomplished the goal of bringing visitors quickly to an interpretive facility placed immediately next

to those attractions. On the interior, Cooper developed a circulation pattern that controlled visitor flow, as NPS desired, but also provided flexibility that kept visitors moving through the building toward the canal and the falls. The primary path took visitors from the ramp north of Building B-C into the information area and the exhibit space, across the bridge to the auditorium in Building A-B for a film or lecture, and then down the South ramp to the canal and the falls. For visitors who took the opportunity provided by the visitor center's amenities (restrooms, dining facilities, and picnic tables and benches on the lower level and courtyard, which Mission 66 planners also considered integral to a visitor center's purpose), the stair in Building A-B provided the opportunity to rejoin the primary circulation.

MATERIALS AND FINISHES

The material palette of the visitor center consists of modern building materials with elements that echo the canal era of the nineteenth century. Smooth-finished, structural concrete, painted concrete block partitions, plate and sheet glass, and split concrete block facing represent the modern materials. The blue-gray color of the split concrete blocks was intended to recall the rocky outcrops of the falls landscape, while more natural materials, such as cedar roof shingles and stained wood in the auditorium and exhibit space ribs and walls, echoed the houses and canal boats of the nineteenth-century. These materials still characterize the primary materials of the visitor center.

COMPOSITION

Cooper composed the materials, spaces, and functions of the visitor center with a clarity consistent with Modernist design goals. Buildings A-B and B-C mirror each other in plan and are offset so that circulation is obvious. The building's concrete structure is visible on the exterior, as are finishes that echo the natural world. Elements such as the wood grilles between split concrete block walls call out focal points, including circulation features. The design also functioned in an expressionistic way, as in the use of the split east and west entrance and exit doors intended to recall circulation along the gunwales of canal boats.

SETTING

While the landscape around the visitor center is not addressed as part of the historic structure report, the setting of the building is an integral part of its significance and will therefore be mentioned briefly here. Mission 66 visitor centers were planned to be located near both a park's primary circulation corridor and its most important

attractions. They were also intended to recede into the natural setting in order to occupy a secondary role in the visitor's experience. The Great Falls Park Visitor Center is located in such a setting – near Old Dominion Drive and the Patowmack Canal ruins and within a developed area characterized by abundant tree growth. This setting therefore helps to convey its significance as a Mission 66 construction.

INTEGRITY

The National Register of Historic Places evaluates seven aspects of integrity to determine whether a historical resource is capable of conveying its significance. These aspects are location, design, setting, materials, workmanship, feeling, and association. The Great Falls Park Visitor Center ranks high in all seven of these categories. The building remains in its original location, and the setting around the building has changed little since its completion. Original materials remain generally unchanged, with the exception of floor coverings and door replacements. The most obvious change to architect Kent Cooper's design relates to its original circulation. The design provided control of visitor flow, while also providing flexibility within that flow, and evoked aspects of moving around in a canal boat. The alterations to the North entrance and relocation of the ranger information desk has obscured, if not prevented, an understanding of the circulation pattern that Cooper designed. The flow planned from the ramp into Building B-C across the bridge to Building A-B and out of its South ramp has been altered so that visitors both enter and exit through Building B-C. The stair hall in Building A-B, originally part of the integrated circulation plan, has now become mainly circulation for park employees and visitors using the accessible lift. The cross axis circulation has been compromised by the closure of the ground floor doors on the east façade of Building A-B and the west façade of Building B-C. Despite these changes, the planned circulation remains apparent and could be reinstated. The Great Falls Park Visitor Center also retains a high degree of integrity of feeling (of a Modernist building of its period) and association with the design principles and goals of a National Park Service building designed and constructed during the Mission 66 period.

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CHAPTER 5 : CONDITIONS ASSESSMENT

The condition of the Great Falls Park Visitor Center was assessed by the Design Team during a visual survey on October 26, 2021. The CRTKL and the rest of the consultants also reviewed various previous reports, documents and drawings provided by the National Park Service.

The American Society for Testing and Materials (ASTM) reference standard E-2018-01, titled, The Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process was adopted for use by the Historic Preservation Training Center and the National Capital Regional Office. The condition assessment definitions used for this HSR are based on those outlined in the NPS PFMD's Asset Management Process (AMP), the Facilities Management Software System (FMSS) Uniformat methodology, and the Facility Condition Assessment Survey (FCAS).

QUALITATIVE CONDITION RATINGS

GOOD

- Routine maintenance should be sufficient to maintain the current condition; and/ or
- A cyclic maintenance or repair/rehabilitation project is not specifically required to maintain the current condition or correct deficiencies

FAIR

- The feature generally provides an adequate level of service to operations, but
- The feature requires more than routine maintenance, and
- Cyclic maintenance or repair/rehabilitation work may be required in the future

POOR

- Feature requires immediate attention
- Routine maintenance is needed at higher level of effort to meet significant safety and legal requirements
- Cyclic maintenance should be scheduled for the current year
- A special repair/rehabilitation project should be requested consistent with park requirements, priorities, and long- term management objectives

MAINTENANCE DEFICIENCY PRIORITY RATINGS

(10- YEAR RATING PERIOD)

MINOR- Short Term/ Long- Term Priority

- This rating indicates standard preventative maintenance priorities and preservation methods have not been followed
- There is reduced life expectancy of affected adjacent or related materials and/or systems within 5 to 10 years and beyond;
- There is condition with long-term impact within 5 to 10 years and beyond

SERIOUS - Immediate/Short- Term Priority

- This rating defines a deteriorated condition that if not corrected within 1 to 5 years will result in the failure of the feature
- A threat to the health and/ or safety of the user may occur within 1 to 5 years if the-ongoing deterioration is not corrected
- There is ongoing deterioration of adjacent or related materials and/or features as a result of the feature's deficiency

CRITICAL- Immediate Priority

- This rating defines an advanced state of deterioration which has resulted in the failure of a feature or will result in the failure of a feature if not corrected within year
- There is accelerated deterioration of adjacent or related materials or systems as a result of the feature's deficiencies if not corrected within 1 year
- There is immediate threat to the health and safety of the user
- There is failure to meet a legislated requirement

NOT RATED

- The feature was not rated as it was not extant at the time of the report or is noncontributing removed, and is not planned to be replaced.



Figure 169. Great Falls Visitor Center in 1969, looking north. (MRCE)

SUMMARY OF CONDITIONS

Based upon FMSS terminology, as previously defined, the Great Falls Visitor Center has been rated as follows:

Exterior Building Features

Overall Condition Rating: Fair

Overall Deficiency Rating: Minor

Interior Building Features

Overall Condition Rating: Fair

Overall Deficiency Rating: Minor

A summary of the building's component features with the most Critical and Serious Maintenance Deficiencies listed in priority order as found in the Summary of Conditions table are as follows:

- The asphalt roof membrane is in poor condition and the roof drainage is not sloped to drain the roof completely. The main roof is to be replaced in 2023.
- The domestic water piping in the pump room is rusted, with signs of previous leakage and condensation. There is no backflow preventer and the pipe is uninsulated. There is no floor drain located near the service lines.
- Two of the three water heaters in the building show signs of rust and require replacement.
- The electric baseboard heaters, exhaust fans, and forced-air mechanical systems are aging, inefficient and should be replaced.
- There is no fire sprinkler system in the building. The existing fire alarm system does not meet code in several aspects and should be reviewed.
- The electrical system, lighting, emergency exit lighting and panelboards in the building are aging and require full replacement.

Major Group Element	Group Elements	Individual Elements	Material	Qualitative Condition Rating	Maintenance Deficiency Priority
A Substructure	A10 Foundations	A1010 Standard Foundations	Concrete	Good	Minor
		A1030 Slab on Grade	Concrete	Fair	Minor
B Shell	B10 Superstructure	B1010 Floor Construction	Concrete	Good	Minor
		B1020 Ramps	Concrete Masonary	Good	Minor
			Steel/wood handrails	Poor	Serious
		B1030 Roof Construction	Wood (Framing)	Fair	Minor
	B20 Exterior Enclosure	B2010 Exterior Walls	CMU	Fair	Minor
			Wood Framing with Wood Shakes, Wood Siding	Fair	Serious
			Exposed Concrete	Good	Minor
		B2020 Exterior Windows	Wood-Framed	Fair	Minor
			Metal-Framed	Fair	Serious
		B2030 Exterior Doors	Wood-Framed and Glass	Poor	Critical
	B30 Roofing	B3010 Roof Coverings	Modified-Bitumen	Poor	Critical
		B3020 Roof Openings	Metal Hatches	Poor	Critical

Major Group Element	Group Elements	Individual Elements	Material	Qualitative Condition Rating	Maintenance Deficiency Priority
C Interiors	C10 Interior Construction	C1010 Partitions	CMU	Good	Minor
			Wood Grille over CMU	Good	Minor
		C1020 Interior Doors	Wood	Poor	Critical
	C20 Stairs	C2010 Stair Construction	Steel with Wood Treads	Good	Minor
	C30 Interior Finishes	C3010 Wall Finishes	Paint over CMU, Split-face CMU, Stained T&G wood, Unfinished concrete	Good	Minor
		C3020 Floor Finishes	Paint, Carpert Tile, Unfinished Concrete	Fair	Minor
		C3030 Ceiling Finishes	Stained T&G Wood, Unfinished Concrete, Paint	Good	Minor
D Services	D10 Conveying	D1010 Elevators & Lifts	Metal Platform Lift	Good	Minor
	D20 Plumbing	D2010 Plumbing Fixtures	China/ Porcelain	Good	Minor
		D2020 Domestic Water Service & Distribution	Copper	Poor	Critical
		D2030 Sanitary Waste	Various	Fair	Serious
		D2040 Roof Drain System	Unknown	Poor	Critical
		D2050 Sewage Ejector System	Copper	Poor	Critical
		D2090 Water Heaters	Metal	Fair	Serious

Major Group Element	Group Elements	Individual Elements	Material	Qualitative Condition Rating	Maintenance Deficiency Priority
D Services	D30 HVAC	D3020 Heating Systems Office area Electric Baseboard Heater, Staff Kitchen cabinet unit heater	Metal	Fair	Minor
		D3050.01 Auditorium 10-Ton Rooftop Unit	Metal	Poor	Serious
		D3050.02 Office 3-Ton Split System Heat Pump	Metal	Fair	Minor
		D3050.03 Women's restroom 1-Ton Liebert Unit (mini-mate)	Metal	Fair	Minor
		D3050.04 Staff Kitchen thru-wall AC Unit	Metal	Fair	Minor
		D3050.05 Exhibition room 10-Ton Split System Heat Pump	Metal	Poor	Serious
		D3050.06 3-Ton Split System Heat Pump	Metal	Fair	Serious
		D3050.07 Concession kitchen 5-Ton Split System Heat Pump	Metal	Poor	Serious
		D3090 Other HVAC Systems and Equipment Concession kitchen Air Curtain Fan, Men's restroom Ductless Split Unit	Metal	Poor	Serious
	D40 Fire Protection	D4010 Fire Sprinkler System	Nonexistent	Poor	Serious

Major Group Element	Group Elements	Individual Elements	Material	Qualitative Condition Rating	Maintenance Deficiency Priority
D Services	D50 Electrical	D5010 Electrical Service and Electrical Distribution Equipment	Steel/Metal	Poor	Critical
		D5020 Lighting System, Controls	Various	Poor	Critical
		D5030 Emergency Lighting and Exit Signs	Various	Poor	Critical
		D5037 Fire Alarm System	Copper wire and plastic	Poor	Critical
		D5090 Receptacles and Branch Circuits	Various	Poor	Critical
E Equipment & Furnishings	E20 Furnishings	E2010 Fixed Furnishings	Millwork	Good	Minor
F Special Construction & Demolition	F20 Selective Building Demolition	F2020 Hazardous Components Abatement	Asbestos and Lead	Fair	Serious



Figure 170. Great Falls Visitor Center, view from the parking lot. Looking southeast toward North ramp of Building B-C. (CRTKL, 2021)

INDIVIDUAL CONDITIONS

Foundations were not visible and there do not appear to be other signs that would indicate foundation damage.

Deficiency Description. The small crack on the base of the CMU wall at the southeast corner of the southeast building could be a result of minor settling. However, foundations should be sitting on rock so it is unlikely there is a settlement issue. That area is known to be a low point for drainage and where the slab-on-grade settlement on the interior is happening.

Maintenance Recommendations. If the slab on grade is replaced or a probe is done to determine the source of the slab-on-grade settlement is done, then it is recommended to include observing the foundation to verify it is in good condition.

Major Group Element
A Substructure

Group Elements
A10 Foundations

Individual Elements
A1010 Standard Foundations

Material
Concrete

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

Major Group Element
A Substructure

Group Elements
A10 Foundations

Individual Elements
A1030 Slab on Grade

Material
Concreate

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

Sections of the slab on grade in the south-east corner of Building A-B and the north-middle of Building B-C have settled. While the wall foundations are sitting on rock, the slab on grade is sitting on the fill and a layer of gravel, per the original detail shown in Figure 171. The thickness of the fill likely means that there is not enough thickness of soil to be concerned about compressibility of soils, so the only other concern would be erosion or washout.

Deficiency Description. The slab on grade has some cracking but nothing that is of a structural concern. Similarly, the slab on grade is not level as a result of the settlement but also not a structural concern.

Maintenance Recommendations. For a short-term repair, the cracks can be filled and a self-leveling topping slab installed as needed to make the floor level. Note that if the source of the settlement is not addressed, this short-term solution may not last long. To investigate the source of the settlement, either a test pit is needed to observe where the settlement is happening, or it can be monitored to see if exterior drainage improvements prevent further movement. The more durable long-term repair is to replace the sections of slab on grade; however, again the source of the settlement should be resolved before doing this.



Figure 171. Hairline crack (top-left), plan location of photos (top-right, excerpt from original structural drawings), slab-on-grade settlement (bottom-left), slab-on-grade settlement (bottom-right). (Silman, 2021)

The concrete rib beam and slab floor framing system is in good condition with no significant issues noted. The overall system is robust because of the number and configuration of the rib beams, however the existing slab has limited capacity because it is very thin at 3-1/2". Further, the 2-1/2" topping slab while reinforced is a thin slab that can be damaged by heavy point loads. Point loading should be distributed over an area to limit the equivalent area loading to the original design pressure of 100psf or aligned over top of rib beams.

Deficiency Description. The exposed surface of the concrete slab and rib beams appears to be performing well for its age. There are minor cracks and spalls throughout (Figures 172-174), but nothing of structural concern because the amount of concrete or steel section loss is minimal. The slab is reinforced with small diameter wire mesh reinforcing which is more susceptible to corrosion because it is less material and corrodes faster. Also, at most exterior locations where the existing reinforcing was exposed it was observed closer to the concrete surface than the typical ¾" concrete cover.

Maintenance Recommendations. The condition is not a concern at the moment, but it is recommended to do repairs in the mid-term of 3-5 years to avoid conditions developing into more substantial repairs. The repairs should include cleaning of biological growth, patching of spalls, patching of cracks and cleaning of exposed reinforcing. Portions of the exposed concrete slab edges and soffits on the north half of the east building are stained red/orange (Figure 175) or green, but the staining appears to be cosmetic and unrelated to water-borne materials or corroding reinforcing.

Major Group Element
B Shell

Group Elements
B10 Superstructure

Individual Elements
B1010 Floor Construction

Material
Concrete

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor



Figure 172. Spalled area with exposed reinforcement. (Silman, 2021)



Figure 173. Building A-B access hatch. (Silman, 2021)



Figure 174. Prior patching of the spalled area. (Silman,2021)



Figure 175. Concrete floor structure with exterior staining. (SGH, 2021)

Major Group Element
B Shell

Group Elements
B10 Superstructure

Individual Elements
B1020 Ramps

Material
Concrete Masonry

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

The ramp walls are in good condition. Refer to the exterior wall (B2010 Exterior Walls - CMU) review and comments because they have a similar construction and condition to the building walls.

The ramps extend over grade and over occupied space. Water testing and diagnostic openings were not included in the scope of work for this report. Based on observations by the Design Team and reported by NPS personnel during the condition assessment, the position of water leakage corresponds with the transition between construction over grade and construction over occupied space along the site walls abutting the ramps.

Deficiency Description. Ramp finishes, visible perimeter seals, and concealed waterproofing are exhibiting signs of deterioration and are reaching the end of their service life. We note the following general comments regarding the condition of the ramps:

- NPS personnel reported that there was previously water infiltration in the Building A-B women's restroom below the South ramp, but that the ceiling tiles had been replaced recently thereby eliminating substantial evidence of the infiltration. At the time of our visit, we observed minor staining of the ceiling tiles near the west-facing ramp wall aligned with the ramp wall control joint.
- On the South ramp, we saw the existing waterproofing membrane through a discontinuity in the ramp perimeter sealant at the parapet wall. The waterproofing membrane turns up the parapet to the height of the topping slab. Although it is generally concealed by the perimeter sealant, the waterproofing membrane is embrittled and has poor termination detailing, which likely contributes to the leakage nearby into the women's restroom.
- In the mechanical room and storage area below the North ramp, we observed widespread water infiltration entering through the control joint in the ceiling above, through the control joint in the walls, and through the perimeter joint between the ramp slab and the CMU walls. The North ramp was partially reconstructed in 2010; the reconstruction project documents do not describe waterproofing replacement. It is possible that the original waterproofing membrane was removed but not replaced in kind, contributing to widespread water infiltration.
- The CMU and mortar composing the ramp walls are in generally good condition without signs of cracking or distress except at courses that have steel bed joint reinforcing. On Building A-B, we observed loose and spalling mortar due to corroded bed joint reinforcing. There appears to be one to two courses on each ramp wall elevation with steel reinforcing in the bed joint, each experiencing corrosion that forces mortar spalling.
- Efflorescence stains both site walls of the North ramp only, which was partially reconstructed in 2010 as described above. The efflorescence appears to originate from mortar joints that align with surface of the ramp. Based on lack of efflorescence on the South ramp of the Building A-B, it is likely that ramp reconstruction, potentially without a waterproofing membrane, has contributed to the efflorescence occurring only at the North ramp.

Over time, the ongoing water infiltration through the cold joint of both ramps may lead to structural deterioration.

Deficiency Description. The steel tube post in the guardrails at the top of the Building A-B ramp walls appear to be corroding, which is resulting in cracking and spalling of the CMU around it. The wood railings are also degraded to the point where some are missing.

Maintenance Recommendations. The steel post likely has significant section remaining so it may be able to be cleaned, treated for corrosion, refinished with high performance coating, and reused. Alternatively, the post can be replaced, by designing an improved guardrail connection detail to reduce the potential for corrosion. The improved detail could connect the steel tube post to the angle that is embedded in the corner of the concrete slab that caps the wall.

The wood rails of the Building A-B ramp are rotting and have to be repaired, which will likely involve replacement of damaged parts.

Major Group Element
B Shell

Group Elements
B10 Superstructure

Individual Elements
B1020 Ramps

Material
Steel/Wood Railings

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious



Figure 176. Typical post and wood railing (left) and typical post connection to embedded angle (right). (Silman, 2021)

Major Group Element
B Shell

Group Elements
B10 Superstructure

Individual Elements
B1030 Roof Construction

Material
Wood

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

The roof framing is generally in good condition with no signs of material degradation noted in any of the accessible locations. There were some signs of water infiltration, however the wood was in good condition and not a structural concern. The T&G sheathing, purlins and laminated beams were all observed to match the original structural drawings in size and configuration.

Deficiency Description. The only issue noted is the gap and lateral displacement of the miter joint in the roof purlin at the north and south edges of the roof (Figure 177).

There are two types of movements observed with the connections:

First, there is a gap in-line with the purlin on the inside corner of the miter. This gap could be from shortening of the wood purlin; however, for that length of purlin, it should not be able to shorten the amount that there is a gap. It could also be that the roof structure had an initial deflection, because this joint detail locates the screws that tie the two purlins together at the back side of the detail, allowing movement where there are not screws. It is likely this initial deflection that is the primary source for this first movement.

Second, there is lateral displacement when viewing the joint from the short side of the purlin. This lateral displacement seems to be a result of warping of the wood material because it is not a consistent magnitude or direction.

Maintenance Recommendations. Both types of movement appear to have been present in 1981 based on the repair detail developed for them. However, this repair was never implemented and there is no sign that this movement continued or resulted in damage to surrounding elements. This lack of evidence that it is continuing to move suggests that the condition is stable. The amount of movement is significant, at as much as 7/8" movement in-line with the purlin and 1-1/8" lateral movement, and warrants periodic monitoring. Note these displacement measurements are taken at the corner without screws or split ring connectors, and at the other side of the connection where those fasteners are located, the displacement goes to zero. So, the joint is rotating in two directions around the fasteners, but the fasteners appear to be engaged and working.



Figure 177. Joint at exterior wall (top-left), typical interior joint (top-right), post-purlin warped (bottom-left), split ring connector (bottom-right). (Silman, 2021)

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2010 Exterior Walls

Material
CMU

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

We observed no widespread distress of the CMU block wall.

Portions of the CMU on the north half of the Building A-B are stained red/orange where the wall is shaded and remains damp for prolonged periods of time.

Deficiency Description. The only issue noted with the CMU load bearing walls is that the Building A-B had a long stepped crack in the south-east corner of the outer wythe (Figure 178). The crack is a hairline crack and it is unknown if the crack extends into the 8" solid CMU backup wythe. The foundations for this wall should be sitting on rock so it is not likely that this is a result of settlement. The crack could also be a result of lateral loading from the building or thermal expansion / contraction. Cracking of the CMU or mortar joints reduces the walls' ability to act as an air, water, and thermal barrier, and may lead to water infiltration.

Maintenance Recommendations. Repoint the wall to repair the crack and match the existing mortar material and color. NPS shall consider consulting a conservator to confirm an appropriate mortar mix and require mock-ups before the repair.



Figure 178. Hairline crack in load bearing wall of the Building A-B. (Silman, 2021)

Exterior wood frame walls are variously clad with wood shakes, wood siding, or wood grille.

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2010 Exterior Walls

Material
Wood Framing with Wood Shakes, Wood Siding

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious

WOOD SHAKES

The battered walls clad in wood shakes are showing signs of wear and minor warping commensurate with their age, but they remain in serviceable condition. The wood shakes on the east elevation of the Building A-B are darkly stained where the wall is shaded and remains damp for prolonged periods of time. The vintage of the wood shakes is unknown based on our review of documentation. We observed no loose or dislodged wood shakes. While NPS personnel reported four leaks in the vicinity of the wood shake walls, these leaks appear to be related to the roofing. The battered wood shake wall assembly does not appear to contribute to the observed water infiltration.

We found gaps in the wood trusses forming part of the exterior enclosure that are more than ½ inch wide (Figure 180). Some of the truss joints have been treated with a black sealant in the areas of reported leakage (Figure 181). Based on our observations of active leakage while on site, the gaps between the truss chords appear to be unrelated to the leakage and the leakage occurs exclusively through the roof.



Figure 179. Building A-B east elevation, stained wood shakes. (SGH, 2021)



Figure 180. Wood truss separation gap. (SGH, 2021)



Figure 181. Wood truss gap patched with the black sealant in the area of reported leakage. (SGH, 2021)



Figure 182. The un-sealed enclosure penetrations. (SGH, 2021)

Deficiency Description. The Original Drawings indicate the wood shake walls have a dedicated water, thermal, and air barrier through the asphalt felt paper, insulation, and foil-facer on the insulation. We observed discontinuities in the water-resistive barrier around conduit penetrations hidden from occupant view above the drop ceiling aligned with the bridge between the west and east building wings (Figure 182). These unsealed penetrations allow unabated air infiltration/exfiltration and are prone to water leakage from wind-driven rain.

Maintenance Recommendations. Seal all unsealed penetrations.

WOOD SIDING

The diagonal wood siding on the cantilevered portion of the Building A-B is in good condition, with minor signs of wear and discoloration at the base of the wall (Figure 183). The roof overhang protects the siding from direct water exposure, but the concrete slab may not properly slope off the edge, allowing water to pond against the base of the wall. We were not able to observe and confirm the water-resistive barrier or insulation within the wall assembly.

The vertical tongue-and-groove siding around the PTAC unit on the east elevation of Building A-B and below the concession service counters on the east elevation of Building B-C is in good condition and is well-protected from weather exposure from the cantilever above. The wood siding is slightly raised up off the ground and does not appear to be damaged by ponding water (Figure 184).

Deficiency Description. The wood siding is in servicable condition.

Maintenance Recommendations. Observe siding condition for signs of deterioration.

WOOD GRILLE WALLS

The wood grille walls at the top of the ramps near the second-floor entrances are in good condition and are well-protected from weather exposure from the surrounding roof canopy (Figure 186).

Deficiency Description. The two-story wood grille walls opposite the ramp elevations are largely in good condition despite more weather exposure; however, some areas particularly near the base have been damaged by insects (Figure 185) and have discolored from biological growth, particularly where shaded by surrounding trees.

Maintenance Recommendations. NPS shall consider repairing damaged wood elements and treating wood walls to repel insects.



Figure 183. Diagonal wood siding on north facade of Building A-B. (SGH, 2021)



Figure 185. Building A-B wood grille damaged by insects. (SGH, 2021).



Figure 184. The vertical tongue-and-groove siding at Building B-C concession service counters. (SGH, 2021)



Figure 186. Wood grille at Building A-B entrance, at top of South ramp. (CRTKL, 2021)

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2010 Exterior Walls

Material
Exposed Concrete

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

The exposed concrete is generally in good condition with minor spalling or cracking where steel reinforcement is corroded . The exposed concrete functions as a barrier wall.

Deficiency Description. Cold joints in exposed concrete walls are vulnerable to water infiltration but do not appear to be leaking now. Rough openings for fenestration set within in the exposed concrete walls are sealed around the perimeter (Figure 187). The sealant is in serviceable condition and does not appear to contribute to air or water infiltration. Consistent with building practices at the time of construction, the exposed concrete walls lack a thermal barrier.

Maintenance Recommendations. Observe for air or water infiltration.



Figure 187. Concrete wall of the bridge with window opening. (SGH, 2021)

Despite their age, the original wood-framed ground floor windows are in good condition and are well-protected from the overhanging second floor slabs.

Deficiency Description. The narrow windows on the east elevation of the Building A-B which lack an independent head mullion are at increased risk of breakage in the event of differential movement since the glass is separated from direct contact with the concrete above only by sealant (Figure 188). Repair of these windows would present a historic preservation challenge as it will require a partial demolition of the surrounding construction to accommodate a contemporary replacement window. The ground floor windows generally rely on continuity of perimeter seals and periodic maintenance to resist air and water infiltration. Most of the ground floor windows have wood-framed single-pane glass which have poor thermal performance and do not meet contemporary standards. Although NPS personnel reported that condensation does not regularly occur, low interior relative humidity in cold winter months and the position of HVAC diffusers near the windows likely reduce the instances when the interior surface of the glass reaches dew point. The post-applied privacy film on the interior of some windows is generally well-adhered but is scratched in discrete locations.

Maintenance Recommendations. N/A. See Treatment Recommendations.

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2020 Exterior Windows

Material
Wood-Framed

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor



Figure 188. The narrow windows on the east elevation of Building A-B. (SGH, 2021)

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2020 Exterior Windows

Material
Metal-Framed

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious

The second-floor windows feature a combination of single pane windows and IGUs captured in aluminum frames, depending on the elevation. In addition to the poor thermal performance of single-pane windows, all the existing windows on the second floor suffer from poor water and air infiltration performance, primarily due to shrinking gaskets at corners, cuts in the gaskets, or missing interior and exterior gaskets.

Deficiency Description. We made the following specific observations:

- At the south elevation window on the bridge, we observed gaps in both the interior and exterior glazing gaskets approximately four inches long (Figure 190). The gap allows for unabated air infiltration and exfiltration, and we felt cool exterior air traveling into the enclosed bridge through the gap.
- At the north-facing aluminum framed window on the bridge, we observed staining corresponding to reported water leakage. Around the stain, we observed remedial sealant that does not cover the entirety of the gaps in glazing gaskets or between separated mullions.
- The second-floor windows on the bridge, at the projecting bays, and the trapezoidal windows in the exhibition space are well-protected from precipitation by concrete or wood overhangs (Figure 189).
- The second-floor windows on the bridge, at the projecting bays, and the trapezoidal windows in the exhibition space have dimensions in excess of eight feet, with the widest window being eleven feet wide and the tallest window being 10 ft – 4 in. tall. These sizes will require specialized fabrication in the event of replacement.
- Some of the clerestory windows near the main entrance lack jamb mullions and are at increased risk of breakage in the event of differential movement since the glass is in direct contact with the adjacent concrete (Figure 191). Any repair of these windows would present a historic preservation challenge and will require partial demolition of the surrounding construction to access the window and accommodate any contemporary replacement windows.
- Similarly, the plate glass soffits adjacent to the concrete "bench" in the exhibition and auditorium space are also set directly into the adjacent concrete. One of the glazing panels closest to the bridge on the west elevation of the east building is shattered but remains in place (Figure 192).
- The translucent plastic soffit panels above the intersection of the bridge and the building wall are partially laid in sealant, broken, and in danger of falling out of place (Figure 193). Discontinuities in the broken plastic allows unabated air infiltration/exfiltration.

Other than the damaged soffit panels described above, the vertical glazing and aluminum frames of the second-floor windows generally appear to be in good condition. Frames that currently hold single-pane glass do not appear adjustable to accommodate deeper contemporary IGUs.

Maintenance Recommendations. Replace and re-seal all translucent plastic soffit panels above the intersection of the bridge and the building wall.



Figure 189. Second foor window protected with roof overhang at south facade of Building B-C. (CRTKL, 2021)



Figure 190. Gap in exteror and interior glazing gasket. (SGH, 2021)



Figure 191. The clerestory windows near the main entrance of Building B-C lack jamb mullions. (SGH, 2021)



Figure 192. The clerestory soffit glass between interior low concreate wall and exterior wall. (SGH, 2021)



Figure 193. The translucent plastic soffit panels above the intersection of the bridge and the building wall are partially laid in sealant, broken, and in danger of falling out of place. (SGH, 2021).

The original wood-framed doors on the first floor are in good condition. However, various conditions were observed concerning weatherstripping, hardware, and thresholds.

Deficiency Description. Refer to Chapter 3 Physical Description/Accessibility and Life Safety descriptions in this report for further discussion of accessiblility compliance for existing doors and thresholds. The following descriptions include accessibility and life safety door deficiencies that can be addressed through maintenence.

- *Exterior door seals.* Daylight passes through gaps in weatherstripping between door leaves and at the thresholds, resulting in air infiltration (Figure 194). Single-pane glass set into the doors has poor thermal performance, although we did not observe evidence of condensation. The post-applied privacy film on the interior of some glass is generally well-adhered but is scratched in discrete locations.

- *Exterior door hardware.* Most doors used by visitors and exterior doors used by staff have accessible lever door handles. All doors into the building were surveyed and all required more than the minimum five pounds of force to open. Most required between ten to seventeen pounds to open (push or pull), with the men's restroom doors particularly difficult to open, at well over 20 pounds of force required (Figure 197).

Major Group Element
B Shell

Group Elements
B20 Exterior Enclosure

Individual Elements
B2030 Exterior Doors

Material
Wood-Framed with Glass

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical



Figure 194. Typical first floor exterior door condition. (SGH, 2021)



Figure 195. Typical first floor exterior door threshold condition. (SGH, 2021)

- *Exterior door opener.* One of the two pairs of doors at the main north ramp entrance has an automatic door opener which works only from the inside of the building (Figure 196). The power assist button outside is not fully operational.

- *Exterior door thresholds*. Other than the pair of entrance doors at the North ramp, the majority of doors into the building exceed the maximum threshold height requirements (Figure 195). However, it should be noted NPS personnel reported that, because of poor site drainage, water occasionally ponds in the courtyard, and water has accumulated up to but not breached the door threshold. The door thresholds are low-profile and are not designed to resist hydrostatic pressure resulting from ponding water (Figure 198).

Maintenance Recommendations. We recommend the following:

- ***Exterior door seals.*** Repair gaps in weatherstripping of doors or replace weatherstripping to reduce air infiltration.
- ***Exterior door hardware.*** Install power assist or automatic openers with activation buttons for men's and women's restroom doors to address the minimum force requirements for opening. Adjust other door closers in the building to comply with ABAAS force requirements.
- ***Exterior door opener.*** The automatic door opener unit at the main north ramp entrance needs repair or replacement.
- ***Exterior door locks.*** Keep exit doors at second floor east lobby/south ramp unlocked during normal hours to allow egress from second floor without requiring use of unsprinklered stair or bridge between the buildings for emergency egress.
- ***Exterior door thresholds.*** A courtyard project is currently in progress and is scheduled for implementation in 2022-23 to address courtyard drainage. This project shall provide an improved interface condition between the courtyard and building to allow proper drainage away from the building entries and to comply with ABAAS accessibility requirements. Upon completion of the courtyard project NPS shall review threshold conditions and confirm if further threshold modifications are needed to meet ABAAS requirements.



Figure 196. Entrance door on accessible route into the visitor center, at the top of the North ramp. (CRTKL, 2021)



Figure 197. The entrance to the men's restroom accessed through the courtyard. (CRTKL, 2021)



Figure 198. The door threshold of the women's restroom accessed through the courtyard. (CRTKL, 2021)

Major Group Element
B Shell

Group Elements
B30 Roofing

Individual Elements
B3010 Roof Coverings

Material
Modified-Bitumen

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. The existing low-slope roofs are in poor condition and allow water leakage to the interior. We made the following observations:

- Seven active leaks around the perimeter of the wood tongue-and-groove roof deck, as described by NPS personnel and documented in Appendix C. Water leakage primarily occurs along the roof perimeters under copper gravel edge stops. We did not make destructive openings to diagnose leak paths.
- Accumulation of debris around dome leaf strainers and scuppers. We also observed ponding water on the roof (Figures 199 and 200). Poor drainage likely exacerbates defects in the roof edge construction and contribute to ongoing water infiltration.
- The surface of the granule-faced cap sheet is worn, cracked, and crazed, and during our visit we identified multiple membrane blisters delaminated from the substrate.
- Daylight is visible through the butt-seals of the copper panel covering an opening in the Building B-C mechanical roof overrun (Figure 201).
- We observed a pitch pocket (a sheet metal enclosure filled with mastic) encasing several pipe penetrations and collecting water on the mechanical roof overrun of the Building B-C (Figure 202).

Maintenance Recommendations. The roofs are nearly 20 years old and slated for replacement. Re-roofing design documents have been prepared by the National Park Service dated 14 June 2021 which, in part, aim to address these deficiencies.



Figure 199. Accumulation of debris around dome leaf strainers and scuppers. (SGH, 2021)



Figure 200. Ponding water on the roof. (SGH, 2021)

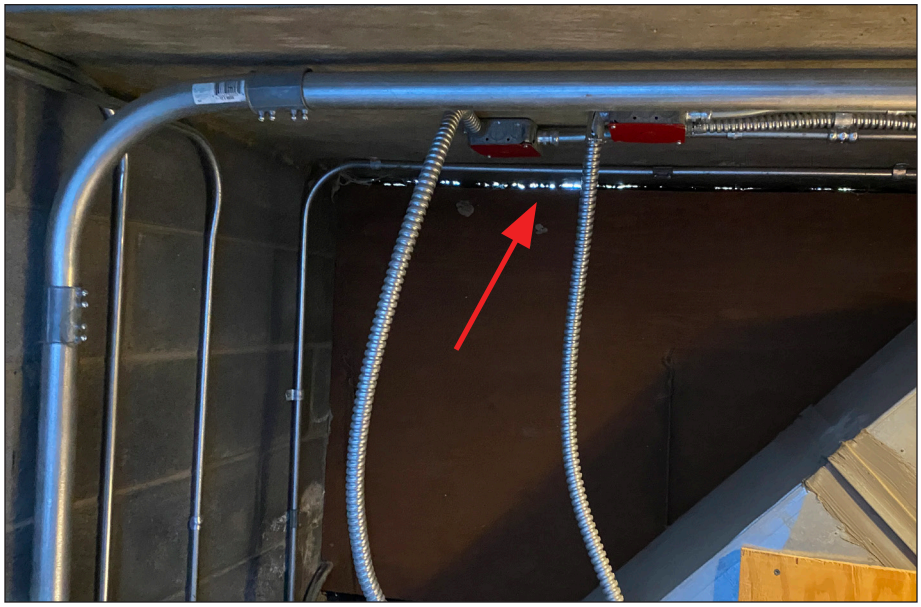


Figure 201. Daylight is visible through the butt-seals of the copper panel covering an opening in Building B-C mechanical roof overrun. (SGH, 2021)



Figure 202. A pitch pocket (a sheet metal enclosure filled with mastic) encasing several pipe penetrations. (SGH, 2021)

Deficiency Description. The Building A-B roof access hatch is in a poor condition. The Building B-C hatch is in a fair condition. Roof hatches and associated metal ladders do not meet OSHA (Occupational Health and Safety Act) requirements. The hatches are located immediately adjacent to the roof edge and lack safety rails. The configuration of the Building A-B hatch is particularly unsafe because the direction of its hatch door swing routes the user closer to the roof edge. The configurations of the ladders are also unsafe. The ladder paint contains lead, so any hot work repair of the ladder will require an abatement. Both of the roof access hatches were replaced at some point in the past.

Major Group Element
B Shell

Group Elements
B30 Roofing

Individual Elements
B3010 Roof Openings

Material
Metal Hatch

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical



Figure 203. Building A-B roof hatch. (CRTKL, 2021)



Figure 204. Building B-C roof hatch. (CRTKL, 2021)

Major Group Element
C Interiors

Group Elements
C10 Interior Construction

Individual Elements
C1010 Partitions

Material
CMU

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

The interior CMU walls are finished with paint and appear to be in good condition. In many locations of the building, exterior split-face CMU walls extend inside the interior space, such as the first and second floor public lobby spaces, while split-face CMU feature walls frame the spaces of the exhibit hall. The CMU interior walls in the NPS administrative office space have original wood-framed clearstory windows.

Deficiency Description. N/A. The Interior CMU walls appear to be in serviceable condition.

Maintenance Recommendations. Provide regular maintenance and repair for painted finishes.



Figure 205. CMU partitions with clearstory windows provide daylight to NPS administrative office space. (CRTKL, 2021)

The interior wall separating the auditorium from the lobby/bridge area is finished with a decorative wood grille. This original millwork is generally in a good condition with some visible wear around the doors. The original design documents show a similar wood decorative grille separating the Buiding B-C exhibition space and entry lobby space.

Deficiency Description. The concealed electrical room door with the decorative wood grille finish most likely contains asbestos used as fireproofing material during original construction.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations.

Major Group Element
C Interiors

Group Elements
C10 Interior Construction

Individual Elements
C1010 Partitions

Material
Wood Grille over CMU

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor



Figure 206. Original decorative wood grille on interior wall. (CRTKL, 2021)

Major Group Element
C Interiors

Group Elements
C10 Interior Construction

Individual Elements
C1020 Interior Doors

Material
Wood

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. The interior doors are in serviceable condition but do not meet accessibility and life safety requirements. The existing first-floor interior doors are solid wood finish doors with dark tone stain and metal frames painted black. The second-floor public space doors are solid wood finish doors with wood frames. Most interior doors (except auditorium doors) have knob-type hardware and do not meet accessibility requirements (Figure 207). Auditorium doors are equipped with lever hardware but lack push bar exiting devices on the push side (Figure 208). The office space staff restroom doors have integrated air grilles (Figure 209).

Maintenance Recommendations. Replace door hardware to meet accessibility and life safety requirements.



Figure 207. NPS administrative office space CMU partition with clearstory windows. (CRTKL, 2021)



Figure 208. Auditorium double-leaf wood doors. (R&A, 2021)



Figure 209. Administrative office space locker room and restroom doors. (CRTKL, 2021)

Major Group Element
C Interiors

Group Elements
C20 Stairs

Individual Elements
C2010 Stair Constrution

Material
Steel with Wood Treads

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

The altered communicating stair is in good condition. The stair is under-utilized as it connects second-floor public space and first-floor administrative space. The stair is primarily used by the NPS staff. Originally, the stair at this location was connecting public spaces on both levels.

Deficiency Description. Design Team observed the following conditions that are not permitted:

- The interior stair from the first floor to the second floor is not enclosed, and the exceptions for providing an unenclosed stair are not met.
- The handrail does not return to the post, wall or ground as required. In addition, the handrail does not continue for twelve inches beyond the bottom riser as required. The stair becomes more narrow as one descends. The handrails are of different heights.
- The handrail post spacing is exceeding four inches.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations.



Figure 210. Non-original stair with steel structure and re-used original treads. (R&A, 2021)

The interior wall finishes are in a good condition and appeared well-maintained.

The split-face CMU and painted CMU wall finishes are in a good condition.

Deficiency Description. The decorative millwork of the wall wood grilles has some wear along the floor surface and around door openings. (Figure 211) The wood wear is an expected result for public use of the space with a regular cleaning program.

Maintenance Recommendations. NPS may consider refinishing decorative millwork.

Major Group Element
C Interiors

Group Elements
C30 Interior Finishes

Individual Elements
C3010 Wall Finishes

Material
Paint over CMU, Split-face CMU, Stained T&G wood, Unfinshed concrete

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

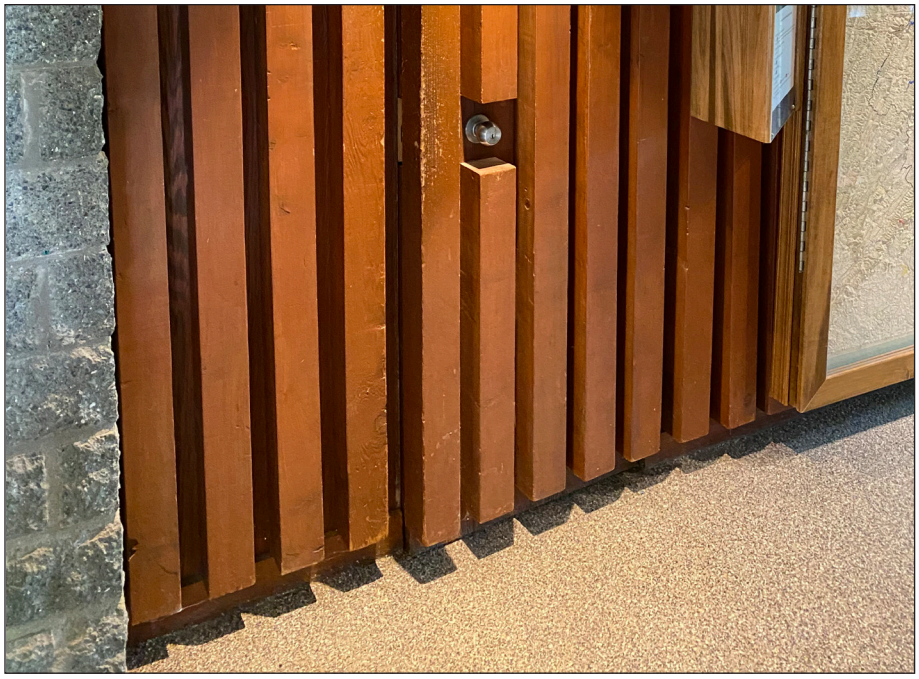


Figure 211. Signs of wear of the decorative wood walls. (CRTKL, 2021)

Major Group Element
C Interiors

Group Elements
C30 Interior Finishes

Individual Elements
C3020 Floor Finishes

Material
Paint, Carpert Tile, Unfinshed concrete

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

The floor finishes are not original and appear to be in a good or fair condition with signs of ongoing expected wear (Figures 212 and 213).

The speckled painted floor finish in the Building A-B NPS office space shows previous paint layers at the areas where millwork or furniture was reconfigured (Figure 214). The speckled painted finish in the NPS office space in both buildings shows some chipping and scratching.

The auditorium carpet tile is in a good condition (Figure 215).

Deficiency Description. The floor finish wear has resulted from the regular use and cleaning of the space. There are some areas without the most recent finish, exposing past finishes.

Maintenance Recommendations. Provide regular maintenance and repair for painted finishes and carpet tile.



Figure 212. Speckled floor paint finish in public spaces. (CRTKL, 2021)

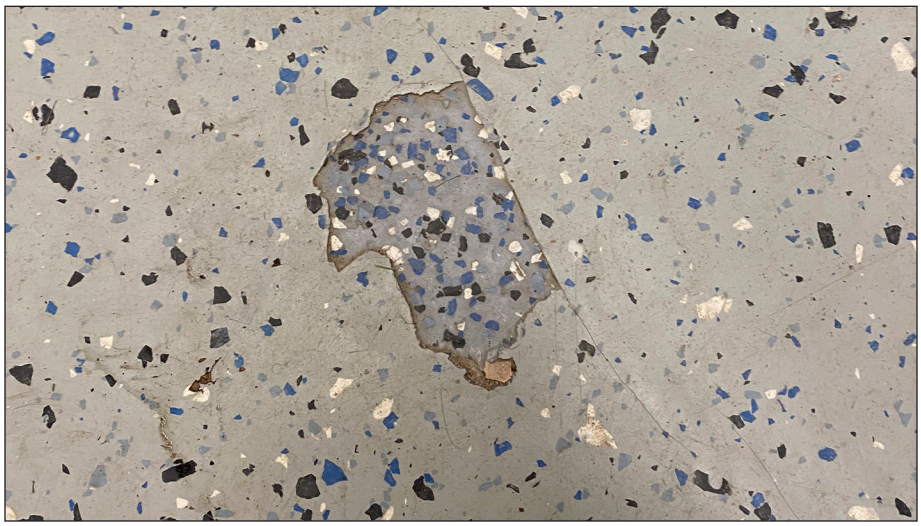


Figure 213. Speckled floor paint finish in BOH and food service spaces with minor chipping. (CRTKL, 2021)



Figure 214. The speckled painted floor finish in office area of Building A-B. (CRTKL, 2021)



Figure 215. Carpet tiles in auditorium. (CRTKL, 2021)

Major Group Element
C Interiors

Group Elements
C30 Interior Finishes

Individual Elements
C3030 Ceiling Finishes

Material
T&G Wood, Unfinshed concrete, Paint

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

The unfinished concrete ceilings are in a good condition (Figure 218). The painted concrete ceilings are in a good condition (Figure 217).

Deficiency Description. The T&G wood ceilings in the auditorium and exhibition hall show some minor finish damage at the location of the ongoing roof leakage (Figure 216). See Appendix C for leakage locations.

Maintenance Recommendations. After replacing the roof of the building, NPS may consider refinishing T&G wood ceiling areas affected by the previous leakage.



Figure 216. Ongoing water infiltration at the auditorium ceiling. (CRTKL, 2021)



Figure 217. The painted cast-in-place ceiling of the Building A-B first floor office space. (CRTKL, 2021)



Figure 218. Unfinished concrete ceiling along the bridge. (CRTKL, 2021)

Major Group Element
D Services

Group Elements
D10 Conveying

Individual Elements
D1010 Elevators and Lifts

Material
Metal

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Critical

Deficiency Description. The platform lift was installed in 2008 in Building A-B and appeared to be in a good condition. The configuration of the lift (including platform size and controls) does not meet Accessibility requirements. See the Architectural Accessibility Description for more information.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations.



Figure 219. The platform lift. (CRTKL, 2021)

We made the following specific observations of existing plumbing fixtures:

Deficiency Description. In the men's public restroom, the existing plumbing fixtures are not the water saver type (low flow water fixtures):

- There are four existing floor mounted, flush valve, water closets: the first water closet is an ADA water closet (eighteen-inch height from rim to floor) with manual flush valve; the second water closet is a fifteen-inch height water closet with a sensor type flush valve (battery operated); the third water closet is a fifteen-inch height water closet with manual flush valve; and the fourth water closet, is a fifteen-inch height water closet with a manual flush valve with ADA holding bars.
- There are four existing wall-hung lavatories, each with a sensor-type faucet. The supplies and 'P' trap are poorly insulated.
- There are four existing flush valve urinals: (from left to right) the first urinal is an ADA urinal, mounted at seventeen-inch height from rim to floor with a sensor flush valve (battery operated); the second urinal is mounted at 20-inch height with a manual flush valve; the third urinal is mounted at 24-inch height with a sensor flush valve (battery operated); and the fourth urinal, is mounted at 24-inch height with a manual flush valve.
- Existing restroom has two floor drains.
- There is a janitor closet within the men's restroom. The mop sink is a 24x36 stainless steel mop sink with vacuum breaker.

In the women's public restroom, the existing plumbing fixtures are not the water saver type (low flow water fixtures):

- There are ten existing wall mounted, flush valve, water closets: one water closet is an ADA water closet mounted at eighteen-inch height from rim to floor with manual flush valve; There other four water closets are mounted at fifteen-inch height from rim to floor with manual type flush valve.
- There are six existing wall-hung lavatories, each with a sensor-type faucet. The supplies and 'P' trap are poorly insulated.
- Existing restroom has two floor drains.
- There is a janitor closet within the women's restroom. The mop sink is a 24 x 36 stainless steel mop sink with a faucet with vacuum breaker.

In each of the staff men's and women's restrooms, the existing plumbing fixtures are not the water saver type (low flow water fixtures). Each restroom has a floor mounted flush valve water closet with manual type flush valve and wall hung lavatory with metering faucet. Supplies and 'P' trap under the lavatories are not insulated.

Maintenance Recommendation. Provide a new insulation kit for each lavatory in the men's public restrooms. Provide typical routine maintenance for restroom plumbing fixtures. Note that the selected Treatment Recommendation in Part Two calls for significant reconfigurations and upgrades to restrooms and fixtures.

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2010 Plumbing Fixtures

Material
China/Porcelain

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor



Figure 220. ADA flush valve water closet in men's public restroom. (GES, 2021)



Figure 221. Wall-hung lavatories in men's public restroom. (GES, 2021)



Figure 222. Women's staff restroom. The supplies and 'P' trap under the lavatory are not insulated. (GES, 2021)



Figure 223. Floor drain in men's public restroom. (GES, 2021)



Figure 224. Mop sink in men's public restroom. (GES, 2021)



Figure 225. Second floor stainless steel electric water cooler with bottle filler. The drainpipe from the unit is not installed per today's plumbing code. Vent was not provided. (GES, 2021)



Figure 226. Second floor janitor closet cast-iron service sink with faucet with vacuum breaker. There is a drainpipe in front that creates a tripping hazard. (GES, 2021)



Figure 227. Compartment sink in concession kitchen. Fixtures in this kitchen are not installed per today's plumbing and health codes. (GES, 2021)

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2010 Domestic Water Service & Distribution

Material
Copper

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. We observed the following Domestic Water Service & Distribution issues: The existing domestic water piping in the pump/storage room is in poor condition. Valves are rusted and signs of previous leakage and condensation are notable. The existing water service is not provided with a backflow preventer nor is the pipe insulated. Floor drains were not provided near the domestic water service.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations for proposed repairs and replacement.



Figure 228. The incoming domestic water service piping in the pump room is in poor condition. (GES, 2021)



Figure 229. Rusted pipes and pipes with no insulation in the pump room. (GES, 2021)

Deficiency Description. We observed the following sanitary waste issues. The sanitary waste service is generally in good condition. However, there are some code-related deficiencies. In Building A-B, the supplies and 'P' trap under the lavatories of the staff men's and women's restrooms are not insulated and do not provide the proper clearance per current plumbing code. These restrooms also do not have floor drains. In Building B-C, the concession kitchen is provided with a three-compartment sink, a hand sink, an ice maker and a coffee maker (Figure 230). These fixtures are not installed per today's plumbing and health codes, as described below.

- The indirect drain from the kitchen appliance located at the left end of the three-compartment sink (sink next to the ice maker) was not provided with pipe supports. The pipe should be provided with a minimum one-inch air gap before it is discharged to the floor drain.
- The three indirect drainpipes from the three-compartment sinks are not supported to the underside of the compartment sink and/or floor. The pipe should be provided with a minimum 1 1/2-inch air gap before it is discharged to the hub drain.
- The two indirect drainpipes from the ice maker located at the right end of the three-compartment sink (sink next to the ice maker) was not provided with pipe supports. The pipes should be provided with a minimum one-inch air gap before it discharged to the hub drain.
- The indirect drain from the coffee maker was not provided with pipe supports. The pipe should be provided with a minimum one-inch air gap before it is discharged to the hub drain.
- The lavatory waste pipe was not provided with vent pipe (any trap fixture shall be provided with vent pipe). The lavatory waste pipe is not supported to the underside of the counter and/or to the wall. The waste pipe should be provided with a minimum one-inch air gap before it is discharged to the hub drain.
- The pipes extend beyond the counter and create a trip hazard.

Maintenance Recommendations. See Treatment Recommendations for proposed repairs and replacement.

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2010 Sanitary Waste

Material
Cast Iron, PVC

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious



Figure 230. Piping in the concession kitchen is not per code. (GES, 2021)

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2040 Roof Drain System

Material
Unknown

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. We made the following specific observations of the roof drain system:

Some of the roof drains are not provided with leaf strainers and the roof structures do not have proper sloping to the low points. The lower roof connecting the two buildings requires maintenance to remove leaves and tree debris. The roof drains appear to be in fair condition. See Appendix D for Roof Drains and Rain Leaders Sizing Calculations.

On the Building B-C, the roof downspouts (3" x 6") are not provided with leaf strainers and the roof structure does not have a proper slope to the low points. It is recommended that the roof downspouts be provided with leaf strainers to protect from leaves and debris getting into the downspouts. (Figure 231)

On the bridge link roof, the roof drains with leaf strainers appear to be in fair condition. A three-inch storm pipe serves each roof drain and individually spills overhead onto the courtyard. (Figures 232 and 233)

Maintenance Recommendations. Remove leaves and tree debris from roof of connecting bridge. Provide new domed leaf wire strainers at all roof drains.



Figure 231. Typical 3"x 6" downspout with no leaf strainer. (GES, 2021)



Figure 232. Roof of the bridge. (GES, 2021)



Figure 233. Bridge roof drains spill overhead to the courtyard. (GES, 2021)

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2050 Sewage Ejector System

Material
Copper

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

The entire plumbing system, in both buildings, is connected to the duplex sewage ejector pump located in the pump/storage room in Building B-C. The four-inch discharged drainpipe is pumped to the street's main sewer line.

Deficiency Description. An odor of sewer gas was prevalent in the room, maybe due to a failing gasket.

Maintenance Recommendation. The replacement of the seal gasket is recommended.



Figure 234. Existing sewage ejector in pump room in Building B-C. Electric water heater #1 is in back. (GES, 2021)

There are three domestic electric water heaters in the building. The domestic electric water heater #1, a 38-gallon electric water heater with a one-gallon expansion tank, is located in the pump/storage room in Building B-C and serves the existing men's public restroom. This water heater is a Rheem model XE38S06ST45U1 with electrical requirements of 4.5 KW – 240 1 phase. It is mounted on a shelf about 30-inches above floor, which is supported at the wall and at the structure above. The water heater was installed in 2020 and is in good condition.

Deficiency Description. The domestic water heater #2 (no date) is located in the concession storage room in Building B-C and serves the concession kitchen. This 50-gallon electric water heater with expansion tank is by State model ES650DORS 210 with electrical requirements of 4.5 KW – 240 1 phase. The water heater is floor-mounted and shows signs of rust.

Heater #3 (dated January 13, 2013), located in a storage room in Building A-B, serves the existing women's restroom, two staff restrooms, and the staff kitchen sink. It is 50 gallons with recirculating hot water pump without an expansion tank by Vanguards (model could not be found) with electrical requirements of 4.5 KW – 240 1 phase. This water heater is floor-mounted and shows signs of rust.

Maintenance Recommendation. Water heaters #2 and #3 are showing signs of rust and replacement is recommended.

Major Group Element
D Services

Group Elements
D20 Plumbing

Individual Elements
D2090 Other Plumbing Systems - Water Heaters (3)

Material
Metal

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious



Figure 235. Electric water heater#2 in storage room serves fixtures in the staff kitchen in Building A-B. (GES, 2021)

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3020 Heating Systems

Office area Electric Baseboard heaters

Staff Kitchen cabinet unit heater

Material
Metal

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

In Building A-B, on the ground floor, the office corridor and each of the staff men's and women's restrooms are heated by electric baseboards. The rooms exhaust by a common plenum fan that discharges to the exterior wall. Both baseboards appeared in fair condition. The staff kitchen is heated by a ceiling-mounted cabinet unit heater in fair condition.

Maintenance Recommendation. Both electric baseboards are recommended to be cleaned. Provide standard maintenance on baseboards and unit heater.



Figure 236. Typical electric baseboard in office area of Building A-B. (GES, 2021)



Figure 237. Cabinet unit heater in staff kitchen in Building A-B. (GES, 2021)

The second floor auditorium in Building A-B is conditioned by a 10-ton rooftop unit that was manufactured in 2010 and found to be in poor condition.

Deficiency Description. According to facilities, the unit cannot maintain temperature or humidity in the space and has been infrequently maintained and serviced over its lifetime. The unit has a single-stage compressor and is oversized for the demand much of the year (outside of full occupancy at peak outside air temperatures).

Maintenance Recommendation. The identified deficiencies cannot be addressed through a maintenence program. See Treatment Recommendations for unit replacement and ugrade information.

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.01 Auditorium 10-Ton Rooftop Unit

Material
Metal

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious



Figure 238. Building A-B 10-ton rooftop unit. (GES, 2021)

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.02 Office 3-Ton Split System Heat Pump

Material
Metal

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor

The first floor offices are conditioned by a 3-ton split system heat pump. The condensing unit is located on the roof of the building while a ducted air handling unit is located in a mechanical closet inside the first floor office. The unit was manufactured in 2014 and is in fair visible condition.

Deficiency Description. The unit is oversized for the small office, cycles on and off frequently, which causes wear and tear to the unit compressor, and creates humidity and comfort issues in the office. The refrigerant piping insulation on the roof is torn also. The unit has a single-stage compressor and is oversized for the demand much of the year (outside of full occupancy at peak outside air temperatures).

Maintenance Recommendation. The identified deficiencies cannot be addressed through a maintenence program. See Treatment Recommendations for unit replacement and ugrade information.



Figure 239. The 3-ton split system heat pump on roof of Building A-B. (GES, 2021)



Figure 240. Ducted air-handling unit in mechanical room in first floor offices. (GES, 2021)

The women's public restroom is conditioned by a 1-ton Liebert unit (mini-mate) and is exhausted by an above ceiling exhaust fan. The unit was manufactured in 2014 and is located near the door.

The staff kitchen is cooled by a thru-wall air conditioning unit and heated by a ceiling-mounted electric heater. Although the kitchen has not been operated for several years, both units appeared in fair condition.

Deficiency Description. The Liebert mini-mate is meant for computer room applications and is overdesigned (and sized) for the ground floor restroom. This air conditioning unit cycles on/off frequently, causing temperature and humidity issues in the staff kitchen.

Maintenance Recommendation. It is recommended to replace the Liebert unit with a ductless mini split-ceiling cassette, similar to the men's restroom in the north building, and recalculate the unit capacity. It is recommended to clean both the staff kitchen wall unit and electric heater and replace filters.

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.03 Women's Restroon
1-Ton Liebert Unit

D3050.04 Staff Kitchen
Thru-Wall AC Unit

Material
Metal

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Minor



Figure 241. Women's public restroom air conditioning unit. (GES, 2021)



Figure 242. Staff kitchen thru-wall AC unit. (GES, 2021)

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.05 Exhibition Room 10-Ton Split System Heat Pump

Material
Metal

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious

The second floor exhibit area in Building B-C is conditioned by a 10-ton rooftop unit that was manufactured in 2010 and found to be in poor condition.

Deficiency Description. According to facilities, the unit cannot maintain temperature or humidity in the space and has been infrequently maintained and serviced over its lifetime. The unit has a single-stage compressor and is oversized for the demand much of the year (outside of full occupancy at peak outside air temperatures).

Maintenance Recommendation. The identified deficiencies cannot be addressed through a maintenence program. See Treatment Recommendations for unit replacement and ugrade information.



Figure 243. The 10-ton split system heat pump on roof of Building A-B serves the exhibition room. (GES, 2021)

The ground floor office is conditioned by a 3-ton split system heat pump. The condensing unit is located on the ground floor outside the building while a ducted air handling unit is located in the room (exposed). The room is also exhausted by a wall-mounted exhaust fan that discharges to the exterior wall. The unit was manufactured in 2013 and is in fair visible condition.

Deficiency Description. The unit is oversized for the small office, cycles on and off frequently, which causes wear and tear to the unit compressor, and creates humidity and comfort issues in the office. The unit has a single-stage compressor and is oversized for most of the year (outside of full occupancy at peak outside air temperatures.

Maintenance Recommendation. The identified deficiencies cannot be addressed through a maintenence program. See Treatment Recommendations for unit replacement and ugrade information.

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.06 3-Ton Split System Heat Pump

Material
Metal

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious



Figure 244. The 3-ton split system heat pump in the first floor office space of Building B-C. (GES, 2021)



Figure 245. Condensing unit serving first floor office space of Building B-C. (GES, 2021)

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3050 Teminal & Package Units

D3050.07 Concession Kitchen
5-Ton Split System Heat Pump

Material

Metal

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious

The ground floor concession kitchen is conditioned by a 5-ton split system heat pump. The condensing unit is located on the ground floor outside the building while the fan coil unit is located in the room (exposed). Cooking equipment is exhausted by a tubular/grease exhaust fan that discharges to the exterior wall.

Deficiency Description. The split system age is unknown but the unit is in poor condition and assumed to be inoperable. It is recommended to replace and upgrade the unit to a more efficient type unit with multiple stages or a modulating compressor/fan and recalculate the required unit capacity.

Maintenance Recommendation. The identified deficiencies cannot be addressed through a maintenence program. See Treatment Recommendations for unit replacement and ugrade information.



Figure 246. 5-ton split system heat pump and compressor serve the concession kitchen. (GES, 2021)



Figure 247. Fan coil unit in the concession kitchen. (GES, 2021)

Deficiency Description. The concession kitchen is equipped with overhead air curtain fans mounted above the concessions windows. The age of the equipment is unknown, and the fans appear to be inoperable.

The men's public restroom is conditioned by a ductless split system ceiling cassette and is exhausted by an above ceiling exhaust fan that discharges to the outside. The intake louver that provides makeup air into the room is blocked with debris, and this is putting the men's restroom under negative pressure.

Maintenance Recommendation. The air curtain fans mounted above the concessions windows should be repaired or replaced in order to maintain conditioned air and to keep bugs and debris out of the kitchen area. The intake louver of the men's restoom split unit should be cleaned to provide increased air flow.

Major Group Element
D Services

Group Elements
D30 HVAC

Individual Elements
D3090 Other HVAC Systems and Equipment

D3090.01 Air Curtain Fan

D3090.02 Ductless Split Unit and Louver

Material
Metal/Sheet Metal

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious



Figure 248. Air curtain fan in the concession kitchen. (GES, 2021)



Figure 249. Ductless split in men's public restroom. (GES, 2021)



Figure 250. Air intake louver for men's public restroom is blocked with debris. (GES, 2021)

Major Group Element
D Services

Group Elements
D40 Fire Protection

Individual Elements
D4010 Fire Sprinkler System

D4090 Other Fire Protection Systems - Fire Extinguishers

Material

n/a

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Serious

Deficiency Description. *Lack of Fire Sprinkler System*. The building is currently not protected by any fire sprinkler system. This could allow any serious fires to grow until fire department intervention. NPS indicated that there is a plan to provide sprinkler protection throughout the building.

Fire Extinguishers. The building is provided with fire extinguishers throughout. However, the fire extinguishers are not regularly inspected, monthly or annually. The access to the fire extinguisher in the second floor lobby near the main entrance is blocked by a bench.

Maintenance Recommendation. Provide regular inspection of all fire extinguishers. Relocate the bench in the second floor lobby to allow access to the fire extinguisher. Note that the selected Treatment Recommendation in Part Two calls for installation of a fire sprinkler system throughout the building.



Figure 251. Access to fire extinguisher in lobby is blocked by a bench. (Rhino, 2021)

Main Distribution Panelboard in Main Electrical Room. The main electrical room, located off of the lobby corridor outside the auditorium on the second floor of Building A-B, houses the main distribution panelboard. It serves branch circuit panelboards throughout the facility.

Deficiency Description. The electrical distribution equipment is in poor condition. Federal Pacific is no longer in operation and spare parts availability is a real concern. Typed written panelboard directories are not installed. The main electrical room does not have code-required access clearance. A 36-inch clear access clearance is not observed in front of the electrical distribution equipment.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. The electrical panels must be reconfigured to allow for code-required access clearance. Relocating the panels that are directly in front of the distribution equipment may alleviate the issue but space is limited and further investigation is needed. See Treatment Recommendations for proposed repairs and replacement.

Major Group Element
D Services

Group Elements
D50 Electrical

Individual Elements
D5010 Electrical Service and Electrical Distribution Equipment

Material
Metal/Sheet Metal

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical



Figure 252. Main distribution panelboard in the main electrical room, second floor, Building A-B. (GES, 2021)



Figure 253. Main electrical room does not have access clearance required by code. (GES, 2021)

Major Group Element
D Services

Group Elements
D50 Electrical

Individual Elements
D5020 Lighting System and Controls

Material
Various

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. Exterior lighting fixtures are in poor condition. Some of the lighting fixtures are not in operation and the outdoor lighting control system is inoperable. Outdoor lighting is controlled via manual switches. While the design team did not take light level measurements during the survey, we believe that the current courtyard lighting conditions do not meet the Code and Accessibility requirements due to the disrepair of the outdoor lighting.

Interior lighting fixtures and controls are generally in a similar poor condition. Some of the lighting fixtures in the ground floor offices of both building wings are missing wrap-around acrylic lenses.

Maintenance Recommendations. Repair and replace broken or missing light fixtures. See Treatment Recommendations for full replacement of Lighting System and Controls.



Figure 254. Light fixtures in the office area of Building A-B. (GES, 2021)



Figure 255. Missing exterior light fixtures at the Building A-B. (GES, 2021)

The existing emergency lighting system is in poor condition. Emergency lighting is provided by battery-backed lighting fixtures; however, the existing units are not in operation. The battery-backed exit signs are also not working, and some of the exit signs are not the required illuminated type. None of the exit signs have code required battery packs to maintain 90 minutes of battery operation during a power outage.

Additionally, the emergency lighting and the exit signs are not installed at all locations where they are required throughout the facility to lead occupants along paths of egress to exits.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations for proposed repairs and replacement.

Major Group Element
D Services

Group Elements
D50 Electrical

Individual Elements
D5020 Emergency Lighting and Exit Signs

Material
Various

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical



Figure 256. Exit sign and emergency lighting at the Building A-B auditorium exit door. (GES, 2021)

Major Group Element
D Services

Group Elements
D50 Electrical

Individual Elements
D5037 Fire Alarm System

Material

Copper wire and plastic

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical

Deficiency Description. The fire alarm system has several non-compliant conditions. There are issues with some devices that may result in the system not functioning in an emergency. In addition, it has been reported by the NPS staff that the fire alarm system is not capable of reporting to a monitored location (e.g. mega center or fire department). This can significantly increase the fire department response time to a fire. The Design Team observed several other conditions that are not permitted:

- The action part of the manual pull station (i.e. the top) needs to be between 42 inches and 48 inches above the floor. Many manual pull stations throughout are placed too high (i.e. above 48 inches).
- There appear to be smoke or heat detectors throughout the building. However, there are rooms without detection (e.g. rooms south and north of concession area, public men's restroom closet, bookstore storage, connecting bridge). This can cause significant delays in fire detection.
- The smoke detectors provided are spaced too far from the corners of the spaces. This can cause a delay in fire detection.
- There are several locations in which notification (e.g. horns, strobes and horn/strobes) are not provided (e.g. hallway connecting offices with the break-room area, the break room) or are inadequate (e.g. office next to concession area, exhibition area and exhibition lobby, auditorium and auditorium lobby). This can delay when occupants are notified of a fire or other emergency.
- There is storage in front of the fire alarm control panel, making access difficult.
- The bookstore closet was a former exit from the building. A new exit door is now provided, and the closet is no longer an exit door. The bookstore storage closet has a manual pull station next to it, but the new exit door does not. Manual pull stations are to be provided next to exit doors.
- The electrical closets have unsealed openings in the ceilings. This can cause delay in detection.

Maintenance Recommendations. See Treatment Recommendations for fire alarm system repairs and replacement. NPS AHJ shall review identified deficiencies and confirm the items that must be addressed immediately through the existing maintenance program.

Deficiency Description. Branch circuit panelboards are in poor condition. Both were manufactured by Federal Pacific which is no longer in business. Both panelboards are recommended to be replaced.

There are an inadequate number of duplex receptacles in the office areas. Power strips are used to serve multiple pieces of equipment.

Maintenance Recommendations. The identified deficiencies could not be addressed with maintenance efforts. See Treatment Recommendations for proposed repairs and replacement.

Major Group Element
D Services

Group Elements
D50 Electrical

Individual Elements
D5090 Receptacles and Branch Circuits

Material
Various

Qualitative Condition Rating
Poor

Maintenance Deficiency Priority
Critical



Figure 257. Panels in the concession kitchen. (GES, 2021)



Figure 258. Power strips are used to serve multiple pieces of equipment in the NPS office space. (GES, 2021)

Major Group Element
E Equipment and Furnishings

Group Elements
E20 Furnishings

Individual Elements
E2010 Fixed Furnishings

Material
Millwork

Qualitative Condition Rating
Good

Maintenance Deficiency Priority
Minor

Most of the millwork appeared generally to be in good condition. The original millwork does show wear expected for the vintage of wood elements.

The auditorium fixed wood benches were installed in 1968 and are in good condition (Figure 259).

The original millwork inside the auditorium projector room appeared to be in good condition with some signs of expected wear (Figure 262).

The original cabinets of the Building A-B first aid station appeared to be in good condition with some signs of expected wear (Figure 260).

The non-original cabinets inside the staff kitchen are in good condition. The non-original Building B-C reception desk is in good condition (Figure 261).

See interior walls description for the decorative interior wood grille millwork.

Deficiency Description. The millwork finish wear is an expected result for use of the space with a regular cleaning program.

Maintenance Recommendations. The NPS may consider refinishing the millwork.



Figure 259. Auditorium fixed wood benches. (CRTKL, 2021)



Figure 260. Building A-B original millwork of first aid station. (CRTKL, 2021)



Figure 261. Building B-C reception desk. (CRTKL, 2021)



Figure 262. Original millwork inside the auditorium projection room. (CRTKL, 2021)

Major Group Element
F Special Construction & Demolition

Group Elements
F20 Selective Building Demolition

Individual Elements
F2020 Hazardous Components Abatement

Material
Asbestos and Lead

Qualitative Condition Rating
Fair

Maintenance Deficiency Priority
Serious

The Hazardous Materials Survey Report identifies a number of components containing hazardous materials and requiring abatement during any future construction.

Deficiency Description. The following materials were found to be asbestos containing by laboratory analysis and/or assumption:

- Mudded pipe fitting insulation
- Expansion joint caulk
- Concealed electrical fire door at the decorative wall separating auditorium from the lobby (assumed ACM).

The following building components were finished with lead based paint and/or lead surface coatings:

- Structural steel
- Metal ladders
- Ceramic/porcelain sinks
- Metal stair spindles
- Yellow concrete floor stripe

It should be assumed that all fluorescent lamps and bulbs have mercury levels requiring proper removal and waste disposal.

See Appendix B /Hazardous Materials Survey Report for more details.

Maintenance Description. Any future repairs that include identified hazardous materials shall require proper abatement and disposal.

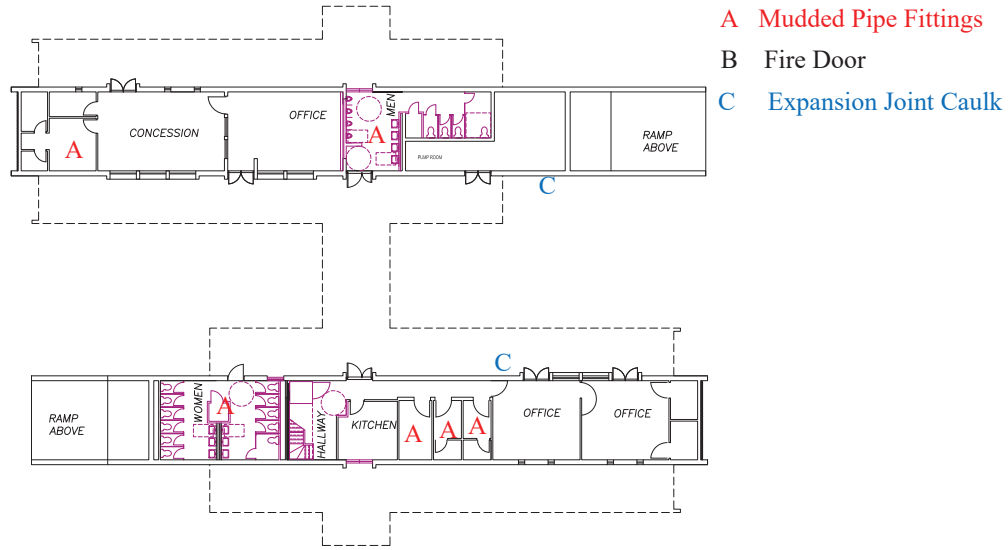


Figure 263. First Floor HazMat Survey Diagrams from the HazMat Survey Report. (AMA 2021)



Figure 264. Second Floor HazMat Survey Diagrams from the HazMat Survey Report. (AMA 2021)

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Part II: Ultimate Treatment and Use

Requirements for Treatment and Use
Treatment Recommendations



Figure 265. Looking northwest at the south ramp from Building A-B, with Building B-C to the left, 1973. (MRCE)

Chapter 6: Requirements for Treatment and Use

The treatment and use of the Great Falls Park Visitor Center must be considered within a framework of applicable laws, agreements and policies. These mandates govern a wide range of management issues beyond the preservation, protection and interpretation of the GWMP's cultural resources, and extend to issues of visitor and staff use, safety, universal accessibility, and resiliency to natural hazards, among others. Some of these requirements may contradict or be at cross purposes with one another if they are rigidly interpreted. Any treatment must be carefully considered to ensure the historic fabric of the structure is preserved.

LEGISLATION

NATIONAL HISTORIC PRESERVATION ACT OF 1966

National Historic Preservation Act Section 106 of the National Historic Preservation Act (NHPA) mandates that federal agencies, such as the NPS, consider the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places and allow the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment.[1] The Great Falls Visitor Center listed as a contributing structure in the Great Falls Park Historic District (December 22, 2014) and any undertakings involving the expenditure of federal funds will be reviewed in accordance with NPS policy and federal historic preservation laws including the service-wide Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act (2008). [2]

1 The NHPA of 1966 was last amended in 2006. A downloadable copy is located at (http://www.achp.gov/nhpa.html).

2 A copy of this agreement can be found on the NPS's website at (http://www.nps.gov/policy/106agreement.pdf).

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966

A routine step in the Park's planning process for the treatment of cultural resources is compliance with Section 106 of the NHPA. This requires that prior to any undertaking involving National Register or National Register-eligible historic properties, federal agencies "take into account the effect" of the undertaking on the property and give the Advisory Council on Historic Preservation (Advisory Council) "a reasonable opportunity to comment with regard to such under-taking." To satisfy the requirements of Section 106, regulations have been published (36 CFR Part 800, "Protection of Historic Properties") that require, among other things, consultation with local governments, State Historic Preservation Officers, and Indian tribal representatives. They also establish criteria under which the Advisory Council may comment, but as a practical matter, the vast majority of Federal undertakings do not involve review by the Advisory Council. The point of Section 106 review is to ensure that all interested parties have a voice in the treatment of the nation's cultural heritage.

SECTION 110 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966

Section 110 of the NHPA clarifies the broad historic preservation responsibilities of federal agencies with the intention of ensuring that historic preservation is fully integrated into the ongoing programs of all federal agencies by identifying, protecting, and avoiding unnecessary damage to historic properties. Additionally, each agency is required to use historic properties available to it and when managing these properties, must consider preservation of their historic, archaeological, architectural, and cultural values.[3]

EXECUTIVE ORDER 11593

Executive Order 11593: Protection and Enhancement of the Cultural Environment (1971) mandates that "the Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation."[4] Responsibilities of federal agencies include:

[3] More information on Section 110 can be found on the NPS's website at (http://www.nps.gov/hps/fapa_110.htm).

[4] A copy of this E.O. can be found on the NPS's website at (http://www.

- Nominating "...to the Secretary of the Interior all sites, buildings, districts, and objects under their jurisdiction of the control that appear to qualify for listing on the National Register of Historic Places."
- Exert caution "…during the interim period until inventories and evaluation…are completed to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered."
- "Initiate measures to assure that where as a result of Federal action or assistance a property listed on the National Register of Historic Places is to be substantially altered or demolished, timely steps be taken to make or have made records, including measured drawings, photographs, and maps, of the property, and that copy of such records then be deposited in the Library of Congress as part of the Historic American Buildings Survey or Historic American Engineering Record for future use and reference."
- "Initiate measures and procedures to provide for the maintenance, through preservation, rehabilitation, or restoration, of federally owned and registered sites professional standards prescribed by the Secretary of the Interior."

EXECUTIVE ORDER 13006

Executive Order 13006: Locating Federal Facilities on Historic Properties (1996) mandates that "the Federal Government shall utilize and maintain, wherever operationally appropriate and economically prudent, historic properties and district…." Furthermore, "any rehabilitation or construction that is undertaken pursuant to this order must be architecturally compatible with the character of the surrounding historic district or properties."

THE SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES

The Secretary of the Interior's Standards for the Treatment of Historic Properties (Standards) provide a philosophy to underpin historic preservation that is widely understood and almost universally accepted in the United States. By separate

nps.gov/history/history/online_books/anps/anps_7b.htm).

regulation, the Secretary has required the application of the Standards in certain programs that the Secretary administers through the Park Service. They have also been widely adopted by state and local governments and by the private sector, and are intended to be applied to a wide variety of resource types, including the 1978 buildings, sites, structures, objects, and districts. The Standards, revised in 1992, are codified as 36 CFR Part 68 in the 12 July 1995 Federal Register (Vol. 60, No. 133). The revision replaced and 1983 versions of 36 CFR 68 entitled "The Secretary of the Interior's Standards for the Treatment of Historic Properties". The Standards are neither technical nor prescriptive but are intended to promote responsible preservation practices that help protect the nation's irreplaceable cultural resources. For example, they cannot, in and of themselves, be used to make essential decisions about which features of the historic building should be saved and which can be changed. But once a treatment is selected, the Standards provide philosophical consistency to the work.

Standards describe four broad approaches to the treatment and use of historic properties.

These are, in hierarchical order:

- Preservation, which places a high premium on the retention of all historic fabric through conservation, maintenance and repair. It reflects a building's continuum over time, through successive occupancies, and the respectful changes and alterations that are made.
- Rehabilitation, which emphasizes the retention and repair of historic materials, but provides more latitude for replacement because it is assumed the property is more deteriorated prior to work. (Both Preservation and Rehabilitation standards focus attention on the preservation of those materials, features, finishes, a property its historic character.)
- Restoration, which focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods.
- Reconstruction, which establishes limited opportunities to re-create a non-surviving site, landscape, building, structure, or object in all new materials.

Regardless of treatment approach, the Standards put a high priority on the preservation of existing historic materials and not just the architectural form and style. The Standards also require that any alterations, additions, or other modifications be reversible. For example, additions must be designed and constructed in such a way that they can be removed or reversed in the future without the loss of existing historic materials, features, or character.

DIRECTOR'S ORDER 28

Also circumscribing treatment and use of historic properties in National Parks is Director's Order 28, Cultural Resource Management Guideline. It requires that the NPS plan for the protection of cultural resources and reinforces the requirement to use existing buildings for NPS purposes. In Chapter 8, "Management of Historic and Prehistoric Structures," observes that "the primary preservation issue…is the compatibility of the use with the structure." DO-28 also requires that no historic structure be rehabilitated or restored without an appropriate historic structure report.

FOUNDATION DOCUMENT

A Foundation Document was prepared for the George Washington Memorial Parkway in December 2014. It identifies the fundamental resources and values associated with the park as well as the park significance and interpretive themes. Preparation of the Foundation Document included an assessment of planning and data needs, other important resources, and identification of key park-wide and major issues. All of these were prioritized and connected with stewardship priorities.

FOUNDATION DOCUMENT PURPOSE STATEMENT

The Purpose Statement for the park reinforces the foundation for future park management and use decisions. The purpose statement for the George Washington Memorial Parkway was drafted through a careful analysis of its enabling legislation and legislative history that influenced its development. The unit was established when the enabling legislation adopted by Congress was signed into law on May 29, 1930. The following is the purpose statement for the George Washington Memorial Parkway of which the Great Falls Park Visitor Center is a part:

The George Washington Memorial Parkway is a scenic roadway honoring the nation's first president, that protects and preserves cultural and natural resources along the Potomac River below Great Falls to Mount Vernon, and is part of a comprehensive system of parks, parkways and recreational areas surrounding the nation's capital.

Great Falls Park is amongst the Fundamental Resources and Values identified in the Foundation Document: Great Falls Park, including the Patowmack Canal. Great Falls Park offers many opportunities to explore history and nature, all in a scenic 800-acre park only 15 miles from the nation's capital. The park protects geologic features such as the Mather Gorge and the Great Falls of the Potomac, endemic and disjunct plant communities, historic sites, and recreational opportunities. The park also includes the Patowmack Canal, one of the first canal systems built in the country (1785–1802) and the realization of George Washington's plan to construct a canal that circumvented the Great Falls in order to support trade with the Upper Potomac Region. This national historic landmark includes intact stoneworks, locks, quarried drill holes, and the historic remains of Matildaville, the town that grew up around the canal construction site.

FOUNDATION DOCUMENT SIGNIFICANCE

Significance expresses why resources are important enough to merit National Park unit designation. Statements of significance describe why an area is significant within a global, national, regional, and system-wide context. These statements are linked to the purpose of the park unit and are supported by data, research, and consensus. Great Falls Park is one of 25 park units within the George Washington Memorial Parkway. The following significance statements have been identified for the Great Falls Park Visitor Center directly:

Great Falls Park protects the views and access to the Great Falls of the Potomac, the largest waterfall on the Potomac River.
Inspired by George Washington's vision for Western expansion and interstate commerce, the Patowmack Canal was one of the first canal systems in the country and used innovative engineering to meet the challenges of navigating the Great Falls of the Potomac.

Completed in 2014, when the Great Falls Visitor Center was 45 years old, and not yet considered eligible for the National Register, the Foundation Document does not specifically address the structure, but the Visitor Center supports the activities described in the Fundamental Resources and Values.

ALTERNATIVES FOR TREATMENT

Apart from rehabilitation, alternative treatments are preservation or restoration. However, the urgent need for a total replacement of Electrical and Mechanical systems, the recommendation for a new passenger elevator, and redistribution of the building program will most likely not allow the scope of work to meet the standard for Preservation or Restoration.

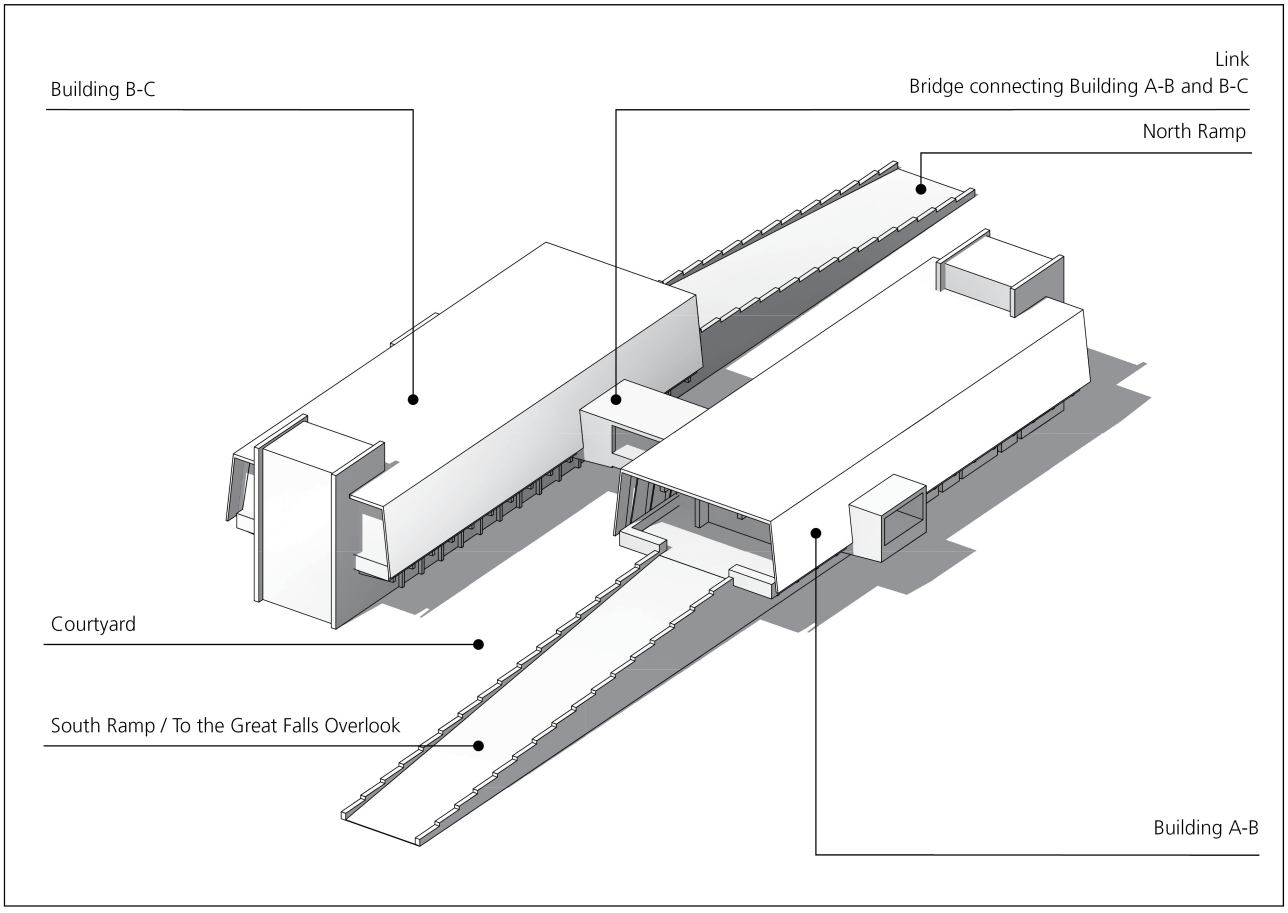


Figure 266. Great Falls Visitor Center Massing Diagram. (CRTKL, 2022)

Chapter 7: Treatment Recommendations

The Secretary of the Interior has established standards and guidelines for the appropriate treatment of historic properties. These standards identify three approaches that might be considered for treatment and use of the Great Falls Park Visitor Center: preservation, restoration, and rehabilitation. The fourth approach, reconstruction, is not an applicable treatment consideration for this site because the structure stands intact.

PRESERVATION

Preservation is defined as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses on the ongoing maintenance and repair of historic materials and features rather than extensive replacement or new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code required work to make properties functional is appropriate within a preservation project." Under Preservation, the Great Falls Park Visitor Center would be maintained in its present state, with the minimal maintenance necessary to continue in its present condition. If applied, this treatment would involve envelope waterproofing and MEP systems repairs.

RESTORATION

Restoration is defined as "the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code required work to make properties functional is appropriate within a restoration project." This approach if applied to the Great Falls Park Visitor Center would likely mandate their restoration to the period of significance, likely its construction date of 1968. But this treatment also must involve envelope waterproofing and MEP systems repairs or replacement.

REHABILITATION

Rehabilitation is defined as "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those por-

tions or features which convey its historical, cultural, or architectural values." This approach emphasizes the retention and repair of historic materials but provides more latitude for replacement because it is assumed the property is more deteriorated prior to work. Like those for Preservation, the standards for Rehabilitation focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.

Since its construction in 1968, the Great Falls Park Visitor Center has retained its historic use. However, the evolution of building program and public space area reduction led to some change of both historic fabric and original design intent for visitor circulation and experience. Other current building deficiencies include disrepair of the outdated building MEP systems and ongoing envelope water infiltration. The building is in urgent need of replacement or major repairs of all MEP systems and exterior envelope repairs. The recommended treatment for the Great Falls Park Visitor Center is rehabilitation of both the exterior and interior, including maintenance and retention of character-defining features.

DIRECTOR'S ORDER-28

DO-28 Cultural Resource Management Guideline is intended to guide the National Park Service through successful cultural resource management through three steps:[1]

- Research: "identify, evaluate, document, register, and establish other basic information about cultural resources;"
- Planning: "ensure that this information is well integrated into management processes for making decisions and setting priorities;" and
- Stewardship: "planning decisions are carried out and resources are preserved, protected, and interpreted to the public." [2]

Through the development of this HSR, the research and planning (for treatment and use) of this historic building is addressed. The general preservation philosophy integrated into this HSR is best represented by the following: "Better to preserve than to repair, better repair than restore, better restore than [re]construct. It is ordinarily better to retain genuine old work of several periods, rather than arbitrarily to 'restore' the whole, by new work, to its aspect at a single period."[3]

1 A copy of NPS-28 can be found at http://www.nps.gov/history/history/online_books/nps28/28contents.htm.
2 NPS-28, p. 1.
3 The Advisory Board on National Parks, Historic Sites, Buildings,

The demolition of a structure listed or eligible for listing on the National Register is allowable "only when all alternatives have been determined infeasible in the planning process." [4]

Decisions for the future stewardship of the Great Falls Visitor Center are under the purview of GWMP. As part of NPS-28, "stewardship focuses on five major activities:

- Control of treatment and use,
- Monitoring conditions of deterioration and structural failure,
- Protecting from human and environmental threats,
- Retaining or delegating responsibility for structures, and
- Developing the skills, knowledge, and attitudes needed to support the program. [5]

DO-28 provides standards for each of the SOI's Standards. Preservation sustains the existing form, integrity, and materials of a historic property. Work generally focuses the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. Sensitive upgrading of systems to ensure the long-term functionality and code-compliance of a property is appropriate within a preservation project. The following standards based on the Secretary's Standards apply:

- A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
- The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
- Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close

and Monuments policy statement (1936). NPS-28, p. 2.

4 NPS-28, p. 122.

5 NPS-28, p. 127.

inspection and properly documented for future research.

- Changes to a property that have acquired historic significance in their own right will be retained and preserved.
- Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
- The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color and texture.
- Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
- Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken. [6]

The following additional standards apply to all treatments:

- Use is monitored and regulated to minimize both immediate and long-term damage.
- Use of destructive techniques, such as archeological excavation, is limited to providing sufficient information for research, interpretation, and management needs.
- All work that may affect resources is evaluated by an historical architect and other professionals, as appropriate.
- All modification, repair, or replacement of materials and features is preceded by sufficient study and recording to protect research and interpretive values.
- New work, materials, and replacement features are identified, documented, or permanently marked in an unobtrusive manner to distinguish them from original work, materials, and features. The manner and location of identification is recorded using the Inventory and Condition Assessment Program (ICAP).
- A proposed treatment project is initiated by the appropriate programming document, including a scope of work and cost estimate from an HSR or ICAP.

[6] NPS-28, pp.96-101.

Such projects include preservation maintenance as well as major treatment. No treatment is undertaken without an approved HSR or work procedure documenting the work, and Section 106 compliance.

- A treatment project is directed by a historical architect and performed by qualified technicians.
- Representative features salvaged from a historic structure are accessioned and cataloged, provided that they fall within the park's scope of collection statement.
- All changes made during treatment are graphically documented with drawings and photographs. Records of treatment are managed as archival materials by a curator or archivist within the park's museum collection.

CODE ANALYSIS

Both NPS policies and federal regulations stipulate that when a historic structure is preserved and/or rehabilitated, attempts should be made to meet applicable nationally-accepted model building codes to the maximum extent feasible. Compliance with nationally accepted codes does not automatically trigger a complete code-based upgrade. Alternative criteria exist for alterations to historic structures which typically encourage flexibility in the literal application of the code intent. The Public Buildings Amendment of 1988 instructs Federal agencies to follow "to the maximum extent feasible," as determined by the administrator or head of the agency, the "…nationally recognized model building codes and other applicable nationally recognized codes such as electrical codes, and fire and life safety codes." The NPS consults pertinent national, state, and local codes, and typically adheres to the most strident code requirements. The NPS National Capital Regional Office Structural Fire Officer is the Authority Having Jurisdiction (AHJ) for final determination of code applications for these structures.

The NPS has prepared Design Standards for all construction projects, including those affecting historic structures.[7] The design standard presents all codes that should be reviewed and includes the most recent copies of the following major codes and applicable laws, policies, codes, directives, standards, and NPS guide-

[7] Denver Service Center. "Design Standards." Denver Service Center Workflows. National Park Service, Department of the Interior, 2009. Accessed at http://www.nps.gov/dscw/dstandards.htm on March 6, 2012.

lines. The design standards present requirements for accessibility, civil, and environmental engineering, landscape architecture, architecture, including roofing and waterproofing, structural, mechanical, safety and fire protection, electrical, lighting, and sustainability disciplines. The recommendations in this document are in accordance with the International Code Council (ICC) Model Codes and Standards, 2018 editions and the NFPA National Fire Codes, including but not limited to the following:

BUILDING:

- 2018 ICC International Building Code (IBC);
- 2018 ICC International Existing Building Code (IEBC);
- ANSI/ASSEZ117.1, Safety Requirements for Confined Spaces;
- 2018 NFPA Life Safety Code (NFPA 101) – the most restrictive

M***ECHANICAL:***

- 2018 ICC International Mechanical Code (IMC)

PLUMBING:

- 2018 ICC International Plumbing Code (lPC)

FIRE:

- 2018 ICC International Fire Code (lFC);
- National Fire Protection Association (NFPA) Codes, Including Annexes (except NFPA 5000)

ENERGY:

- 2018 ICC International Energy Conservation Code (IECC)

FUEL GAS:

- 2018 ICC International Fuel Gas Code (lFUGC)

OTHER LOCAL CODES AND LOCAL UTILITY GUIDELINES, CODES, REGULATIONS:

- National Fire Protection Association (NFPA) 70, 2020 National Electrical Code (NEC)
- Building Construction and Safety Code (NFPA 5000)
- Installation of Lightning Protection Systems (NFPA 780)
- Code for the Protection of Cultural Resource Properties (NFPA 909)
- Code for the Fire Protection of Historic Structures (NFPA 914)

- Safeguarding Construction, Alteration, and Demolition Operations (NFPA 241)

FEDERAL GOVERNMENT LEGISLATION, REGULATIONS, STANDARDS AND GUIDELINES:

- 2004 Architectural Barriers Act and ABAAS Guidelines
- Americans with Disabilities Act (ADA) 2010 Design Guidelines
- ANSI A117.1 2003
- Uniform Federal Accessibility Standards (UFAS)
- Occupational Safety and Health Administration (OSHA)
- The Authority Having Jurisdiction (AHJ) for the National Capitol Region is James King, Branch Chief Fire and Emergency Management.
- ASCE 7-16 Minimum Design Loads (and Associated Criteria) for Buildings and Other Structures
- ACI 318-14 Building Code Requirements for Structural Concrete
- ACI 530-16 Building Code Requirements for Masonry Structures
- NDS-2018 National Design Specification (NDS) for Wood Construction
- National Historic Preservation Act of 1966 (NHPA), amended
- The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (36 CFR 68), 1995
- The Secretary of the Interior's Standards for the Treatment of Historic Properties and the Guidelines for the Treatment of Cultural Landscapes
- The Secretary of the Interior's Standards and Guidelines for Archeological Documentation
- The Secretary of the Interior's Guidelines on Flood Adaptation for Rehabilitating Historic Buildings
- Uniform Code for Building Conservation
- Building Construction and Safety Code (NFPA 5000)
- Director's Order (DO) 50B, Risk Management (Manual 50B)
- Director's Order (DO) 58, Structural Fire Management (Manual 58)
- 5 U.S.C § 7902 (Safety Program)
- 15 U.S.C § 2225 (Fire Prevention and Control)
- 29 U.S.C § 668 (Occupational Safety and Health)
- 40 U.S.C § 619 (Construction, Alteration, and Acquisition of Public Buildings)

CODES INTRODUCTION

A code analysis of the existing building conditions has been conducted. The analysis is largely based on new construction criteria (IBC, NFPA 101 new building criteria), which may need to be met for significant renovations. In instances where new construction criteria are not able to be met, existing construction criteria are used to determine the adequacy of the existing building (IEBC, NFPA 101 existing building criteria).

INTERNATIONAL EXISTING BUILDING CODE

According to The Public Buildings Amendments of 1988, any building constructed or altered by a Federal agency must, "to the maximum extent feasible, be in compliance with one of the nationally recognized model building codes and with other applicable nationally recognized codes." The International Existing Building Code (IEBC) is one of the allowable recognized model building codes. [8]

Treatments of the buildings and site are to be guided by the IEBC.[9] Threats to public life, safety, and welfare must be addressed; however, because this building is historic, alternatives to full legislative and code compliance are recommended where compliance would needlessly compromise the integrity of the historic building, such as the removal of character-defining features or infringement upon the national register characteristics of the site and/or structures.

The IEBC Chapter 12 is for historic structures. A historic building that does not conform with the construction requirements specified in the IEBC shall be provided with an automatic fire extinguishing system (note: this cannot be used to substitute for obtaining the required numbers of egress). Grand stairways may be accepted without complying with handrail/guardrail requirements, provided they are not structurally dangerous.

OCCUPANCY TYPE

(Chapter 3 IBC: Use and Occupancy classification) Great Falls Park Visitor Center has multiple use groups: *A-3 – Assembly* (Museum, Auditorium and Assembly Areas of greater than 50 people), *B – Business* (staff support spaces, concession kitchen), and *M – Mercantile* (Retail Space).

[8] The General Services Administration has more information on this amendment and other accepted building codes at (http://www.gsa.gov/portal/content/101288).

[9] IEBC is overseen by the International Code Council. More information is located at http://www.iccsafe.org/CS/Pages/default.aspx.

OCCUPANCY LIVE LOADING

(Chapter 16 IBC: Live Loads) Based on the occupancy type the two primary occupancy live loading types are assembly space for the second floor and office for the first floor. Note that the original structural drawings indicate a 100 psf live loading capacity for all supported floors and 30 psf roof live load.

Occupancy or Use	Live Load	
	Uniform *(psf)*	Concentrated *(lbs)*
Offices	50	2,000
Assembly Area	100	
Roof Live	20	300

CONSTRUCTION TYPE

The first floor of both Buildings A-B and B-C, consist of concrete masonry units (CMU) and concrete. This construction type is most similar to construction Type IIB. The second floor of the building is made primarily of wood and is most similar to a Type VB construction.

FIRE-RESISTANCE RATINGS

Building Element Type IIB and VB

Building Element	Fire Resistance Rating, Type IIB *(hr)*	Fire Resistance Rating, Type VB *(hr)*
Primary structural frame	0	0
Bearing walls - Exterior	0	0
Bearing walls - Interior	0	0
Nonbearing walls and partitions - Exterior	0	0
Nonbearing walls and partitions – Interior	0	0
Floor construction and associated secondary members	0	0
Roof construction and associated secondary members	0	0

OCCUPANCY LOAD FACTOR *(Chapter 7, 2015 NFPA 101)*:

Occupancy Type	Example Room	Occupant Load Factor
Assembly, less concentrated use w/o fixed seating	Museum spaces, Auditorium (non-seating areas), Staff Kitchen	15 ft²/person net
Bench Type Seating	Auditorium (seating areas)	1 person / 18 linear in.
Business	Staff Offices, Concession Kitchen	150 ft²/person
Mercantile	Gift Shop	40 ft²/person
Accessory Storage areas, mechanical rooms, equipment rooms	Mechanical Rooms	300 ft²/person (IBC, 2018 edition, Table 1004.5)

1st Floor, AB		
Room	**Area**	**Occupant Load *(persons)***
Restroom	398 ft²	3
Staff Kitchen	137 ft²	10
Office Area	1,186 ft²	8
Total	N/A	21

1st Floor, BC		
Room	**Area**	**Occupant Load *(persons)***
Concession Kitchen Area	665 ft²	4
Office Area	372 ft²	3
Restroom	338 ft²	3
Mechanical Room	377 ft²	2
Total	N/A	12

2nd Floor AB and BC		
Room	**Area**	**Occupant Load *(persons)***
Exhibition Area	2,812 ft²	188
Auditorium, Seating area	5 benches X 288” long = 1440”	80
Auditorium, Non-Seating area	1,018 ft²	68
Auditorium, Projector Room	176 ft²	2
Gift Shop	290 ft²	8
Five Misc. Equipment / Storage Rooms <300 sq. ft.	N/A	5
Total	N/A	351

EGRESS

MEANS OF EGRESS

The number of means of egress from any balcony, mezzanine, story, or portion thereof shall be not less than two, except where a single means of egress is permitted by NFPA 101, Chapters 11 through 43 (NFPA 101, Section 7.4.1.1)

First Floor Building A-B. Each Room/Area has at least two means of egress or meets the single means of egress exception provided in description below.

First Floor Building B-C. Each Room/Area has only one means of egress. While the concession and office area are connected, means of egress is not permitted through a kitchen or an area that is subject to locking (NFPA 101, Section 7.5.2.1)

Per NFPA 101, Chapter 38 (Section 38.2.4.3), a single exit is permitted when the occupant load is less than 100 persons, provided that the exit discharges directly to the outside, the total travel distance is less than 100 feet, and the total distance of travel is on the same story. All conditions are met for first floor of Building B-C.

Second Floor Buildings A-B and B-C. Each Room/Area has two means of egress. However, the two means of egress from the auditorium are not remote from each other for new construction (NFPA 101, Section 7.5.1.3.1). The diagonal dimension of the auditorium is roughly 64 feet. The distance between the two auditorium exits is 18 feet. The remoteness between them is roughly 0.28. The required remoteness for a non-sprinklered new building is 0.5. If sprinklers are provided, then the remoteness for a new building is 0.33. The existing remoteness for the auditorium is inadequate for a new building. However, for an existing building, NFPA 101 does not require that a measurement be conducted, only that the exits are remote enough to minimize the possibility that both exits may be blocked by any one fire or other emergency. Since the auditorium and other spaces have smoke detection, the time between a fire starting, and occupants knowing about the fire is reduced, allowing occupants to egress sooner. Since they are able to egress sooner, it is less likely that a fire blocking one exit will block both exits.

ARRANGEMENT OF MEANS OF EGRESS

Areas accessible to people with severe mobility impairment, other than existing buildings, shall have not less than two accessible means of egress, unless otherwise provided in 7.5.4.1.2 through 7.5.4.1.4 (7.5.4.1).

Common path limit for unsprinklered building (Table A7.6):

- Assembly 20 ft (>50 people)/75 ft (< 50 people)
- Mercantile (Class C) 75 ft
- Business 75 ft

Dead End Corridor limit for unsprinklered building (Table A7.6):

- Assembly 20 ft
- Mercantile (Class C) 20 ft
- Business 20 ft

Travel Distance Limit for unsprinklered building (Table A7.6):

- Assembly 200 ft
- Mercantile (Class C) 150 ft
- Business 200 ft

EGRESS COMPONENTS

Per Table 7.3.3.1, the capacity factor for stairways is 0.3 inches/ person. The capacity factor for level components and ramps is 0.2 inches/person.

A single leaf door has about 32 inches minimum of clear width, allowing 160 persons to exit per single leaf door (32 in /(0.2in/per- son) = 160 persons). A double door has about 64 inches of clear width, allowing 320 persons to exit (64 in /(0.2in/ person) = 320 persons). The first floor Building A-B and Building B-C areas have an occupant load significantly less than 160 persons, so the single leaf doors on the first floor are adequate. On the second floor, the occupant load is 351, which can be met by the double door and multiple single doors on this floor. In addition, the main entrance/exit (the double door in the main lobby) is able to accommodate one half of the total occupant load of the floor (320 > 178) (NFPA 101, Section 12.2.3.6.2(2)).

The open stair connecting the Building A-B first floor and second floor is not required to be a means of egress. However, the stair is still required to meet NFPA 101, Section 8.6 for vertical openings, per the requirements of an existing assembly occupancy per NFPA 101, Section 13.3.1. Section 8.6 requires that the vertical opening either be enclosed with fire barriers, or meet some exception. Most exceptions require a partial fire rated enclosure or fire rated separation from adjacent spaces, which the Visitor Center stair does not meet. The exception that is almost met is for a convenience stair, which requires that the stair not serve as a means of egress, and a sprinkler system is installed. The building is not currently protected by a sprinkler system, but if one were installed, then the stair would meet the requirements for a convenience stair.

The exit doors currently have locks that require a key to exit, and are locked during non-public hours when Park staff are inside the building. However, NFPA 101 does not permit locks that require special effort to operate from the egress side (NFPA 101, Section 7.2.1.5.3). In other words, all exit doors need to be immediately operable from the inside, even if the door is locked from the outside. In addition, an assembly area with 100 or more persons is required to have panic hardware per existing building assembly occupancy criteria (NFPA 101, Section 13.2.2.2.3). This would apply to all exit doors serving the second floor, and the doors serving the auditorium. But these doors do not have panic hardware.

SITE RESILIENCY

The Great Falls Park Visitor Center is located outside but adjacent to the Federal Emergency Management (FEMA) special flood hazard area.

The scope of this HSR report does not include any conditions outside of the building footprint. While the design team did not study the site conditions, according to anecdotal evidence provided by the NPS staff, the Visitor Center Courtyard is subject to frequent flooding. We did not observe evidence of severe water infiltration at the ground floor doors or extensive façade deterioration at the interface with the courtyard. We did observe ongoing site erosion and standing water in the courtyard during or after rain events that create accessibility problems. The structural survey identified erosion as a potential reason for ongoing settlement of the interior ground floor slabs but noted that structural walls are sitting on top of the solid rock and did not settle.

The Great Falls Park Visitor Center is located near large impervious parking areas, adjacent to a historic canal and in proximity to the FEMA special flood hazard zone. We recommend that the NPS undertakes further evaluation of the larger site and landscape areas surrounding the building (including the historic canal, parking areas, courtyard and adjacent trails) to confirm evolving flood risks. The study shall include an analysis of negative effects on the building envelope from large trees immediately adjacent to the Visitor Center and an evaluation of civil infrastructure conditions, including elevation of the building transformer concrete pad.

Building resiliency planning shall also take into consideration the location of electrical equipment and utility spaces inside the visitor center, and should evaluate the flooding risks and vulnerabilities of the building, in accordance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines on Flood Adaptation for Rehabilitating Historic Buildings.

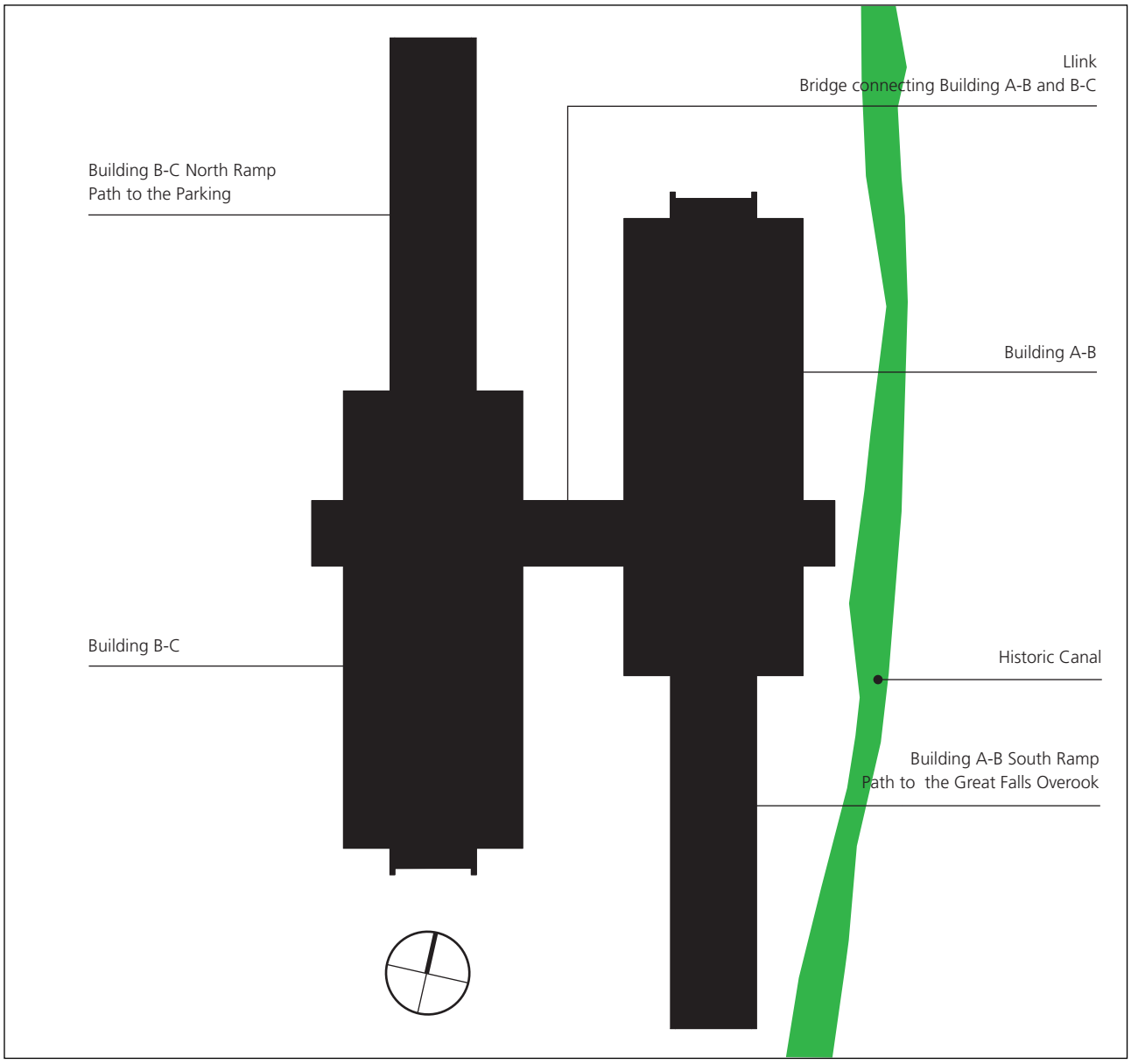


Figure 267. Great Falls Visitor Center Roof Plan Diagram. (CRTKL 2022)

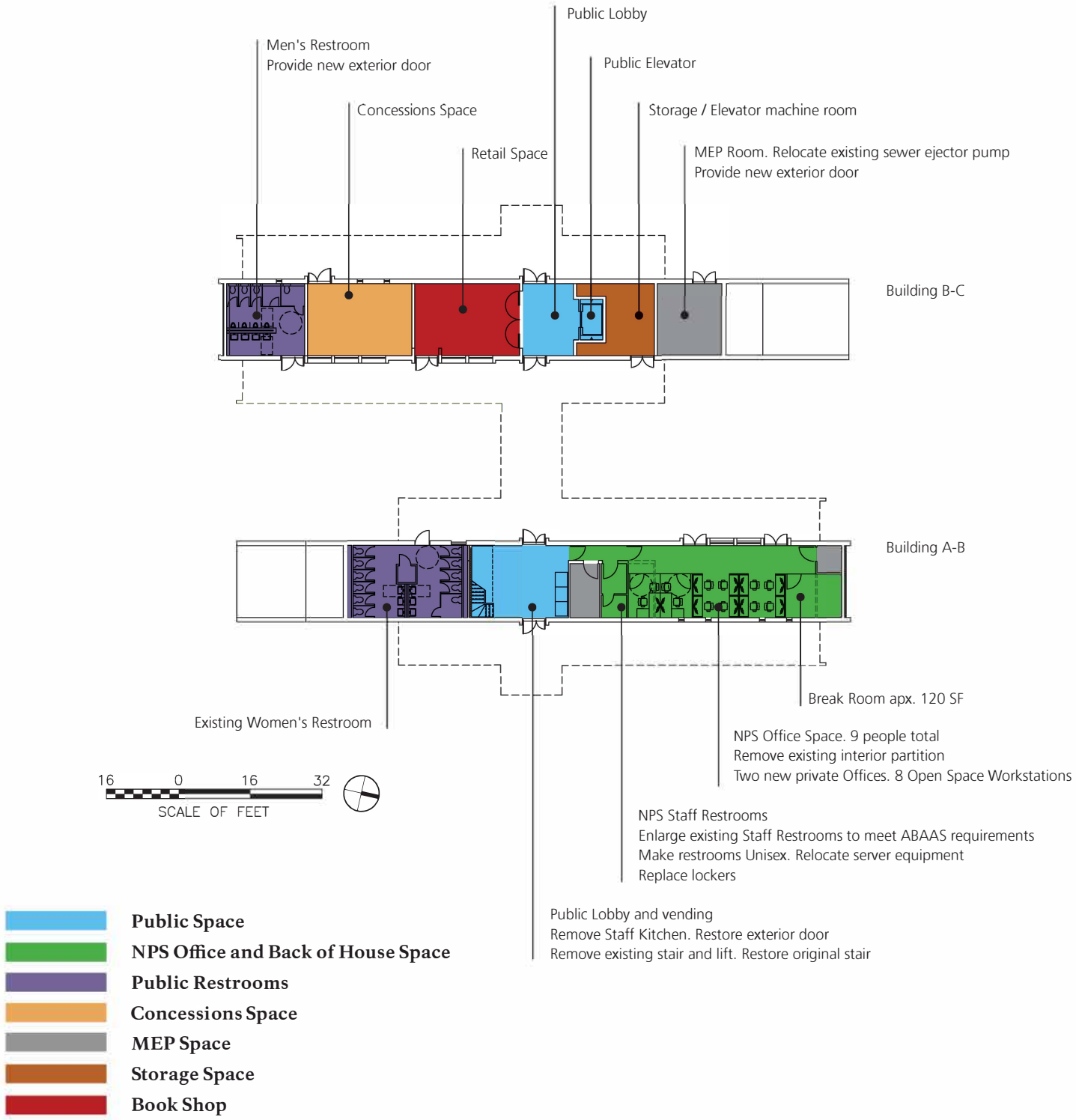


Figure 268. Treatment Recommendation First Floor Program Diagram. (CRTKL 2022)

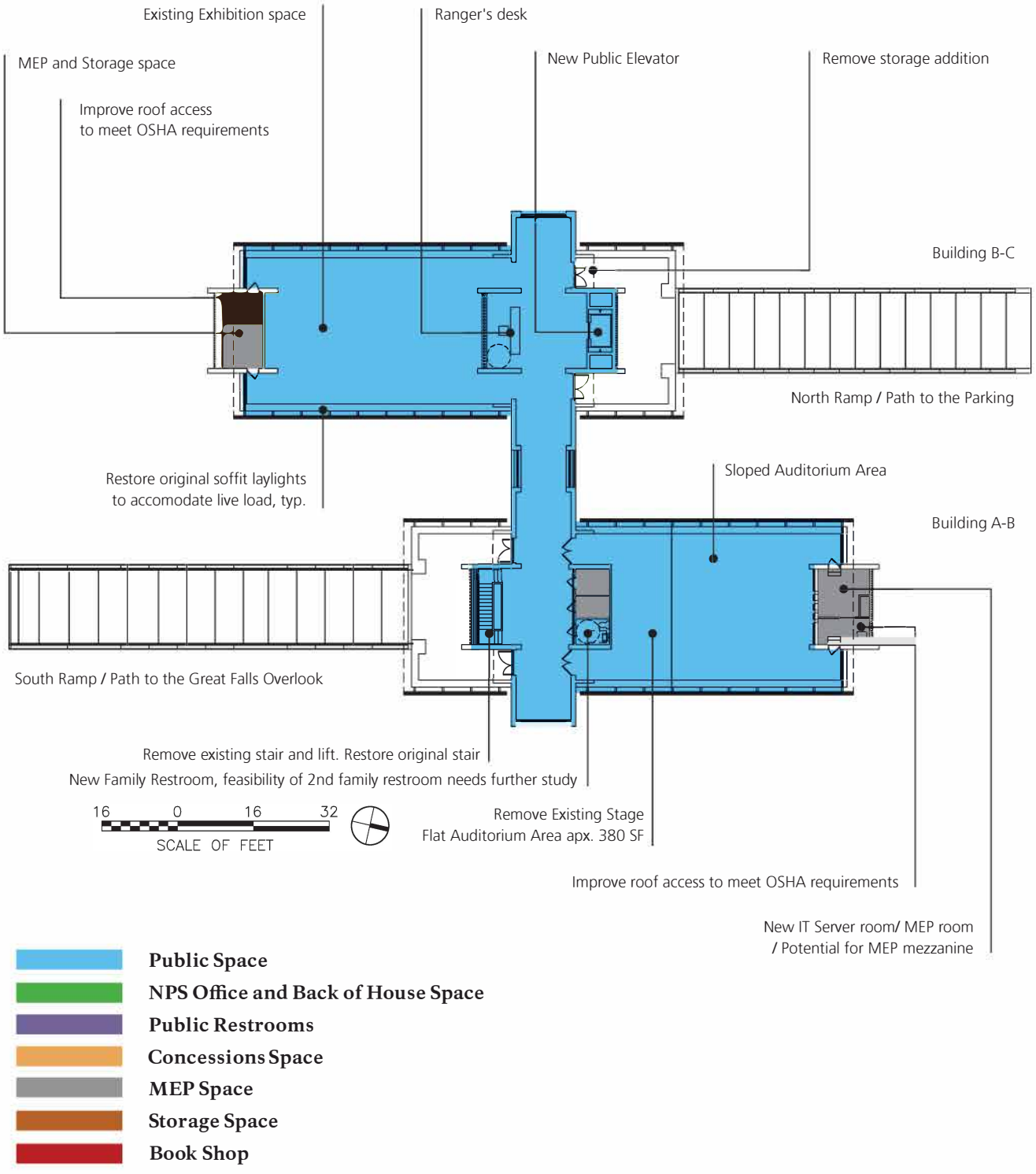


Figure 269. Treatment Recommendation Second Floor Program Diagram. (CRTKL 2022)

SPECIALIZED TREATMENT RECOMMENDATIONS

Following the 22 November 2021 Planning Workshop with CRTKL, NPS/GWMP held a series of internal discussions, drawing in facilities, interpretation, and cultural resources staff to discuss the maintenance, use, and significance of the Great Falls Park Visitor Center. On February 23, 2022, NPS issued to CRTKL a memo with the direction regarding three potential Treatment Options. The Design Team used this NPS memo to inform the three proposed Treatment Options included in the 75% HSR Report Submission. Following the review of the 75% HSR Report, on July 7, 2022, NPS issued a memo with the direction regarding the selected Treatment Option. The Design Team used this NPS memo to inform the selected Treatment Option included in this report. The selected Treatment Option is a Rehabilitation, as defined by the Secretary of the Interior's Standards for the Treatment of Historic Buildings.

SELECTED TREATMENT OPTION

The intent of the selected Treatment Option is to return to the original ratio of public and private space and also enhance the design to improve visitor use and experience with bold “revitalization” of the original design. The main goal for the program and circulation adjustment is to fully restore and enhance the original building circulation pattern as follows (see Figures 268 and 269):

1. Restore an open public cross circulation in the east-west direction on the ground floor connecting Buildings A-B and B-C with the adjacent outdoor spaces.
2. Provide more public space on the ground floor for retail and vending and improve accessibility throughout the building. Integrate ground floor interior public space and courtyard space as one unified program system to enhance the visitor experience.
3. Provide space for a staffed concessions space serving prepared foods only and remove existing concessions back-of-house outdoor area.
4. Reconfigure Building A-B ground floor to include the following NPS office program:
    - Staff break room (approximately 120 - 150 sf), to include a kitchenette and preferably natural light.
    - Eight workstations

- Two private offices (in addition to the workstations).
- Provide one accessible unisex toilet and locker room.

5. Reconnect the second-floor public space to the reclaimed original ground floor public lobby in Building A-B. Restore the original public stair.
6. Provide ABAAS (Architectural Barriers Act Accessibility Standards) compliant passenger elevator to create a new public connection between Building B-C second level entrance and reclaimed ground floor public lobby.
7. Treatment recommendations also include discussion about improving the building's energy performance, resiliency in the face of climate change, responding to evolving climate change expectations and adapting to updated flood conditions, consistent with Guiding Principles for Sustainable Federal Buildings and Executive Order 14057, and applicable to rehabilitation of historic buildings consistent with Department of Interior.

PROGRAM AND GENERAL ARCHITECTURAL TREATMENT RECOMMENDATIONS *(Figures 268 and 269)*

Building A-B Ground floor

1. Reconfigure floor layout by relocating staff kitchen area and interior partitions in the NPS office space. Replace staff kitchen program with public lobby program to match original design intent. Provide vending area in the renovated public lobby.
2. Provide two private office and eight open space workstations in the NPS office area (ten people total).
3. Provide new staff break room with kitchenette with access to daylight by removing existing MEP and back-of-house spaces at the north end of the ground floor. Retain space at the NW corner for MEP use.
4. Restore double doors of public lobby on the east wall of the building.
5. Keep existing women’s restroom layout.
6. Reconfigure NPS staff restrooms by removing north restroom and locker area and moving CMU partition and making south restroom larger to meet ABAAS requirements. The single remaining larger staff restroom shall be Unisex.
7. Consider relocating server equipment to the new IT room / server space inside the original auditorium projector booth space. The removal of the

server equipment will allow for ABAAS-compliant restroom access.

8. Reconfigure lockers located in the restroom lobby. Provide stacked lockers. Coordinate locker and space layouts to allow access for proposed unisex restroom to meet ABAAS requirements.
9. Repair exterior ramp rail.
10. Re-grade the courtyard and make drainage improvements to prevent flooding into ground floor office spaces.
11. Re-grade and provide ABAAS-compliant condition at all exterior door thresholds.
12. Consider renovation of the existing women's restroom including replacement of the finishes and fixtures.

Building B-C Ground floor

1. Restore original public lobby program by removing NPS office use. Reconfigure interior partition separating public lobby and adjacent proposed retail space and provide securable doors between the retail and new adjacent public space.
2. Provide a ground floor space for the retail program located between concessions space and renovated public lobby. The retail space shall be securable from the elevator lobby with good visibility and access from the courtyard.
3. Provide new ABAAS-compliant hydraulic elevator connecting Building B-C first floor level lobby and second floor entry lobby.
4. Relocate men's restroom to the south end of the Building B-C. Provide new exterior door for the restroom space.
5. Reconfigure MEP room layout. Relocate existing sewer ejector pump to allow the new storage / elevator room machine space. Provide new exterior door for the MEP space.
6. Reduce concessions program and change food service program to a snack bar serving prepared and microwaved foods only.
7. Remove concessions exterior storage area and fence.
8. Re-grade to reduce flooding into the building and reduce burden on CMU base-of-wall to prevent leakage into concealed spaces near the northwest building corner. Provide ABAAS-compliant condition at all exterior door thresholds.

Building A-B and B-C Second floor

1. Reconfigure the main building entry (Building B-C) in the spirit of the original design. Remove the storage addition at the North ramp and non-original entry doors.
2. Relocate retail program to the first floor of the Building B-C.
3. Provide new ABAAS-compliant hydraulic elevator connecting Building B-C first floor level lobby and second floor entry lobby.
4. Remove non-original ranger's desk to open the east-west corridor connecting the Buildings A-B and B-C. Consider locating ranger's desk between existing freestanding CMU walls opposite to the public elevator and entrance.
5. Consider reconfiguration of the exhibit to allow a fully enclosed back-of-house space along the south façade of the Building B-C. This space could be used as MEP and storage space.
6. Consider locating a new central IT/server room in the auditorium projection room.
7. Improve roof access in the Buildings A-B and B-C to meet OSHA requirements.
8. Remove existing non-original communicating stair and lift to restore original communicating stair.
9. Auditorium space shall keep the current function as a theater and retain existing fixed wood benches. The NPS Authority Having Jurisdiction has reviewed the exiting auditorium egress conditions, and given that the exiting distance is within a few percentage points of the code requirement (assuming the installation of fire sprinklers), believes compliance can be achieved by providing Alternatives within the space, rather than fully meeting the code requirement (example: adding additional fire extinguishers).
10. Remove existing auditorium stage and install large digital screen to replace projection. Historic character of the space should be considered.
11. Maximize the flat floor area at the front, south end of the auditorium, and provide around 380 SF of the flat floor area. This area will be useful for student activities.
12. Reconfigure MEP rooms located between auditorium and public circulation space to provide ABAAS-compliant public family restroom. The door of the new restroom shall match the existing decorative wood grille wall, similar to the existing electrical room door, and will require careful con-

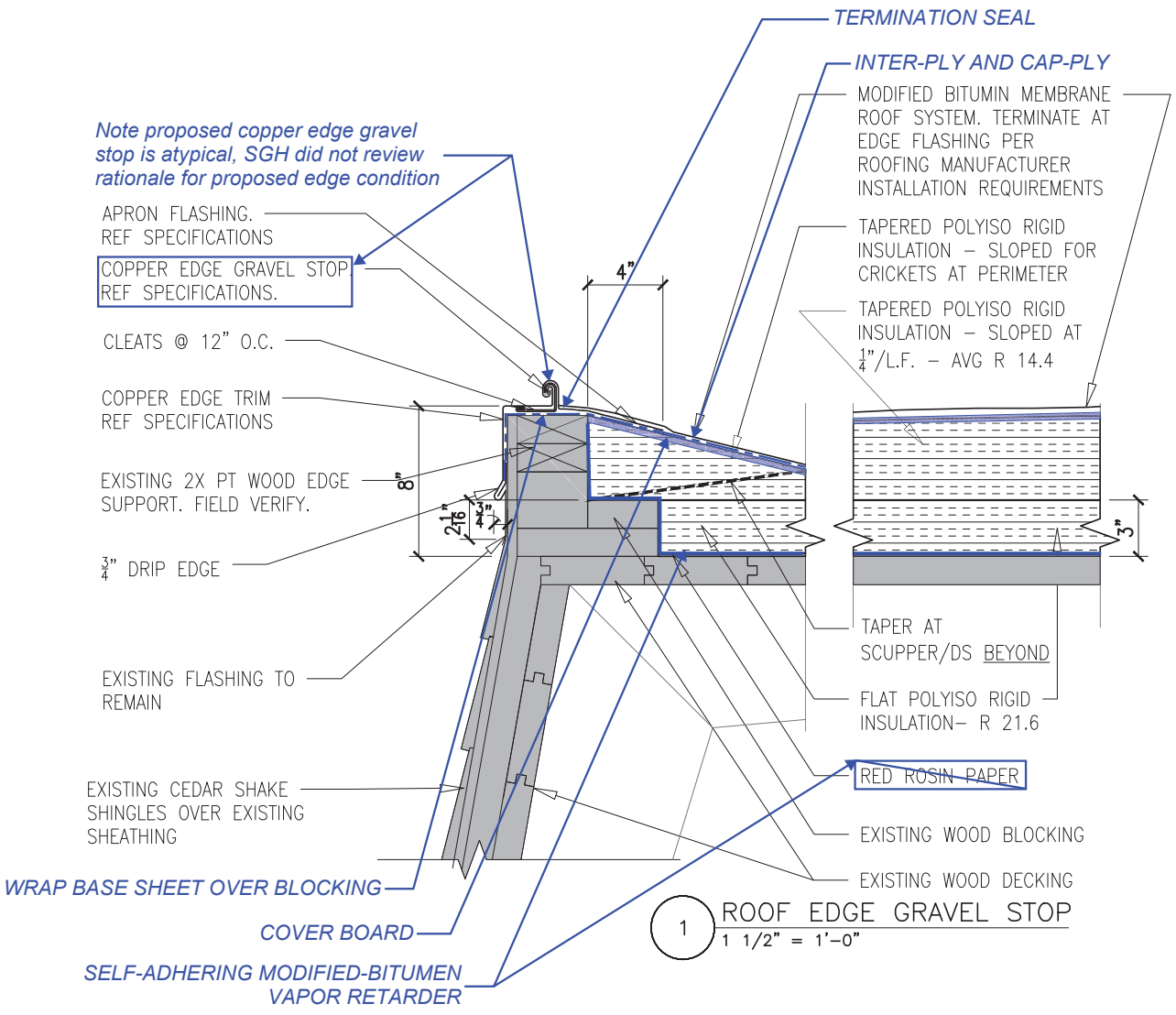


Figure 270. Treatment Recommendations Roof Edge. (SGH, 2022)

sideration and detailing.

ENCLOSURE TREATMENT RECOMMENDATIONS

Building Enclosure Treatment recommendations include the following:

1. Roof

To eliminate leakage around the roof perimeter, replace the roofing and reconfigure the perimeter flashings. NPS has undertaken a roof replacement project, as described in the 100% CD Set for the "Roof Replacement, HVAC Units Replacement, and HVAC Maintenance" project prepared by the National Park Service and dated 14 June 2021. The re-roofing design changes the roof slope and incorporates contemporary code-required amounts of insulation above the roof deck (average R-30 roof insulation). In general, the roof replacement design satisfies the project goals and will address leakage around the roof perimeter if constructed properly.

We have the following specific recommendations:

- The existing roof assembly is not original; the roof edge has a short parapet formed by wood blocking approximately 3 inches taller than shown on the original architectural drawings. The re-roofing drawings do not propose any further changes to the height of the perimeter parapet and incorporate gravel edge stops and cricketing to accommodate new roof insulation. We generally agree with the design approach shown in the re-roofing drawings; however, we recommend adjusting edge detailing so that the base ply of the modified bituminous roof laps onto exterior wall materials. (Figure 270).
- During re-roofing cover the tongue-and-groove decking with a self-adhered vapor retarder rather than red rosin paper.
- The existing roof assembly suffers from bond loss and crushed insulation. For re-roofing include a cover board on top of the tapered insulation to reduce incidence of crushed insulation in the new roof assembly.
- To reduce air infiltration and potential for water leakage at roof truss joints which interface with the building enclosure, we recommend filling the gaps with sealant. Note the sealant will require periodic maintenance. Other solutions may require less maintenance while reducing air leakage but will have a greater aesthetic impact (e.g. metal flashing or silicone sheet

flashing). We recommend prioritizing preservation of the historic appearance of the trusses while approaching modern performance goals for air infiltration using a low-viscosity, paintable sealant.

2. Fenestration

The existing conditions feature a wide variety of fenestration systems; some have recently been replaced, such as the windows on the second floor, but others are original, such as the narrow ground floor windows. We found instances where fenestration requires replacement for safety. Beyond life safety issues, the Preferred Option includes near-term maintenance to further the life cycle of units. We have the following specific recommendations:

- The narrow ground floor windows, soffit glazing in the auditorium and exhibit space, and some clerestory glazing near the second-floor entrances are at increased risk for breakage because the glass is in direct contact with concrete or separated from concrete by only a thin layer of sealant. The original drawings indicate the narrow ground floor windows are constructed of 3/16 in. sheet glass. The glass at these locations is unmarked, indicating it is likely not safety glazing. We recommend replacing and reconfiguring the support mechanism for all glass which is in direct contact with concrete to reduce risk of breakage. This may be achieved by enlarging the concrete opening reveal to install a new glazing shoe which will prevent contact between the glass and the concrete. Some alteration of the perimeter detailing is expected when modifying any existing glazing assembly, so further study is needed to minimize visual impact as well as impact to historic fabric. If there is a need to upgrade or replace the windows, they should be replaced with safety glass to meet contemporary code requirements. If replacing the glass with safety glazing, also NPS may consider upgrading the fenestration to contemporary energy standards with an insulated glass unit (IGU).

- We could not confirm if the ground floor fenestration with translucent film which faces the courtyard consists of safety glazing. Similar to the remaining ground floor windows, if replacing the glass with safety glazing, also consider upgrading the fenestration to contemporary energy standards with an insulated glass unit (IGU).

- Soffit glazing and plastic paneling along the base of the cedar-shake clad walls is a fall hazard and must be addressed. Replacement of the soffit glaz-

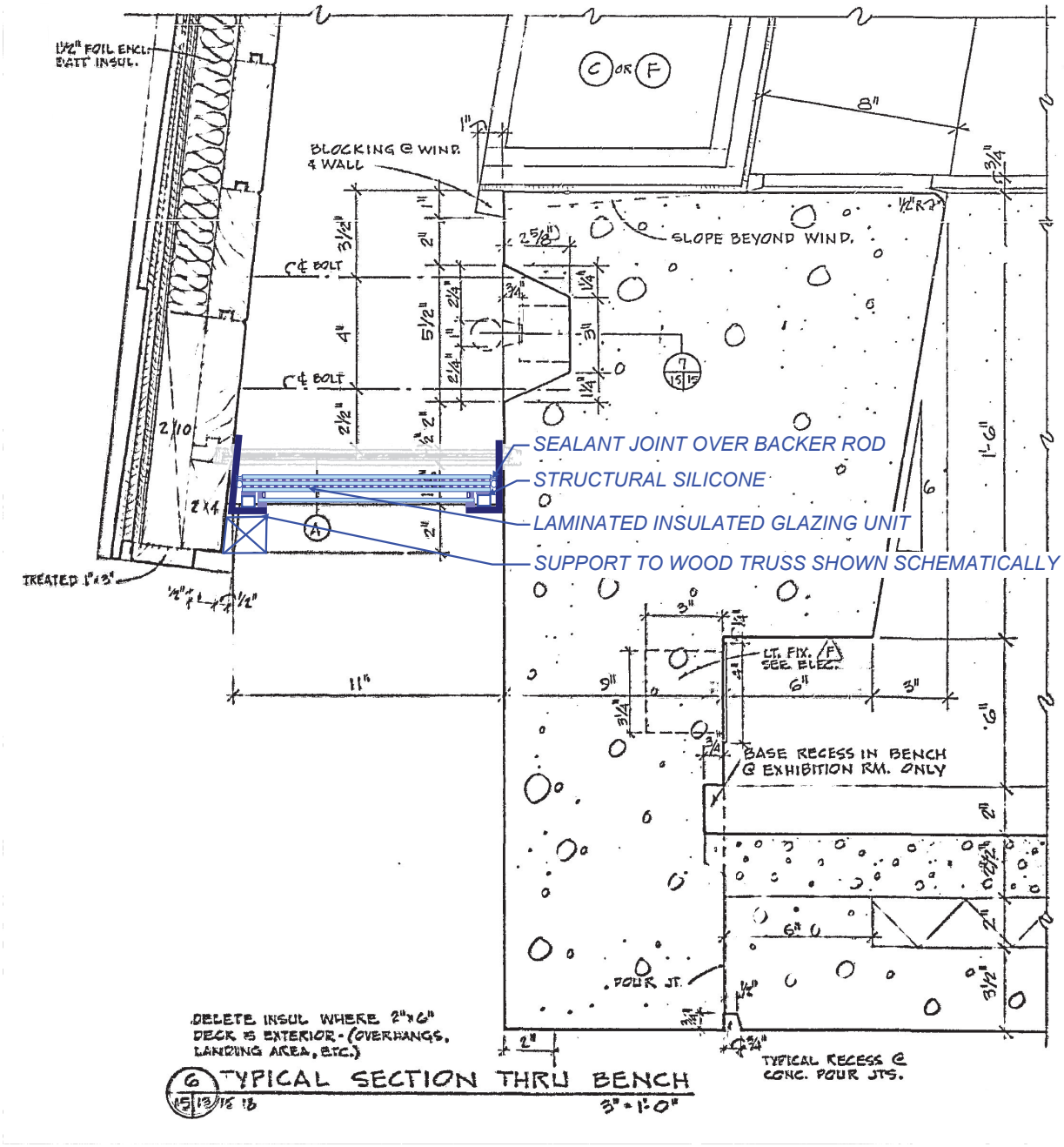


Figure 271. Treatment Recommendations Laylight Condition. (SGH, 2022)

ing will require either designing the laylight or solid soffit assembly to accommodate live loads or introducing fall protection to the interior space (e.g., grating or railing). We recommend designing a walkable laylight to replace the existing glazing and plastic infill panels to accommodate occupant live loads while reintroducing natural light (See Figure 271).

- Install operable shade / louver system or consider use of dynamic glazing (e.g., electrochromic or thermochromic) or electrochromic film to control the soffit laylight daylight in the auditorium. Coordinate daylight control systems with specific future use and programs.
- Storefront systems along the bridge connecting Building A-B to Building B-C have an etched stamp for safety glazing but suffer from gasket shrinkage and air leakage. All other second-floor glazing is greater than 18 in. above the floor and does not require safety glazing based on current code requirements. To reduce air leakage of the second-floor windows, wet-seal storefront units on the second floor but plan for glazing and gasket replacement in the next five to ten years. Reducing air leakage will improve energy performance and reduce duration and severity of condensation.
- Introducing glazing units and frames behind the grilles at the A-B and B-C second-floor entrance can improve natural daylight and views between the exterior and interior; however, it may interfere with the proposed location of the new elevator. Although not a recommended treatment, we provide a conceptual sketch for future discussion and consideration (See Figure 272). Note that new glazing units will require new structural members to convey loads into the base structure, and the units must integrate with existing adjacent enclosure thermal, air, and water barriers. Existing grilles may be preserved but will require support modification, as well, since they do not extend to the top of the ceiling or to the floor and the existing clerestory windows appear to bear directly on the grilles. Offset the grilles from the glass by at least 4 in. to accommodate glass maintenance and cleaning. Elevate new fenestration on a concrete curb to keep sills above the plane of water travel. All new grilles and wood framing shall match the existing grille's appearance. Note that piping and conduit are currently installed between the grilles on the B-C second-floor entrance and will require relocation if they are aesthetically objectionable. This option for consideration has not yet been reviewed by NPS Compliance Section 106 process.



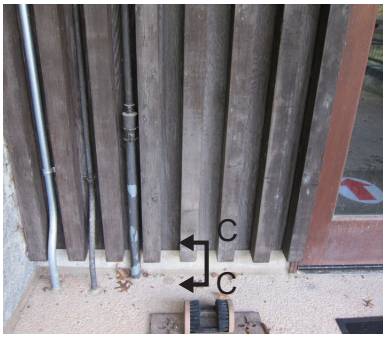


Figure 272. Alternative Treatment Recommendations for integrated glazing at the south and north Second Floor Bulding Entrances. (SGH, 2022)

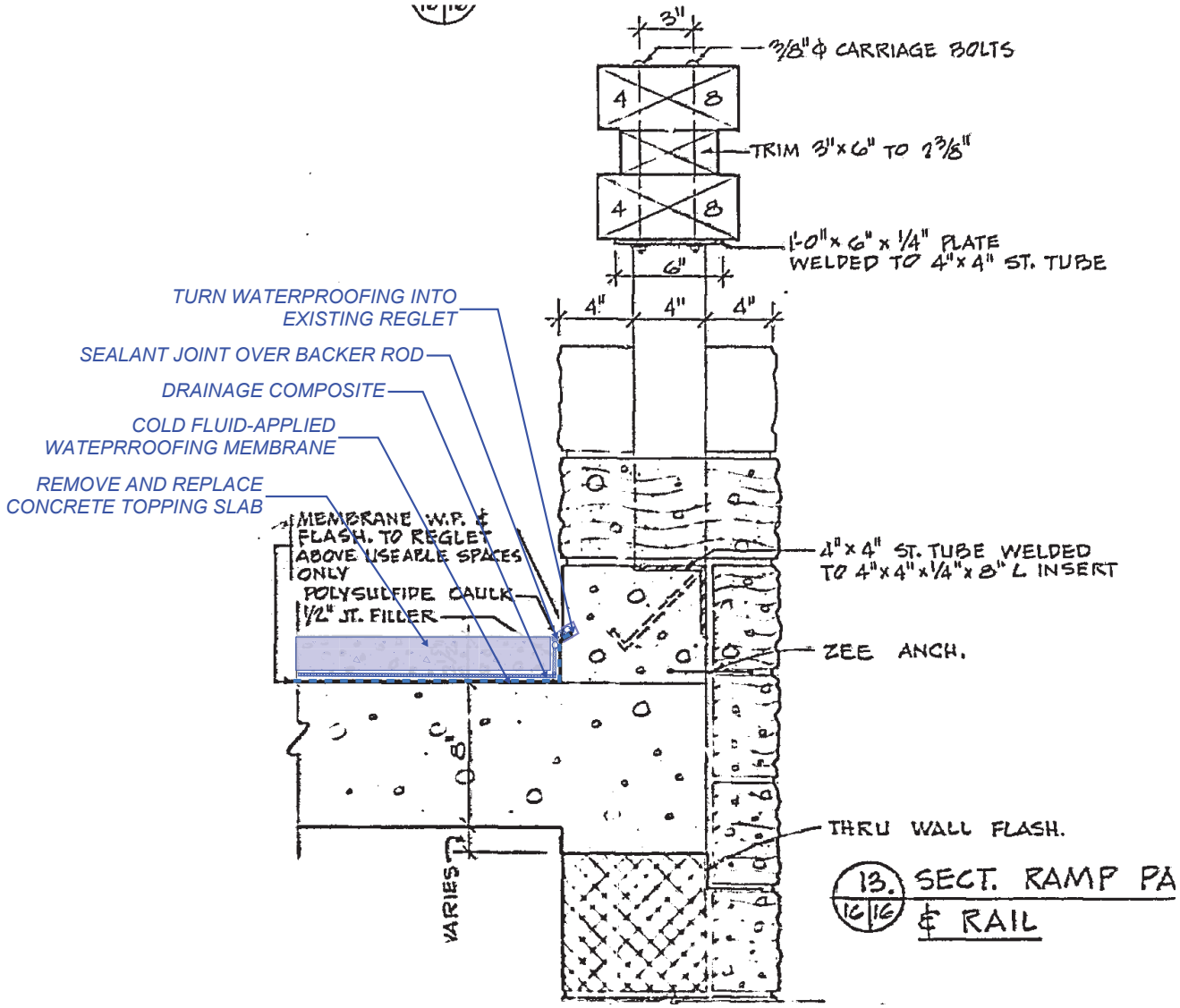


Figure 273. Treatment Recommendations Ramp Waterproofing Condition. (SGH, 2022)

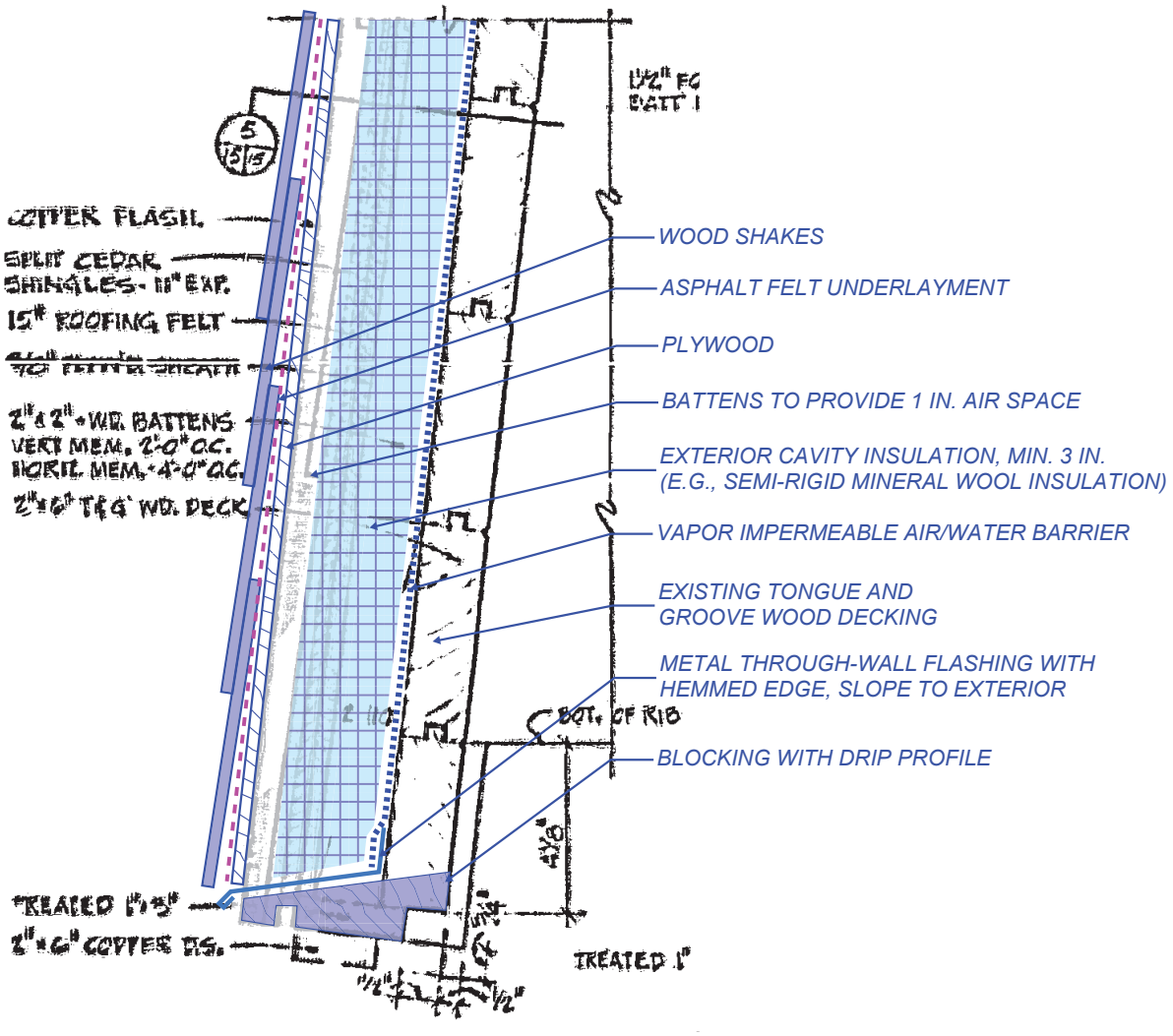


Figure 274. Treatment Recommendations Second Floor Wall Condition. (SGH, 2022)

3. Second Level Exterior Walls

Although the exterior wall does not appear to be the source of current leakage and the cladding is generally in good condition, NPS may consider modifying the existing exterior second floor wood walls assembly to improve building energy performance and reduce air leakage by adding insulation and establishing a continuous air/water barrier. Contemporary codes for a wood-framed building either require R-20 insulation between studs, R-13 insulation between studs with R-3.8 continuous insulation, or a total U-Factor of 0.064 Btu/h·ft2·F. The original architectural drawings show 1-1/2 inch foil enclosed batt insulation installed over the tongue-and-groove wood decking in between battens. To meet contemporary energy codes, the wood shake wall assembly may require 3 to 5 inches of insulation, depending on the selected compliance path, which will increase the thickness of the wall assembly. Mineral insulation may be considered due to its fire-resistant and moisture-repellant properties. Further architectural study of the modified building enclosure is required to review the visual appearance impacts, and potential adverse effects (Figure 274).

4. Ramps

The women's restroom in Building A-B and the MEP room in Building B-C, both located below the exterior ramps, show signs of the ongoing water infiltration. To address water leakage, we recommend replacing the waterproofing above the ramps with a cold fluid-applied polyurethane based or poly-methyl methacrylate based waterproofing membrane. The South ramp has an original waterproofing membrane that is likely beyond its useful life and is now allowing perimeter leakage. Based on observations and review of repair project documentation, the North ramp may not have a waterproofing membrane at all, contributing to the widespread water infiltration in the mechanical room and storage area below. Replacement of the waterproofing will require demolition of the topping slab, which must be replaced to match the current appearance. Replacement waterproofing should include appropriate accessory components, including membrane-level drainage composite to quickly evacuate water that migrates past the topping slab (Figure 273).

Although not part of this HSR scope, to reduce periodic flooding through ground floor door thresholds at grade into the restrooms and ground floor office spaces, we recommend re-grading the courtyard away from the building walls and increasing site drainage. A design task is currently in progress to address courtyard drainage.

STRUCTURAL TREATMENT RECOMMENDATIONS

1. ***Second floor wood structure miter joint.***

   The recommendation is to monitor. If the roof loading is changed during re-roofing project, we recommend evaluation for required structural reinforcement. The gap and warping of the wood structure could be addressed only if structural members are replaced. The roof is currently a flexible system and therefore any changes to the second-floor building enclosure should accommodate required movements. The flexibility of the roof system comes from the way the miter joint connection is made because it allows rotation and when the roof members deflect vertically, horizontally or twist from warping this joint allows these movements to occur. The miter joint connection has two components that serve specific purposes: first are the two split ring connectors which is a hollow steel pipe section that is cut into the cross-section of the ends of the wood members and transfers shear across the connection; second are the two bolts that go through the center of the split ring connectors and transfer tension across the connection. Both of these elements are located in the outside corner of the miter joint allowing the inside corner to open up a small amount as the joint rotates.

2. ***Concrete Repair.***

   Provide minor concrete repair around exposed concrete elevated slab and beam structure to prevent further degradation while it is still in good condition. Conservator input is recommended for the concrete repair materials.

3. ***Slab on grade settlement.***

   The building wall foundations are sitting on rock. The slab on grade most likely is sitting on a thin layer of fill. It is unlikely the observed settlement is a result of soil compression. The settlement is more likely an issue related to the drainage. Therefore, if the site drainage is improved, then a leveling slab could be a viable option.

4. ***Stepped crack in CMU wall***

   The observed stepped crack does not currently present a structural concern because in the cracked condition it is still acting as a bearing element. Until the crack is repaired the small section of wall is not contributing to the lateral system, however there is so much existing wall intact that this is not an issue. The source of the crack is unknown. It is not likely a settlement issue because the foundations should be sitting directly on rock according to original design doc-

uments. Repair the crack by re-pointing and correct the site drainage. Monitor the area in the future to see if crack reappears after repointing.

5. ***Laylights***

   Provide structural reinforcement of the existing structure and provide new structural framing and attachments to restore the second floor horizontal laylight. The new laylight system shall hold a live load to eliminate fall hazards.

6. ***New Elevator***

   Provide structural modifications required for installation of the proposed passenger elevator.

7. ***Interior Stair***

   Restore the original cast-in-place structure for the communicating stair in the Building A-B.

8. ***First Floor New Exterior Doors***

   Add two openings at the first floor CMU exterior wall as needed for architectural changes.

9. ***Second Floor Family Restroom***

   Provide slab penetrations for the second floor Family Restroom plumbing in Building A-B.

ELECTRICAL TREATMENT RECOMMENDATIONS

The proposed electrical system shall consist of consolidating existing electrical services and all LED lighting with a centralized lighting control system along with automatic local lighting control devices. NPS shall consider a solar panel system over the parking lot along with storage battery to provide on-site energy generation.

1. ***Electrical Power Distribution***

   The existing main electrical room shall be renovated to meet current code required access distance and spaces. Antiquated electrical distribution equipment should be replaced with new in its entirety as the equipment and wiring are of the original building vintage and are beyond their useful service life. Additionally, the existing panels are all indicated to be fully used without any

spare circuits or capacity to accommodate any new circuits or loads. Two utility service meters should be combined into one and overall system coordination and arc flash study should be performed.

The main building service is rated at 800A, 208Y/120V, 3-phase, 4-wire. The service for the kitchen is rated at 200A, 208 Y/120V, 3-phase, 4-wire. The main electrical room does not have the code-required access space for electrical distribution equipment, and this requires immediate remedy. Furthermore, the electrical distribution equipment is at end of its service life and should be replaced. The main distribution panelboard is manufactured by Federal Pacific, a company that is no longer in business. The main electrical room should be enlarged or rearranged to accommodate code-mandated access clearances for all electrical distribution equipment. A more suitable location for the main electrical room will be on the first floor closer to where the main utility service enters the building. However, resiliency of the building should be considered.

Location of the main electrical distribution equipment within the building, such as to address future flooding, shall be considered as part of building resiliency planning.

2. ***Lighting Fixtures and Control***

Existing indoor and exterior lighting fixtures should be replaced with new energy efficient LED luminaries. A new centralized lighting control system should be installed to control both interior and exterior lighting fixtures.

Occupancy sensors should be installed in all spaces. In addition, daylight dimming controls, which consist of photocell sensors connected to dimming LED drivers, should be installed in rooms next to large windows to harvest natural daylight.

Photocells should be utilized to control all exterior lighting fixtures by energizing them at dusk. The centralized lighting control system will turn off the exterior luminaries at a pre-determined time.

3. ***Automatically controlled Motorized Shading system***

Automatic shading systems may be considered at the large curtain wall glazing at east- and west-facing overlook windows at the second floor. The glazing on the north and south facades is heavily shaded.

4. Emergency Lighting and Exit Signs

Battery-backed emergency lighting heads should be installed in all major means of egress to provide illumination during normal power outage. Provide battery backed exit signs and emergency lighting to meet life safety and building codes.

MECHANICAL TREATMENT RECOMMENDATIONS

The proposed HVAC system shall consist of a geothermal wellfield coupled with a water cooled variable refrigerant flow (VRF) system. Refer to the major work components and description of the HVAC system below:

1. Geotechnical Survey

A geotechnical survey and environmental report would be required to determine the soil conditions, feasible locations, and allowable depths for drilling and installing the new geothermal wellfield. The report would also indicate if metal casings are required for each well, and the total depth of well casing that is required to prevent contamination during well installation.

2. Geothermal Test Well

Prior to completion of permit documents two test wells would be recommended to be installed during the design phase. Test wells would determine the soil conductivity, and provide an accurate cooling/heating capacity per well. Based off of this information, engineers can design the total quantity of wells required to meet the building's heating and cooling load demands.

3. Geothermal Wellfield

The geothermal wellfield would consist of a closed loop system of vertically drilled boreholes (horizontal loops require a larger footprint and are more applicable and cost effective for small residential systems). The wellfield location, and well piping depths would be determined by the geotechnical report, but it is most feasible to locate the wellfield as close to the building as possible without disturbing the environment (which may be at the paved parking lot). Well depths generally range from 250ft to 400 ft deep but may be drilled up to 600 ft deep. A typical 400 ft deep well would yield two-tons cooling capacity per well, while a 600 ft deep well may yield up to three tons per well. Boreholes would be 5"-6" in diameter with grout having a K value of 1.0. Wells would be

recommended to be spaced at least 20 ft apart, and if space is available, wells spaced 25 feet apart are best to prevent wellfield saturation over time. Geothermal piping typically consists of cross-linked polyethylene piping. Borehole piping is 1-1/4" in diameter, and typically 8 boreholes are connected to a single geothermal circuit. Each circuit is sized at 3 inch to 4 inch piping diameter and all wellfield circuits are routed underground back to the geothermal manifold location. Estimated building cooling capacity is estimated at 20 to 40 tons of cooling. Geothermal well quantity is estimated at 10 to 20 wells based on a 400 feet deep well. Total wellfield area is estimated at about 125'x100' maximum dimensions.

4. ***Geothermal Vault***

The geothermal circuits from the wellfield would be routed to a new underground prefabricated vault made from high density polyethylene material. The vault provides a location where all the geothermal circuits can combine into a single large supply/return manifold, and prevents multiple piping penetrations into the building mechanical room. The vault dimensions are estimated at 12 to 15 feet long, and 8 feet tall. Vault will include a manhole cover, ladder, and lighting.

5. ***Variable Refrigerant Flow (VRF) System***

Geothermal loop piping from the manifold will enter into the large main mechanical room in one building and connect into geothermal pumps (estimated three pumps at 10 HP each). The pumps will have variable frequency drives and will distribute condensing water to water cooled VRF Heat pumps at each building. The VRF water source heat pumps shall be energy recovery type, which will allow for better energy efficiency and simultaneous heating and cooling in the building. Refrigerant piping (ACR copper with one inch insulation) from the VRF heat pumps shall be distributed to branch connector boxes and ductless VRF cassettes at the ground floor, and ducted above ceiling units at the second floor. Estimated capacities of the VRF system is 10 to 15 tons each building.

6. ***Ventilation***

Ventilation to each building will be provided by roof-mounted dedicated outside air systems (DOAS) that shall supply dehumidified and conditioned out-

side air directly to each space. Outside air shall be directly ducted into each room. Second floor duct distribution shall be overhead. First floor duct distribution shall be distributed via underground ductwork under the building. Shaft size and locations to bring outside air and exhaust ductwork down underground shall be coordinated with the architect. A new underground enclosure to house the underground ductwork is estimated to be 18"x18" and will require earthwork and excavation of rock. Ductwork shall be internally lined with one inch elastomeric insulation. Option for underground duct distribution for the first floor shall be considered alongside flood resiliency planning.

The outside air supply shall be controlled by overhead VAV boxes at the second floor, and duct mounted modulating dampers at the ground floors. The DOAS system shall be demand controlled by $C0_2$ sensors mounted on the wall. DOAS rooftop units will be piped to the geothermal system and will include energy recovery wheels and variable speed supply/exhaust fans. DOAS piping on roof shall be heat traced. Size of DOAS units for each building is estimated at 2000 CFM each.

7. Exhaust

General exhaust from each building will be routed to the rooftop DOAS unit. Toilet exhaust at the ground level will be local and terminate to exterior walls. Building pressure will be controlled to a negative in the toilets, and positive in lobbies and vestibules.

8. Mechanical Rooms

Mechanical space in each building will be required to house floor mounted VRF water source heat pumps. One mechanical room will be slightly larger which will include the geothermal pumps, expansion tank (100 gallons), air separator, and chemical treatment equipment. Mechanical floor area in one building is estimated at 10'x10' (square space) and 8'x5' in the other building.

9. Building Automation System

The project will be designed with a direct digital controlled (DDC) energy management system. Head end equipment, including a workstation/printer/monitor will be located in the main mechanical room. The system will also include a sustainability dashboard that will report total building energy that can be displayed to visitors and guests. All HVAC equipment, plumbing pumps

and the water heater system shall be interfaced with the system. Other control components included with the system shall include energy meters and outside airflow monitoring stations.

MECHANICAL TREATMENT RECOMMENDATIONS (ALTERNATES)

The following alternative MEP recommendations are options for consideration, and have not been reviewed for compliance with NPS Compliance Section 106.

1. ***Alternative Geothermal System***

   An alternate configuration to the geothermal system would be to locate the geothermal header inside the larger mechanical room in lieu of installing a vault. This would save on vault construction costs but would require a larger mechanical room (10'x15') to house the manifold, and more piping penetrations into the building.

2. ***Water Source Heat Pumps***

   An alternative to the VRF system would be to design water source heat pumps (WSHP). Water source heat pumps are much larger (VRF units are 12" deep, WSHPs are 21" deep) and louder than VRF units (35 dBA for VRF, 45-55 dBA for WSHPs), and may not be feasible for serving the ground floor due to the deep beam arrangement in the ceiling.

OPTION FOR NET ZERO TREATMENT RECOMMENDATIONS

The following Net Zero treatment recommendations are options for consideration, and have not been reviewed for compliance with NPS Compliance Section 106.

1. ***Automatically controlled Motorized Shading system***

   An automatic shading system may be considered at the large curtain wall glazing at the east- and west-facing windows at the second floor. The system would be controlled based on the amount of sunlight shining through a a window. Shading will have a reflective coated backing that would reduce the shading coefficient to 12% when combined with glazing of minimum code-required performance. However, the option for a shading system shall be evaluated against

historic preservation requirements. An alternative option could be replacing existing the large windows with high performance glazing.

2. ***Variable speed pumps***

   Geothermal pumps would be fitted with variable frequency drives to reduce overall pumping energy over the year.

3. ***Receptacle plug load controls with automatic off-timers***

   Receptacles serving computers and other equipment that can be left idling on overnight would be recommended to be controlled with programmable off-timers that would shut off power at a designated time.

4. ***LED lighting with low power densities***

   In addition to occupancy sensors throughout the building and daylight dimming controls near large windows, lighting would be LED type with low power densities based on the NetZero guidelines for lighting. Exterior lighting would be motor controlled.

5. ***Photo-voltaic panel system***

   Solar panels can be placed in the parking lot to generate on-site energy. The photo-voltaic panel system will require approximately 10,000 sf of overall footprint. Carport canopies installed throughout the parking lot would support solar panels on their roofs. Constructing the structures from timber would reduce the embedded carbon of the proposed system.

   On site battery storage system will allow energy to be stored during the day and serve the building electrical loads at night. Overall, this scheme will reduce energy consumption from utilities and will reduce the building's carbon footprint.

PLUMBING TREATMENT RECOMMENDATIONS

1. The existing domestic water service piping and valves are old and are severely rusted. They must be replaced with new. Install a new backflow preventer on the incoming domestic water service to comply with code requirements.

2. It is recommended to replace any plumbing fixtures in spaces that are affected

by this optimization phase to newer more water efficient and low flow fixtures.

3. Provide new plumbing systems and connections for the new men's restroom layout.

4. Relocate the sewage ejector pump to allow reconfiguration of the Building B-C men's restroom and MEP room.

5. Provide plumbing systems and fixtures for the new Building B-C men's restroom layout.

6. Reconfigure plumbing systems as required for reconfiguration of the concession space.

7. Provide plumbing systems and connections for the family restroom located on the second floor of the Building B-C.

8. NPS shall consider renovations of the first floor public women's restroom and related systems.

FUTURE MEP MAINTENANCE RECOMMENDATIONS

Following the building rehabilitation, we recommend engaging a third-party preventative maintenance company to maintain the MEP systems. The following is a recommendation of what items may need to be on a regular preventative maintenance list.

1. Mechanical System.

The proposed mechanical equipment for all options shall require the following periodic maintenance:

- Replacement of air filters every 6 months
- Annual inspections of all HVAC air conditioners to include:
- Checking of refrigerant oil levels,
- Straightening condensing coil fins
- Checking electrical connections
- Checking unit for excessive noise and vibrations
- A qualified mechanical system maintenence company to maintain the MEP systems.

2. Electrical System.

The proposed electrical equipment and systems for all options shall require the following periodic maintenance:

- A qualified electrical maintenance contracting company shall be engaged to inspect the panel and feeders and to provide testing and infrared scanning every three years to look for the following:
- Overloading of panels
- Inspect connections for excessive heating
- Torque loose connections.
- Periodic visual inspections shall also take place to replace burned out bulbs

3. Plumbing System.

The proposed plumbing equipment and systems for all options shall require the following periodic maintenance:

- Provide annual inspections of plumbing equipment for leaks, loose connections, excessive vibrations, clogging, and electrical connections. Typical systems for inspections shall be:
- Water heaters
- Recirculation pumps
- Sump and Sewage ejector pumps
- Toilets, sinks and floor drains

FIRE PROTECTION AND LIFE SAFETY TREATMENT RECOMMENDATIONS

1. Fire Alarm System Repair or Replacement

The existing fire alarm system is currently in poor condition, with numerous trouble signals and site personnel stating that the fire alarm system cannot transmit signals outside the site. Additionally, the fire alarm system was likely installed about 2006, making it 16 years old.

We recommend a fire alarm technician be engaged to find and repair the issues to have a functional fire alarm system.

There are a number of deficiencies of the existing fire alarm system installation outside of functionality, such as manual pull stations at an improper height, manual pull stations not located at each exit, lack of smoke detection in some

parts of the building, and inadequate notification appliances. Address issues listed above by making minor fire alarm modifications to the existing system.

Consider replacing the fire alarm system with a modern system, including voice notification. This will provide the Visitor Center with a more robust fire alarm system that is easier to repair and maintain, as older systems become more difficult to maintain as parts become less available. In addition, providing a new fire alarm system will allow the installers to fix existing issues, such as manual pull stations at an improper height, manual pull stations not located at each exit, lack of smoke detection in some parts of the building, and inadequate notification appliances.

2. ***Exit Door Updates***

The exit doors serving the second floor and the doors serving the auditorium are required to have panic hardware on the doors. In addition, egress doors are required to release locks upon egress without special effort. Neither the panic hardware nor lock releases are provided. It is recommended that the doors are modified to have panic hardware and lock releasing doors as applicable.

In addition, the first floor exit doors to the courtyard do not have exit signs. Provide missing Exit signs to meet code requirements.

3. ***Update Stair Railing***

The Building A-B communicating stair has several deficiencies:

- The stair handrail does not return to post, wall or floor and does not meet NFPA 101 requirements (NFPA 101, 2018 edition, section 7.2.2.4.5.9). The handrail height is an ABAAS issue (Section 505.4).
- The handrails are of different heights and do not meet ABAAS standard (Section 505.4).

It is recommended that the handrails be modified to return to post, wall or floor, and be at the same height.

4. ***Fire Extinguisher Inspections***

The fire extinguishers are required by NFPA to be inspected on both a monthly and annual basis. For the monthly requirement, the person performing the visual inspection does not need qualifications, but needs to look for the following:

- Location in designated place
- Visibility of the extinguisher or means of indicating the extinguisher location
- Access to the extinguisher
- Pressure gauge reading or indicator in the operable range or position
- Fullness determined by weighing or hefting
- Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers
- Indicator for non-rechargeable extinguishers using push-to-test pressure indicators

For the annual inspection requirement, the external maintenance examination must be conducted by a qualified person.

However, the fire extinguishers in the Visitor Center are not inspected annually, nor is the monthly external maintenance examination conducted. It is recommended that an inspector be hired to come in monthly and annually.

5. ***New Sprinkler System Throughout***

The Great Falls Park Visitor Center is not currently protected by a sprinkler system. A sprinkler system would help contain a potential fire, limit the potential damage, and give occupants more time to egress. The sprinklers would help improve the exit remoteness justification for the auditorium. In addition, a sprinkler system is necessary to meet the requirements for a convenience stair for the stair connecting the first and second floors. We recommend installing a sprinkler system.

The sprinkler system will require between 16,200 and 46,800 gallons of water (estimated). In addition, the water tank provided will need to be refilled within 8 hours of emptying.

6. ***Fire and Life Safety Treatment Recommendation***

Adjust systems to accommodate recommended architectural changes.

VERTICAL TRANSPORTATION AND CIRCULATION

Consider the feasibility of adding a full-size ABAAS-compliant hydraulic passenger elevator in Building B-C at the main building entry. The proposed elevator will connect the second-floor entry lobby and the ground-floor lobby areas. The intent is to mirror the original vertical circulation element (public stair) of Building A-B.

The existing structural conditions will drive the feasibility of the elevator construction. The installation of the new elevator will require the construction of an elevator pit in the rock below the building and cutting openings in structural slabs of the first floor, second floor, and the floating structural slab above the entry area. The second-floor slab structural beams are spaced 6-feet o.c. with approximately 5 ft – 4 in. clear dimensions between every two beams. This condition will present a dimensional constraint for the elevator system. The 5 ft – 4 in. clear dimension of the elevator hoistway requires a custom elevator platform and cab construction to meet ABAAS requirements.

The elevator installation will require modifications to the adjacent exterior wall, including the existing wood grille on the interior side. But it is important to note that this wall was previously altered by the installation of the new entry door. The treatment recommendations call for the removal of this door. Careful consideration of this condition is required to recreate the original exterior appearance while accommodating the elevator hoistway construction. We also recommend considering an option for a custom glass elevator cab and glass hoistway construction. Glazing behind wood grille of the new wall, to increase natural light, may also be considered (see discussion and detail on page 264).

SIGNAGE

Improve wayfinding inside and out, consistent with the courtyard redesign and interpretive efforts.

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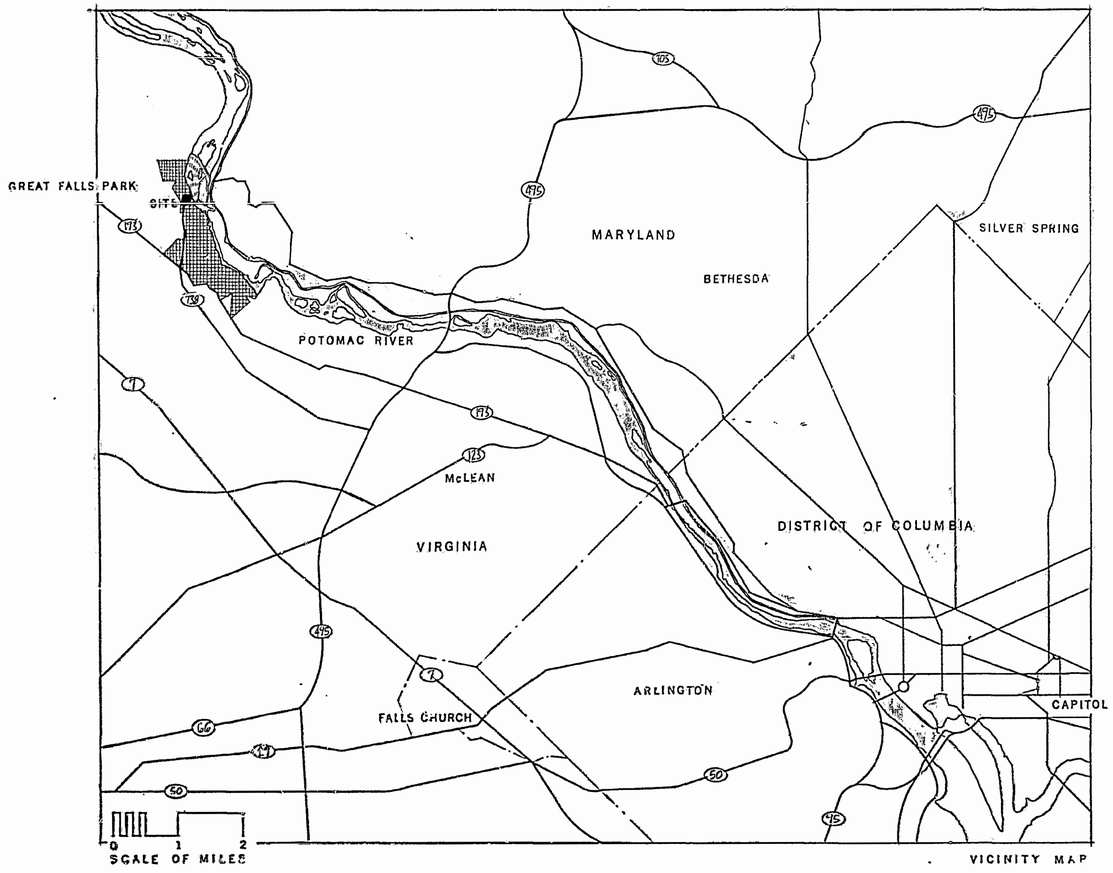
APPENDICES

ORIGINAL DESIGN DOCUMENTS
HAZARDOUS MATERIALS SURVEY REPORT
DIAGRAMS OF OBSERVED LEAKAGE
ROOF DRAINS AND RAIN LEADERS SIZING CALCULATIONS
SOUTH RAMP ALTERNATIVES
75% HSR SUBMISSION TREATMENT OPTIONS

APPENDIX A: ORIGINAL DESIGN DOCUMENTS

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

VISITOR CENTER FOR GREAT FALLS, VIRGINIA



VICINITY MAP

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ARCHITECTURAL
1 COVER SHEET
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3 BUILDING ORIENTATION
4 TERRACE DETAILS AND PLAN
5 GROUND FLOOR PLAN: A—B
6 GROUND FLOOR PLAN: B—C
7 UPPER FLOOR PLAN: A—B
8 UPPER FLOOR PLAN: B—C
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11 ELEVATIONS
12 BUILDING SECTIONS
13 WALL SECTIONS
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STRUCTURAL
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21 FIRST FLOOR FRAMING PLAN AND DETAILS
22 ROOF FRAMING PLAN AND DETAILS
23 SECTIONS AND DETAILS
24 LINK PLANS AND DETAILS
MECHANICAL, PLUMBING, ELECTRICAL
25 MECHANICAL GROUND FLOOR
26 MECHANICAL UPPER FLOOR: A—B
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28 SITE PLAN
29 PLUMBING GROUND FLOOR: A—B
30 PLUMBING GROUND FLOOR: B—C
31 PLUMBING DETAILS AND SCHEDULES
32 ELECTRICAL DETAILS AND SCHEDULES
33 ELECTRICAL GROUND FLOOR: A—B
34 ELECTRICAL GROUND FLOOR: B—C
35 ELECTRICAL UPPER FLOOR: A—B
36 ELECTRICAL UPPER FLOOR: B—C

CONTRACT NUMBER: 14-10-0028-3071

N
ORIENTATION

This drawing has been prepared in compliance with Preliminary Drawing No. 117-1-721, approved by

T. SUTTON JETT — Name — REG. DIR. — Title

10-8-65 — Date

Robert W. Andrews 6-1-66
ACTG. Chief, - DIV. OF PROJECT DESIGN — Date

PREPARED	
KCA	
DESIGNED / DRAWN	
HWH	
CHECKED	
ROTH	5-31-66
ROTH	5-31-66
RWA	5-31-66
RWA	5/31/66

REDUCED SIZE REPRODUCTION

SCALE AS NOTED

RECOMMENDED — DATE

APPROVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA — LOCATION WITHIN PARK
RES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY — NAME OF PARK

REGION
NATIONAL CAPITAL
PCP B-34, B-37
SHEET 1 OF 36
DRAWING NO.
N.C.R.
117.1-732
DATE 5/25/66

JAMES MADISON CUTTS
STRUCTURAL ENGINEER
1826 JEFFERSON PLACE., N.W., WASHINGTON, D.C.

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33RD STREET, N.W., WASHINGTON, D.C.

SMITH AND LEE-THORP
MECH. AND ELEC. ENGINEERS
5518 CONNECTICUT AVE., N.W., WASHINGTON, D.C.

COVER SHEET

SITE PLAN

BENCH MARK: SPIKE IN 30" OAK U.S.E.D. DATUM = 153.00

EXISTING GUARDRAIL

EXISTING ROAD

EXISTING PARKING LOT

ATTOX. 210'

OLD DOMINION DRIVE

NATURAL AREA

EXISTING CANAL BED

EXISTING FARGE

TERRACE GRADING, SEE SH. 3 DETAILS, SEE SH. 4

FIN. FLR. 150.5

UNDER RAMP

AD ⊠ 149.83

AD ⊠ 149.92

AD ⊠ 150.17

6'x10'-4" CONC. PAD @ 149.0 FOR TRANSFORMER

EQUAL EQUAL

C CREEK BED

SITE KEY

	EXISTING ROCK/STONE TO REMAIN, UNDISTURBED
	NEW ROCK RELOCATED FROM DISTURBED AREAS
O TYP.	EXISTING TREE TO REMAIN IN PROXIMITY OF BUILDING
SYC O TYP.	EXISTING TREE TO REMAIN REFERENCE FOR BLDG SITING
150	NEW CONTOUR, RESULTING FROM FINAL SITE GRADING
150	EXISTING CONTOUR, TO REMAIN, UNDISTURBED
	CONTOUR TO BE REMOVED WITH FINAL SITE GRADING
+ 150.42	NEW GFT ELEVATIONS AT POINT INDICATED
	BUILDING SLAB ON GRADE W/ FINISHED FLOOR GRADE
AD ⊠ 149.92	AREA DRAIN & TOP GRADE LOCATION: SEE SH. 3
	TEST BORING LOCATION, SEE NOTES THIS SHEET

BASIC DATA

LOCATION MAP

1" = 200' 400'

GREAT FALLS PARK

BUILDING

PAVING

RAPIDS

TYPICAL SIDE ELEVATION:

5'-8" UNIT A-B / 6'-1" UNIT B-C

BEGIN EARTH RAMP @ 153.83 = UNIT A-B & 152.83 = UNIT B-C

START CONC. RAMP & END NEW EARTH RAMP @ ELEV. 152.33

END RAMP & BEGIN CONC. LANDING @ GRADE ELEVATION 150.83

CONC. RAMP

UNIT A-B & B-C

BARE FACE OF END WALL

EARTH RAMP

END WALL @ GROUND FLOOR

EXPANSION JOINT

FOOTING

SPLIT BLOCK FACING @ SIDE WALLS (NO PARGING ON SIDE WALLS)

GRADING PLANS @ ENTRANCES:

LINE OF EXP. JT.

10'-0" 69'-4"

2'-0" TYP.

LINE OF 1ST FACE OF WALL BELOW

ROCK

UNIT B-C

NORTH

TREES

TERRACE PAVING

UNIT A-B

RAMP

STEPS

58'-8"

16'-0"

LINE OF EXP. JT.

SCALE: 1" = 20'-0"

ALTERNATE NUMBER

NOTES:

- TEST BORING LOCATION W/ NUMBER

SEE SPECIFICATIONS SECTION 1 FOR TEST BORING REPORT BY "FOUNDATION TEST SERVICE, INC.", WASHINGTON, D.C., S/O. YG6077-1 DATED 4/18/66.

REFERENCE DATA: EXISTING CONDITIONS FROM "U.S. DEPT. OF THE INTERIOR, NATIONAL PARK SERVICE, NATIONAL CAPITAL REGION DWG. NO. NCP 117.1-726 DATED 12/22/65, TITLED: TOPO FOR VISITOR CONTACT STA."

DATUM USED: U.S.E.D.

APPROXIMATE AXIS OF BLDG

S11°30'E

ORIENTATION

SCALE 1" = 20'-0" 20'

RECOMMENDED — DATE

APPROVED

KENT COOPER AND ASSOCIATES ARCHITECTS
1825 R St. STREET NW, WASHINGTON, DC

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY NATIONAL CAPITAL OFFICE

VISITOR CENTER — TITLE OF DRAWING
GREAT FALLS, VIRGINIA — LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY — NAME OF PARK

PREPARED	RCA
DESIGNED	RLB
DRAWN	WPL
CHECKED	
REGION	NATIONAL CAPITAL
PCP & 3d	B-87
SHEET	2 OF 30
DRAWING NO.	N.C.R. 117.1-732
DATE	5/23/66

SYMBOLS

DETAIL NUMBER / SECTION LETTERS — DETAIL SHEET / LOCATION SHEET

(4) ROOM NUMBER SCHEDULE, SEE SHEET 19

(D) WINDOW LETTER SCHEDULE, SEE SHEET 18

(7) LOUVER NUMBER SCHEDULE, SEE SHEET 17

(E) MILLWORK LETTER SCHEDULE SEE SHEET 19

MATERIALS

- CONCRETE BLOCK
- SPLIT BLOCK
- CONCRETE
- WOOD
- WOOD STUD WALL INSULATION BETW. STUDS
- WOOD GRILLE WALL
- 1"x6" T&G - SQUARE EDGE VERTICAL REDWOOD BOARDS
- 1'-0"x8'-0" CDX BOARDS W/ FLUSH BUTT JOINTS
- STEEL

SEE FINISH SCHEDULE, SHEETS 5 THRU 8, & DETAILS FOR ADDITIONAL MATERIALS & LOCATION

0 1/4"=1'-0" 2' GRAPHIC SCALE

LINK

32'-8" | 5'-4" | 34'-0" | 184'-0" | 84'-8"

1'-4" | 4'-0" | 27'-4" | 57'-6" | 6'-6" | 6'-6" | 21'-6" | 15'-4" | 21'-8" | 63'-0"

MATCH LINE C

EXISTING ROCK

EXISTING 36" MAP

EXISTING 14" ELM

EXISTING 12" OAK

EXISTING 14" MAP

6'-0"

AREA DRAIN

SEE SITE PLAN SH.2 FOR GRADING THIS SIDE

ROOF OVER UPPER FLOOR

150.00

BEAMS: 15 BAYS @ 6'-0" = 90'-0" 1'-0"

ELEVATIONS @ TOP OF WALL, HANDRAIL 1.30' ABOVE WALL - SEE DETAILS SHEET 16:

160.00 | 159.50 | 159.00 | 158.50 | 158.00 | 157.50 | 157.00 | 156.50 | 156.00 | 155.50 | 155.00 | 154.50 | 154.00

150.42

4" T.C. DRAIN TILE

FIN. FLR. ELEV. 150.50

F.L.D. (SEE MECH.)

4" CONC.

UNIT B-C

SLOPE UP 1/32

150.00 | 151.00 | 151.50

GRAVEL @ 150.25

2'x6" - 3 SIDES GRAVEL BED, TOP @ PAVING ELEVATION

TERRACE PAVING & DETAILS, SEE SH. 4

25'-0"

150.00

14" MAP

SEE SITE PLAN, SH.2 FOR GRADING HERE

EXISTING 32" MAP, REFERENCE TREE

EXISTING 16" SYC

EXISTING 12" OAK

EXISTING 12" OAK

NEW ROCK RELOCATED FROM DISTURBED AREAS; EXACT ARRANGEMENT TO BE DETERMINED IN FIELD BY ARCHITECT

UPPER FLOOR OVER

EDGE OF ROOF OVER

150.33

AREA DRAIN

150.17

2%

150.25

10'-4" | 12'-0" | 6'-0" | 6'-0" | 12'-0" | 6'-0" | 18'-0" | 12'-0" | 21'-0" | 21'-0"

MATCH LINE B

18'-0" | 12'-0" | 6'-0" | 12'-0" | 18'-0" | 2'-0"

ALL GRADES SHOWN ARE FINISHED SURFACE

SEE SITE PLAN SH.2 FOR GRADING BEYOND THIS CONTOUR

R = 151.00

150.58

150.33

150.28

150.17

AREA DRAIN

GRAVEL @ 150.08

150.25

GRAVEL @ 150.25

2'x6" - 3 SIDES GRAVEL BED, TOP @ PAVING ELEVATION

155.00

4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0" | 4'-0"

ROCK

ROCK

SLOPE UP 3/32

RAMP TO UPPER FLOOR

4" T.C. DRAIN TILE

F.L.D. SEE MECH.

4" CONC.

FIN. FLR. ELEV. 150.50

4" T.C. DRAIN TILE

UNIT A-B

EXISTING ROCK

155.50 | 156.00 | 156.50 | 157.00 | 157.50 | 158.00 | 158.50 | 159.00 | 159.50 | 160.00

NEW ROCK RELOCATED FROM DISTURBED AREAS; EXACT ARRANGEMENT TO BE DETERMINED IN FIELD BY ARCHITECT

ELEVATIONS @ TOP OF WALL, HANDRAIL 1.30' ABOVE WALL SEE DETAILS, SHEET 16

MATCH LINE A

0'-0" BEAMS: 15 BAYS @ 6'-0" = 90'-0" 1'-0"

150.42

UPPER FLOOR OVER ROOF OVER

SEE SITE PLAN SH.2 FOR GRADING THIS SIDE

EXISTING 14" SYC

EXISTING 42" OAK REFERENCE TREE

EXISTING 30" SYC

4" CONCRETE ON 4" GRAVEL TOP @ 149.00, FOR TRANSFORMER, CENTERED

52'-4" | 74'-0" | 71'-8" | 31'-6" | 6'-6" | 6'-6" | 57'-6" | 54'-0" | 43'-4"

EXISTING 14" ELM

173'-4"

EQUAL

EXISTING 32" SYC REFERENCE TREE

EXISTING 18" ELM REFERENCE TREE

ELMS

EXISTING CREEK BED

ORIENTATION

NOTES:

- 150.33 INDICATED FINISHED GRADE AT OR NEAR TERRACE: SEE SH.2 FOR TOTAL SITE GRADING.
- ▣ AREA DRAINS (TOP ELEV. SHOWN ON SH.2) @ SPACE S.E. SIDE OF BUILDING & 2" BELOW TOP SURFACE OF 4" GRAVEL @ TERRACE.

BUILDING ORIENTATION PLAN

SCALE 0 1/8"=1'-0" 12'

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1836 33rd STREET N.W. WASHINGTON, DC

RECOMMENDED ____ DATE ____

APPROVED ____

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
CITY OR VICINITY
GREAT FALLS, VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY
STATE OR PARK

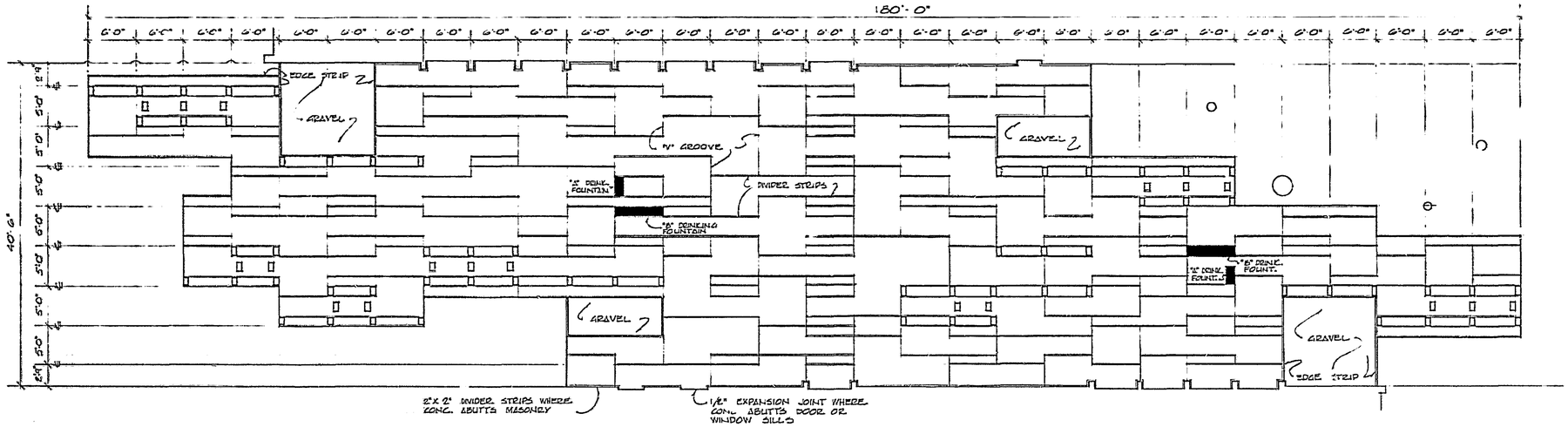
PREPARED HCA
DESIGNED RLB
DRAWN WFL
CHECKED

REGION NATIONAL CAPITAL
PCP 8-24, 8-37
SHEET 3 OF 36
DRAWING NO. N.C.R. 111 132
DATE 3/25/66

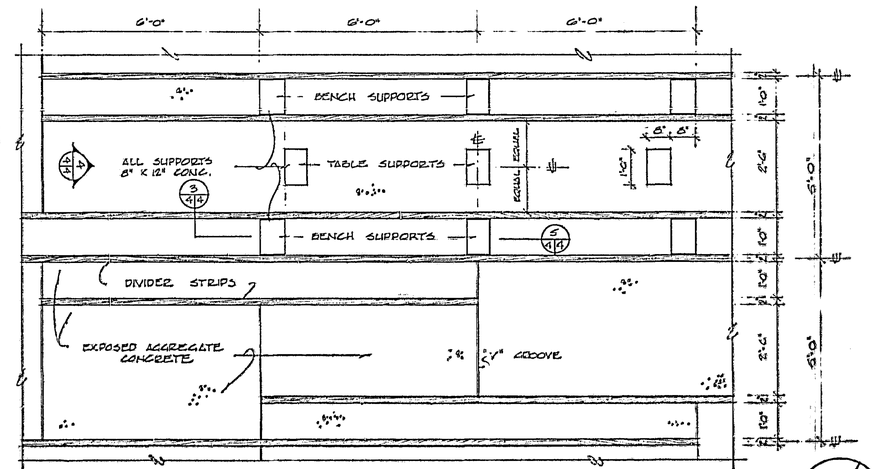
BUILDING ORIENTATION

NOTES:

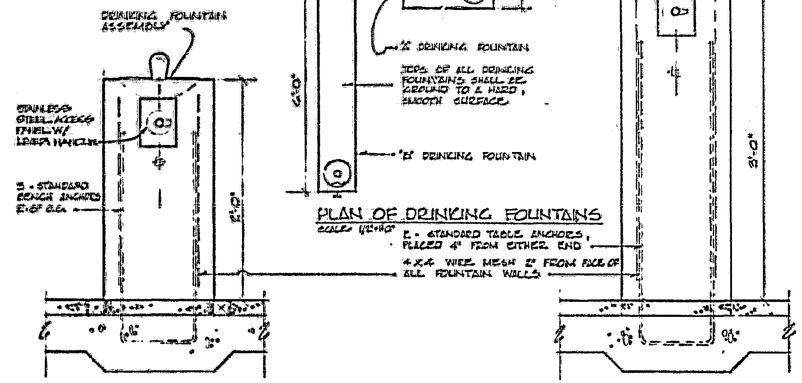
1. FORMS FOR ALL BENCH AND TABLE SUPPORTS AND DRINKING FOUNTAINS SHALL BE CONSTRUCTED OF 1"x4" VERTICAL FORMBOARDS ("V" GROOVE)
2. ALL TABLE TOPS SHALL BE CONSTRUCTED OF CONTINUOUS MEMBERS (NO JOINTS AT CENTER SUPPORTS). BENCH TOP MEMBERS SHALL NOT EXCEED 14'-0". WHERE BENCH IS LONGER THAN 3 SUPPORTS, JOINTS SHOULD BE STAGGERED.
3. 4" SLAB - SLAB SHALL BE CABM-COMP. CONCRETE WITH 6x6 8/8 WELDED WIRE MESH.
4. WEARING SLAB SHALL BE 1 5/8" EXPOSED AGGREGATE CONCRETE.
5. FURNISH, INSTALL & COMPACT 4" BASE UNDER ALL PAVING IN TERRACE



TERRACE PAVING PLAN
SCALE 1/8" = 1'-0"



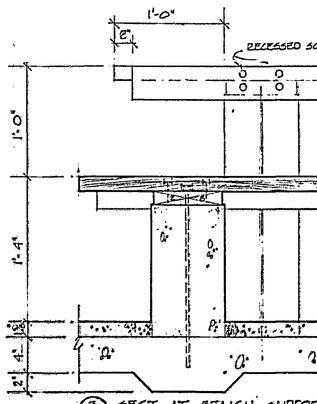
PLAN VIEW OF TYPICAL PAVING PATTERN
SCALE 1/4" = 1'-0"



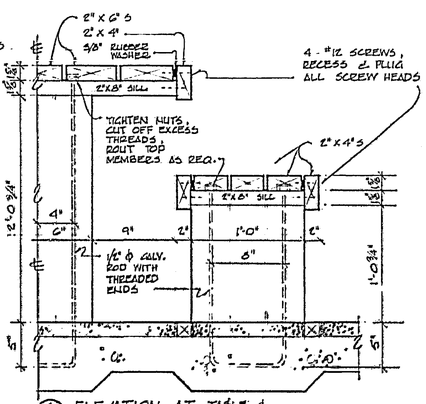
PLAN OF DRINKING FOUNTAINS
SCALE 1/2"=1'-0"

(1) 4/4 END ELEVATION OF DRINKING FOUNTAIN "B"
SCALE 1/2" = 1'-0"

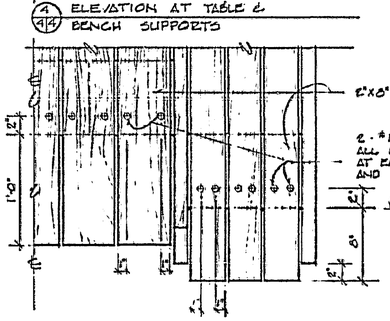
(2) 4/4 END ELEVATION OF DRINKING FOUNTAIN "A"
SCALE 1/2" = 1'-0"



(3) 4/4 SECT. AT BENCH SUPPORT



(4) 4/4 ELEVATION AT TABLE & BENCH SUPPORTS

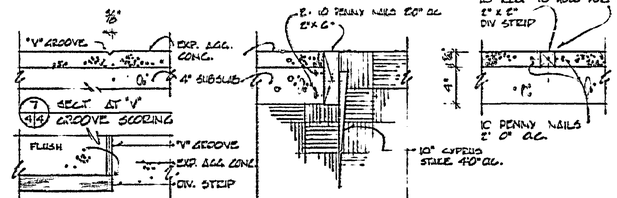


(5) 4/4 SECTION AT TYPICAL CENTER SUPPORT

(6) 4/4 PLAN VIEW OF TABLE & BENCH TOPS

TABLE & BENCH DETAILS
SCALE 1 1/2" = 1'-0"

PAVING DETAILS
SCALE 1 1/2" = 1'-0"



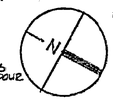
(7) 4/4 SECT. AT "V" GROOVE SCORING

(8) 4/4 PLAN VIEW OF "V" GROOVE

(9) 4/4 SECT. AT EDGE STRIP

(0) 4/4 SECT. AT DIVIDER STRIP

SCALE 1/8" = 1'-0" 1 1/2" = 1'-0" 1/2" = 1'-0"



ORIENTATION

PREPARED ACA
DESIGNED WPL
DRAWN HWH
CHECKED

RECOMMENDED
DATE
APPROVED

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33d STREET NW. WASHINGTON, DC

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
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NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY

REGION NATIONAL CAPITAL
PCP 3 14 8-37
SHEET 2 OF 36
DRAWING NO. N.C.R. 117 - 32
DATE 5/25/66

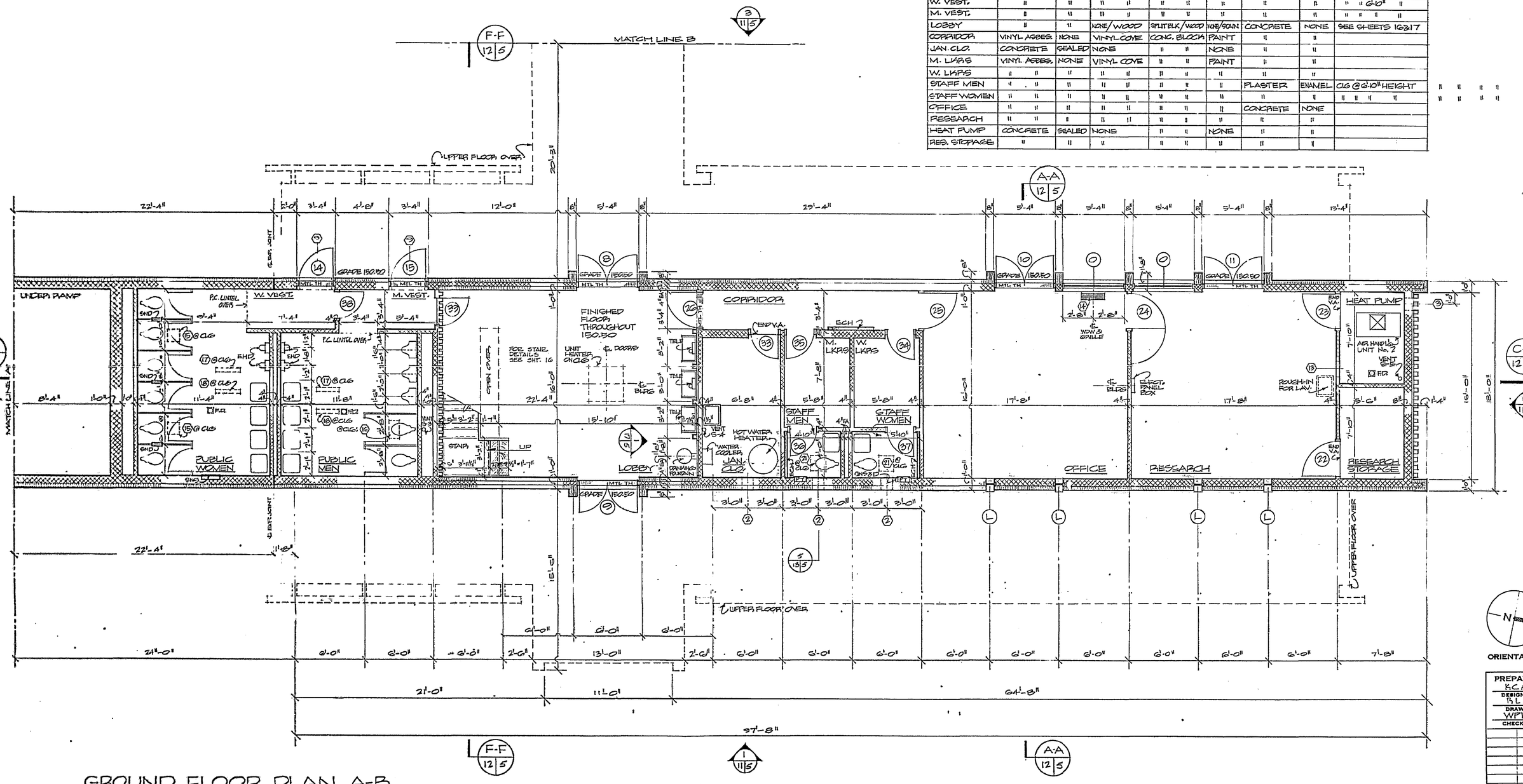
BASIC DATA

TERRACE DETAILS

GROUND FLOOR, A-B FINISH SCHEDULE

SPACE	FLOOR,		BASE	WALLS		CEILING		GENERAL
TITLE	MATERIAL	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH	REMARKS
PUBLIC WOMEN	POLYURETHANE	GLAZE	VINYL COVE	CONC. BLOCK	PAINT	PLASTER	ENAMEL	C.L.G. @ 8'-0" HEIGHT
PUBLIC MEN	〃	〃	〃	〃	〃	〃	〃	〃 〃 〃 〃
W. VEST.	〃	〃	〃	〃	〃	〃	〃	〃 〃 C.L.G. 〃
M. VEST.	〃	〃	〃	〃	〃	〃	〃	〃 〃 〃 〃
LOBBY	〃	〃	NONE/WOOD	SPLIT BLK/WOOD	NONE/STAIN	CONCRETE	NONE	SEE SHEETS 12817
CORRIDOR	VINYL ASBES.	NONE	VINYL COVE	CONC. BLOCK	PAINT	〃	〃	
JAN. CLO.	CONCRETE	SEALED	NONE	〃	NONE	〃	〃	
M. LKRS	VINYL ASBES.	NONE	VINYL COVE	〃	PAINT	〃	〃	
W. LKRS	〃	〃	〃	〃	〃	〃	〃	
STAFF MEN	〃	〃	〃	〃	〃	PLASTER	ENAMEL	C.L.G. @ 2'-10" HEIGHT
STAFF WOMEN	〃	〃	〃	〃	〃	〃	〃	〃 〃 〃 〃
OFFICE	〃	〃	〃	〃	〃	CONCRETE	NONE	
RESEARCH	〃	〃	〃	〃	〃	〃	〃	
HEAT PUMP	CONCRETE	SEALED	NONE	〃	NONE	〃	〃	
RES. STORAGE	〃	〃	〃	〃	〃	〃	〃	

ELEV. SEE SH. 12
〃 〃 〃 〃
〃 〃 〃 〃



GROUND FLOOR PLAN A-B

SCALE 1/4"=1'-0"

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1556 33d STREET NW. WASHINGTON, DC

RECOMMENDED ____ DATE ____
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UNITED STATES
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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY NAME OF PARK
RES. NO. 404V

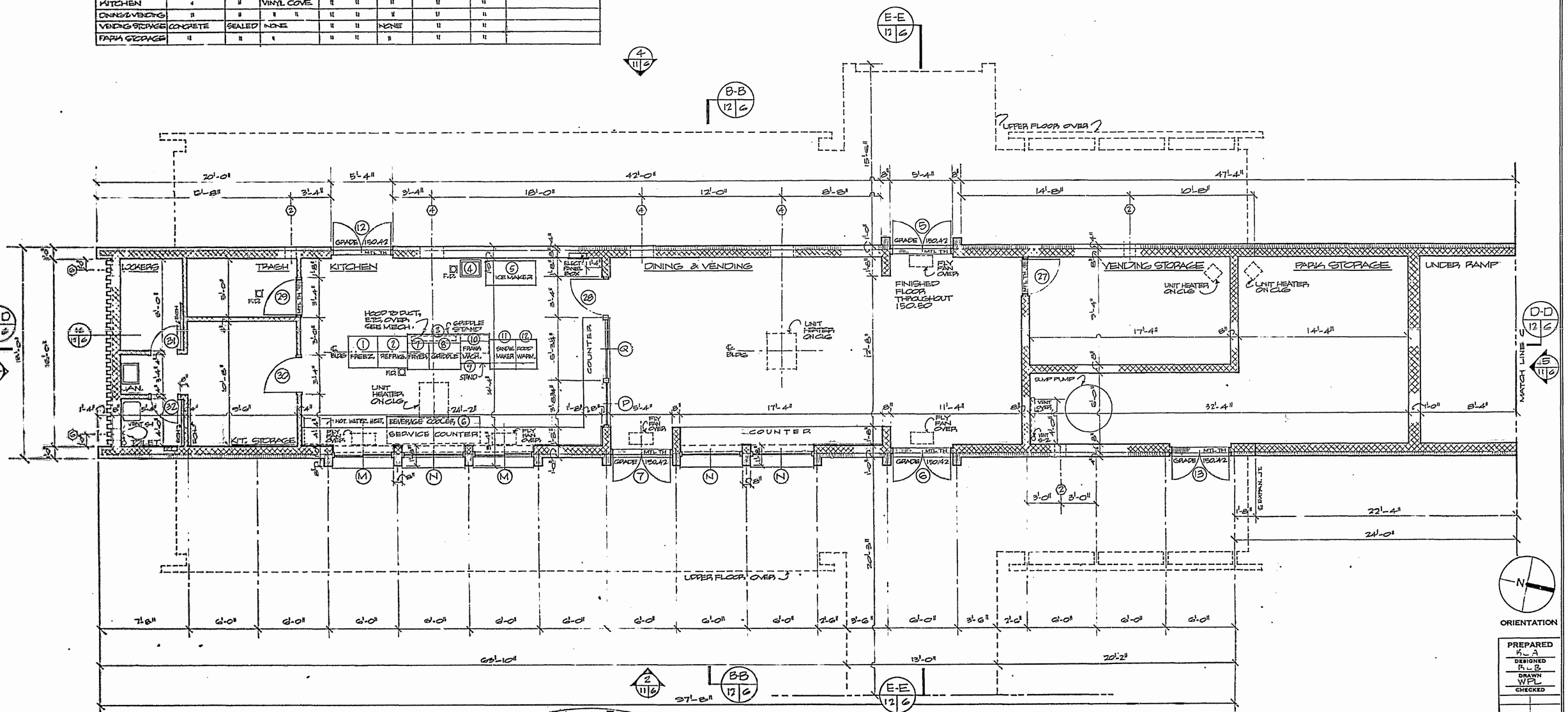
PREPARED KCA
DESIGNED RLB
DRAWN WFL
CHECKED

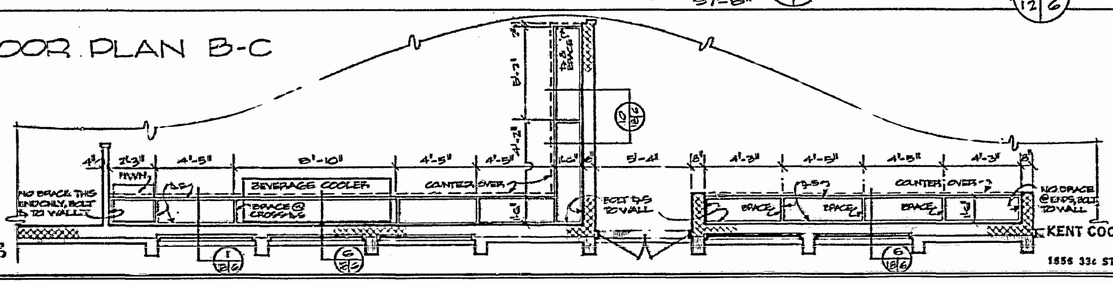
REGION NATIONAL CAPITAL
PCP B-34, B-37
SHEET 5 OF 30
DRAWING NO. N.C.R. 117.1-732
DATE 5/25/62

GROUND FLOOR PLAN A-B

GROUND FLOOR B-C FINISH SCHEDULE

SPACE	FLOOR		BASE	WALLS		CEILING		GENERAL
TITLE	MATERIAL	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH	REMARKS
LOCKERS	POLYURETHANE	GLAZE	NONE	CONC. BLOCK	PAINT	CONCRETE	NONE	
JAN.	"	"	"	"	"	"	"	
TOILET	"	"	"	"	"	"	"	ELEVATIONS, SEE SH. 12
TRASH	CONCRETE	SEALED	"	"	"	"	"	
KIT. STORAGE	POLYURETHANE	GLAZE	"	"	"	"	"	
KITCHEN	"	"	VINYL COVE.	"	"	"	"	
DINING & VENDING	"	"	" "	"	"	"	"	
VENDING STORAGE	CONCRETE	SEALED	NONE	"	"	NONE	"	
PAPER STORAGE	"	"	"	"	"	"	"	





SCALE 0 1/4"=1'-0" 2'

PREPARED	
DESIGNED	K_A
DRAWN	P_L_B
CHECKED	WPL

RECOMMENDED _____ DATE _____

APPROVED _____

UNITED STATES
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DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER,
TITLE OF DRAWING
GREAT FALLS, VIRGINIA FES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

KENT COOPER AND ASSOCIATES
ARCHITECTS
1856 33d STREET NW, WASHINGTON, DC

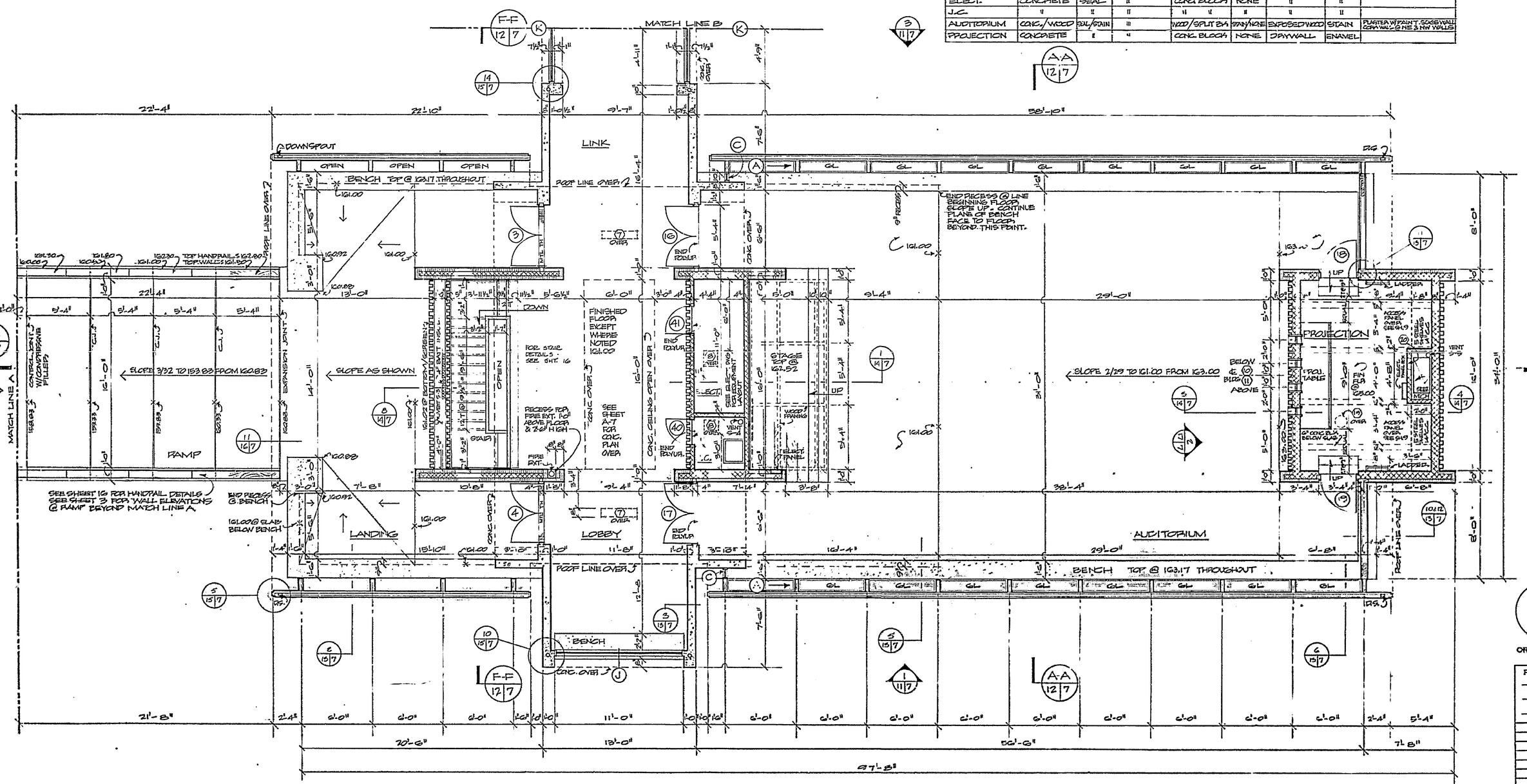
REGION	NATIONAL CAPITAL
PCP S 34 B-31	
SHEET	6 OF 36
DRAWING NO.	N.C.R. 1171-32
DATE	5/25/66

BASIC DATA

GROUND FLOOR PLAN B-C

UPPER FLOOR A-B FINISH SCHEDULE

SPACE	FLOOR		BASE	WALLS		CEILING		GENERAL
TITLE	MATERIAL	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH	REMARKS
LANDING	CONCRETE	NONE	NONE	WOOD/SPLIT BK	STAIN/NONE	EXPOSED WOOD	STAIN	
LINK	POLYURETHANE	GLAZE	"	CONC/ "	NONE	CONCRETE	NONE	
LOBBY	"	"	"	" /SPLIT BK/WOOD	NONE/STAIN	"	"	
ELECT.	CONCRETE	SEAL	"	CONC. BLOCK	NONE	"	"	
J.C.	"	"	"	"	"	"	"	
AUDITORIUM	CONC./WOOD	SEAL/STAIN	"	WOOD/SPLIT BK	STAIN/NONE	EXPOSED WOOD	STAIN	PLASTER W/PAINT, GOSS WALL COPA WALL @ NE & NW WALLS
PROJECTION	CONCRETE	"	"	CONC. BLOCK	NONE	DRYWALL	ENAMEL	



UPPER FLOOR PLAN A-B

SCALE 1/4" = 1'-0"

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ARCHITECTS
1636 33rd STREET NW, WASHINGTON, DC

RECOMMENDED _____ DATE

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UNITED STATES
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VISITOR CENTER
GREAT FALLS, VIRGINIA RES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY

PREPARED RCA
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CHECKED

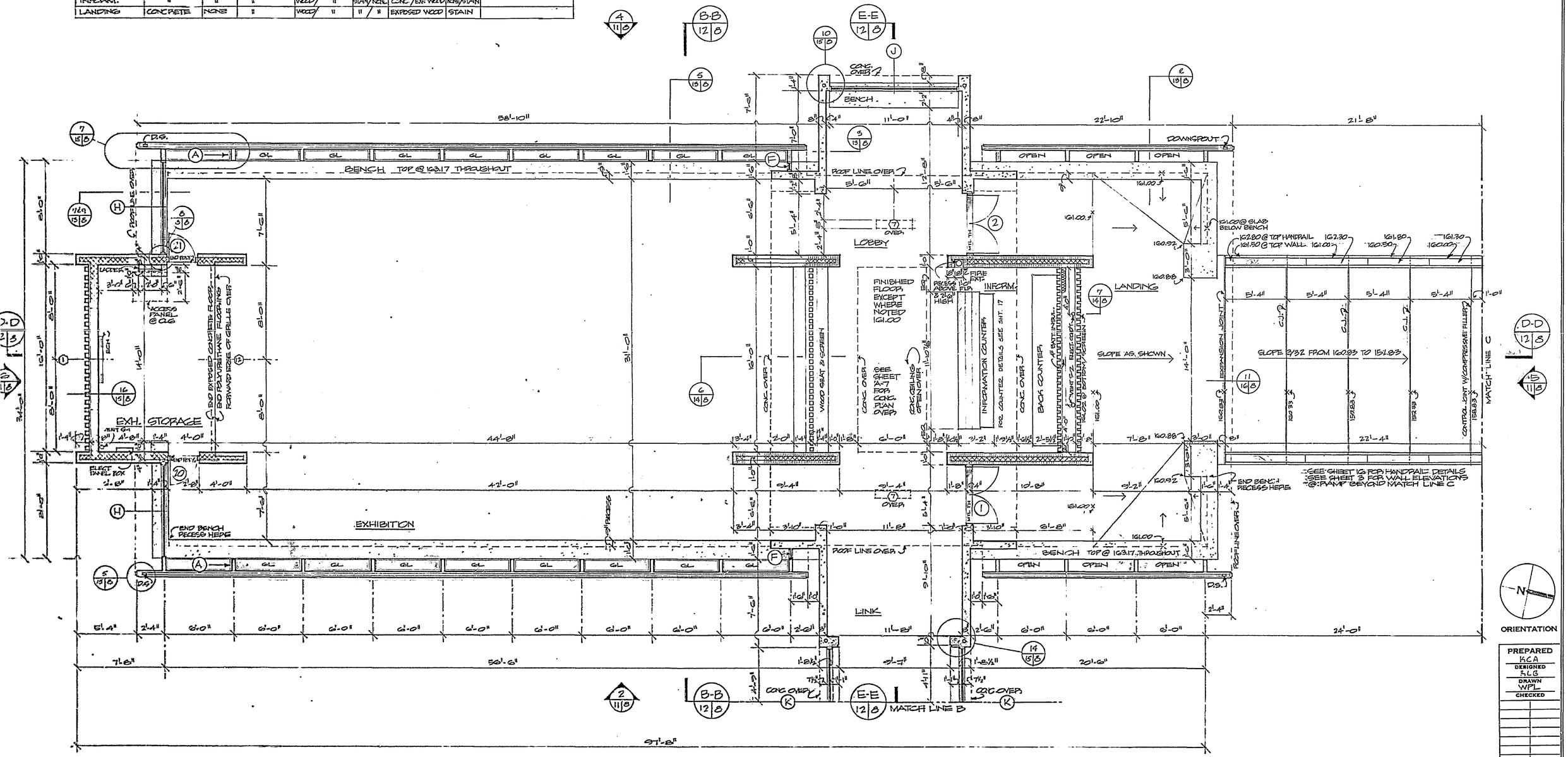
REGION NATIONAL CAPITAL
PCP 3-34, 8-37
SHEET 7 OF 26
DRAWING NO. N.C.R. 17 - 732
DATE 5/25/62

BASIC DATA

UPPER FLOOR PLAN A-B

UPPER FLOOR B-C FINISH SCHEDULE

SPACE	FLOOR		BASE	WALLS		CEILING		GENERAL
TITLE	MATERIAL	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH	REMARKS
EXH. STORAGE	CONCRETE	NONE	NONE	CONC. BLOCK	NONE	PLASTER	ENAMEL	
EXHIBITION	POLYURETHANE	GLAZE	〃	WOOD/SPLIT FIR	STAIN/NONE	EXPOSED WOOD	STAIN	STAINED WOOD SCREEN WALL BETW. SPACES
LOBBY	〃	〃	〃	CONC/〃	NONE	CONCRETE	NONE	
LINK	〃	〃	〃	CONC/〃	〃	〃	〃	
INFORM.	〃	〃	〃	WOOD/〃	STAIN/NONE	CONC./EXP. WOOD	NONE/STAIN	
LANDING	CONCRETE	NONE	〃	WOOD/〃	〃/〃	EXPOSED WOOD	STAIN	



UPPER FLOOR PLAN B-C

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1836 33d STREET NW, WASHINGTON, DC

RECOMMENDED ____ DATE ____
APPROVED ____

SCALE 0 1/8" = 1'-0" 8'

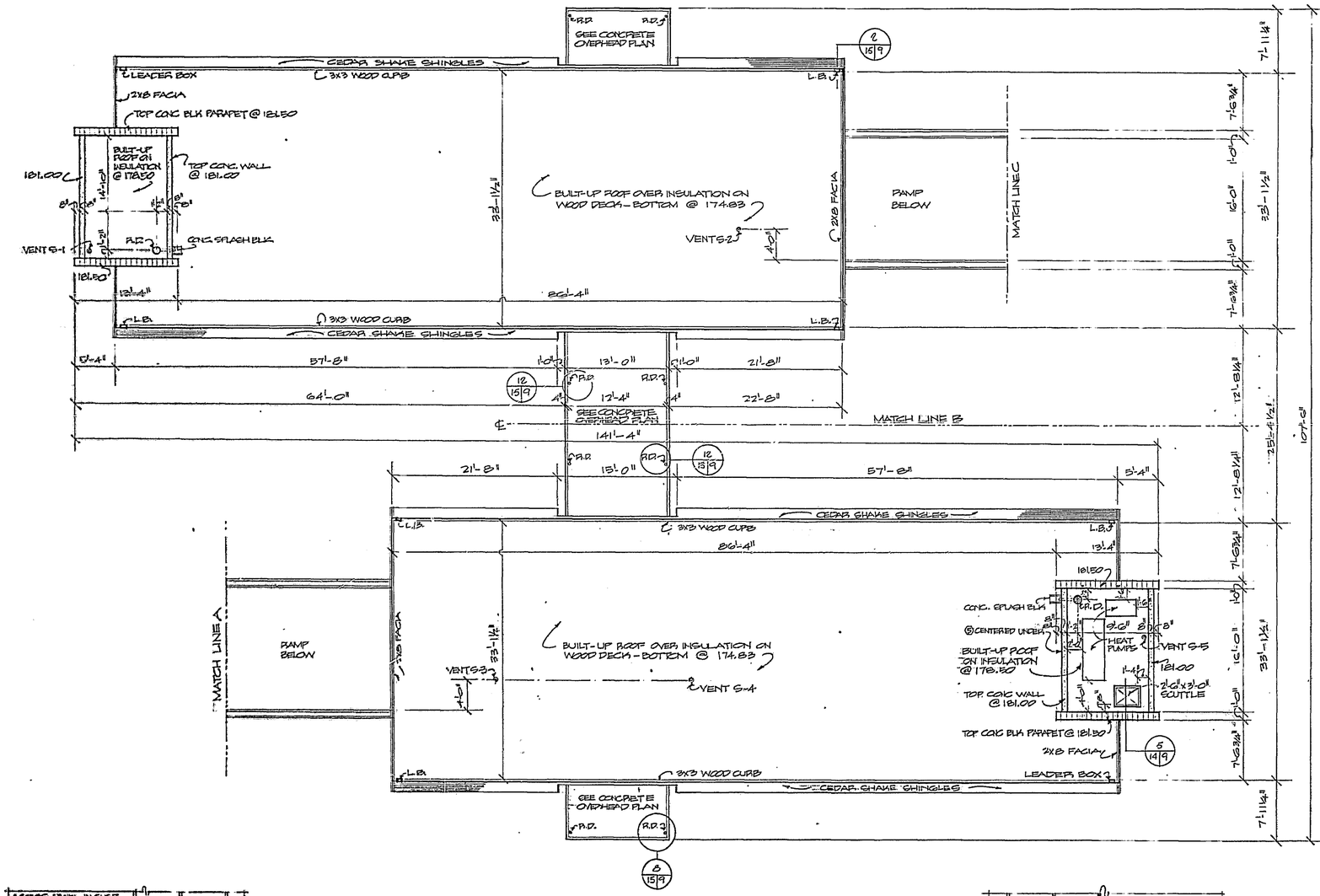
UNITED STATES
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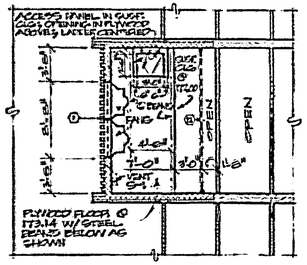
VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA — LOCATION WITHIN PARK — REF. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED KCA
DESIGNED JLG
DRAWN WPL
CHECKED

REGION NATIONAL CAPITAL
PCP B-34,B-37
SHEET 8 OF 36
DRAWING NO. N.C.R. 171-732
DATE 5/25/66

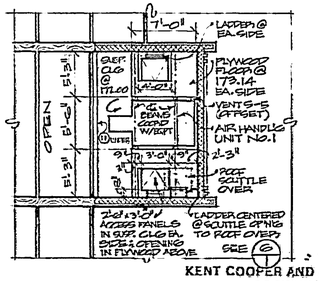
UPPER FLOOR PLAN B-C



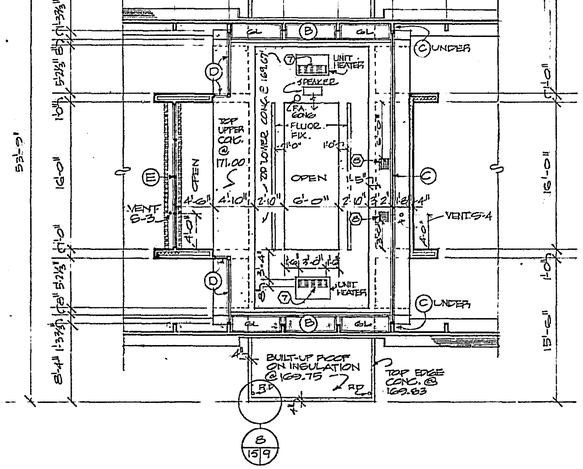


FLOOR PLAN ABOVE EXHIBIT STORAGE

ROOF PLAN



FLOOR PLAN ABOVE PROJECTION



CONCRETE OVERHEAD PLAN

ORIENTATION

SCALE: 1/16" = 1'-0"

RECOMMENDED	DATE
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1656 33d STREET N.W. WASHINGTON, D.C.

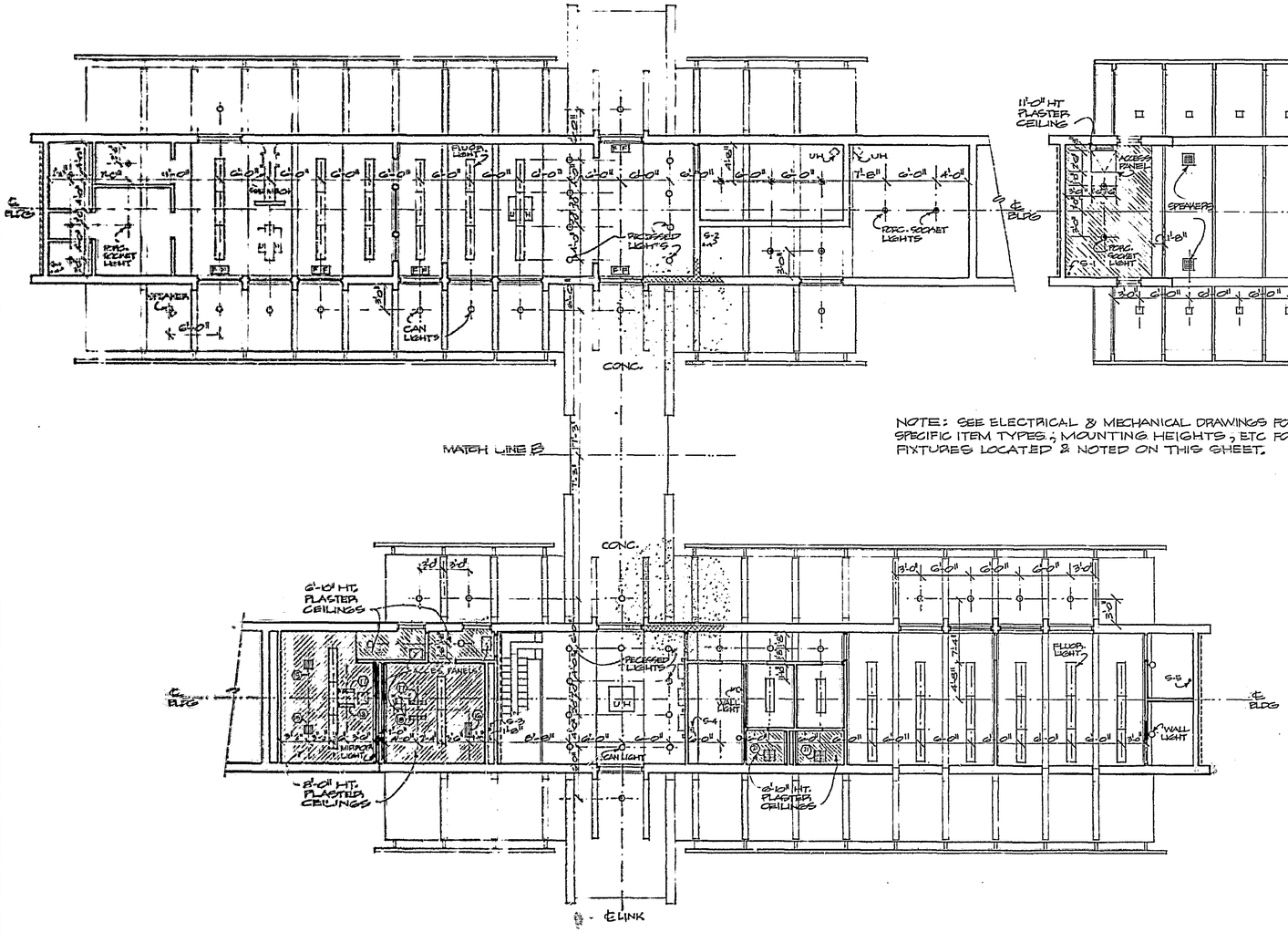
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NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA
LOCATION WITHIN PARK
RES. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

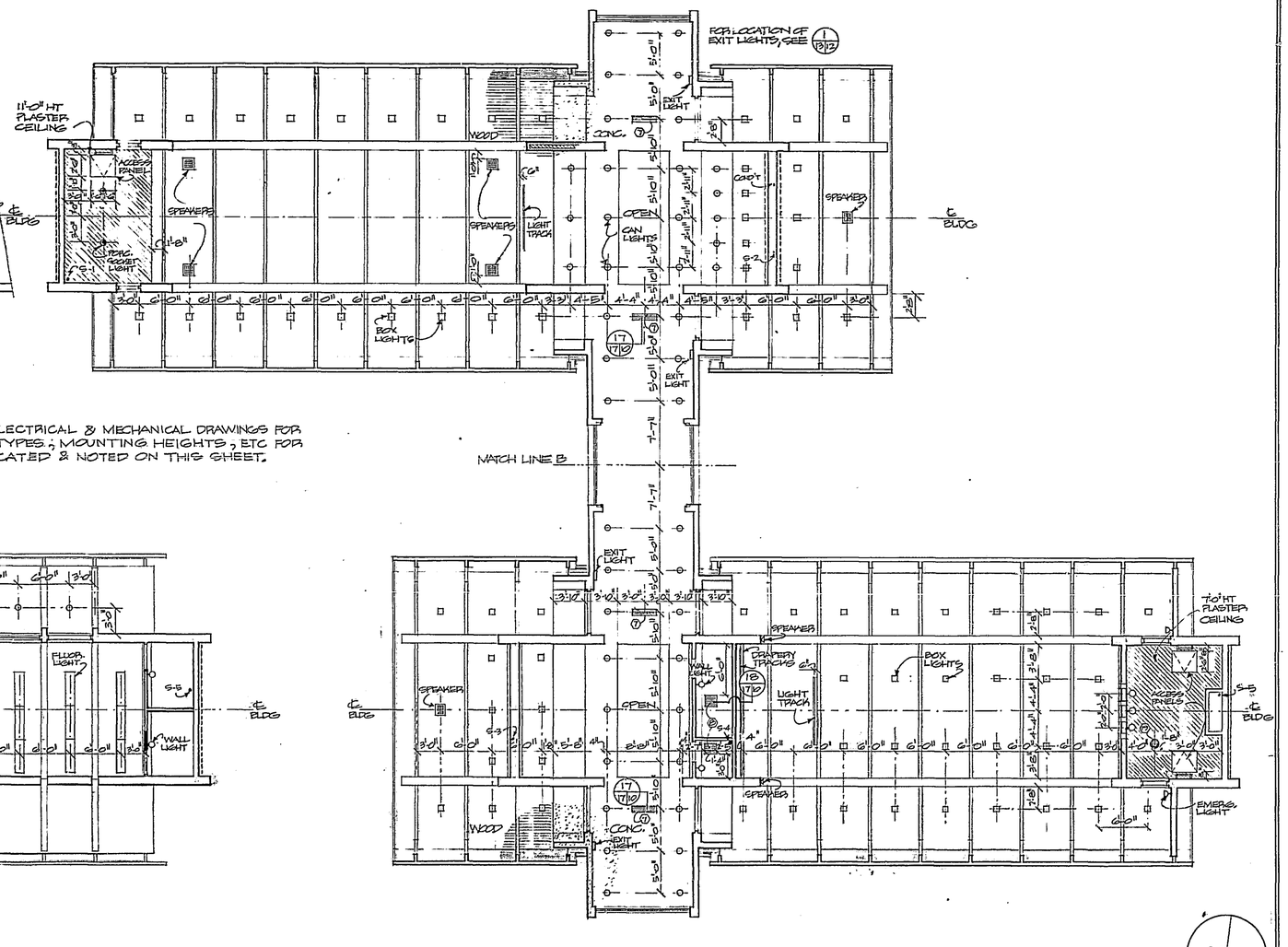
PREPARED	KCA
DESIGNED	HLB
DRAWN	WFL
CHECKED	
REGION	NATIONAL CAPITAL
PCP	B-34, B-37
SHEET	9 OF 36
DRAWING NO.	N.C.R. 117: - 732
DATE	5/25/66

BASIC DATA

BOOF PLAN



GROUND FLOOR REFLECTED CEILING PLAN



UPPER FLOOR REFLECTED CEILING PLAN

NOTE: SEE ELECTRICAL & MECHANICAL DRAWINGS FOR SPECIFIC ITEM TYPES; MOUNTING HEIGHTS, ETC FOR FIXTURES LOCATED & NOTED ON THIS SHEET.

ORIENTATION

SCALE 0 1/8"=1'-0" 12'

RECOMMENDED

DATE

APPROVED

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1656 33rd STREET NW. WASHINGTON, DC

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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA BES NO. 404V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED KCA
DESIGNED RLG
DRAWN WPL
CHECKED

REGION NATIONAL CAPITAL
PCP 3, 34, : 87
SHEET 10 OF 30
DRAWING NO. N.C.R. 111-732
DATE 5/25/80

BASIC DATA

REFLECTED CEILING PLAN

SPLIT CEDAR SHINGLES

CONC.

WOOD RAIL SEE SHT. 16

POLYSULFIDE CAULK IN EXPANSION JOINT

SPLIT CONC. BLOCK

SPLIT CEDAR SHINGLES

SECTION @ MATCH LINE B

CONC.

SPLIT CONC. BLOCK

T&G WOOD SIDING

POLYSULFIDE CAULK IN EXPANSION JOINT

T&G WOOD SIDING

CONC.

EXPOSED FORM DOWEL

WOOD BEAMS

WOOD GRILL

SPLIT CONC. BLOCK

PLYWOOD BEHIND

MATCH LINE C

SPLIT CEDAR SHINGLES

SECTION @ MATCH LINE B

SPLIT CONC BLOCK

POLYSULFIDE CAULK IN EXPANSION JOINT

MATCH LINE A

WOOD GRILL

FIXED GLASS

CONC.

PLYWOOD BEHIND

MATCH LINE B

SPLIT CEDAR SHINGLES

CONC.

POLYSULFIDE CAULK IN EXPANSION JOINT

SPLIT CONC. BLOCK

MATCH LINE C

NORTH

ORIENTATION

BASIC DATA

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1858 33d STREET N.W. WASHINGTON, DC

PREPARED KCA
DESIGNED S.L.S
DRAWN WPL
CHECKED

SCALE 1/8"=1'-0"

RECOMMENDED ____ DATE

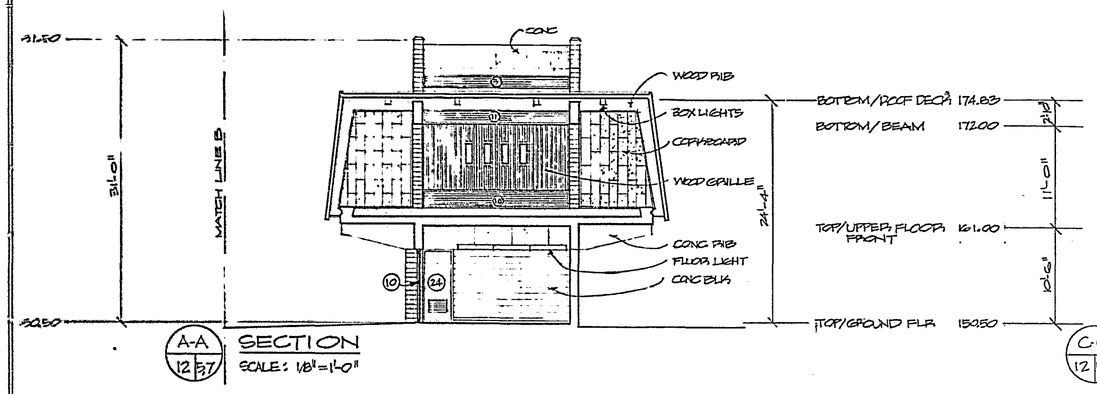
APPROVED ____

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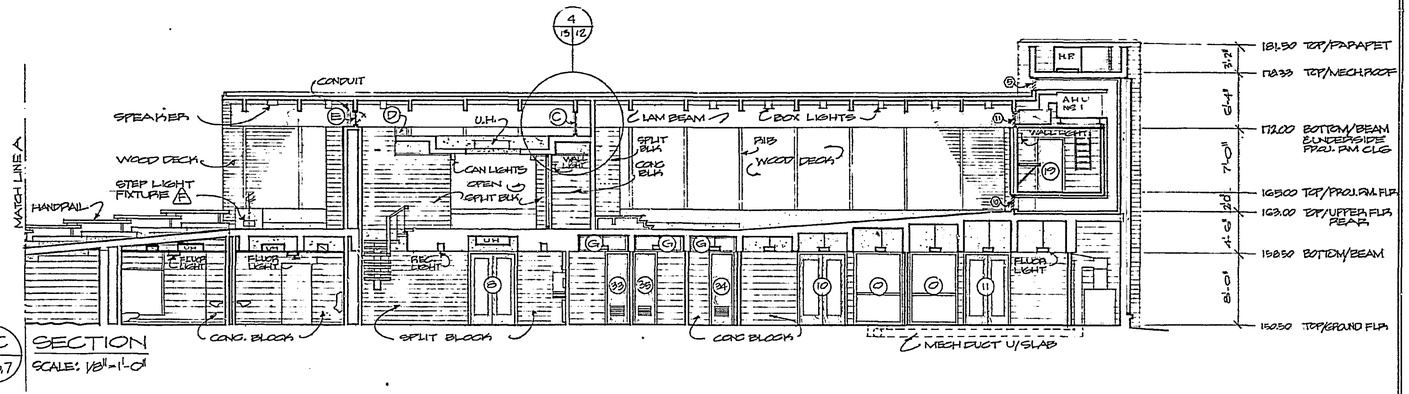
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TITLE OF DRAWING
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LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

REGION
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PCP B-3428-31
SHEET 11 OF 36
DRAWING NO.
N.C.R.
17.1-732
DATE 5/25/66

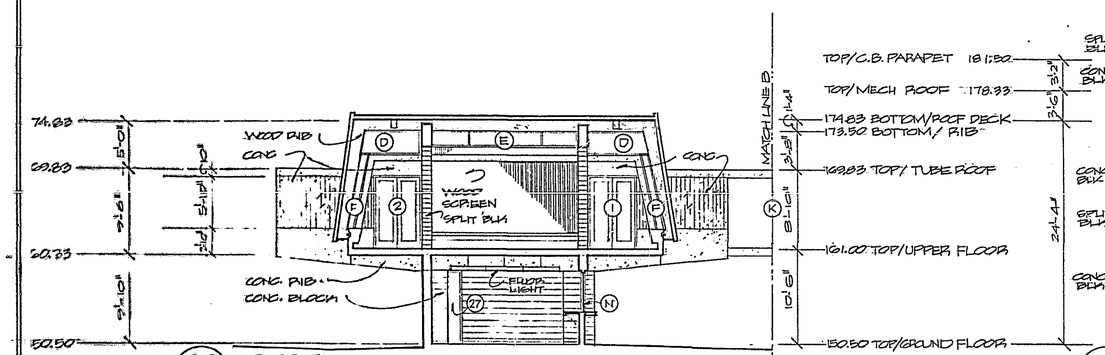
ELEVATIONS



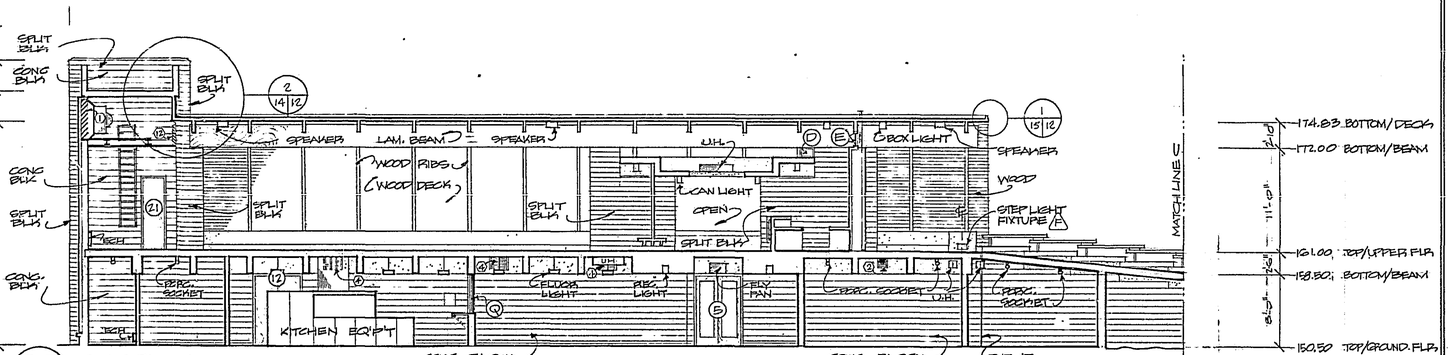
A-A 12|57 SECTION
SCALE: 1/8"=1'-0"



C-C 12|57 SECTION
SCALE: 1/8"=1'-0"

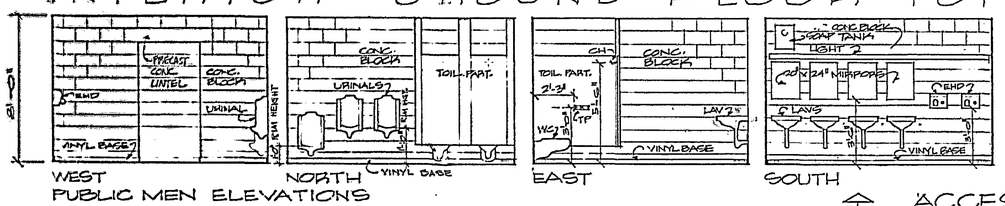


B-B 12|58 SECTION
SCALE: 1/8"=1'-0"



D-D 12|68 SECTION
SCALE: 1/8"=1'-0"

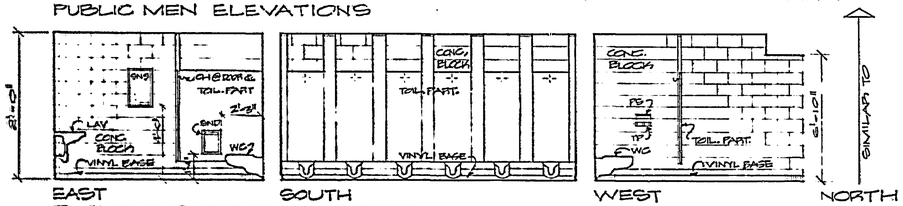
INTERIOR - GROUND FLOOR TOILETS



SCALE: 1/4"=1'-0"

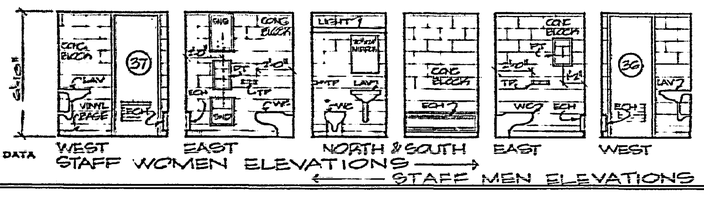
NOTES:

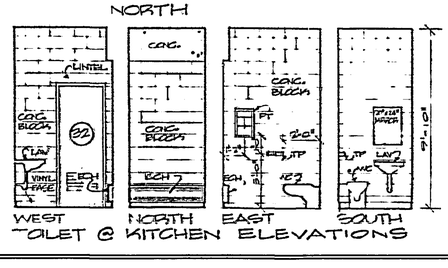
1. ECH - ELECTRIC CONVECTION HEATER, SEE SHEET 33.
2. LIGHT - SEE FIXTURE SCHEDULE, SHEET 32.
3. WC, LAV, URINAL - SEE PLUMBING SHEETS 27 & 28.

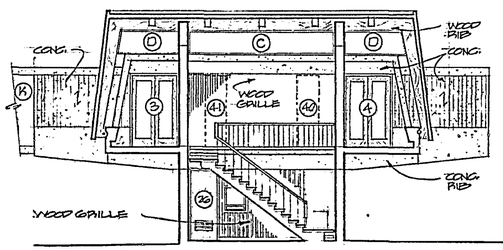


ACCESSORIES

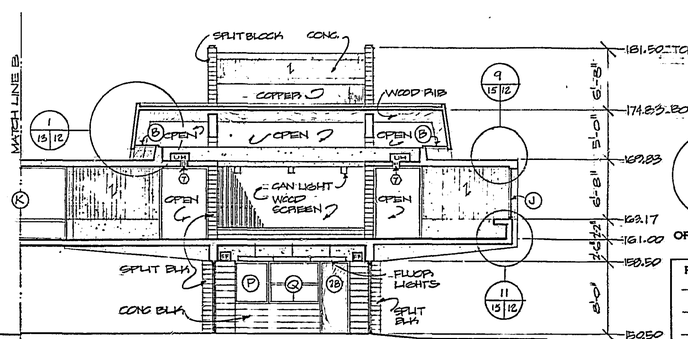
NAME	DESCRIPTION	MFGR.	NO.
EHD	ELECTRIC HAND DRYER	WORLD	A
TOIL. PART.	CEILING HIGH PARTITIONS	ROBART	AC
TP	DUAL TOIL. PAPER HOLDER	ROBART	PH 16S
CH	COAT HOOKS	ROBART	FA 20
PS	PURSE SHELF	ROBART	A 20
PT	PAPER TOWEL DISPENSER	PAPER-MATE	622M
SNS	SANITARY NAPKIN SLOT	WATROUS	W1058
SND	SANITARY NAPKIN DISPOSAL	W. WALL TOIL PART.	WATROUS	W1059 W1260
20"x24" MIRROR		WATROUS	W1260







E-E 12|68 SECTION
SCALE: 1/8"=1'-0"



F-F 12|57 SECTION
SCALE: 1/8"=1'-0"

NOTE:

1. SEE MECHANICAL DRAWINGS FOR EQUIPMENT & ARCHITECTURAL PLANS FOR LOCATION OF UNITS: E.C.H. & H.P. - HEAT PUMP, A.H.U. - AIR HANDLING UNIT, U.H. - UNIT HEATER.
2. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL FIXTURES, ETC.

SCALE 1/2"=1'-0" | 1/4"=1'-0"

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET NW, WASHINGTON, DC

RECOMMENDED _____ DATE

APPROVED _____

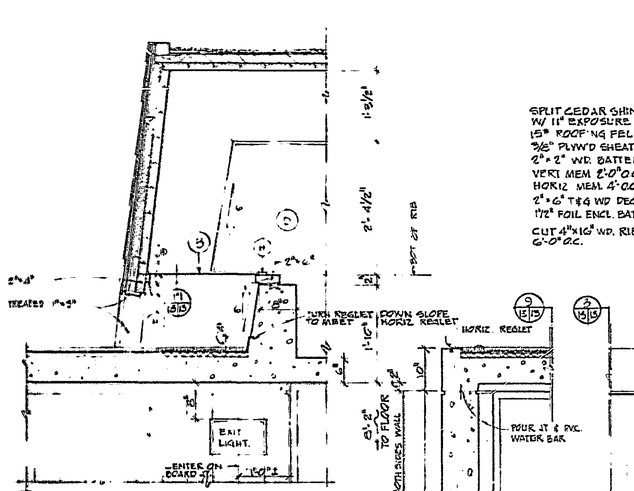
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA RES. NO. 404V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

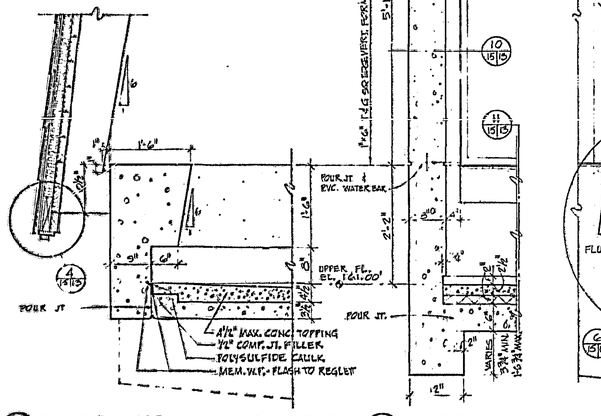
PREPARED KCA
DESIGNED RLB
DRAWN WFL
CHECKED

REGION NATIONAL CAPITAL
PCP 6-34, B-37
SHEET 2 OF 36
DRAWING NO. N.C.R. 117.1 - 732
DATE 5/25/66

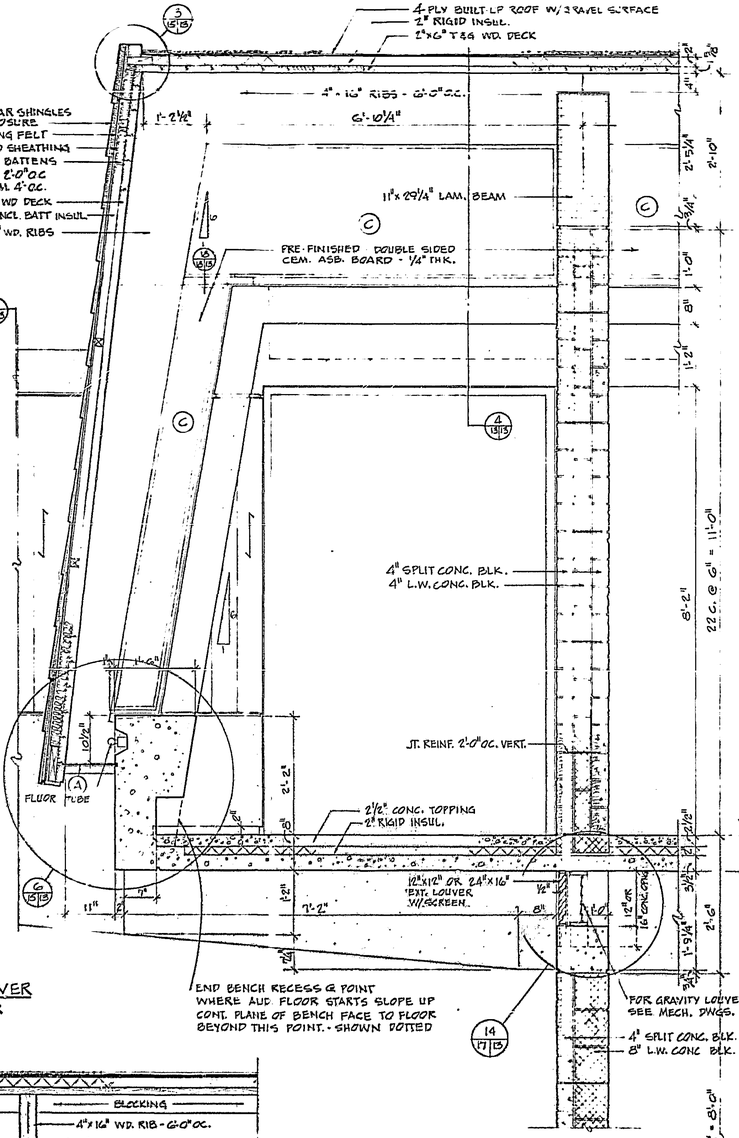
BUILDING SECTIONS



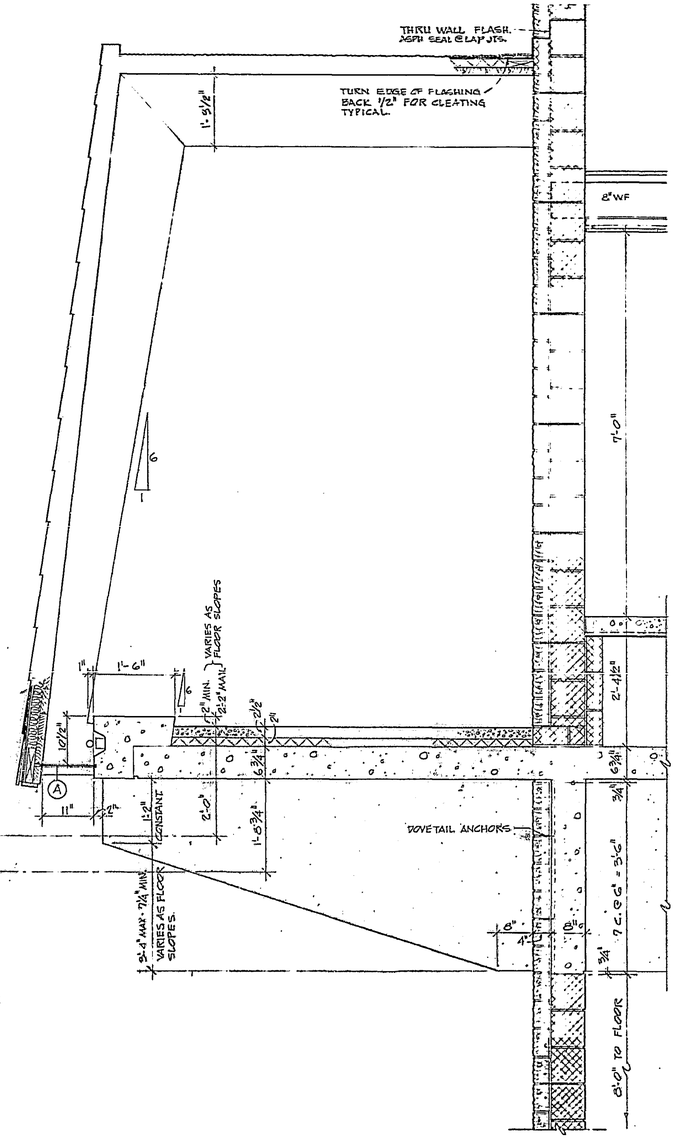
1. LINK ROOF SECT @ HORIZ. GLASS
15/12/15



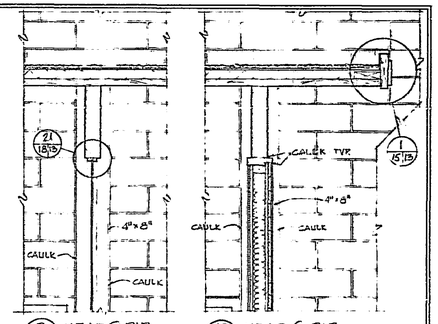
2. SECTION THRU BENCH @ LANDING
15/12/15

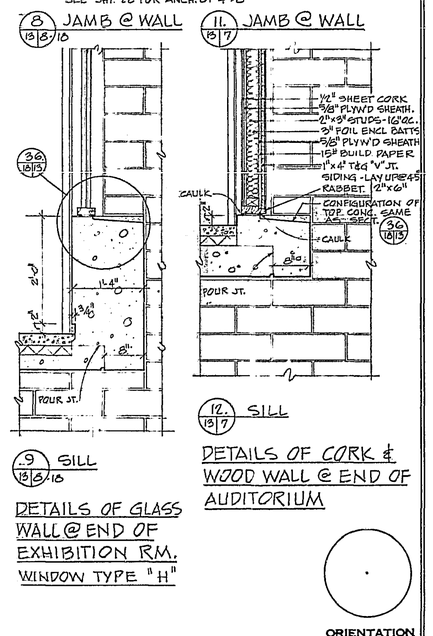


3. SECT. THRU SIDE OF LOBBY CANTILEVER
SECT. @ LINK SIMILAR
15/12/15



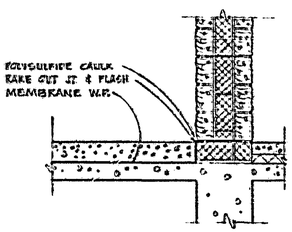
6. SECTION @ HIGH PORTION OF AUD. FLOOR
15/7/11



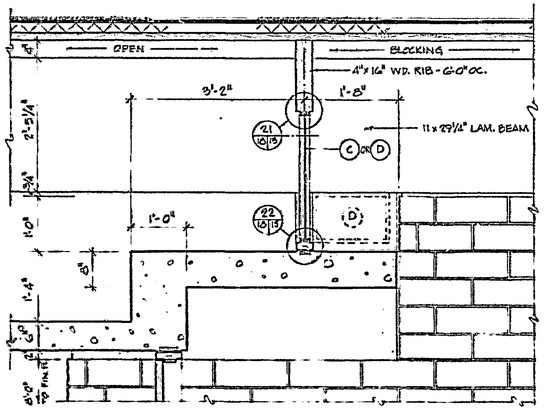


DETAILS OF GLASS WALL @ END OF EXHIBITION RM. WINDOW TYPE "H"

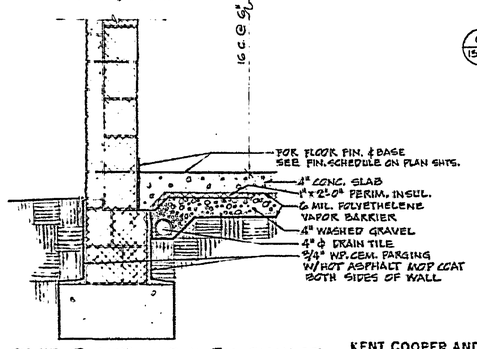
DETAILS OF CORK & WOOD WALL @ END OF AUDITORIUM



2A. LANDING MEM @ MAS. WALLS
1



4. SECTION @ LINK ROOF UP TURN
15/12/15 15



5. TYP. WALL SECT. @ AUD. — EXH. RM. SIMILAR
15/5-C-7-D-11

ORIENTATION

SCALE 3/4" = 1'-0"

RECOMMENDED — DATE

APPROVED

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET NW. WASHINGTON, DC

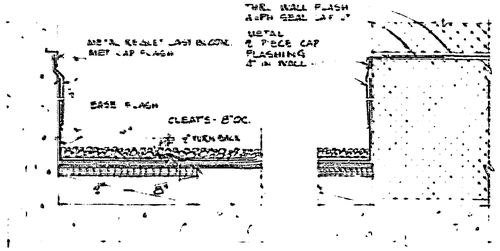
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA — GEORGE WASHINGTON MEMORIAL PARKWAY
PROJECT NAME OF PARK — RES. NO. 404 V

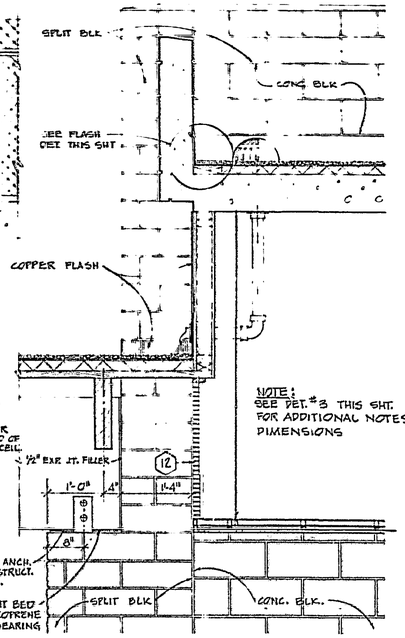
PREPARED	KCA
DESIGNED	NJM
DRAWN	WPL
CHECKED	
REGION	NATIONAL CAPITAL
PCP	3-34, B-37
SHEET	3 OF 36
DRAWING NO.	N.C.R. 117.-732
DATE	5/25/66

BASIC DATA

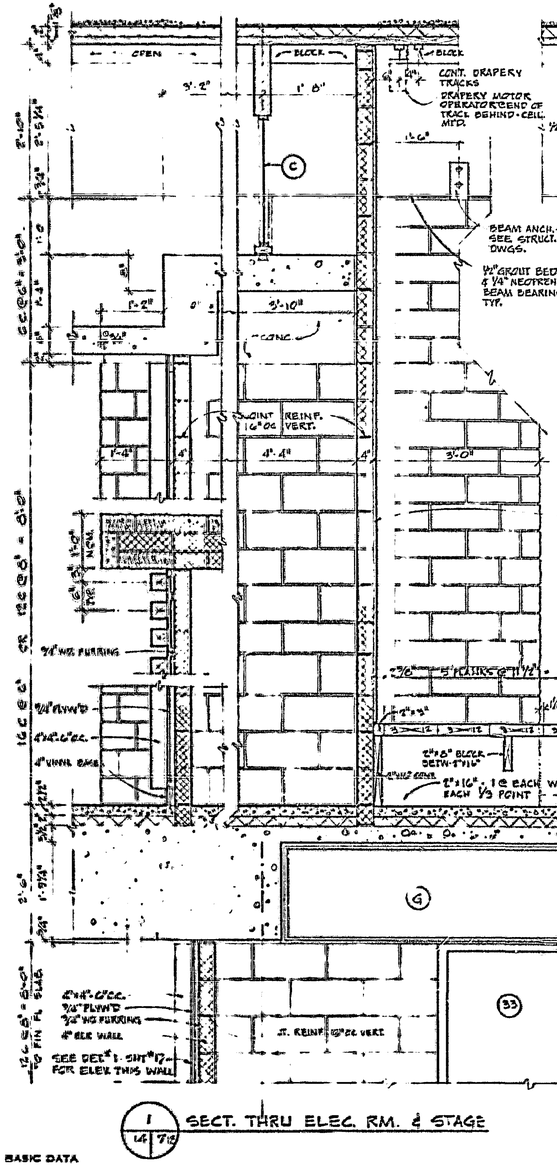
WALL SECTIONS



FLASHING DETAILS 3" = 1'-0"

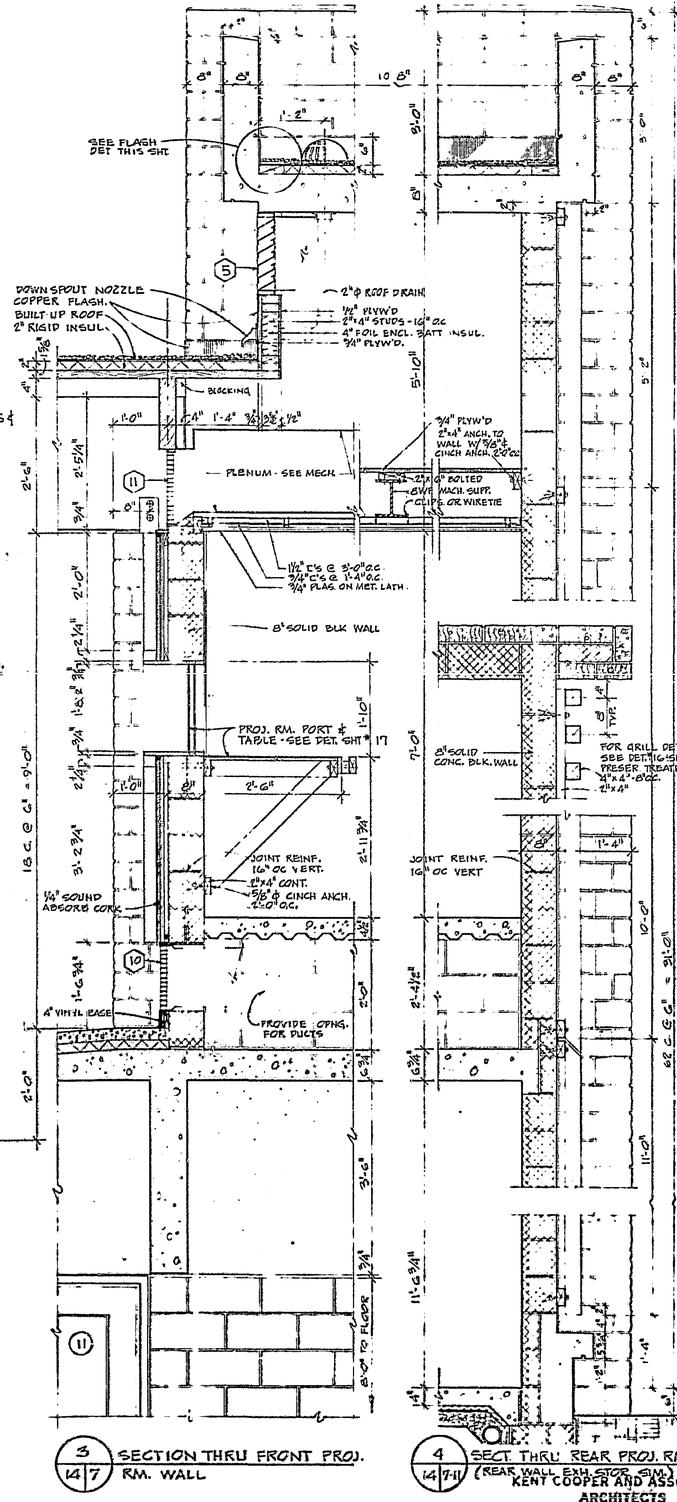


2 / 14 | 12 SECT. THRU EXH. GRILL IN EXH. RM.



1 / 14 | 7 | 8 SECT. THRU ELEC. RM. & STAGE

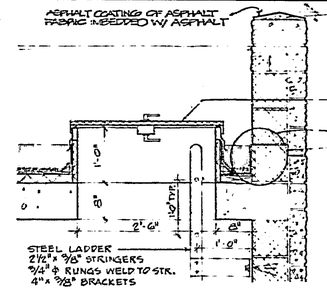
BASIC DATA



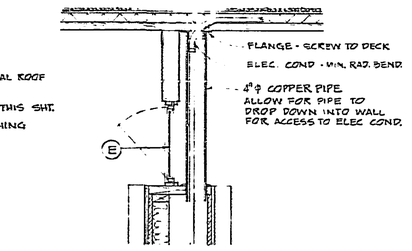
3 / 14 | 7 SECTION THRU FRONT PROJ. RM. WALL

4 / 14 | 7-11 SECT. THRU REAR PROJ. RM WALL (REAR WALL END STOP SIMI.)

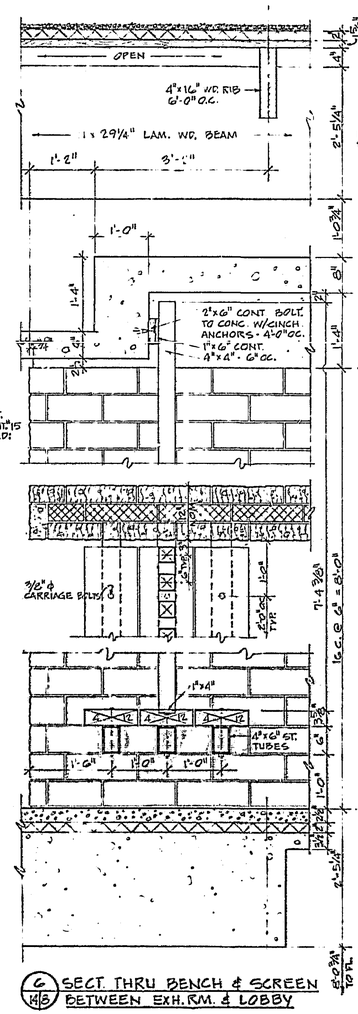
KENT COOPER AND ASSOCIATES
ARCHITECTS
1836 32d STREET NW. WASHINGTON, DC



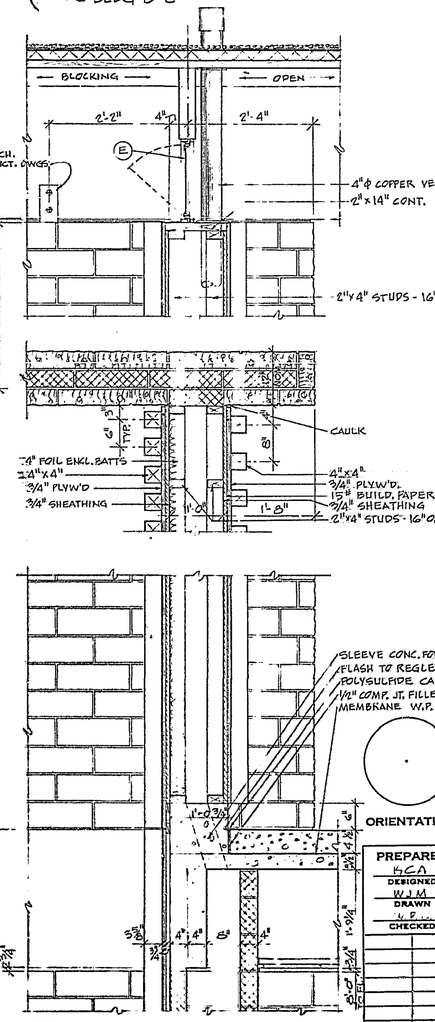
5 / 14 | 9 SECT. THRU ROOF SCUTTLE (SEE DET. #16 - SHT. #17)



SECT. THRU ELEC. DROP @ BLDG B-C



6 / 14 | 8 SECT. THRU BENCH & SCREEN BETWEEN EXH. RM. & LOBBY



8 / 14 | 7-10 SECTION THRU WD GRILL WALL @ STAIR - SECT. @ INFO CTR. SIMILAR

SCALE 0 1'-0" 2'

RECOMMENDED
DATE
APPROVED

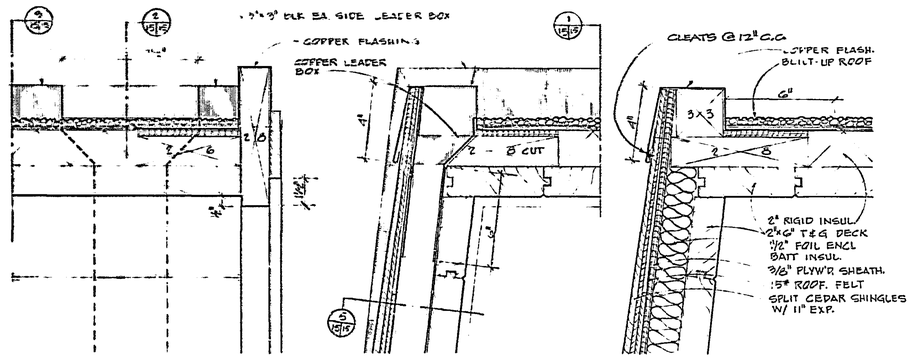
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS, VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY

PREPARED
HCA
DESIGNED
W.J.M.
DRAWN
C.P.
CHECKED

REGION
NATIONAL CAPITAL
PCP B-34, B-37
SHEET 14 OF 36
DRAWING NO.
N.C.R.
171 - 32
DATE 5/25/66

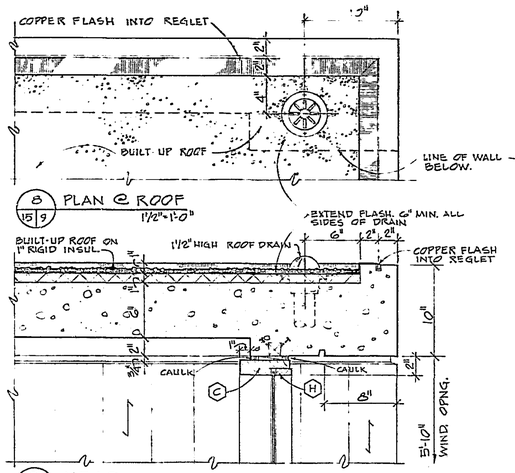
WALL SECTIONS



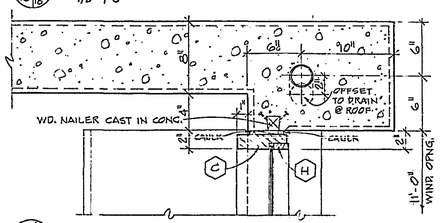
1 15/2.5/19 SECT @ END OF ROOF 3" = 1'-0"

2 15/11.9/16 SECT THRU LEADER BOX & DOWN-SPOUT 3" = 1'-0"

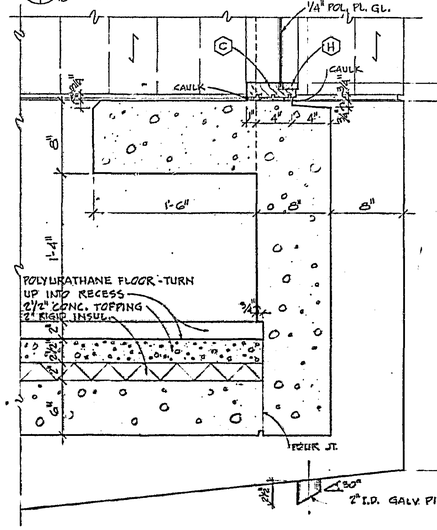
3 15/19/16 SECT @ SIDE OF ROOF 3" = 1'-0"



8 15/9 PLAN @ ROOF 1 1/2" = 1'-0"



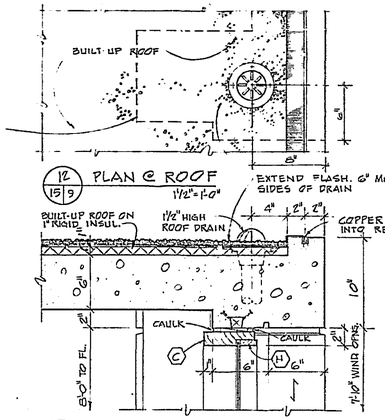
9 15/15.5/16 HEAD 1 1/2" = 1'-0"



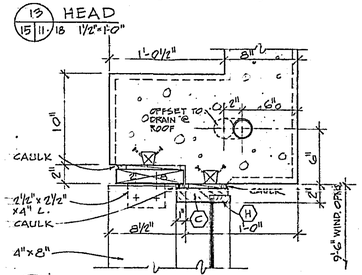
10 15/19/16 JAMB 1 1/2" = 1'-0"

11 15/15.5/19 SILL & BENCH 1 1/2" = 1'-0"

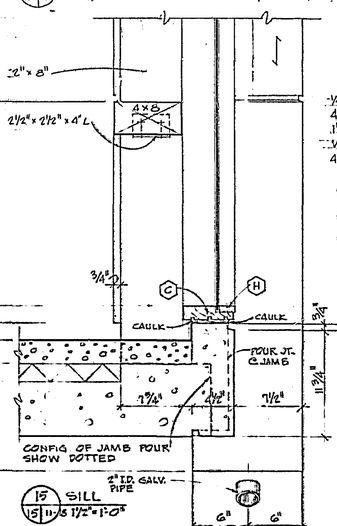
DETAILS WINDOW TYPE "J"



12 15/9 PLAN @ ROOF 1 1/2" = 1'-0"



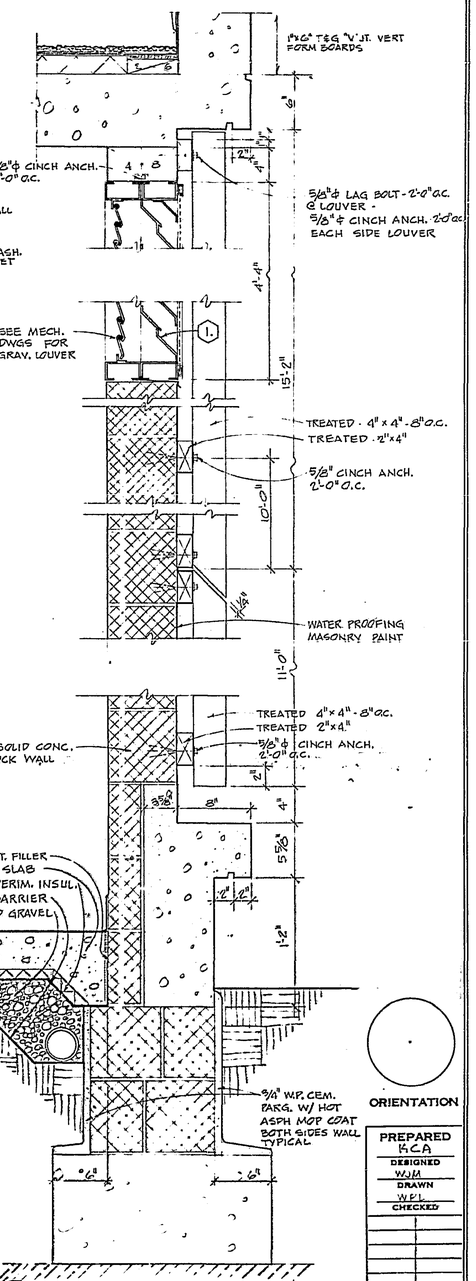
13 15/11/18 HEAD 1 1/2" = 1'-0"



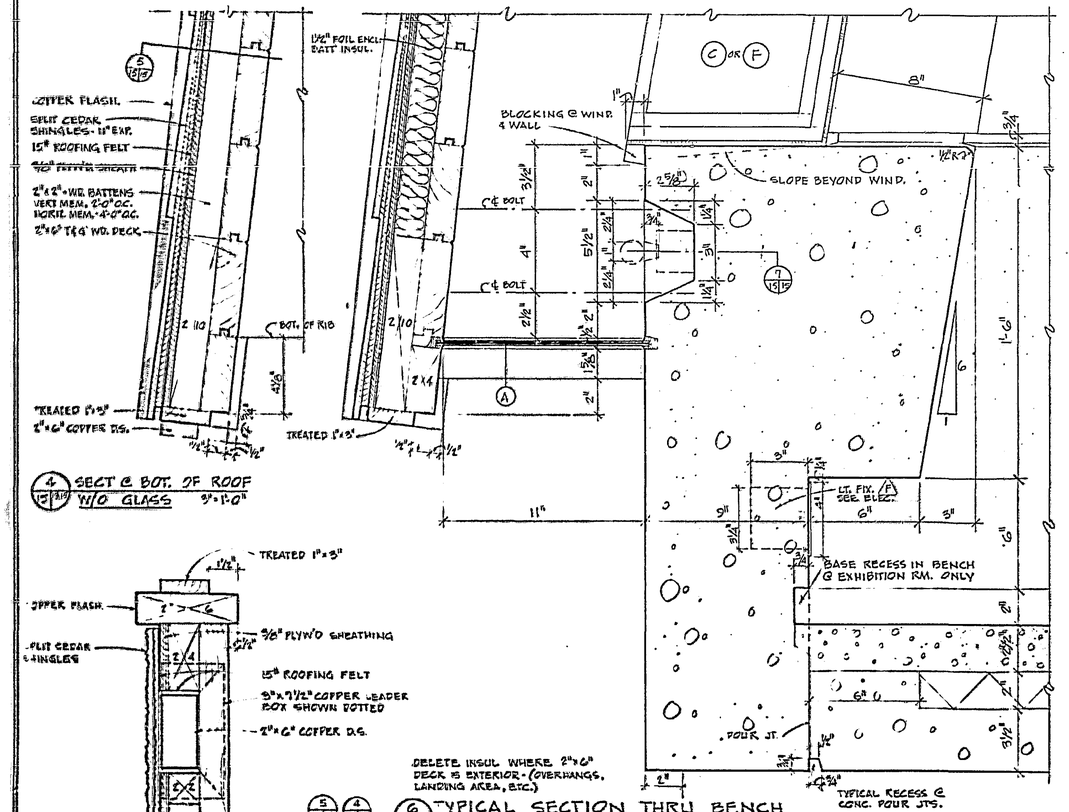
14 15/19/16 JAMB 1 1/2" = 1'-0"

15 15/11/16 SILL 1 1/2" = 1'-0"

DETAILS WINDOW TYPE "K"



16 15/3.4 GRILL DET. @ END WALL EXH. STOR. (GRILL @ PROJ. RM. SIM.) 1 1/2" = 1'-0"



4 15/3.10 SECT @ BOT. OF ROOF W/O GLASS 3" = 1'-0"

5 15/15.6 SECT @ EDGE OF ROOF @ DOWN-SPOUT 3" = 1'-0"

6 15/19/16 TYPICAL SECTION THRU BENCH 3" = 1'-0"

7 15/3.4 PART. PLAN @ BENCH & ROOF JUNCTURE 3/4" = 1'-0"

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET NW, WASHINGTON, DC

RECOMMENDED — DATE

APPROVED

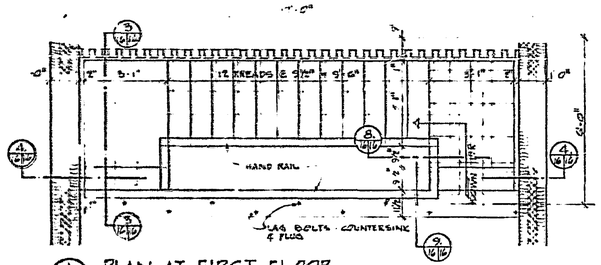
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS VIRGINIA — LOCATION WITHIN PARK — RES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

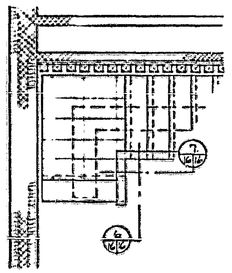
PREPARED KCA
DESIGNED WJM
DRAWN WFL
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REGION NATIONAL CAPITAL
PCP B 34, B-37
SHEET 15 OF 36
DRAWING NO. N.C.R. 117.1 - 732
DATE 5/25/66

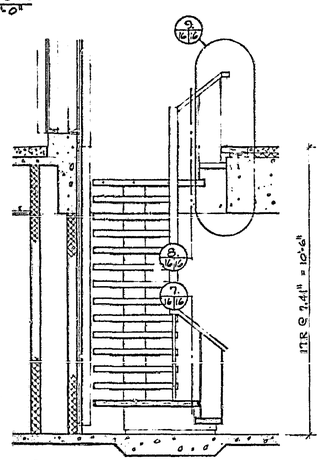
MISC. EXTERIOR DETAILS



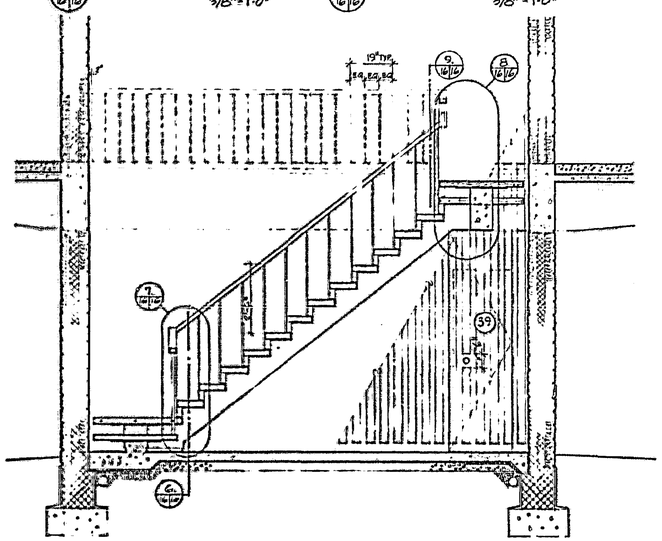
1. PLAN AT FIRST FLOOR
3/8" = 1'-0"



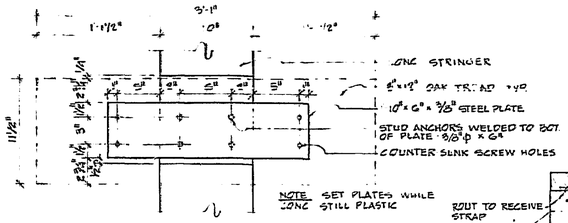
2. PLAN AT GRND FL.
3/8" = 1'-0"



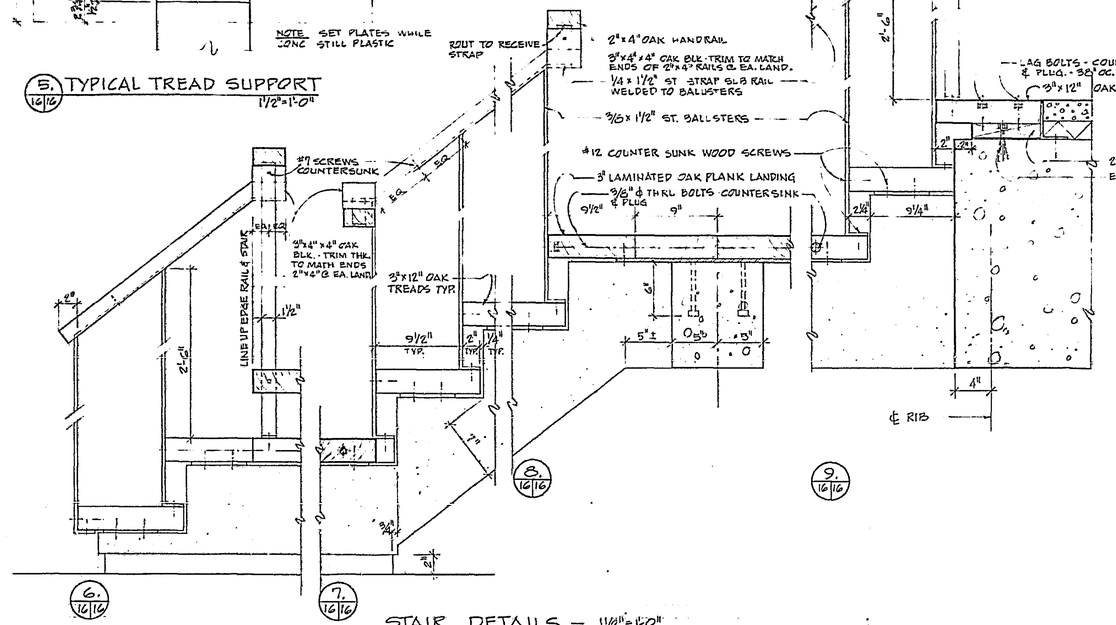
3. CROSS SECTION
3/8" = 1'-0"



4. LONGITUDINAL SECTION
3/8" = 1'-0"

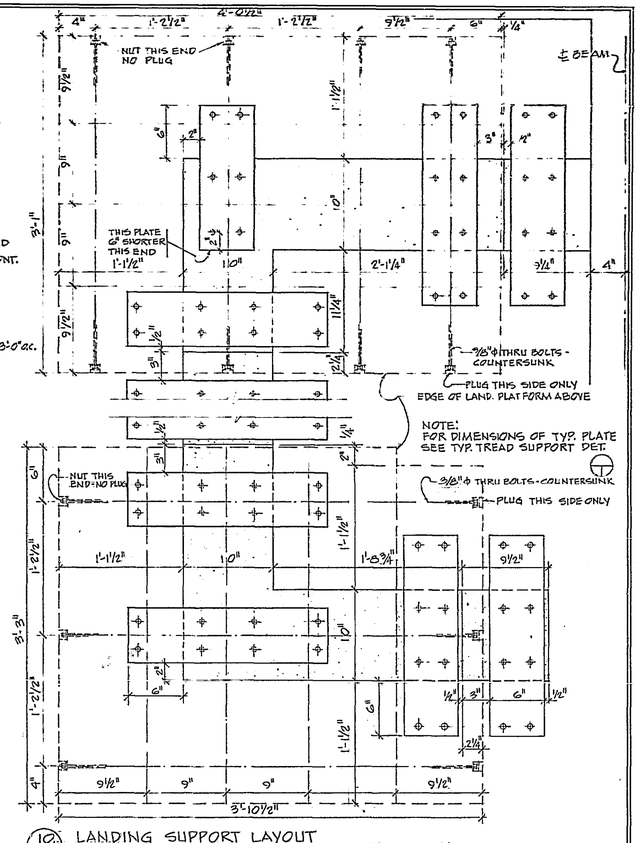


5. TYPICAL TREAD SUPPORT
1 1/2" = 1'-0"

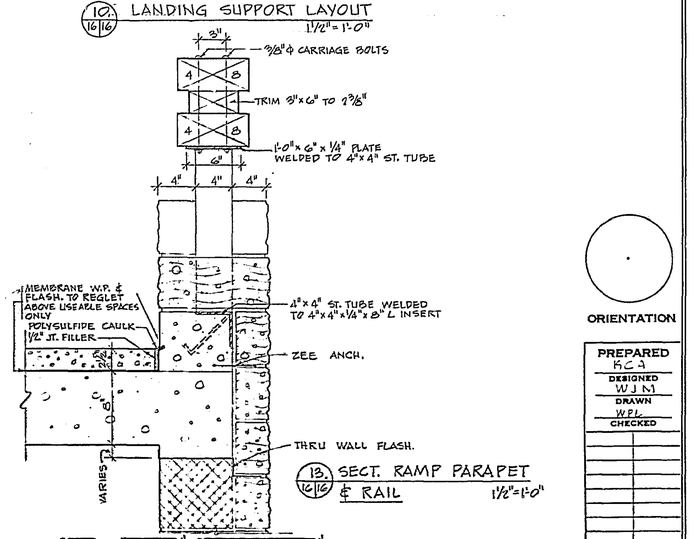


6. 7. 8. 9.

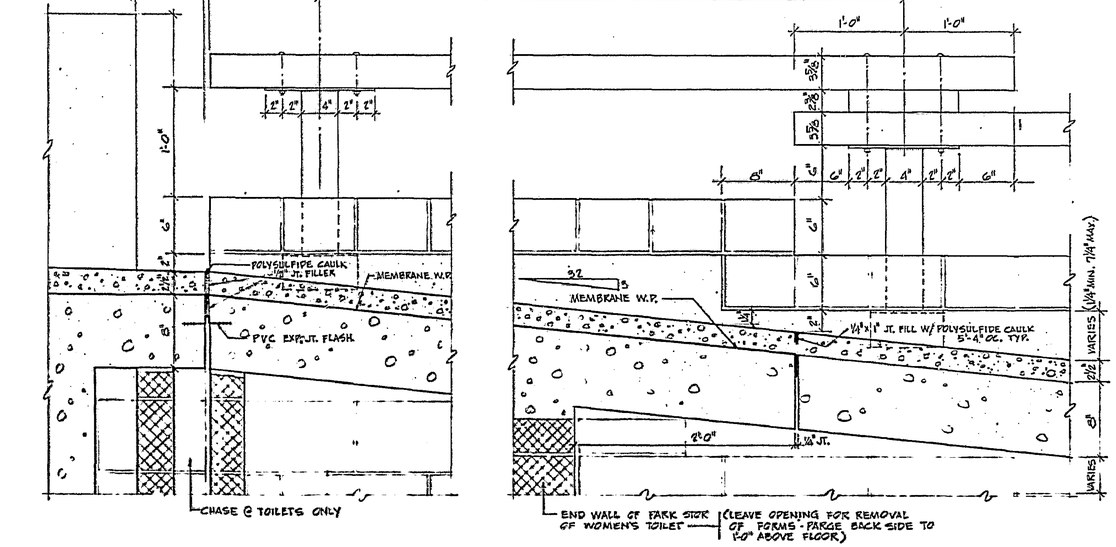
STAIR DETAILS — 1 1/2" = 1'-0"



10. LANDING SUPPORT LAYOUT
1 1/2" = 1'-0"



13. SECT. RAMP PARAPET & RAIL
1 1/2" = 1'-0"



11. RAMP SECTION @ EXPANSION JOINT
1 1/2" = 1'-0"

12. RAMP SECT. @ END OF W.P. W/ TYPICAL RAIL SUPPORT
1 1/2" = 1'-0"

ORIENTATION

SCALE 3/8" = 1'-0" 1 1/2" = 1'-0"

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33d STREET NW. WASHINGTON, DC

RECOMMENDED — DATE
APPROVED

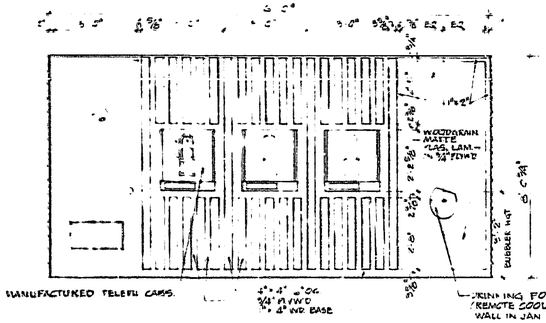
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

TITLE OF DRAWING: VISITOR CENTER
LOCATION WITHIN PARK: GREAT FALLS, VIRGINIA
NAME OF PARK: GEORGE WASHINGTON MEMORIAL PARKWAY
RES. NO. 204 V

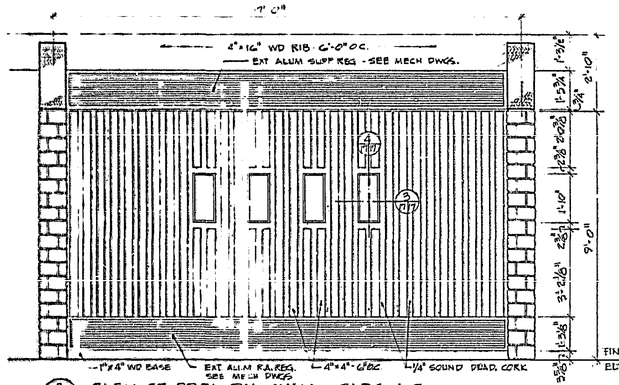
PREPARED KCA
DESIGNED WJM
DRAWN WPL
CHECKED

REGION NATIONAL CAPITAL
PCP E-34 3-37
SHEET 16 OF 36
DRAWING NO. N.C.R. 117: 752
DATE 5/25/60

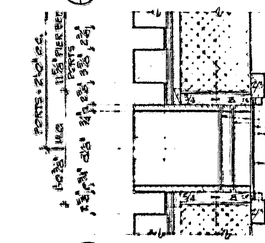
STAIR AND RAMP DETAILS



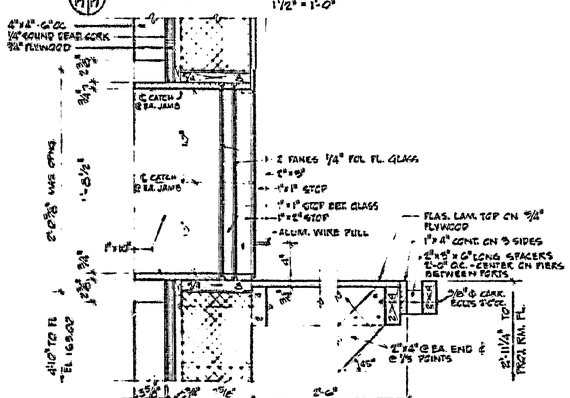
1/17/8 ELEV. OF TELEPHONE CAB. WALL @ GR'ND. FL LOBBY BLDG A-B
3/8" = 1'-0"



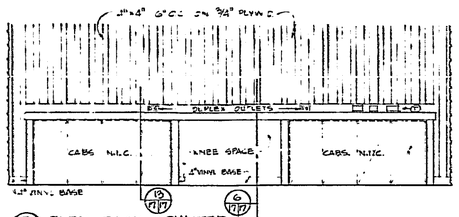
2/17/7 ELEV. OF PROJ. RM. WALL - BLDG A-B
3/8" = 1'-0"



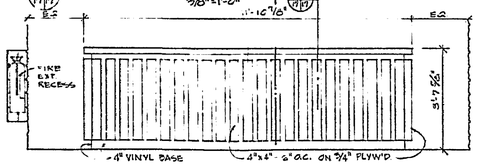
3/17/7 PLAN SECT. OF PROJ. PORT
1 1/2" = 1'-0"



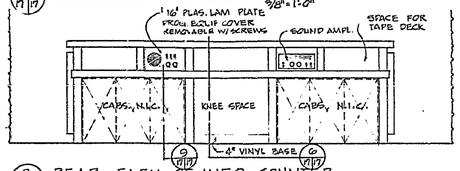
BASIC DATA 4/17/7 VERT. SECT. OF PROJ. PORT
1 1/2" = 1'-0"



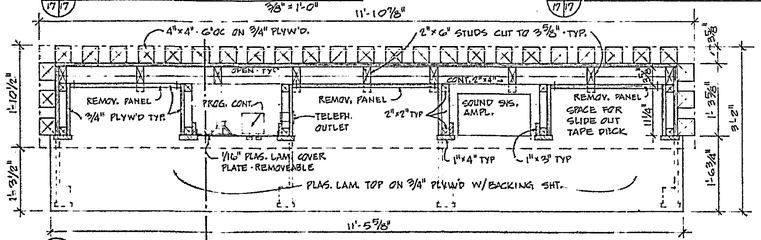
5/17/7 ELEV. BACK COUNTER
3/8" = 1'-0"



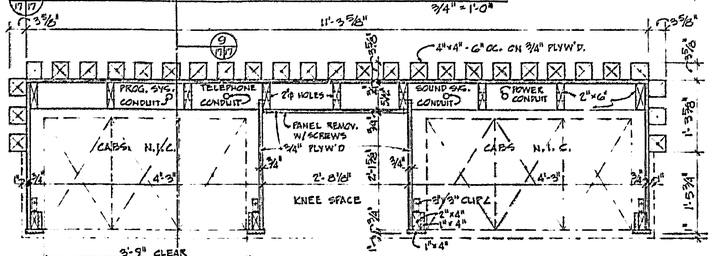
7/17/7 FRONT ELEV. INFO. COUNTER
3/8" = 1'-0"



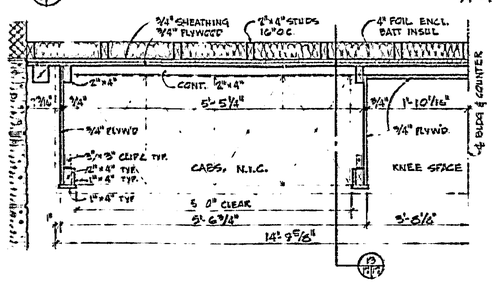
8/17/7 REAR ELEV. OF INFO. COUNTER
3/8" = 1'-0"



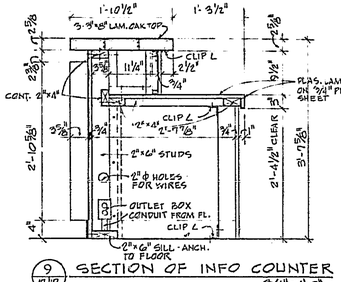
10/17/7 PLAN ABOVE WORK SURFACE OF INFO. COUNTER
3/4" = 1'-0"



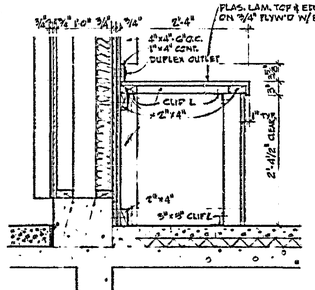
11/17/7 PLAN BELOW WORK SURFACE OF INFO. COUNTER
3/4" = 1'-0"



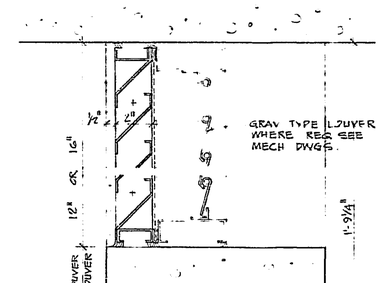
12/17/7 HALF PLAN BELOW WORK SURFACE OF BACK COUNTER
3/4" = 1'-0"



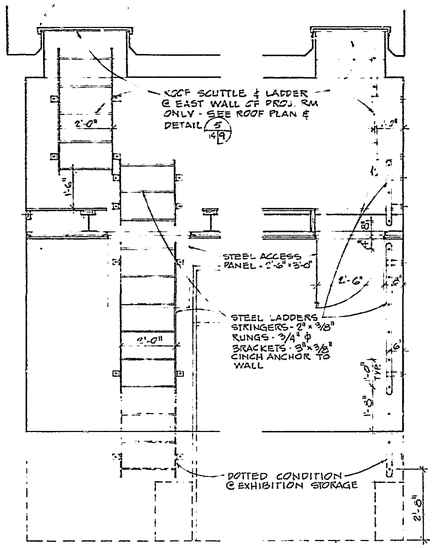
9/17/7 SECTION OF INFO COUNTER
3/4" = 1'-0"



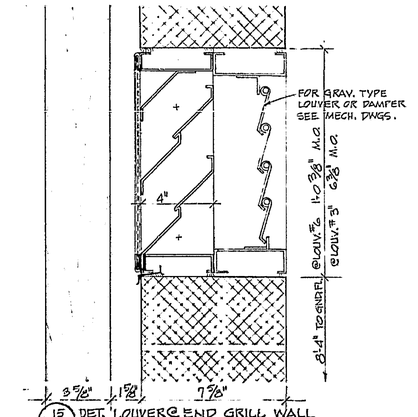
13/17/7 SECTION OF BACK COUNTER
3/4" = 1'-0"



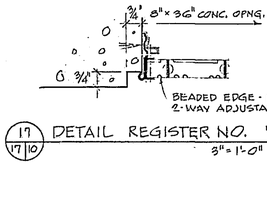
14/17/18/11 DETAIL LOUVER IN CONC. BEAM
3" = 1'-0"



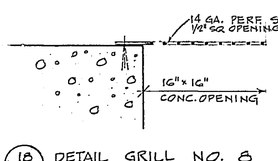
16/17/17 STEEL ACCESS LADDER DETAILS
3/8" = 1'-0"



15/17/11 DET. LOUVER & END GRILL WALL
3" = 1'-0"



17/17/10 DETAIL REGISTER NO. 7
3" = 1'-0"



18/17/10 DETAIL GRILL NO. 8
3" = 1'-0"

LOUVER, GRILLE, & REGISTER SCHEDULE

NO.	SIZE	TYPE	THK.	MAT'L.	DET. NO/SHT.	REMARKS
1.	52" x 24"	FIXED W.P. W/INSECT SCREEN	4"	PAINT STEEL	16,17/15	(1) CENTER MULLION
2.	12" x 12"	FIXED W/INSECT SCREEN	2"	ALUMINUM	5/13, 14/16	(1)
3.	12" x 6"	FIXED W.P. W/INSECT SCREEN	4"	PAINT STEEL	15/16	(1)
4.	16" x 24"	FIXED W/INSECT SCREEN	2"	ALUMINUM	5/13, 14/16	(1)
5.	18" x 10'-0"	FIXED	4"	PAINT STEEL	3/14	BLANK OFF 4'-0" EA. SIDE
6.	12" x 12"	FIXED W.P. W/INSECT SCREEN	4"	PAINT STEEL	15/16	(1)
7.	36" x 8"	2-WAY ADJ. DIFFUSER		PAINT STEEL	17/16	
8.	16" x 16"	PERF. METAL GRILL	14 GA.	PAINT STEEL	18/16	
9.	36" x 12"	FIXED W.P. W/INSECT SCREEN	1 1/2"	ALUMINUM	5,6,7/15	(1)
10.	18" x 16'-0"	RETURN AIR REG.				(1) SEE MECH. DWGS FOR GRAV. LOUVERS, DAMPERS ETC. BEHIND FIXED LOUVERS
11.	17" x 16'-0"	SUPPLY AIR REG.				
12.	30" x 16'-0"	EXHAUST AIR REG.				
13.	16" x 12"	WALL SUPPLY REG.				
14.	24" x 8"	FLOOR SUPPLY REG.				
15.	12" x 12"	CEIL EXH. REG.				
16.	18" x 10"	CEIL. EXH. REG				
17.		UNIT HEAT. SUPPLY REG.				
18.		UNIT HEAT RETURN REG				
19.	16" ø	CEIL. DIFF.				
20.		WALL RETURN REG.				
21.	16" x 16"	CEIL. EXH. GRILLS				

SEE MECH. DWGS.

SCALE: 3/8" = 1'-0" | 3/4" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

ORIENTATION

RECOMMENDED ____ DATE ____

APPROVED ____

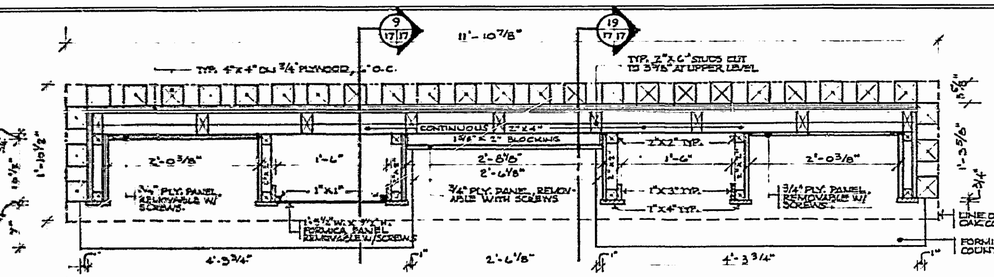
KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET N.W. WASHINGTON, DC

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

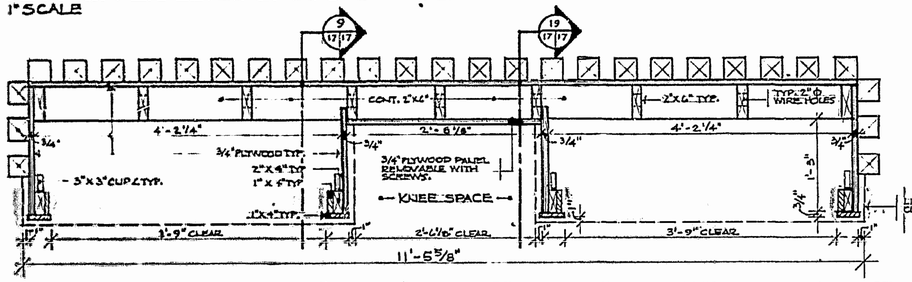
VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA — RES. NO. 404 V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED	HCA
DESIGNED	WJM
DRAWN	MPL
CHECKED	
REGION	NATIONAL CAPITAL
PCP	B-34 3 37
SHEET	7 OF 36
DRAWING NO.	N.C.R. 11" 1 - 732
DATE	5/23/62

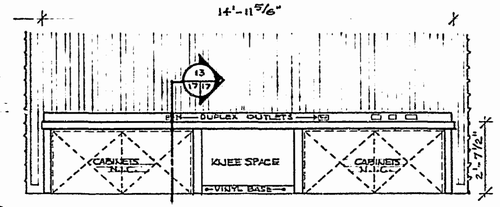
MISCELLANEOUS DETAILS



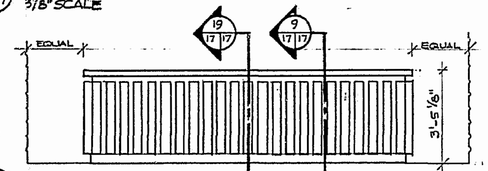
PLAN - UPPER LEVEL OF INFO. COUNTER
1" SCALE



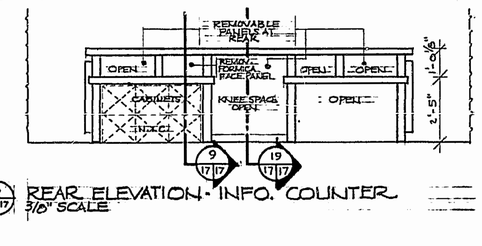
PLAN - LOWER LEVEL OF INFO. COUNTER
1" SCALE



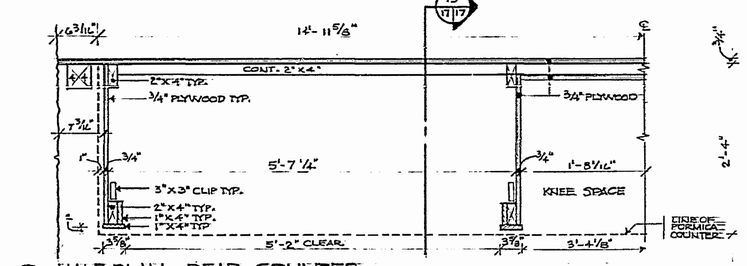
5 / 17|17 ELEVATION - REAR COUNTER
3/8" SCALE



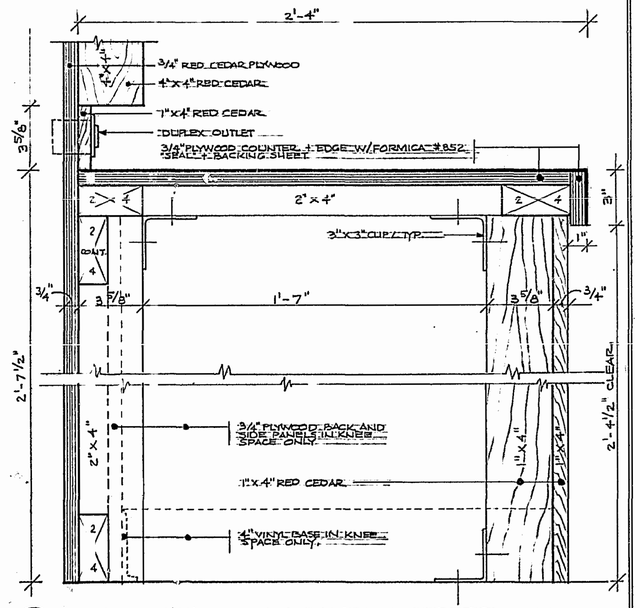
7 / 17|17 FRONT ELEVATION - INFO. COUNTER
3/8" SCALE



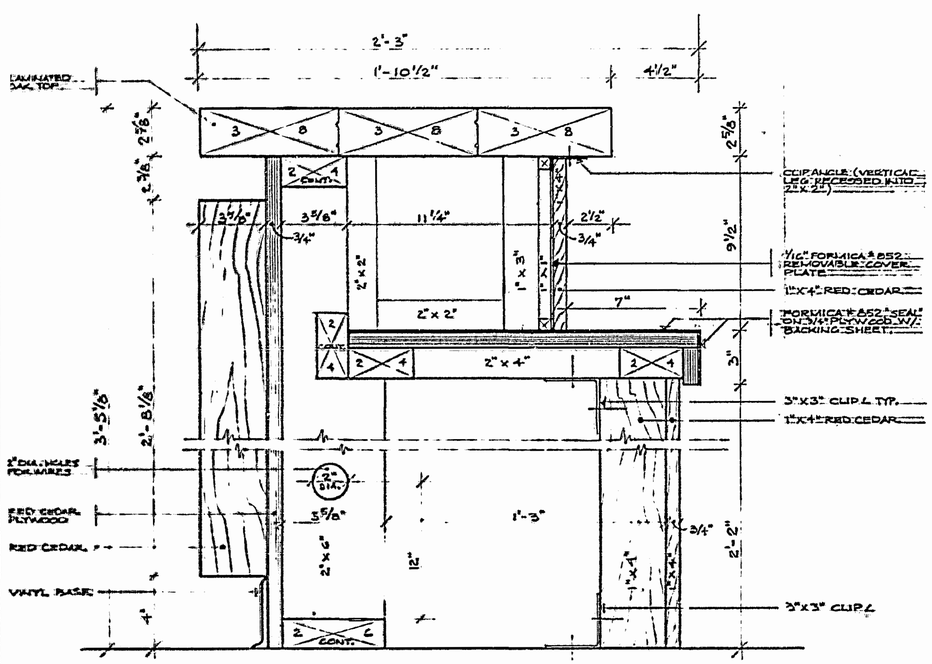
8 / 17|17 REAR ELEVATION - INFO. COUNTER
3/8" SCALE



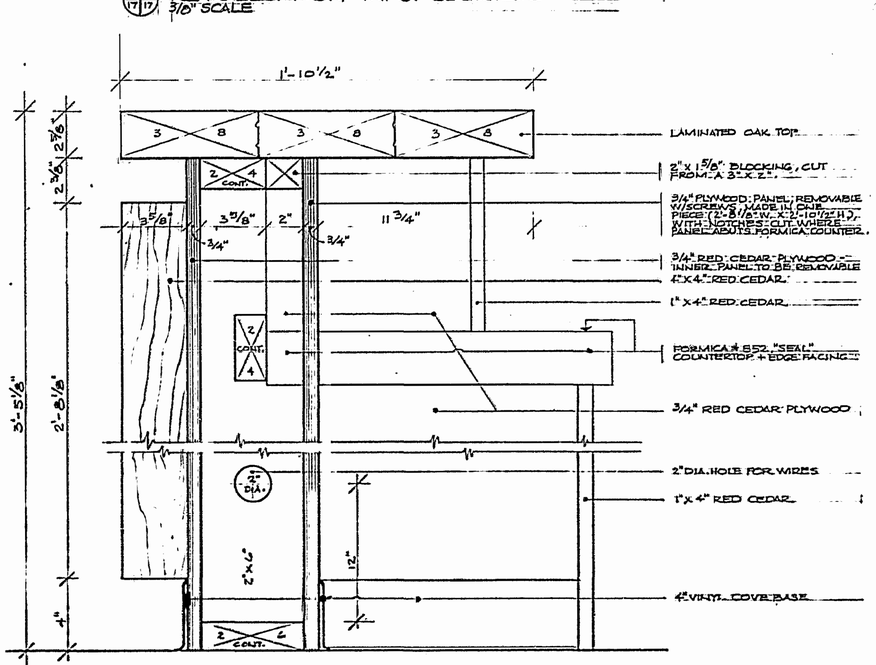
12 / 17|17 HALF PLAN - REAR COUNTER
1" SCALE



13 / 17|17 SECTION THROUGH REAR COUNTER
3" SCALE



9 / 17|17 SECTION THROUGH INFO. COUNTER
3" SCALE



19 / 17|17 SECTION THROUGH INFO. COUNTER AT KNEE SPACE
3" SCALE

ORIENTATION

SCALE: 0 1" 3/16"=1'-0" 3" 0 1" = 1'-0" 2" 0 3"=1'-0" 6"

PREPARED
DESIGNED A. MASSEY
DRAWN
CHECKED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON PLANNING AND SERVICE CENTER
PREPARED BY
DESIGN AND CONSTRUCTION

REVISION TO INFORMATION AREA
TITLE OF DRAWING
GREAT FALLS, VA. RES. 404-V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PKWY.
NAME OF PARK

DATE INITIAL REVISED

REGION
NATIONAL CAPITAL

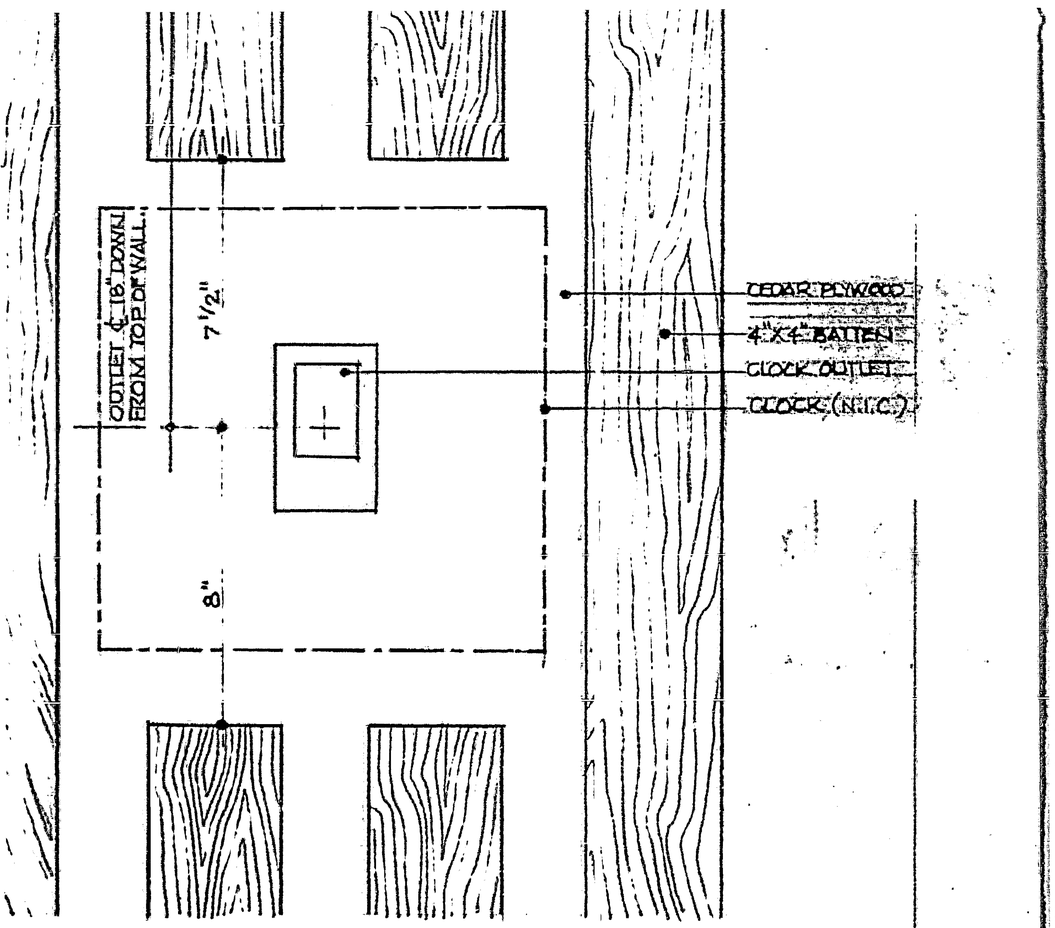
FCP 13-34; 13-37

SHEET 7 OF 7 1 OF 1

DRAWING NO.
N.C.R.
117.1-732-17A

DATE OCT. 19, '67

BASIC DATA

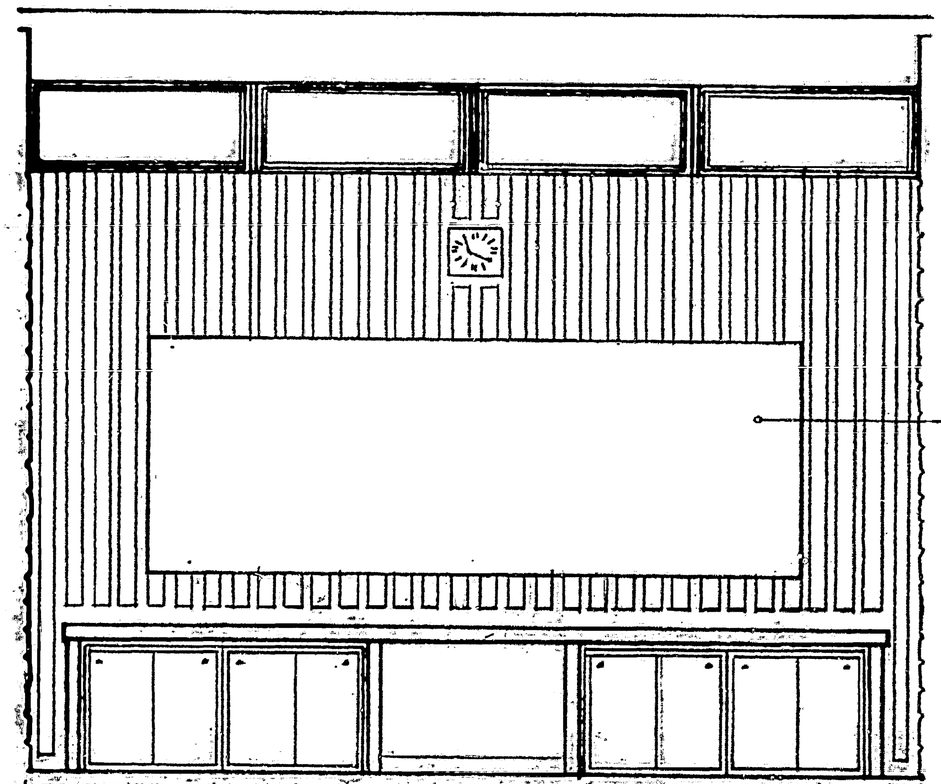


AIL: CUTTING OF 2 CENTRAL BATTENS
FO. AREA WALL TO PROVIDE FOR
ALLATION OF RECESSED CLOCK

3"=1' A.M.M. 1-9-68

AT FALLS VISITOR CENTER

FILE WITH SHEET 17 OF 36
DWG. # N.C.R. 117.1-732

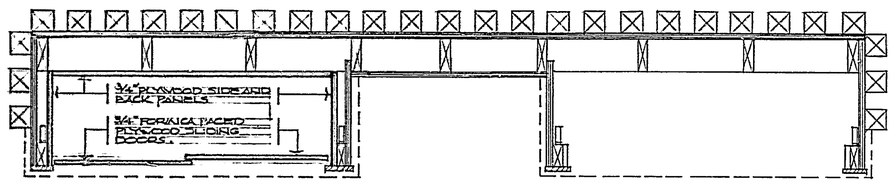


GREAT FALLS VISITOR CENTER

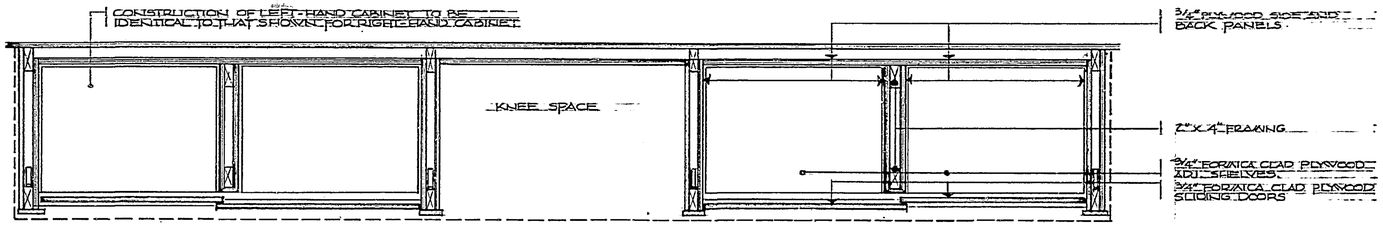
ELEVATION-REAR WALL OF INFORMATION AREA, SHOWING SUGGESTED LOCATION OF EXHIBIT PANEL. (TO BE FABRICATED BY EASTERN MUSEUM LABORATORY).

3/8" SCALE 1-8-68

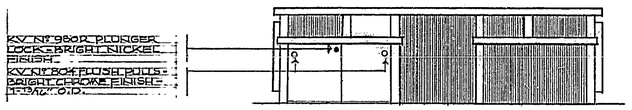
FILE WITH SH
DWG. # N.C.R.



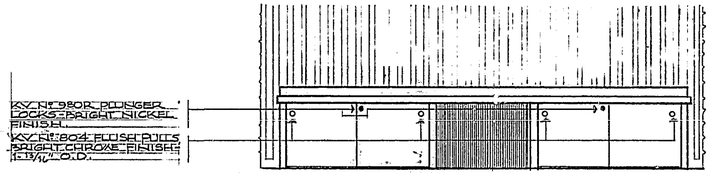
PLAN - LOWER LEVEL OF INFORMATION COUNTER
1" SCALE



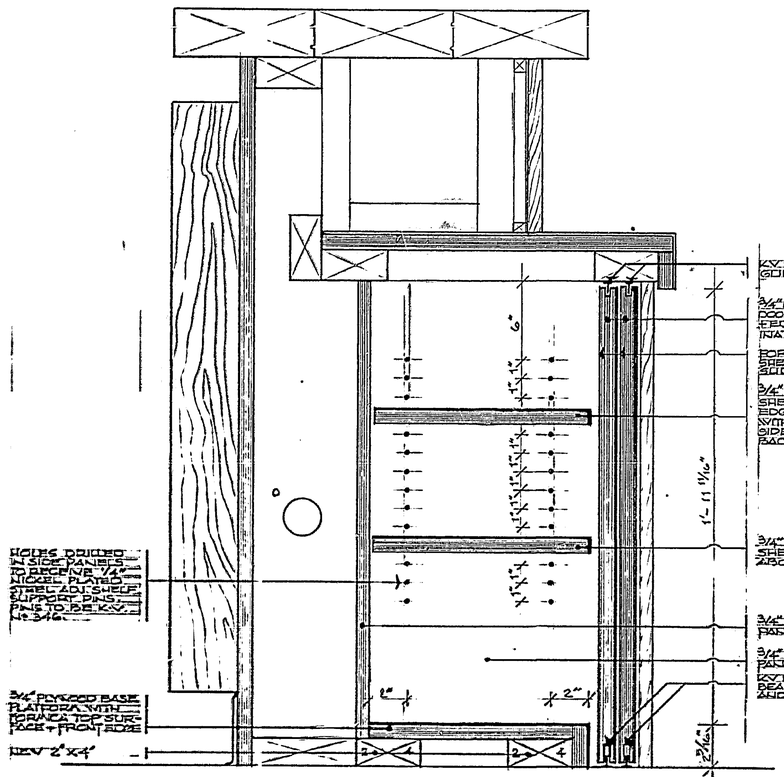
PLAN - REAR WORK/STORAGE COUNTER
1" SCALE



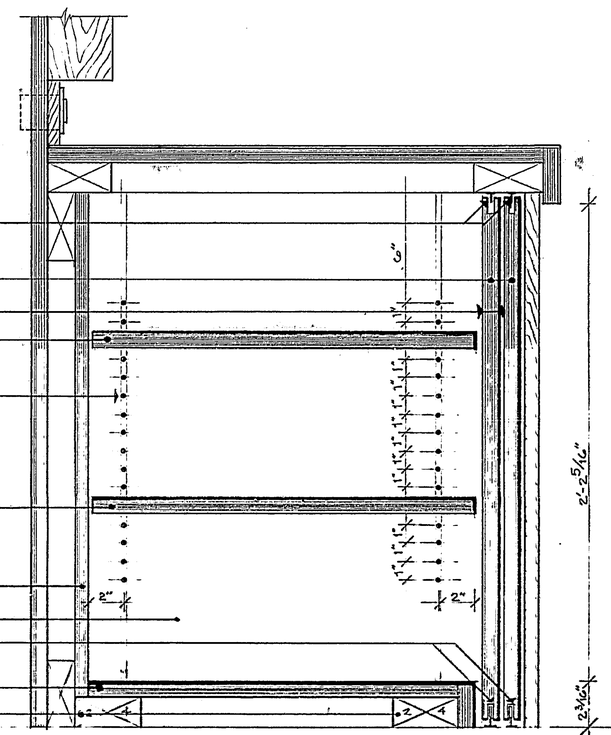
ELEVATION - REAR OF INFORMATION COUNTER
3/8" SCALE



ELEVATION - REAR WORK/STORAGE COUNTER
3/8" SCALE



SECTION - INFO. COUNTER STORAGE AREA
3" SCALE



SECTION - REAR COUNTER STORAGE AREAS
3" SCALE

FINISHES:

FORMICA SURFACES OF SLIDING DOORS AND SHELVES TO BE NO. 852-64 "SEAL" WITH SUEDE FINISH.

INTERIOR SURFACES OF CABINETS THAT ARE NOT SURFACED WITH FORMICA SHALL BE PAINTED AS FOLLOWS:
1 COAT ENAMEL UNDERCOATER
2 COATS PITTSBURGH PAINTS SATINHIDE ALKYD FLUSTRE ENAMEL, COLOR TO BE NO. "A-120" "OLIVE STONE"

NOTE:

FIELD MEASUREMENTS OF THE EXISTING INFORMATION AREA ARE TO BE TAKEN BEFORE FABRICATION OF NEW CABINETRY IS UNDERTAKEN.

ORIENTATION

SCALE: 0 1" 3/16"-1'-0" 3' 0 1" 1"-1'-0" 2' 0 3"-1'-0" 6"

PREPARED	
DATE	SURNAME
DESIGNED	
DRAWN	J. MASSEY
CHECKED	

SYMBOL	REVISIONS — DESCRIPTION	DATE	SURNAME
	REVISIONS TO COUNTERS - INFORMATION AREA VISITOR CENTER		

TITLE OF DRAWING: GREAT FALLS, VIRGINIA — RES. 404-V

LOCATION WITHIN PARK: GEORGE WASHINGTON MEMORIAL PARKWAY

NAME OF PARK

DRAWING NO. NCR. 1171-732-170

SHEET 17 OF 36

WINDOW TYPE ELEVATIONS

NOTE: SECTIONS SHOWN THUS (22) REFER TO SECTIONS ON THIS SHEET ONLY. 1/4" = 1'-0"

1 SILL @ COUNTER WINDOW TYPE "M"

2 JAMB OF PANEL BELOW WIND. TYPES "M" & "N"

3 SILL OF PANEL BELOW WIND. TYPES "M" & "N"

4 HORIZ MULLION WIND. TYPES "M", "N" & "Q"

5 JAMBS WIND. TYPES "M" & "N"

6 SILL @ COUNTER WIND. TYPE "N" SEE (1) FOR OTHER NOTES ETC.

7 JAMB WIND TYPE "P"

8 MULLION BET. WIND. TYPES "P" & "Q"

9 MULLION BET. DOOR # 28 & WIND TYPE "Q"

10 SILL WIND. TYPES "P" & "Q" SEE (1) FOR OTHER NOTES ETC.

11 HEAD WIND. TYPES "M", "N", "O", "P" & "Q"

12 HORIZ. MULLION WIND. TYPE "O"

13 JAMB WIND. TYPE "O"

14 SILL WINDOW TYPE "O"

15 HORIZ. GLASS @ BOT. OF END RIB

16 HORIZ. GLASS @ BOT. OF TYP. RIB

17 HORIZ. GLASS @ BOT. OF RIB OVER LINK

18 HORIZ MULLION @ WIND. TYPE "C"

19 HORIZ. MULLION @ WIND. TYPE "F"

20 HORIZ MULLION @ WIND. TYPE "D"

21 GLASS @ RIB OR BEAM

22 SILL @ LINK ROOF

23 JAMB @ SLOPED WALL - SILL SIM.

24 MULLION UNDER LAM. BEAM @ WIND. "C"

25 VERT. JT. OF "GLASWELD" @ CENTER WIND. "C"

26 VERT. MULLION UNDER LAM. BEAM WIND. TYPE "D"

27 HEAD HOPPER WIND. "E"

28 JAMB HOPPER WIND. "E"

29 VERT. MULLION BETWEEN HOPPER WIND. "E"

30 SILL HOPPER WIND. "E"

31 HEAD WIND. TYPE "L"

32 JAMB WINDOW TYPE "L"

33 SILL - WINDOW TYPE "L"

34 HEAD & JAMB WINDOW "G"

35 SILL WINDOW "G" SEE SEC. (16)

36 SILL WINDOW TYPE "H"

ORIENTATION

SCALE 1/4"=1'-0" 3"=1'-0"

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET, NW, WASHINGTON, DC

RECOMMENDED ____ DATE ____

APPROVED ____

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
DRAWING BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA REG. NO 402 V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

REGION NATIONAL CAPITAL
PCP & 32-837
SHEET 18 OF 36
DRAWING NO. N.C.R. 117-1-732
DATE 5-25-66

PREPARED HCA
DESIGNED W.J.M.
DRAWN
CHECKED

WINDOW DETAILS

DOOR SCHEDULE

NO.	LOCATION	TYPE	SIZE	THK.	MATERIAL	BUCK*	THR'HLD	HARDW.	REMARKS
	RAMP ENT. & EXH. BLDG.	I	2'-2"x6'-8"	1 3/4"	4000 W/ GLASS PANEL	2,3	4.	1	
	"	I	"	"	"	2 9	4	1	
	RAMP ENT. AND BACK	I	"	"	"	1,2,3	4	1	
	"	I	"	"	"	1,2,3	4	1	
	DRESSING RM. ENT.	I	2'-2"x7'-0"	"	"	8,9	11.	1	
	"	I	"	"	"	8,9	11.	1	
	"	I	"	"	"	8,9,10	11.	1	
	LIBRARY ENT. GRAND FL.	I	"	"	"	8,9	11.	1	
	"	I	"	"	"	8,9	11.	1	
	OFF. ENT.	I	"	"	"	8,9,10	11.	2	
	RESEARCH ENT	I	"	"	"	8,9,10	11.	2	
	KITCHEN ENT.	II	"	"	FLUSH WOOD SOLID CORE	8,9	11	3	
	PARK SUPT. ENT.	II	"	"	"	5,6,7,9	11.	2	24" x 12" ADJ. EXT. LOUVER EA. LEAF W/ INSECT SCREEN
	W. VEST ENT.	III	3'-0"x6'-8"	"	"	5,6,7,9	11.	4	24" x 12" ADJ. EXT. LOUVER W/ INSECT SCREEN
	N. VEST ENT.	III	"	"	"	5,6,7,9	11	4	"
	AUDIT.	II	2'-2"x8'-0"	"	"	1,2,3		5	
	"	II	"	"	"	1,2,3		5	
	FREE RM.	IV	3'-0"x7'-0"	1 3/8"	FLUSH WOOD FIBER CORE	9,12,13		6	
	"	IV	"	"	"	9,12,13		6	
	EXH. STOR.	IV	2'-4"x7'-0"	"	"	9,12,13		6	
	"	IV	"	"	"	9,12,13		6	
	RESEARCH STOR.	V	3'-0"x7'-0"	"	"	14,17,18		6	24" x 12" FIXED WD. LOUVER
	HEAT PUMP	IV	"	"	"	14,17,18		6	24"x30" FIXED WD. LOUVER W/ DAMPER BEHIND - SEE MECH. DWGS.
	RESEARCH	V	"	"	"	14,17,18		6	24" x 12" FIXED WD. LOUVER
	OFFICE	IV	"	"	"	14,17,18		6	
	LOCK.	V	"	"	"	8,9,10		6	24" x 12" FIXED WD. LOUVER
	VEND. STOR.	V	"	"	"	8,10,19		7	" " " " "
28.	KITCHEN	VIII	"	"	"	8,19 *		7	* SEE DET. # 9 SHT. # 18
29.	TRASH	V	3'-0"x6'-8"	"	"	15,17		7	24" x 12" FIXED WD. LOUVER
30.	ELT. STOR.	V	"	"	"	15,17		7	" " " "
31.	KIT. LOCK.	V	2'-6"x6'-8"	"	"	15,17		7	12" x 24" " " "
32.	KIT. TOILET	V	"	"	"	15,17		7	" " " "
33.	MEN. CLOS. GRAND FL.	V	2'-8"x7'-0"	"	"	16,17		6	" " " "
34.	W. LOCK.	V	"	"	"	16,17		6	" " " "
35.	M. LOCK.	V	"	"	"	16,17		6	" " " "
36.	STAFF MEN	V	2'-8"x6'-8"	"	"	15,17		6	" " " "
37.	STAFF W.	V	"	"	"	15,17		6	" " " "
38.	VEST. COMM	IV	"	"	"	15,17,18		7	
39.	LOBBY-VEST. COMM.	VI	2'-8"x6'-8"	1 3/4	FLUSH WOOD SOLID CORE	22,23,24		8	
40.	MEN'S TOILET RM.	VII	2'-8"x7'-0"	"	"	21,23,24		8	
41.	ELEC. RM.	VII	2'-6"x7'-0"	"	"	21,23,24		8	

* BUCK NO.'S REFER TO SECTIONS ON THIS SHT. ONLY

BASIC DATA

MILLWORK SCHEDULE

KENT COOPER AND ASSOCIATES
ARCHITECTS
656 33d STREET NW. WASHINGTON, DC

SCALE 0 3"=1'-0" 6"

RECOMMENDED _____ DATE

APPROVED _____

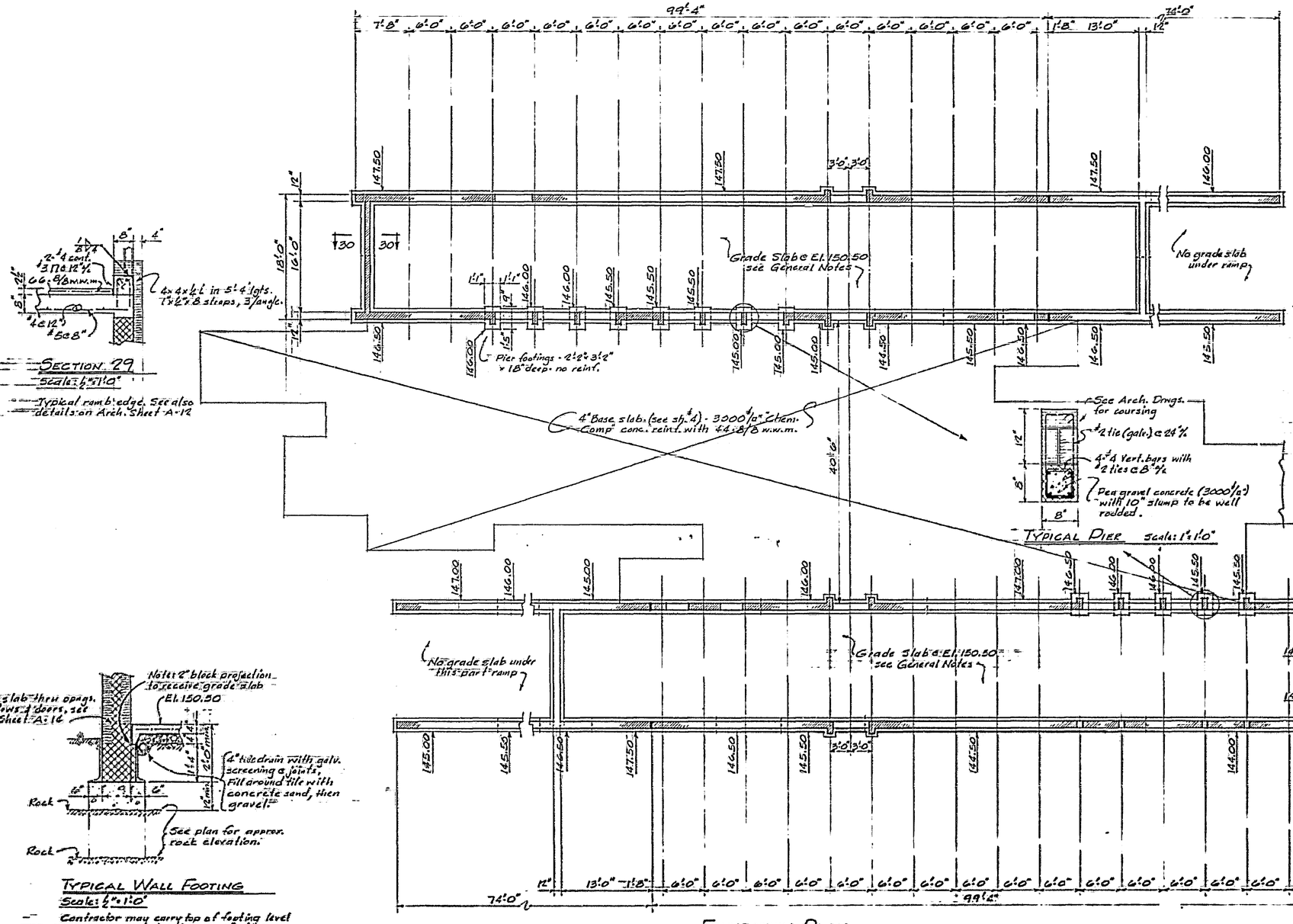
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS VIRGINIA REC. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY

PREPARED HCA
DESIGNED WJM
DRAWN W.F.L.
CHECKED

REGION NATIONAL CAPITAL
PCP B-34, B 37
SHEET 19 OF 36
DRAWING NO. N.C.R. 117.1-732
DATE 8/15/66

DOOR DETAILS

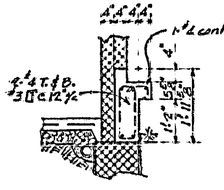


SECTION 29
Scale: 1"=1'0"

Typical ramb'd edge. See also details on Arch. Sheet A-12

TYPICAL WALL FOOTING
Scale: 1/2"=1'0"

Contractor may carry top of footing level @ El. 148.50 or step down in 8" steps as rock becomes deeper. Maintain 12" min. thickness.



SECTION 30
Scale: 1/2"=1'0"

FOUNDATION PLAN
Scale: 1/8"=1'0"

1. Elevations shown are to bottom of footing.
2. Elevation of rock may vary from elevations shown which are to be used for estimating purposes.
3. All wall footings to be taken to rock, see General Notes (D) and Typical Wall Footing.

GENERAL NOTES:

1. The latest edition of the Basic Building Code of the Building Officials Conference of America Inc. shall apply to all work & materials.
2. Live Loads:
   A. Roof — 30 #/sq'
   B. All supported floors — 100 "
   C. Ramp — 100 "
3. Concrete:
   A. Footings & Grade Slab (gravel concrete @ 145 #/cf) — 2500 #/sq"
   B. All formed concrete (light wt. "Solite" conc. with sand finish 115 #/cf) — 3000 #/sq"
   C. Terrace (outside) - "Chem-Comp" by Meduza — 3000 #/sq"
   Maximum slump to be 4". All concrete to be air entrained (5-6% air)
   No concrete to be poured without first notifying Supervising Inspector.
4. Reinforcing Steel:
   A. All reinforcing bars — ASTM A-432
   B. Wire Fabric — ASTM A-185
   C. Accessories, bar supports & detailing to be in accordance with pertinant A.C.I. manuals.
   D. Bar supports at exposed surfaces shall be solid plastic or have plastic feet at least 1/4" thick.
   E. Wire fabric to be supported properly on chairs and not self-draped.
5. Structural Steel:
   All W's, L's, rods, bolts, etc. to be ASTM A-36
   Fabrication & detailing in accordance with A.I.S.C.
   Paint all steel with one shop coat of "Tremec" - 99.
6. Structural Lumber:
   A. Roof Deck - 2"x6" T&G installed in Random - Lay-up" method according to specifications of A.I.T.C. Roof Deck to be Western Red Cedar - "Commercial Dex" Kiln Dryed.
   B. Laminated wood beams to be fabricated, to dimensions shown on plans, according to the standards of the A.I.T.C., Minimum stress requirements - Bending & Tension - 2400 #/sq"; Shear - 165 #/sq"; modulus of elasticity - 1,800,000 #/sq", Douglas Fir, Coast Region; Glue for wet conditions of use.
   C. Purlins (4"x10") - Douglas Fir, Coast Region, Select Structural, B & S. Kiln Dryed, f' = 1900 #/sq" (Protect from weather at job)
7. Grade Slab:
   4" thick poured on .006" P.V.C. over 4" washed gravel: Seal joints in P.V.C. Reinforce with 6x6 - 8/8 w.w.m. Note: Place extra layer of .006" P.V.C. over well tamped ~~subgrade~~ before placing gravel.
8. Foundations:
   Footings are designed to be founded on a layer of rock which the borings indicate is 2'-1 to 4'-6" below existing ground surface. Top of rock to receive footings to be reasonably level (max. slope 1 in 24 ±) and cleaned of loose material. Bearing value assumed @ 10,000 #/sq'. Excavate rock as required for proper bearing or max elevation of 147.50.

ORIENTATION

BASIC DATA

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET N.W. WASHINGTON, D.C.
JAMES MADISON CUTTS
CONSULTING STRUCTURAL ENGINEER

RECOMMENDED — DATE
APPROVED

SCALE 0 1/8"=1'0" 1' 0 1"=10' 3'

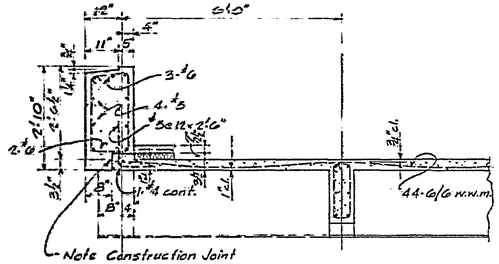
UNITED STATES
DEPARTMENT OF THE INTERIOR
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DESIGN AND CONSTRUCTION
prepared by
NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS, VIRGINIA — RES: NO. 404-V
GEORGE WASHINGTON MEMORIAL PARKWAY

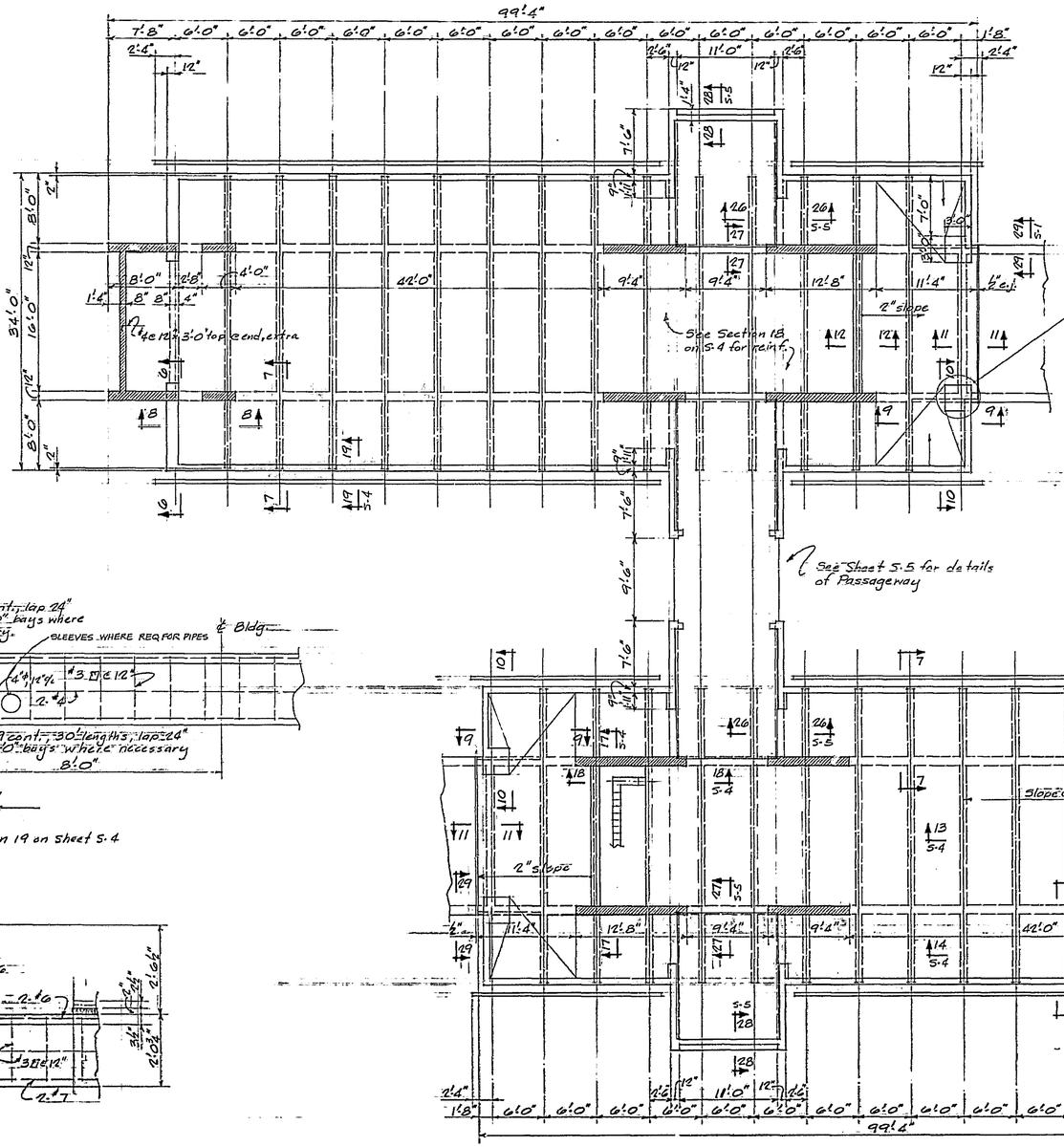
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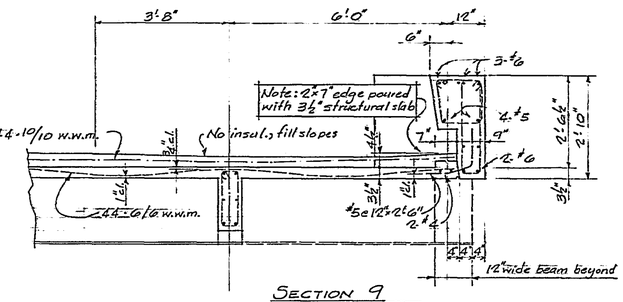
REGION
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PCP B-31, B-51
SHEET 20 OF 36
DRAWING NO.
N.C.R.
171-731
DATE 5/1966

FOUNDATION PLAN

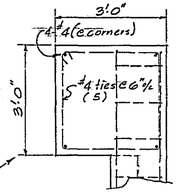


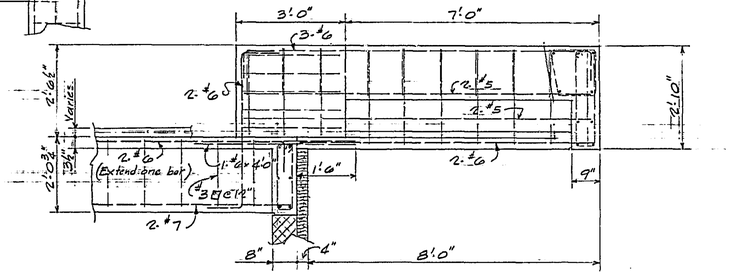
SECTION 8
Scale: ½"=1'-0"



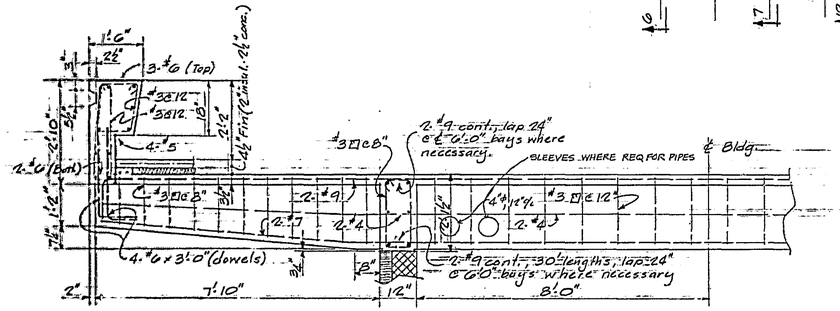


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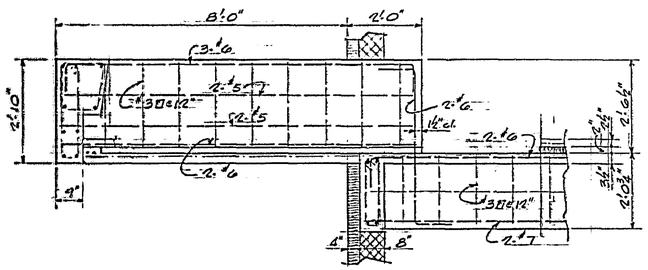




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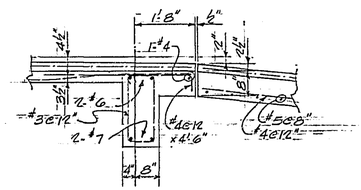
SECTION 7
Scale: ½"=1'-0"
=See also Section 19 on sheet S.4



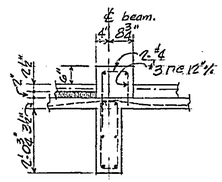
SECTION 6
Scale: ½"=1'-0"

1ST FLOOR FRAMING
Scale: ⅛"=1'-0"

Finish Floor ℄ Elev. 161.00.
Structural slab @ 6) 4½" generally; see sections for details.



SECTION 11
Scale: ½"=1'-0"



SECTION 12
Scale: ½"=1'-0"

ORIENTATION

PREPARED
C
DESIGNED
C
DRAWN
C
CHECKED

SCALE ⅛"=1'-0" ½"=1'-0"

RECOMMENDED
DATE
APPROVED

KENT COOPER AND ASSOCIATES
ARCHITECTS'
1656 33rd STREET NW. WASHINGTON, DC
JAMES MADISON CUTTS
CONSULTING STRUCTURAL ENGINEER

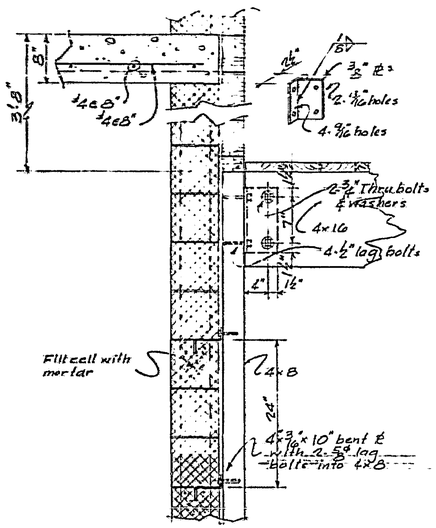
UNITED STATES
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DESIGN AND CONSTRUCTION
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NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA
LOCATION WITHIN PARK
RES. NO. 404V.
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

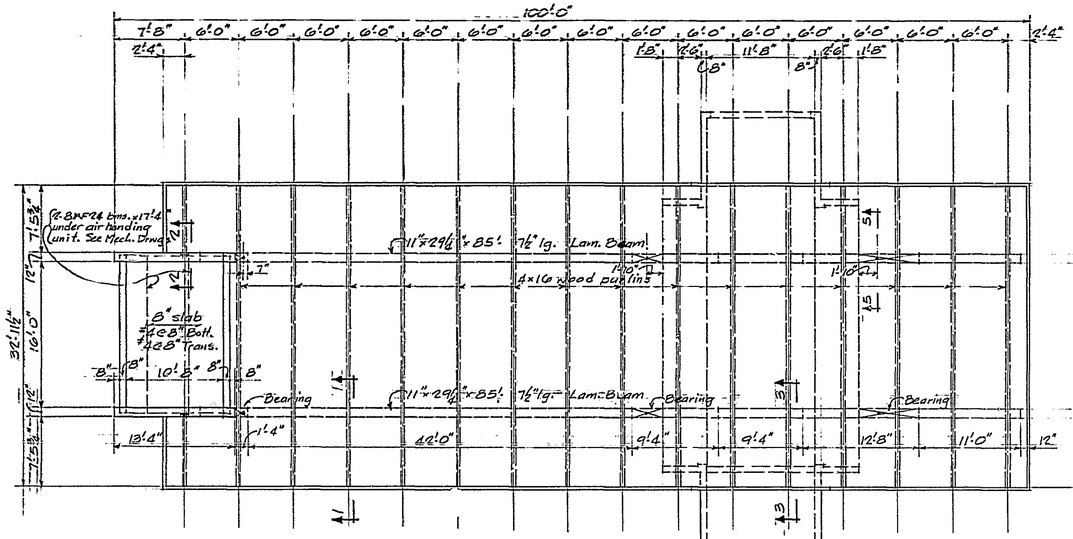
REGION
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PCP 8-34, 8-37
SHEET 21 OF 36
DRAWING NO.
N.C.R.
117.1 - 732
DATE 3/29/60

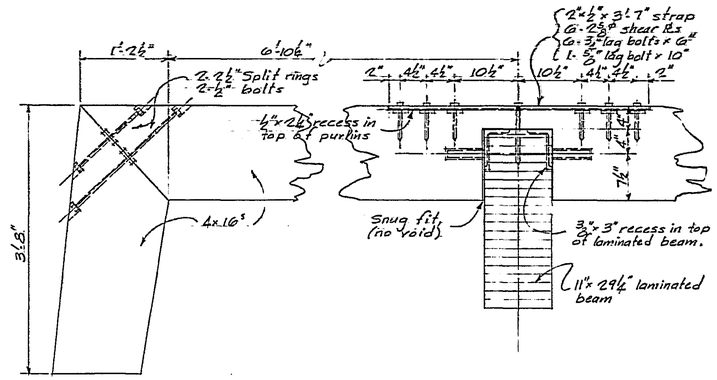
BASIC DATA

1ST FLOOR FRAMING & DETAILS

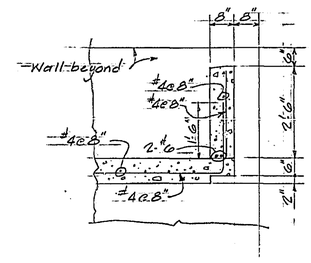


SECTION 2
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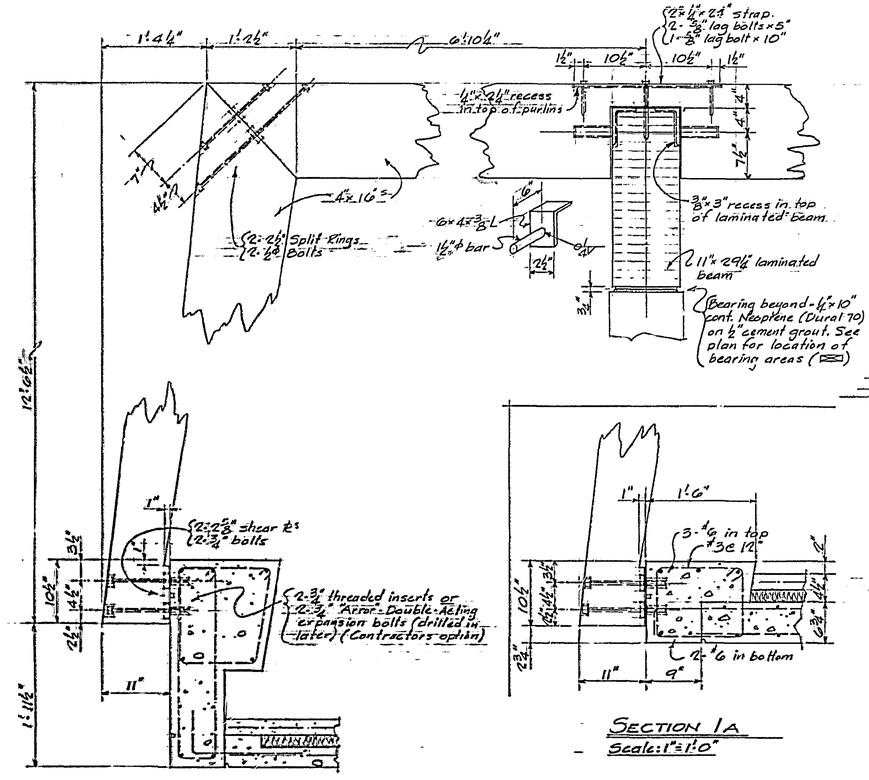




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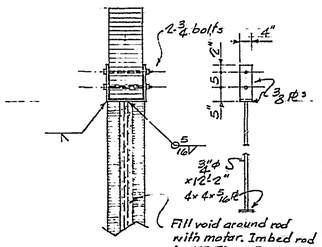
SECTION 4
Scale: ½"=1'-0"



SECTION 1
Scale: 1"=1'-0"

SECTION 1A
Scale: 1"=1'-0"

ROOF FRAMING
Scale: ⅛"=1'-0"



SECTION 5
Scale: ½"=1'-0"
Six per building see plan for location, (•) on top of wall.

NORTH
ORIENTATION

SCALE 0 1/8"=1'-0" 1' 0 1/2"=1'-0" 3' 0 1"=1'-0" 2'

BASIC DATA

KENT COOPER AND ASSOC'ATES
ARCHITECTS
1656 33rd STREET NW. WASHINGTON, DC

JAMES MADISON CUTTS
CONSULTING STRUCTURAL ENGINEER

RECOMMENDED ____ DATE ____

APPROVED ____

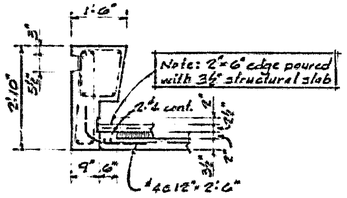
UNITED STATES
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NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA
LOCATION OF PARK
RES. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED
DESIGNED C
DRAWN C
CHECKED

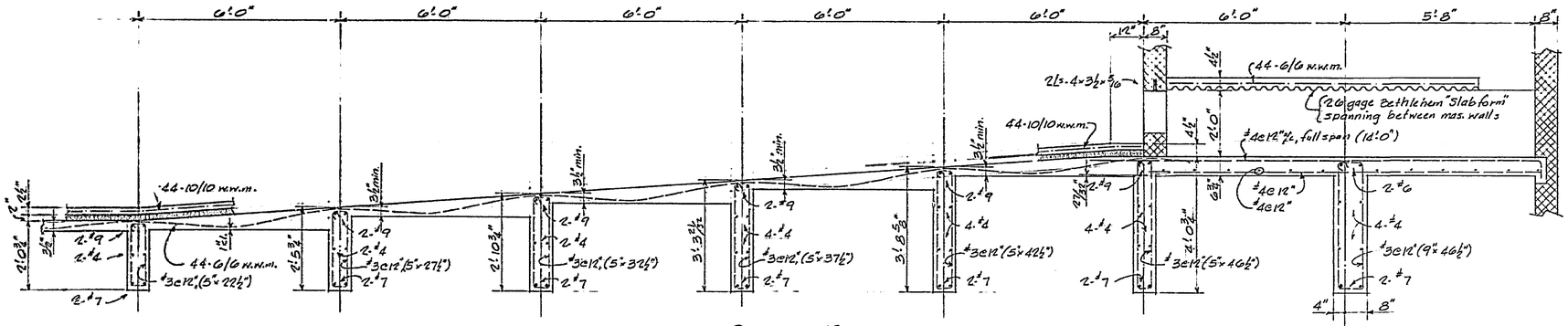
REGION
NATIONAL CAPITAL
PCP B-34, B-37
SHEET 22 OF 36
DRAWING NO.
N.C.R.
117.1-732
DATE 5/15/66

ROOF FRAMING & DETAILS

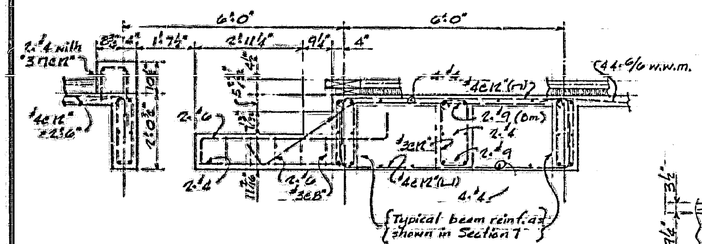


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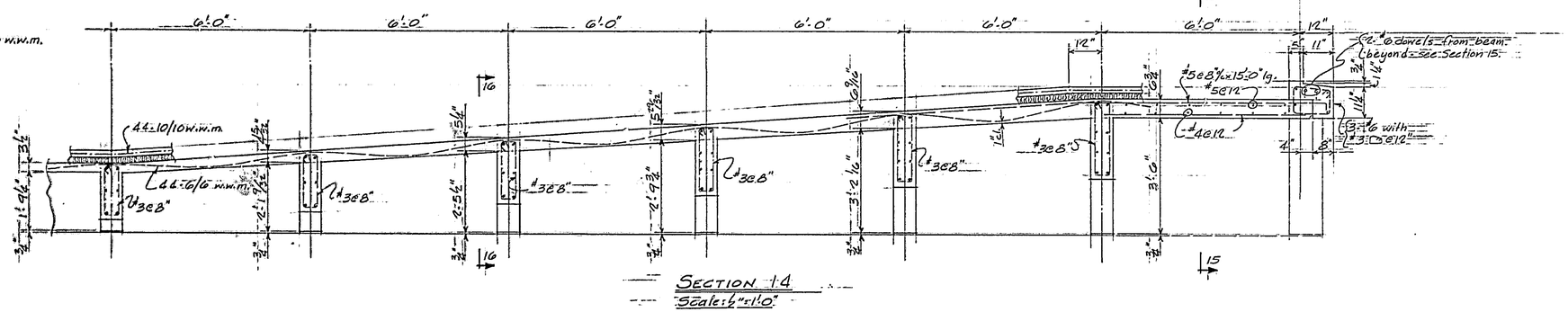
This section is typical connection between bench & floor slab between ribs. See also Section 7 on S-2



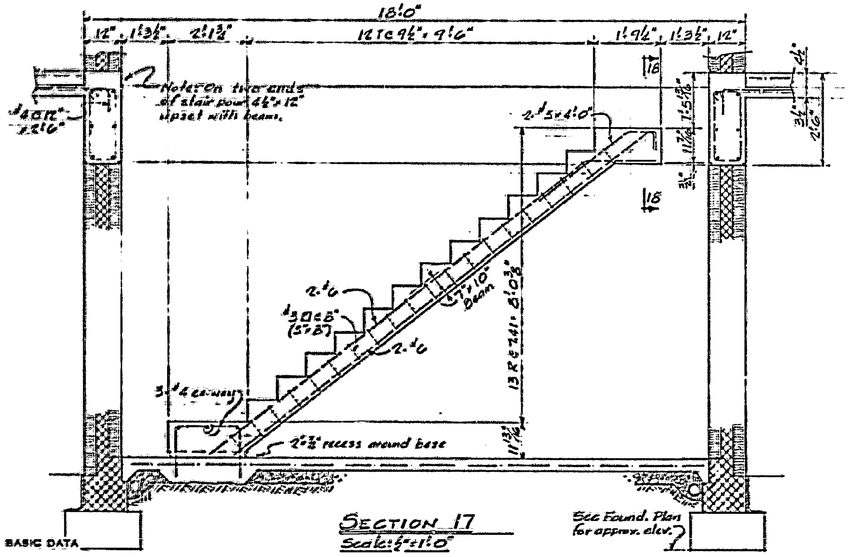
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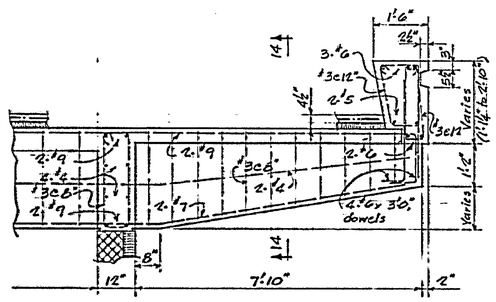
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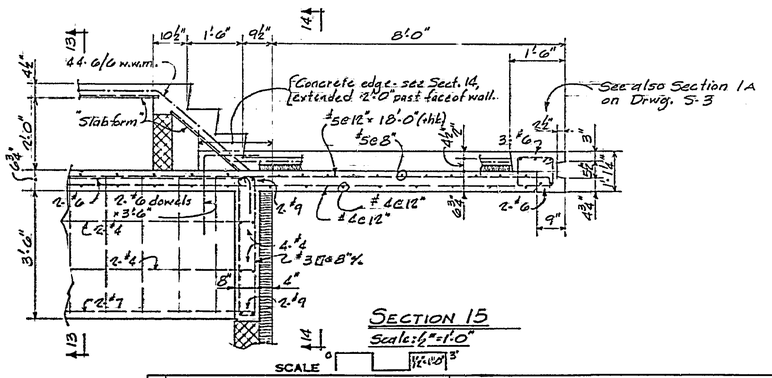
SECTION 14
Scale: ½"=1'-0"



SECTION 17
Scale: ½"=1'-0"



SECTION 16
Scale: ½"=1'-0"



SECTION 15
Scale: ½"=1'-0"

ORIENTATION

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33d STREET NW. WASHINGTON, DC

JAMES MADISON CUTTS
CONSULTING STRUCTURAL ENGINEER

RECOMMENDED ____ DATE

APPROVED ____

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA LOCATION WITHIN PARK RES. NO. 4047
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED
C DESIGNED
C DRAWN
C CHECKED

REGION
NATIONAL CAPITAL

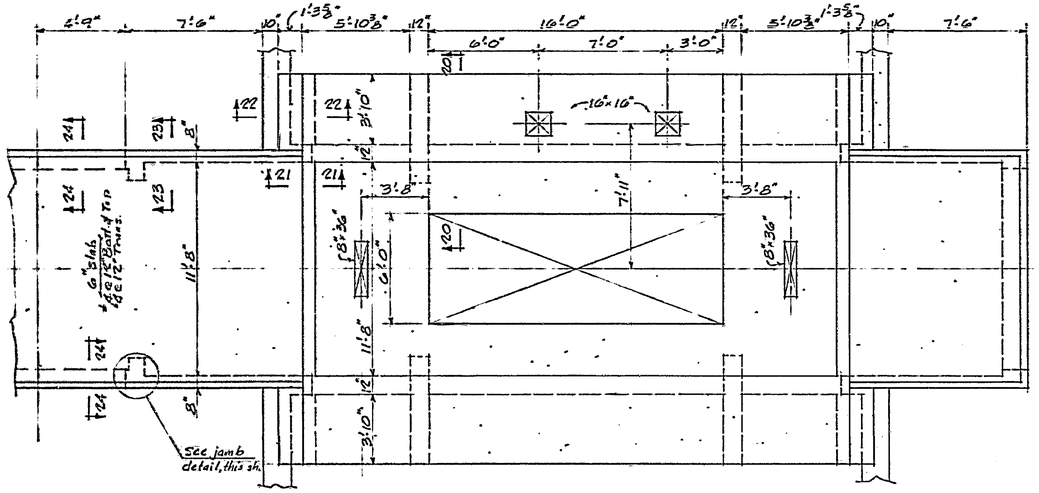
PCP B34, B37

SHEET 23 OF 36

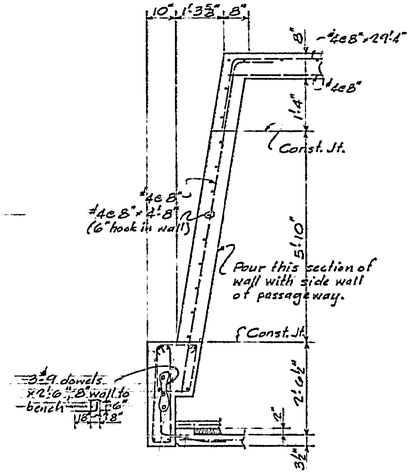
DRAWING NO.
N.C.R.
117.1-732

DATE 5/25/60

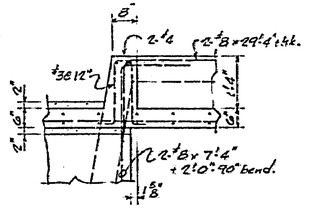
SECTION & DETAILS



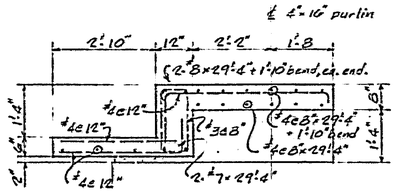
PASSAGEWAY - TOP PLAN
Scale: ½"=1'-0"



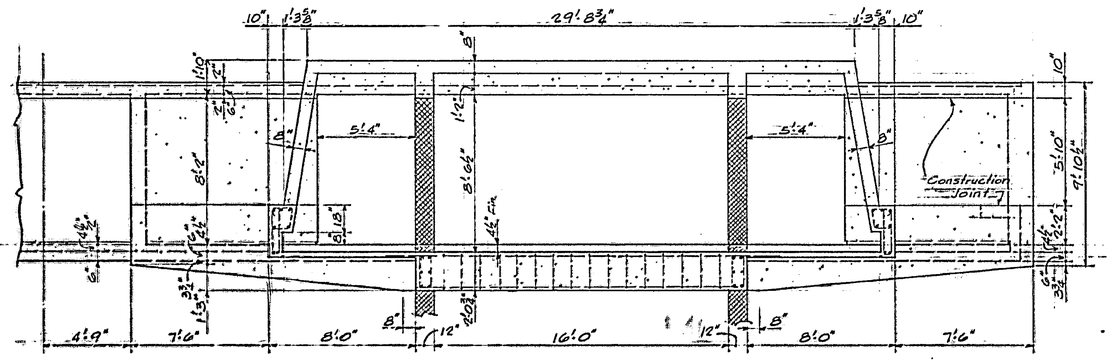
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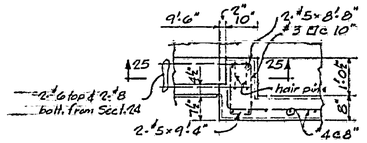
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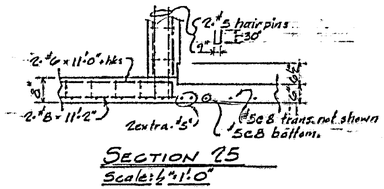
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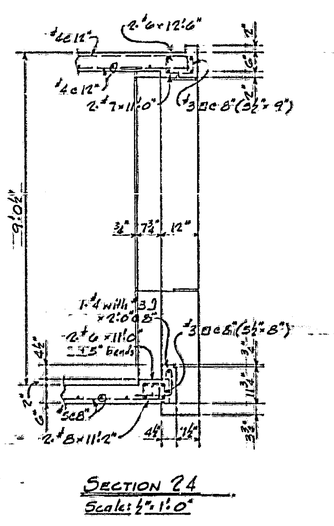
PASSAGEWAY - SIDE ELEVATION
Scale: ½"=1'-0"



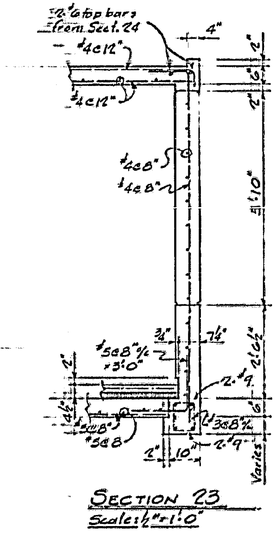
JAMB DETAIL
Scale: ½"=1'-0"



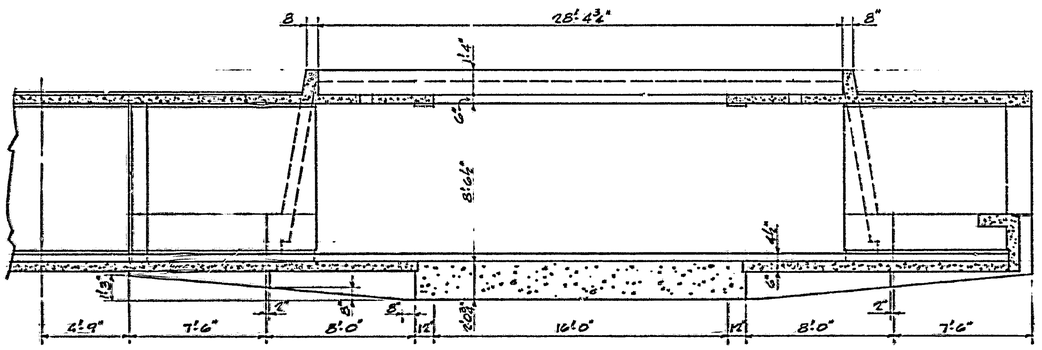
SECTION 25
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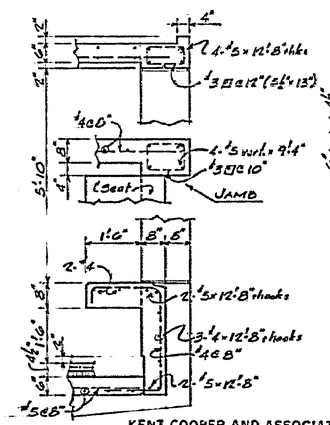
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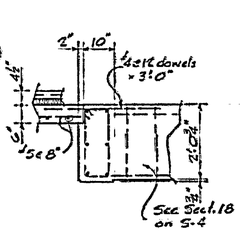
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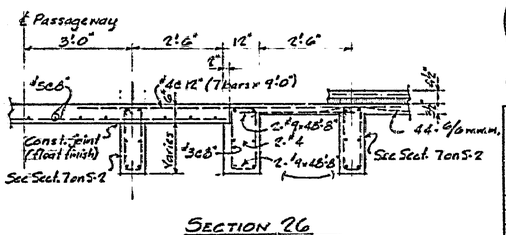
PASSAGEWAY - SECTION
Scale: ½"=1'-0"



SECTION 23
Scale: ½"=1'-0"



SECTION 27
Scale: ½"=1'-0"



SECTION 26
Scale: ½"=1'-0"

ORIENTATION

SCALE 0 ½"=1'-0" 2' 0 1½"=1'-0" 3'

RECOMMENDED
DATE
APPROVED

KENT COOPER AND ASSOCIATES
ARCHITECTS
1656 33rd STREET NW. WASHINGTON, DC
JAMES MADISON CUTTS
CONSULTING STRUCTURAL ENGINEER

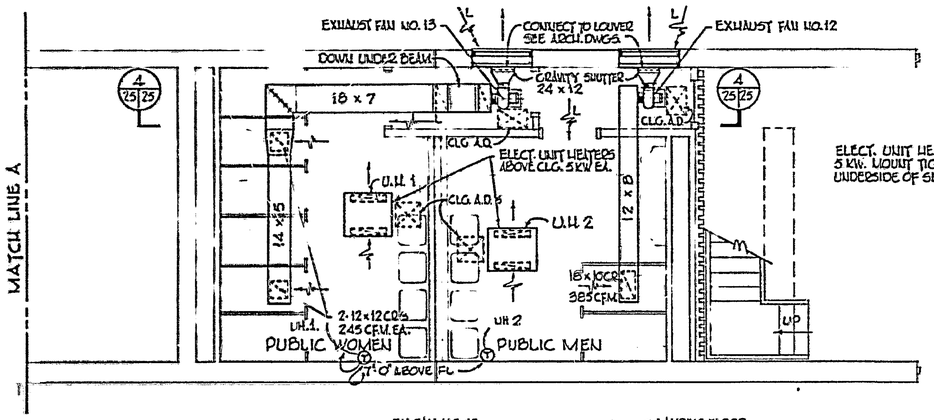
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE
VISITOR CENTER
TITLE OF STRUCTURE
GREAT FALLS, VIRGINIA RES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

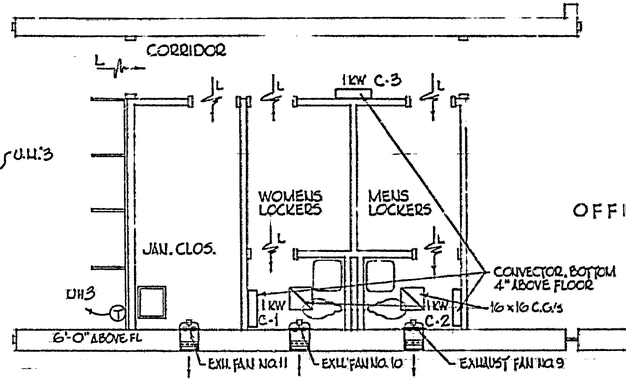
PREPARED
DESIGNED C
DRAWN C
CHECKED

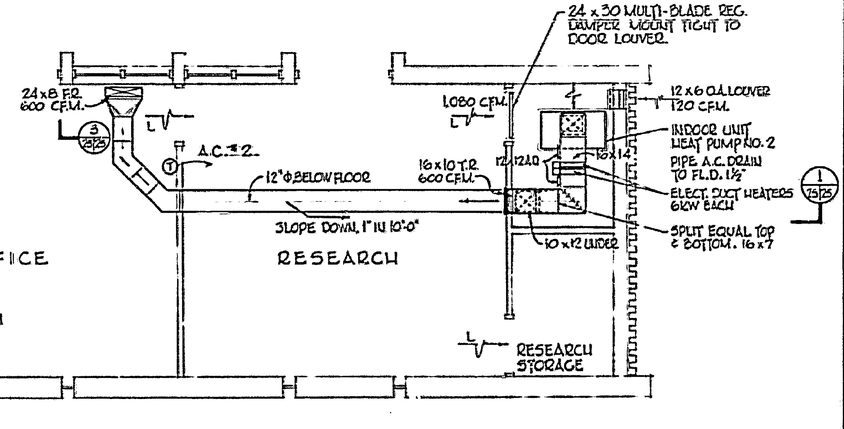
REGION
NATIONAL CAPITAL
PCP 3-34, 3-37
SHEET 24 OF 36
DRAWING NO.
N.C.R.
117.1-732
DATE 5/25/66

BASIC DATA

LINK - PLANS & DETAILS

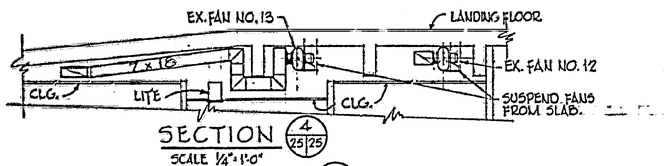






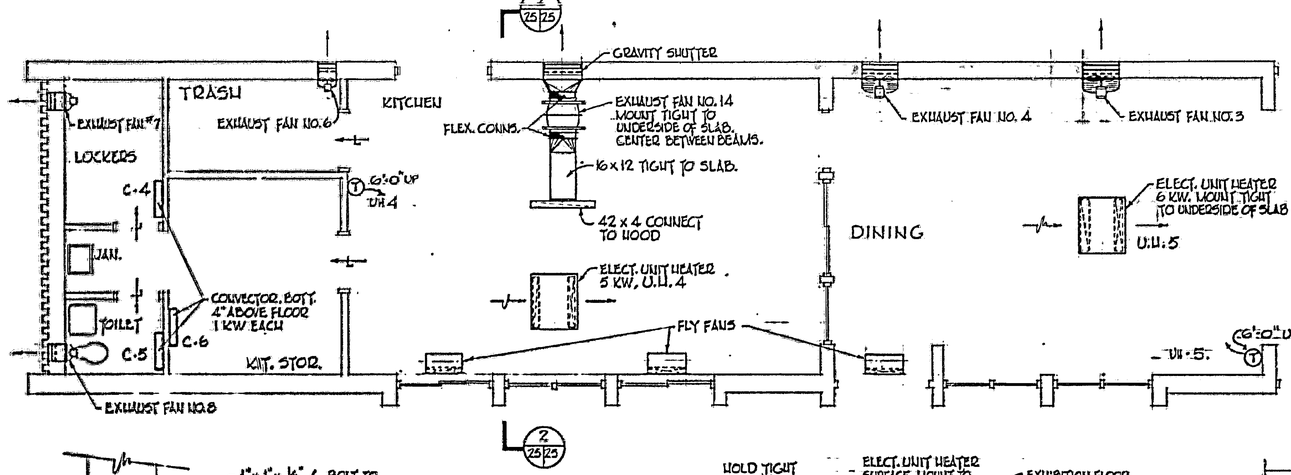
GROUND FLOOR PLAN A-B

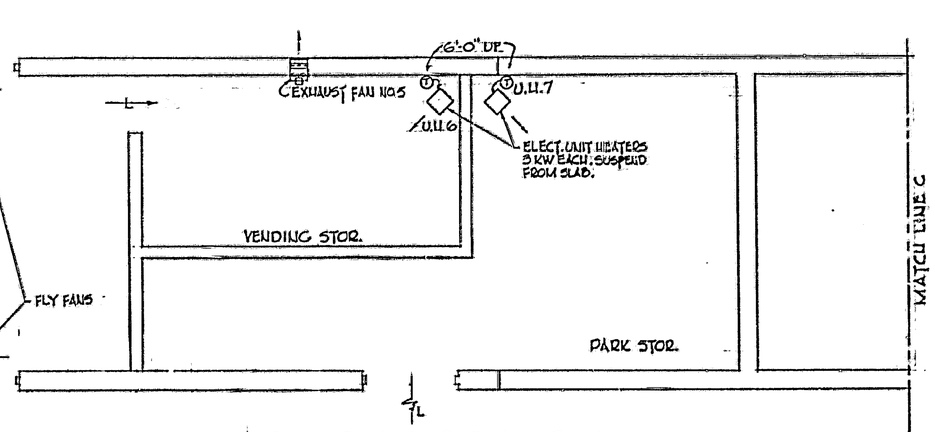
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SECTION 4/25/25

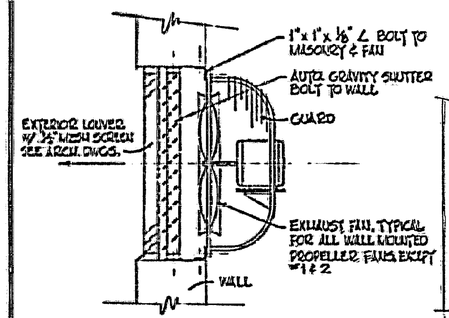
SCALE ¼"=1'-0"





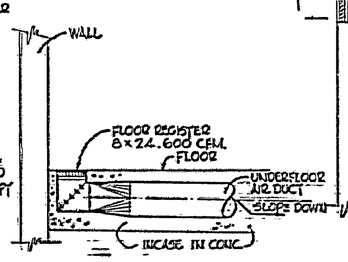
GROUND FLOOR PLAN B-C

SCALE ¼"=1'-0"



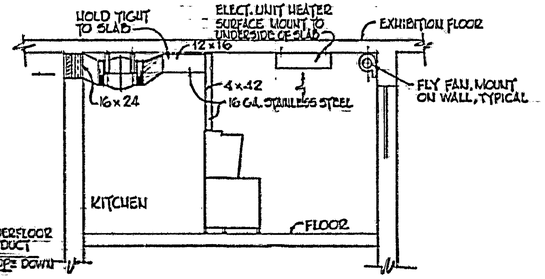
EXHAUST FAN DETAIL

BASIC DATA NO SCALE



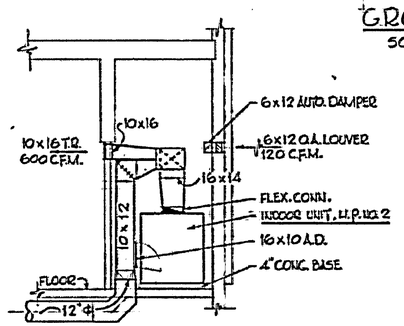
SECTION 3/25/25

NO SCALE



SECTION 2/25/25

SCALE ½"=1'-0"



SECTION 1/25/25

SCALE ¼"=1'-0"

NOTES

1. SEE SHEET 31 FOR H.V. & A.C. SYMBOLS

NORTH

ORIENTATION

SCALE: AS NOTED

RECOMMENDED

DATE

APPROVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY
ABBREVIATED WITHOUT PERIOD
SERIES OF PARK

PREPARED F.N.D.
DESIGNED F.N.D.
DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCF 8-34, 8-37
SHEET 25 OF 36
DRAWING NO. N.C.R. 1171 - 732
DATE 5/25/60

MECHANICAL - GROUND FLOOR

MATCH LINE B

LINK

2/26/26

U.U.-10

ELECT. UNIT HEATER ABOVE CLG. 10.8 KW

DOWN

16x16 C.G.'S SEE ARCH. DWG.

T

A.C. UNIT No 1.

MATCH LINE A

RAMP

LANDING

ELECT. UNIT HEATER ABOVE CLG. 10.8 KW

U.U.-11

2/26/26

LOBBY

AUDITORIUM

6'0" L. X 1'4" H. DOUBLE DEFLECTION REGISTER, WITH 8-24"X16" KEY OPERATED OPPOSED BLADE DAMPERS. REGISTER & DAMPER SHALL BE DULL BLACK FACTORY FIN.

LADDER & ACCESS DOOR TO CLG. SPACE SEE ARCH. DWGS.

REFRIG. LINES UP TO HEAT PUMP 2 ON ROOF

HOLD TIGHT TO SLAB

16x19 WITH ½" S.A.B. A.D.

INDOOR UNIT. HEAT PUMP No. 1 ABOVE CEILING

FLEX. COUN.

36x16

O.A. LOUVER ABOVE

ELECT. DUCT HEATERS

SPLIT 12x12 SEE 10"ø C.D. 300 C.F.M.

12"x12" RISER

1/26/26

SUPPLY PLENUM WITH S.A.B.

1/26/26

LADDER AND ACCESS DOOR TO CLG. SPACE. SEE ARCH. DWGS.

UPPER FLOOR PLAN A-B

SCALE ¼"=1'-0"

3-36x14 TAPS INTO CONT. GRILLE, WITH VOLUME CONTROL DAMPERS. 1030 C.F.M. EACH

18'-0"x14" CONT. GRILLE

24x18x14"Ø SPIRAL DUCT W/½" S.I.B.

37 x 17 w/½" S.I.B.

16

REFRIG. LINES UP TO HEAT PUMP NO. 2

UP TO MIX. BOX

1½" DRAIN DOWN

PLAN: UNDER PROJ. RM.

SCALE ½"=1'-0"

HEAT PUMP NO. 2 OUTDOOR UNIT

⅜" LIQUID & ⅞" SUCTION DOWN THRU ROOF

HEAT PUMP NO. 1 OUTDOOR UNIT

½" LIQUID & 1⅛" SUCTION DOWN THRU ROOF TO A.U. UNIT NO. 1

LADDER AND ACCESS DOOR TO ROOF. SEE ARCH. DWGS.

PART. ROOF PLAN

SCALE ½"=1'-0"

HEAT PUMP NO. 1

HEAT PUMP NO. 2

FAN

HEATING & COOLING COIL

FILTERS

18"x16'-0" O.A. LOUVER BLANK 40" EL. SIDE

18x96

16x96

16x36 MITER O.A. & R.A. DAMPER.

ROOF

19x14

19x12

12x12

17"x16'-0" GRILLE

36x20x60 MIXING BOX WITH 24x16 A.D.S

10"ø C.D. 300 C.F.M.

ELECT. DUCT HEATERS

INDOOR UNIT. H.P. NO. 1

40x18x16'-0" PLENUM LINE WITH ½" S.I.B.

PROJ. ROOM

8x16 REG. 300 C.F.M.

16x36

1½" COND. DRAIN DOWN. PIPE TO FL. D. BELOW.

14"x16'-0" GRILLE

16

17x57 w/S.I.B.

REFRIG. LINES TO A.U. UNIT NO. 2

SECTION 1/26/26

SCALE ½"=1'-0"

NOTES

1. NOMINAL REFRIG. LINE SIZES INDICATED. CONTRACTOR SHALL VERIFY SIZES FOR EQUIPMENT SUPPLIED.

ACCESS FROM ABOVE.

FLEX. CONN.

UNIT HEATER

4"x4"x¼" ST. PLATE WELD TO 1"x1"x2 LEGS

6" MIN.

SHEETMETAL DUCT BOLT TO SLAB.

CONC. SLAB

1" RIBBED RUBBER PADS

SEE ARCH DWG. FOR SUPPLY GRILLE

SECTION 2/26/25/26

NO SCALE

NORTH

ORIENTATION

BASIC DATA

SCALE : AS NOTED.

RECOMMENDED

DATE

APPROVED

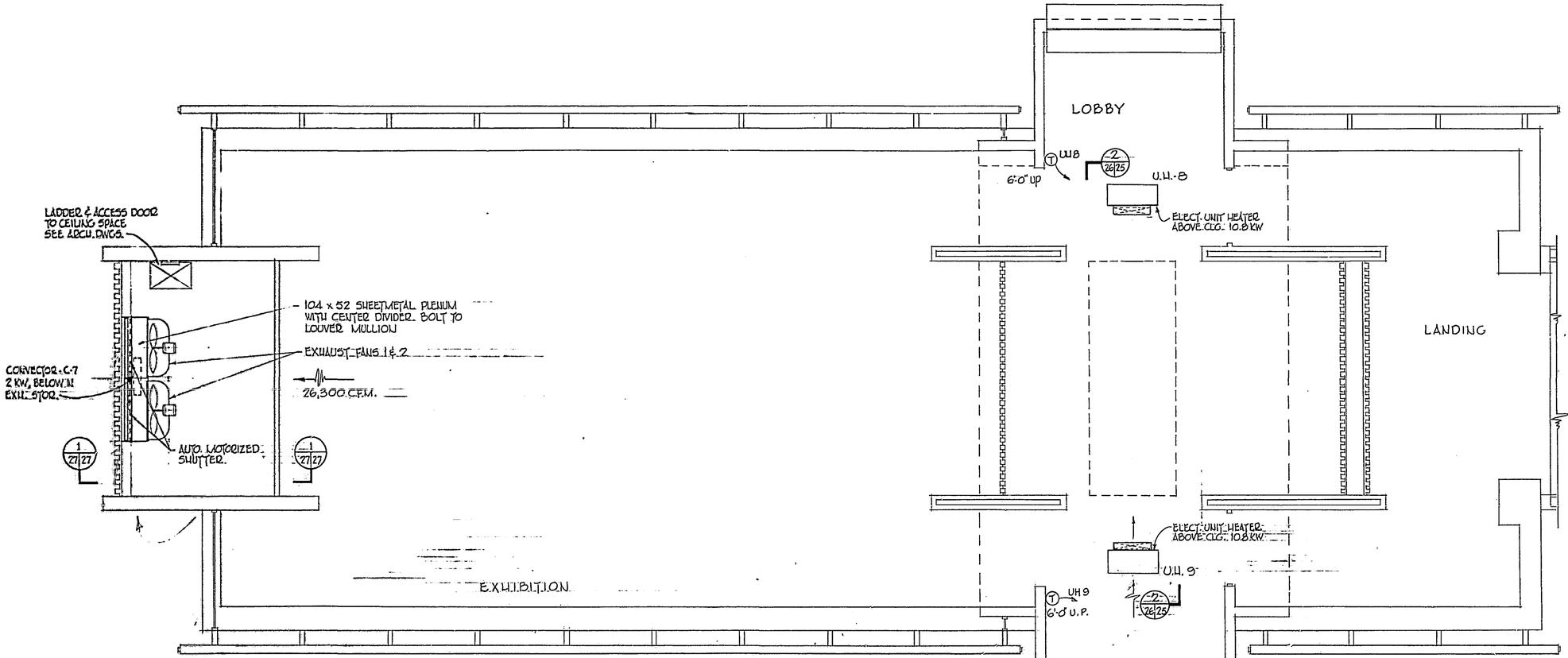
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY NATIONAL CAPITAL OFFICE

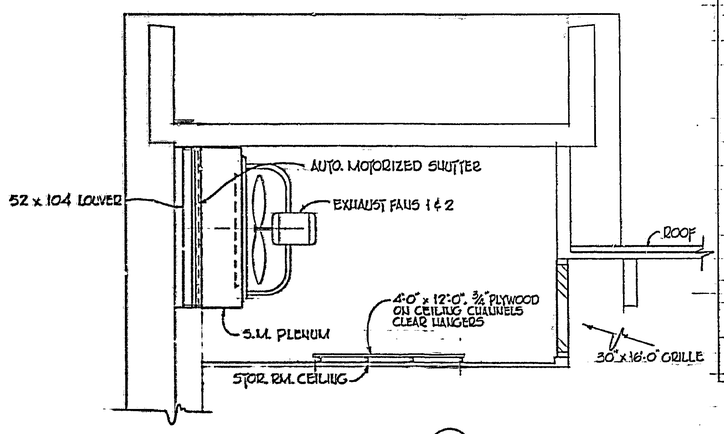
VISITOR CENTER
GREAT FALLS, VIRGINIA REL. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY

PREPARED E.U.P.
DESIGNED E.U.P.
DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCP B-34, B-37
SHEET 26 OF 36
DRAWING NO. N.C.R. 171-732
DATE 5/25/60

MECHANICAL : UPPER FLOOR A-B





SECTION 1/27/27
SCALE ½"=1'-0"

EXHAUST FAN SCHEDULE

NO.	C.F.M.	S.P.	R.P.M.	H.P.	VOLTAGE	REMARKS
1	13,150	⅛"	490	1	208	3 MAX. 7.2 SONES AT 5 F.T.; 2 SPEED MOTORS, 42" ϕ PROP.
2	13,150	"	"	"	"	
3	1,400	1/10"	1,140	⅓	120	PROPELLER, DIRECT DRIVE, 16" ϕ
4	1,400	"	"	"		PROPELLER, DIRECT DRIVE, 16" ϕ
5	270	*	860	½		PROPELLER, DIRECT DRIVE
6	160					
7	115					
8	100					
9	100					
10	100					
11	100					
12	385	⅛"	1,150	½		CENTRIFUGAL, DIRECT DRIVE
13	490	"	1,150	⅙		" " "
14	1,200	⅜"	860	¼		CENTRIFUGAL, w/AIRFOIL BLADES 1.21 ϕ WHEEL, 1125 MAX. O.V.

* SUFFICIENT STATIC TO OPERATE GRAVITY SHUTTER.

FLY FANS - 2,500 C.F.M. AT 3'-0", 8" ϕ CENT. WHEEL, 1,725 R.P.M. ⅓ H.P. MOTOR, 120V-1ϕ-60~, MAX. 19.2 SONES AT 5'-0"

UNIT HEATER & CONVECTOR SCHEDULE

NO.	CAP. KW.	VOLT-ϕ	C.F.M.	TYPE
U.H.-1	5	208-3	250	SEMI-RECESSED CABINET
U.H.-2	5			" " " "
U.H.-3	5			SURFACE MTD. CABINET
U.H.-4	5			" " " "
U.H.-5	6	208-3	250	" " " "
U.H.-6	3	208-1	130	SUSPENDED-HORZ. DISCH.
U.H.-7	3	208-1	130	" " " "
U.H.-8	10.8	208-3	750	RECESSED CABINET
U.H.-9	10.8			" " "
U.H.-10	10.8			" " "
U.H.-11	10.8		750	" " "
C-1	1	208-1		48"L x 11"H x 3"D.
C-2				
C-3				
C-4				
C-5				
C-6				
C-7	2			48"L x 15"H x 4"D.

CONTROLS

1. UNIT HEATERS SHALL HAVE BUILT-IN RELAYS, WITH REMOTE THERMOSTAT TO CONTOL RELAY & FAN.
2. CONVECTORS SHALL HAVE BUILT-IN ADJUSTABLE THERMOSTATS & RELAYS

UPPER FLOOR PLAN B-C

SCALE ¼"=1'-0"

EQUIPMENT SCHEDULE

HEAT PUMP NO. 1 - SPLIT SYSTEM

COOLING CYCLE - TO COOL 3,400 C.F.M. FROM 84.0°F D.B., 70.3°F W.B. TO 62.0°F LEAVING D.B., MIN. TOTAL CAPACITY 130,000 Btu/hr., MIN. SENSIBLE CAPACITY 90,000 Btu/hr., MAX. KW. INPUT 15.0 AT 208-3-60 AND 95°F AMBIENT.

HEATING CYCLE - TO HEAT 3,400 C.F.M. FROM 54°F., MIN. OUTPUT 75,000 Btu/hr. AT 20°F AMBIENT AND 70°F R.A. TEMP.; COMP. INPUT 10 KW MAX.; PROVIDE TWO ELECTRIC DUCT HEATERS, EACH 11 KW AT 208-3-60.

INDOOR UNIT - 3,400 C.F.M. AT 0.6" S.P.; 1½ H.P., 208-3-60 MOTOR. COMPLETE WITH FAN, COIL, FILTERS, CASING AND AUTO. MIXING DAMPERS.

OUTDOOR UNIT - COMPRESSOR, COIL, FAN, CONTROLS FOR OPERATION ON COOLING TO 50°F AND HEATING TO 20°F.

HEAT PUMP NO. 2 - SPLIT SYSTEM

COOLING CYCLE - TO COOL 1,200 FROM 81.2°D.B. & 68.0°W.B.; MIN. TOTAL CAP. 35,000 Btu/hr., MIN. SENS. CAP. 25,000 Btu/hr.; MAX. KW INPUT 5.0 AT 208-3-60 AT 95°F AMBIENT.

HEATING CYCLE - 22,000 Btu/hr. AT 20°F AMBIENT AND 70°F R.A. TEMP.; COMP. INPUT 3.3 KW AT 208-3-60. PROVIDE TWO ELECT. DUCT HEATERS EACH 6 KW AT 208

INDOOR UNIT - 1,200 C.F.M. AT 0.3" E.S.P.; ⅓ H.P. 120-1-60 MOTOR. COMPLETE WITH COIL, CASING, FILTERS, MOTOR AND STARTER. COIL SELECTION TO BALANCE COMPRESSOR CAPACITY.

OUTDOOR UNIT - COMPRESSOR, COIL, FAN AND CONTROLS FOR OPERATION ON COOLING CYCLE TO 50°F AND HEATING CYCLE TO 20°F.

NORTH
ORIENTATION

BASIC DATA

SCALE : AS NOTED

RECOMMENDED _____ DATE

APPROVED _____

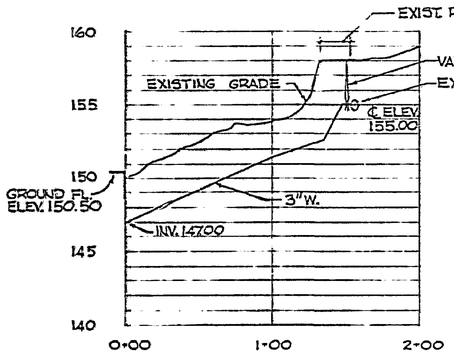
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER (TITLE OF DRAWING)
GREAT FALLS, VIRGINIA (LOCATION WITHIN PARK) RES NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY (NAME OF PARK)

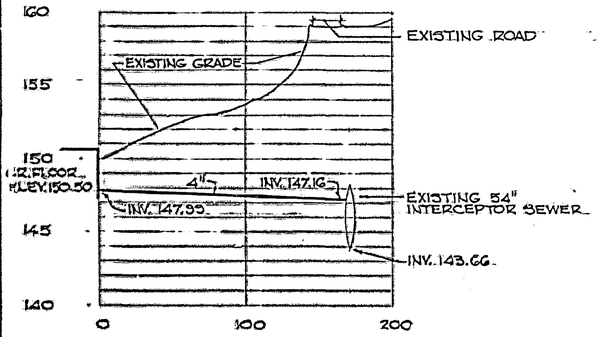
PREPARED V.L.T.
DESIGNED
S.A.W. & FAUP DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCP 8-34 8-37
SHEET 27 OF 36
DRAWING NO. N.C.R. 117.1 - 732
DATE 5/25/60

MECHANICAL: UPPER FLOOR B-C & SCHEDULES



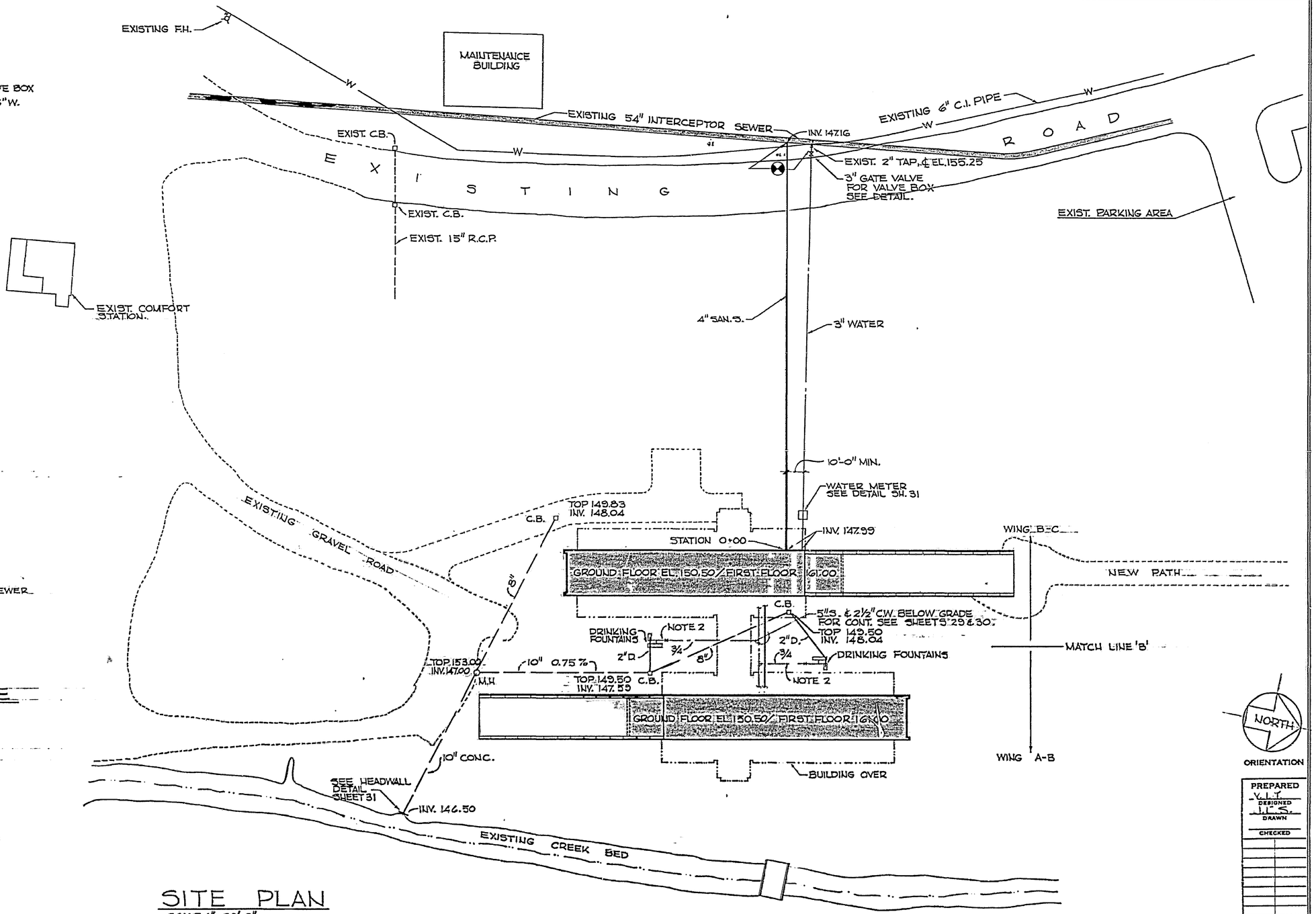
WATER PIPE PROFILE
SCALE: HORIZONTAL 1"= 50'-0"
SCALE: VERTICAL 1"= 5'-0"



SANITARY SEWER PROFILE
SCALE: HORIZONTAL 1"= 50'-0"
SCALE: VERTICAL 1"= 5'-0"

NOTES:

1. M.H. SIMILAR TO C.B. EXCEPT PROVIDE SOLID M.H. COVER & FRAME. MIN. 180 LBS.
2. 3/4" TO DRINKING FOUNTAINS. PROVIDE 3/4" FROST-PROOF VALVE & INSTALL WATER LINES 3'-0" BELOW GRADE.



SITE PLAN
SCALE 1"= 20'-0"

SCALE - AS NOTED

RECOMMENDED — DATE
APPROVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
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NATIONAL CAPITAL OFFICE

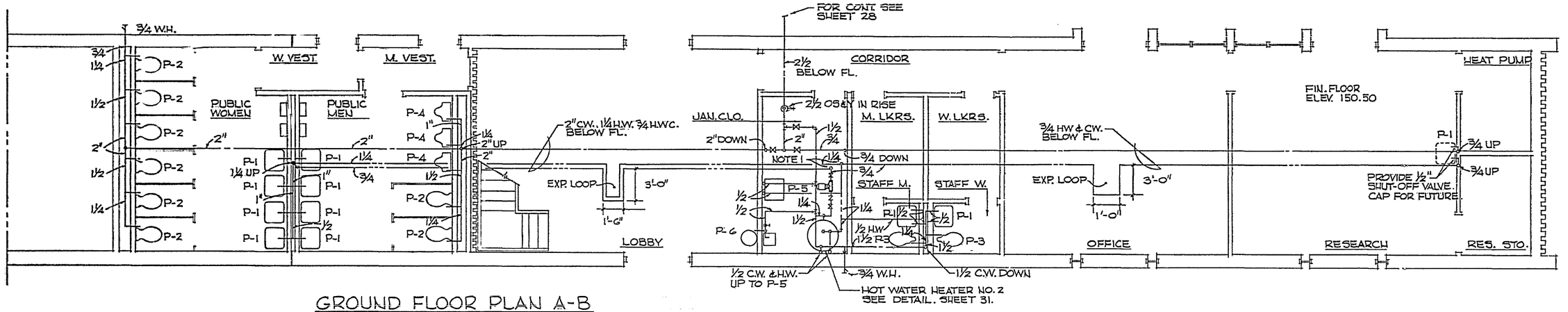
VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA — GEORGE WASHINGTON MEMORIAL PARKWAY
RES. NO. 404V

PREPARED — V.L.T.
DESIGNED — J.L.S.
DRAWN
CHECKED

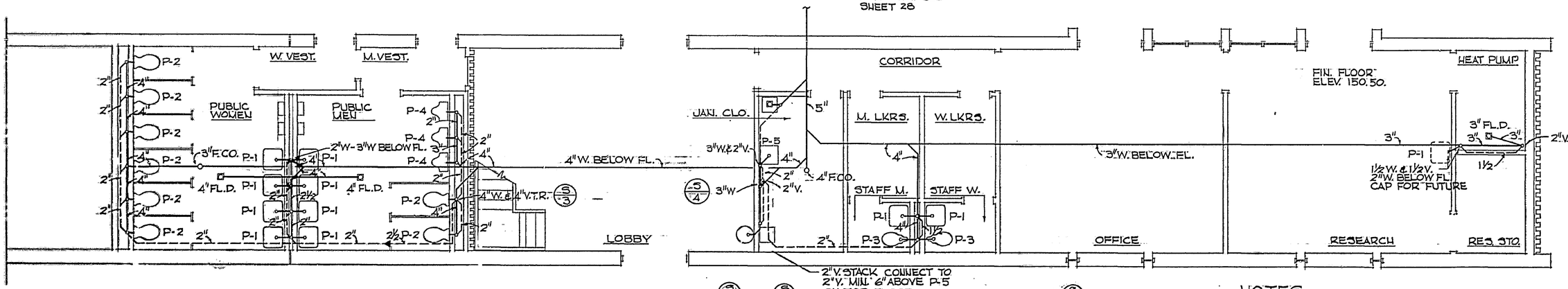
REGION: NATIONAL CAPITAL
PCF B-34, B-37
SHEET 28 OF 36
DRAWING NO.: N.C.R. 117.1-732
DATE 5/25/66

BASIC DATA

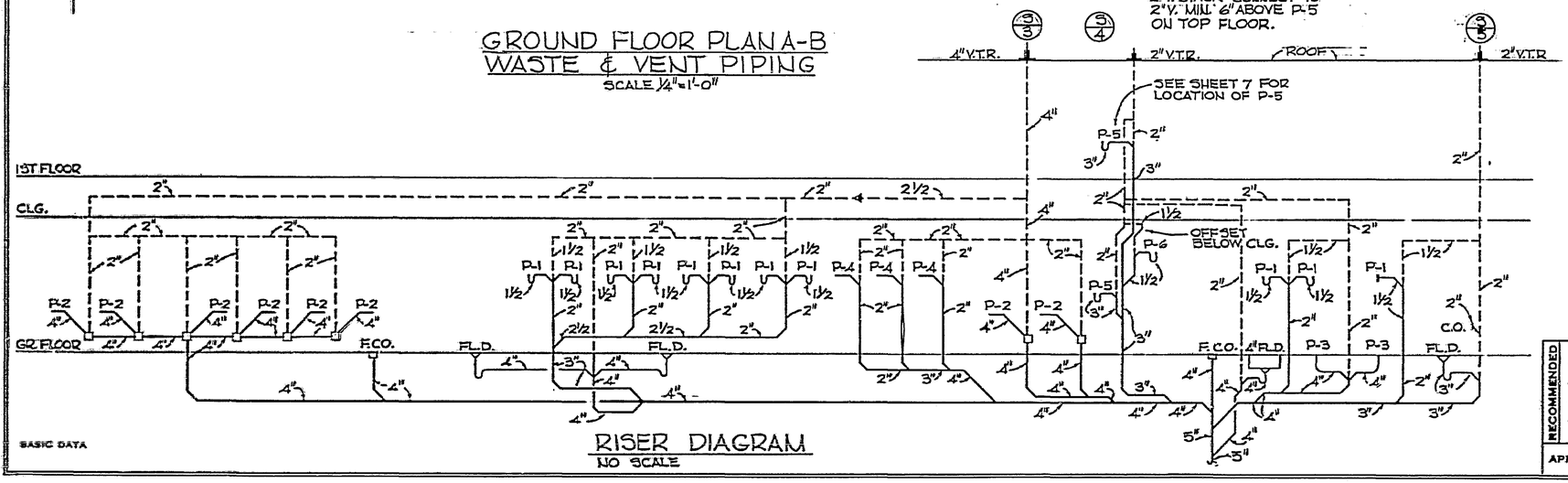
SITE PLAN



GROUND FLOOR PLAN A-B
WATER PIPING
SCALE ¼"=1'-0"



GROUND FLOOR PLAN A-B
WASTE & VENT PIPING
SCALE ¼"=1'-0"



RISER DIAGRAM
NO SCALE

NOTES
1. HOLD RISER CLOSE TO WALL.

NORTH
ORIENTATION

SCALE AS NOTED

RECOMMENDED
DATE
APPROVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
NATIONAL CAPITAL OFFICE

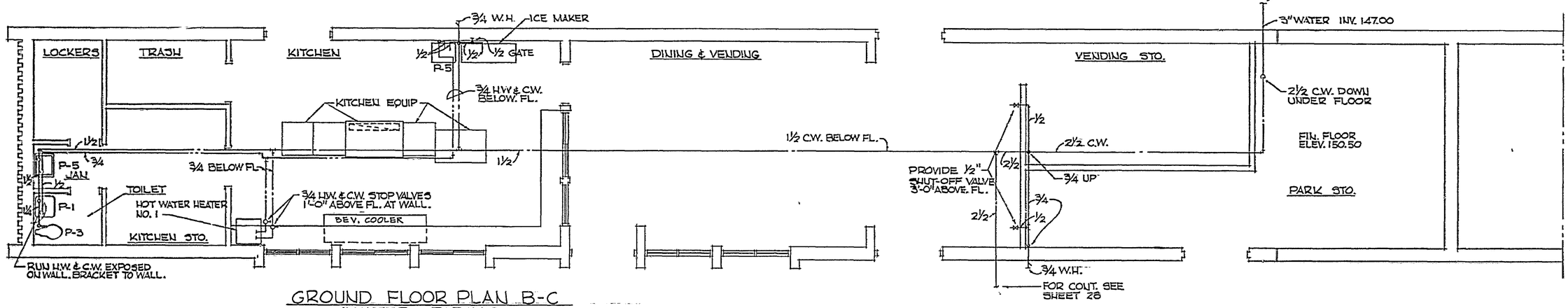
VISITOR CENTER
GREAT FALLS VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY
RES. NO. 404V

PREPARED
DESIGNED J.L.S.
DRAWN
CHECKED

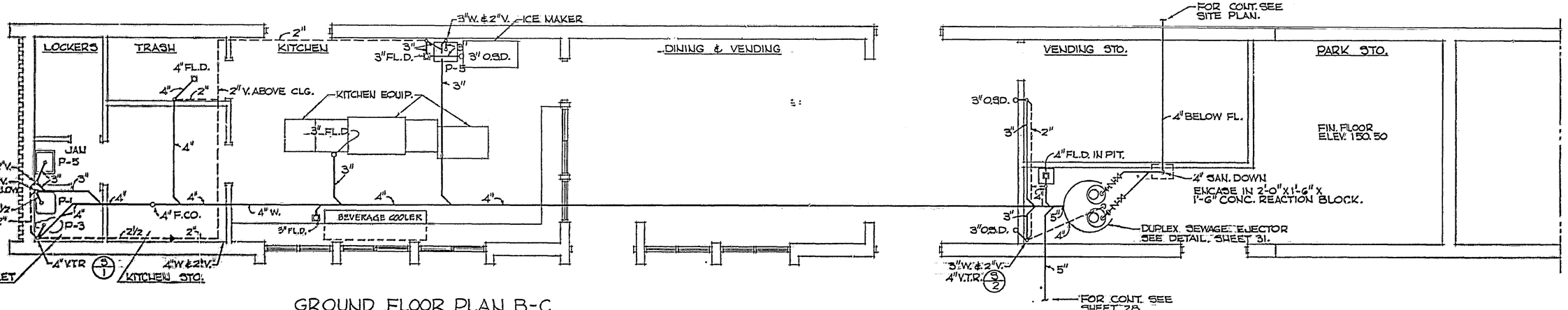
REGION NATIONAL CAPITAL
PCP 2-34, 2-37
SHEET 29 OF 36
DRAWING NO. N.C.R. 117.1-732
DATE 5/25/66

BASIC DATA

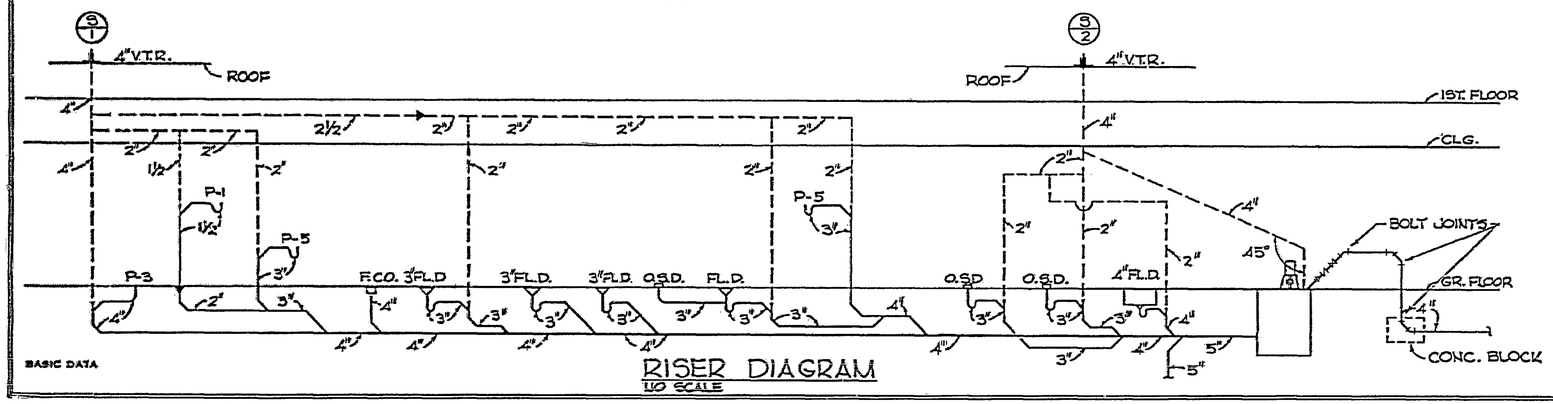
PLUMBING GROUND FLOOR A-B



GROUND FLOOR PLAN B-C
WATER PIPING
SCALE ¼"=1'-0"



GROUND FLOOR PLAN B-C
WASTE & VENT PIPING
SCALE ¼"=1'-0"



RISER DIAGRAM
1/0 SCALE

NORTH
ORIENTATION

PREPARED
DESIGNED J.L.S.
DRAWN
CHECKED

SCALE AS NOTED

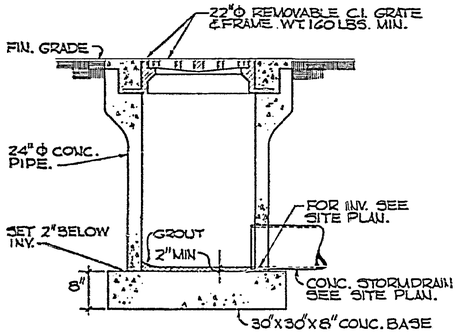
RECOMMENDED
DATE
APPROVED

UNITED STATES
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NATIONAL PARK SERVICE
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NATIONAL CAPITAL OFFICE

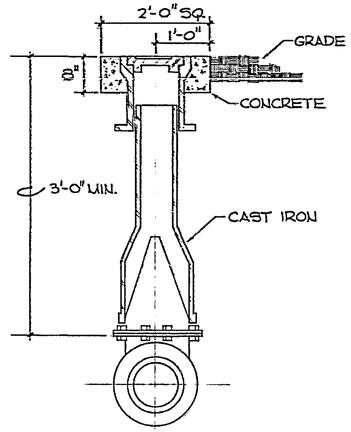
VISITOR CENTER
GREAT FALL, VIRGINIA RES. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY

REGION
NATIONAL CAPITAL
PCP B-34, B-37
SHEET 30 OF 36
DRAWING NO.
N.C.R.
117.1-732
DATE 5/28/60

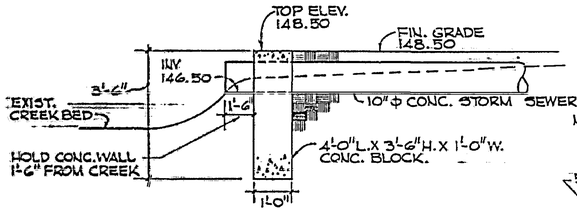
GROUND FLOOR PLAN B-C



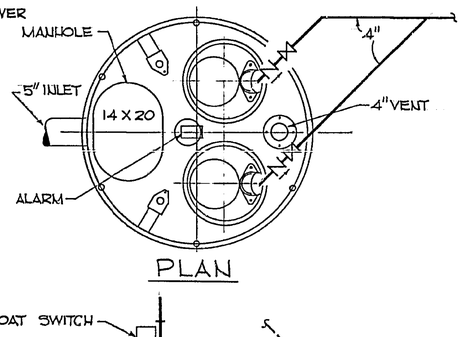
TYPICAL CATCH BASIN
NO SCALE



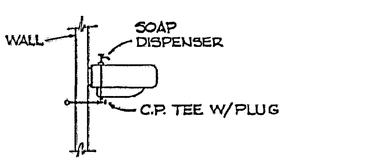
VALVE BOX DETAIL
NO SCALE

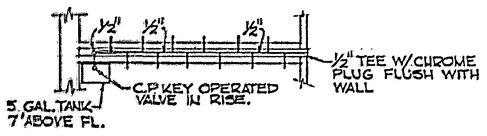


HEADWALL DETAIL
NO SCALE

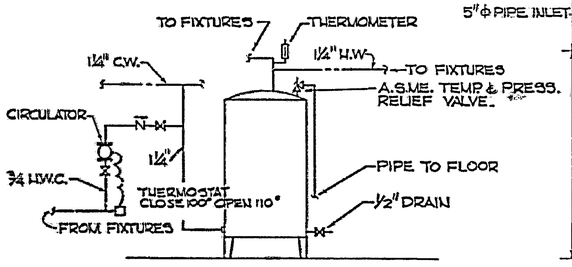


PLAN

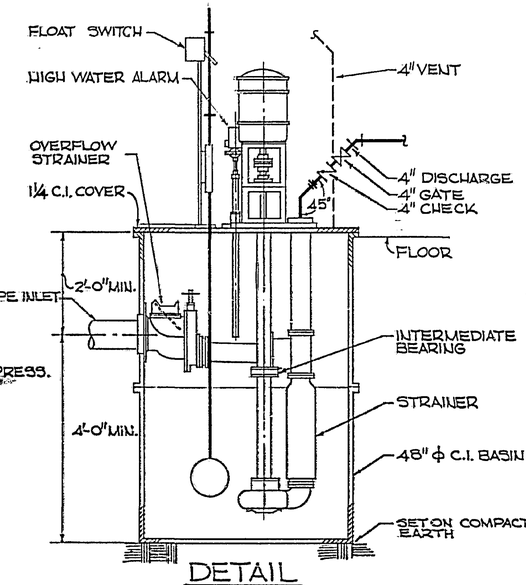




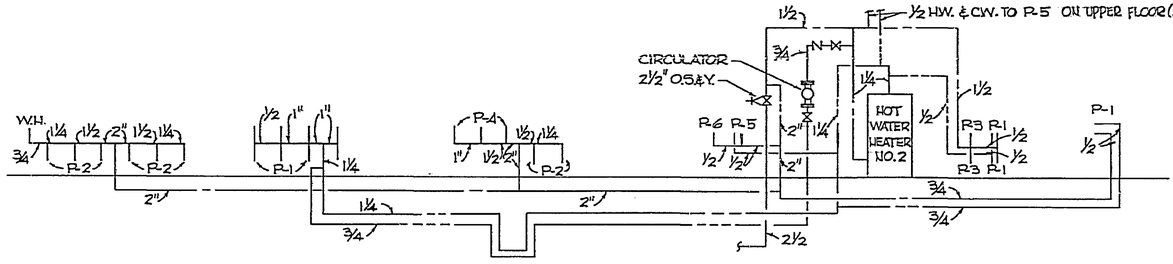
DETAIL CENTRAL SOAP SYSTEM
NO SCALE



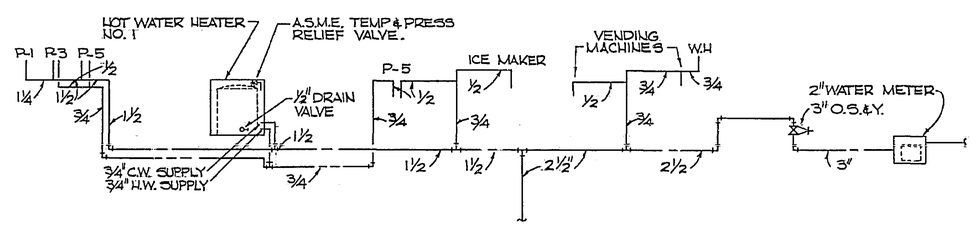
HOT WATER HEATER
NO SCALE



DETAIL SEWAGE EJECTOR
NO SCALE



WATER RISER DIAGRAM WING A-B
NO SCALE



WATER RISER DIAGRAM WING B-C
NO SCALE

EQUIPMENT SCHEDULE

HOT WATER HEATER NO.1 – ELECTRIC STORAGE TYPE TO HEAT 12 G.P.H. FROM 40° TO 140°F. MIN. STORAGE 40 GALS. 1 ELEMENT, 4.0 K.W. 208V.-1-60.

HOT WATER HEATER NO.2 – ELECTRIC STORAGE TYPE TO HEAT 42 G.P.H. FROM 40° TO 140°F. MIN. STORAGE 80 GALS. 2 ELEMENTS 4.5 KW. EACH. 208V-1-60. SET FOR 115°F

CIRCULATOR PUMP – 5 G.P.M. AT 6' HEAD, 1/12 H.P. MOTOR. 1750 R.P.M. ALL BRONZE. 208-1-60.

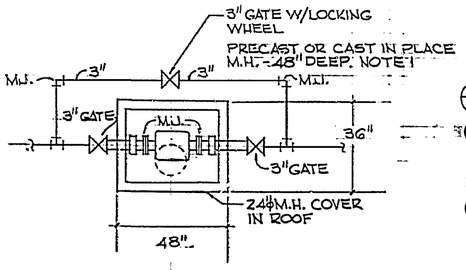
DUPLEX SEWAGE EJECTOR – 125 G.P.M. AT 50' HEAD. TWO 5 HP. MOTORS, 1750 R.P.M., 208V-3-60.

SYMBOLS & ABBREVIATIONS

———	W.	WASTE
- - - - -	V.	VENT
———	C.W	COLD WATER
———	H.W.	HOT WATER
———	H.W.C.	HOT WATER CIRCULATING
⊠	FL.D.	FLOOR DRAIN
o	C.O.	CLEANOUT
⊥	V.T.R	VENT THRU ROOF
	O.S.D.	OPEN SITE DRAIN
	A.D.	AREA DRAIN
	W.H.	WALL HYDRANT
	F.H.	FIRE HYDRANT
	C.I.	CAST IRON
	FL.	FLOOR
	CLG	CEILING
	EXIST.	EXISTING
	C.B.	CATCH BASIN
	A.D.	ACCESS DOOR
S/I		INDICATES SOIL OR WASTE STACK / INDICATES STACK NUMBER
		CONNECT TO EXISTING
		GATE VALVE
M.J.		MECHANICAL JOINT
T		THERMOSTAT

FIXTURE SCHEDULE

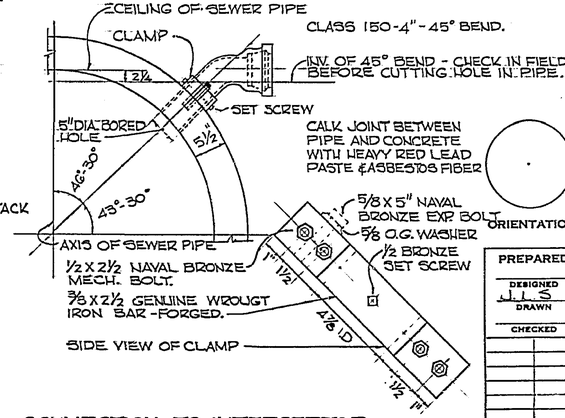
NO.	FIXTURE	H.W.	C.W.	WASTE	VENT
P-1	LAVATORY	½"	½"	1½"	1½"
P-2	WATER CLOSET	—	1¼"	4"	2"
P-3	WATER CLOSET	—	1¼"	4"	2"
P-4	URINAL	—	1"	2"	2"
P-5	SERVICE SINK	½"	½"	3"	2"
P-6	E.W.C.	—	½"	1½"	1½"



WATER METER
NO SCALE

NOTES:

1. CAST IN PLACE M.H. SHALL HAVE 6" MIN. THICK WALLS, FLOOR & ROOF.



CONNECTION TO INTERCEPTOR
NO SCALE

SCALE: AS NOTED

RECOMMENDED ____ DATE ____

APPROVED ____

UNITED STATES
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PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS ; VIRGINIA RES NO 404V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED
DESIGNED J.J.S
DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCP 834,837
SHEET 31 OF 36
DRAWING NO. N.C.R. 117.1-732
DATE 5/15/66

BASIC DATA

PLUMBING, DETAILS & SCHEDULES

PANELBOARD AND CIRCUIT SCHEDULE

PANEL	CIR-CUIT NO.	SERVING	KVA	CURRENT/PHASE AMPERES A	B	C	CUT-OUT POLES	FRAME	TRIP	CONDUCTORS LOAD	GRND	RACEWAY	REMARKS
A 208/120V, 3Φ, 4W, S/N, 225 A M.L.O. SURFACE MTD	1	LIGHTING & RECEPTS.					1	100	20	#12			
	2	HEAT PUMP #2-1/3 HP MTR.					1						
	3-4	SPARE					1						
	5-6	SPACE					1	-	-	-			
	7	HT PUMP #1-COMPR.	15				3	100	40	#6		1¼"	
	8	HT PUMP #2-COMPR.	5					100	40	#12			
	9	HT PUMP #1-2 DUCT HTRS	22					100	100	#4		1½"	
	10	HT PUMP #2-2 DUCT HTRS	12					100	70	#8			
	11	HT. PUMP #1-1½ HP MTR.	1.4					100	15	#12		1"	
	12	SPARE					1	-	-	-			
C 208/120V, 3Φ 4W, S/N, 225A M.L.O.-SURF MTD	1-32	LIGHTING, RECPS, ETC.					1	100	20	#12			
	33,35,37	SPARES											
	34,36,38	LIGHTING											
	39-42	SPACES					1	-	-	-			
K 208/120V. 3Φ, 4W, S/N, 225A MAIN C.B., FLUSH MTD. (2 SECTION)	1-22,24	LIGHTING RECPS, FANS					1	100	20	#12			
	23	ICE MACH RECP					1		30	#12			
	25-26	SPARES					1		20	-			
	27	FRYER	5.5				2		30	#10			
	30	3 CONVECTORS - 1 KW. EA	3.0						20	#12			
	31	GRIDDLE	6.0						40	#8		1"	
	32	SPARE	2.0						-	-			
	33	UNIT HTR #3	6.0				3		30	#10			
	34	WATER HTR	4.0						20	#12			
	35	UNIT HTR #4	5.0						20	#12			
	36	SPARE	3.0						20	—			
	37,38	SPACES	-				1	—	—	—			
P-1 208/120, 3Φ, 4W, S/N, 200A M.L.O. SURF. MTD.	1	SLAB HTR. A					1	100	70	#6			
	2	SPARE							20	-			
	3	SLAB HTR B							40	#8			
	4	SLAB HTR D							20	#12			
	5	SLAB HTR C							50	#8			
	6	AUD. SIDE LTG.							20	#12			
	7,8	SPACES							-	-			
	11	AUDITORIUM DIMMER	5.0				2		30	#10			
	12,14,15,16	HAND DRYERS - 2KW EA.	8.0						30	#10			
	13	WATER HTR.	9.0						50	#6		1"	
	17	3 CONVECTORS - 1 KW EA	3.0						30	#10			
	18	SPARE	2.0						20	—			
	19	UNIT HTR. #8	10.8				3		40	#8		1"	
	20	SPACE					3						
	9,10	SPACES					2						
P-2 208/120, 4Φ, 3W, S/N: 200 A. M.L.O. SURF. MTD.	1,2,4	UNIT HTRS. #9,#10, & #11	32.4				3	100	40	#8		1"	
	3,5,7	UNIT HTRS. #1, #2, & #3	15.0						20	#12			
	6,8	UNIT HTRS. #4 & #7	6.0						20	#12			
	9	PANEL "R"	6.4						50	#6			
	10	SEWAGE PUMPS	10.0						70	#8			
	12	SPARE							20				
	11,14	SPACES							—				
R 208/120, 3Φ, 4W, S/N 100A. M.L.O., SURF. MTD.	1,3	LIGHTING & RECEPS.					1	100	20				
	2,5	SPARES							20				
	4,6	SPACES							—				
X 208/120, 3Φ; 4W; S/N, 100A M.L.O., SURF. MTD.	1-20	LIGHTING, RECPS, ETC.					1	100	20	#12			
	22-24	SPARES											
	25	CONVECTOR C-7	2.0				2		20	#12			
	26	EXH. FAN #1 - 1HP	1.3				3		15				
	27	EXH FAN #2 - 1HP	1.3						15				
	28	SPARE	3.0						20	—			
E	1	EMERG. LTG. BLDG A-B					1	-	20	#12			CKTS 3 & 4 SPARE
	2	EMERG. LTG. BLDG. B-C					1	-	20	#12			
MDP 208/120V-3Φ 4W, S/N 600A M.L.O. SURF. MTD FUSIBLE SW. BRANCHES CURRENT LIMITING FUSES.	1	PANEL P-1	52.2	171	129	133	3	200	200	4#3/0	1#6	2½"	
	2	PANEL X	23.3	64	65	65	3	200	125	4#1/0	1#6	2"	
	3	PANEL C	32.9	102	88	86	3	200	150	4#1/0	1#6	2"	
	4	PANEL A	64.3	176	180	180	3	200	200	4#3/0	1#6	2½"	
	5	PANEL P-2	70.4	198	193	195	3	200	200	4#3/0	1#6	2½"	
	6	SPACE					3	200	-	-	-		

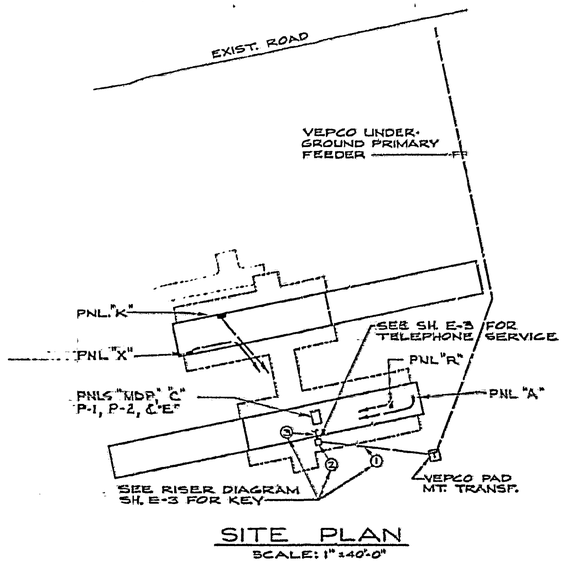
NOTE:
1. ALL PNLS. SHALL BE CIRCUIT BREAKER TYPE EXCEPT "E" & "MDP". "E" = 4 CKT PLUG FUSE TYPE 1PH. 3W 208/120V. 60A.M.L.O.

BASIC DATA

LIGHTING FIXTURE SCHEDULE

TYPE	MFR.	NO.	NO	LAMPS TYPE	MOUNTING	LOCATION	REMARKS
A	McPHILBEN	GW-10TB	1	150W-FL	SURFACE	WOOD CLG, INT & EXT.	BLACK ANODIZED FINISH
B	McPHILBEN	S-10B	1	150W-FL.	SURFACE	AT CONC CLG. INT & EXT	BLACK ANOD. FINISH NOTE 1.
C	McPHILBEN	GW-10TB W/Y-6104	1	250W R40 INFRA-RED	SURFACE	INFORMATION DESK	BLACK ANOD. FINISH
D	McPHILBEN	S-20SSB W/P-R15	1	150W-FL.	RECESSED	LOBBY & DINING RM - GRND FL	
E	HABITAT	10750	1 1	75 W 75 WR30	BRACKET	PROJECTION RM	BLACK W/CHROME HARDWARE. SW EA LAMP
F	McPHILBEN	93-05A	1	40W-T-10	RECESSED	TOP OF RAMP-AUDITORIUM	SEE SHEETS 12 & 15 FOR EXACT LOCATION
G	MOBERN	80-148*	1	F48T12/WWX	WALL SURFACE	EXHIBITION, AUDITORIUM	*EXCEPT W/GUARD AS SHOWN ON DETAIL SH 33
H	LIGHTOLIER	10342	2	40WRS/WW	PENDANT	GRND FL KITCH & OFFICE	NOTE 2
J	LIGHTOLIER	10342	2	40W RS/WW	SURFACE	TOILETS	
K	ALKCO	342 H	1	40WRS/WW	WALL SURFACE	MIRROR LIGHTS TOILETS	STAINLESS STL FINISH
L	PRESCOLITE	SA-41	1	LUMESCENT	WALL SURFACE	EXIT LIGHTS	BRUSHED ALUMINUM FINISH SEE 1/3 1/2
M	MOBERN	80-140	1	F48T12/WWX	SURFACE ABOVE CLG	UPPER LOBBY	

NOTES:
1. WHERE FIXTURE IS AT SLOPED CONCRETE CEILING, MOUNT BY SHIMMING DOWN ONE SIDE.
2. MOUNT ALL PENDANT FIXTURES 8'-0¾" ABV. FIN. GROUND FLOOR.
3. SEE ARCH. DWG'S FOR EXACT LOCATIONS OF ALL LTG. FIXT'S



SITE PLAN
SCALE: 1" = 40'-0"

SYMBOLS

- WALL BRACKET LIGHT
- FLUORESCENT LIGHT & OUTLET
- INCANDESCENT LIGHT & OUTLET
- KEYLESS PORCELAIN LAMPHOLDERS
- DUPLEX CONVENIENCE RECEPTACLE
- FLOOR OUTLET WITH FLUSH DUPLEX RECEPTACLE.
- SINGLE RECEPTACLE. 125V, 3W, 2P, 30A.
- SIMPLEX OUTLET WITH 6" STUB UP FROM FLOOR.
- 6" STUB UP FROM FLOOR WITH DIRECT CONN. TO EQUIPMENT
- SPEAKER OUTLET. SEE SPECS. W.R.=WEATHER RESISTANT
- CLOCK OUTLET. MT. 7'-6" UP OR AS DIRECTED.
- TELEPHONE OUTLET MTG. HT. AS NOTED.
- DISCONNECT SWITCH.
- MOTOR STARTER
- MOTOR
- PANELBOARD BRANCH CIRCUIT
- PANELBOARD DISTRIBUTION CIRCUIT
- CONDUIT CONCEALED IN WALL OR CLG.
- CONDUIT UNDERGROUND IN OR BELOW FLOOR
- CONDUIT EXPOSED
- HOMERUN TO PANELBOARD
- NO. OF CROSS LINES INDICATE NO. OF CONDUCTORS OVER TWO
- TELEPHONE WIRING AND CONDUIT.
- FIRE ALARM STRIKING STA.
- FIRE ALARM GONG.
- S — SINGLE POLE FLUSH TOGGLE SWITCH.
- S_3 THREE WAY SWITCH
- S_K KEY OPERATED SWITCH
- S_M MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD PROTECTION & RED PILOT LIGHT NEMA SIZE "00"
- START-STOP PUSH BUTTON WITH RED PILOT LIGHT
- UNIT HEATER.
- WATER HEATER.
- DUCT HEATER
- EXIT LIGHT
- JUNCTION BOX
- FLOOR HEATING JUNCTION BOX, SEE SCHED. SH. 36
- H.D. HAND DRYER
- C CONVECTOR
- E.W. EMERGENCY WHITE LIGHT
- W.P. WEATHER PROOF

NORTH
ORIENTATION

PREPARED
DESIGNED
DRAWN
CHECKED

SCALE

RECOMMENDED — DATE

APPROVED

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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA RES. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY

REGION NATIONAL CAPITAL
NCP B-34, B-37
SHEET 32 OF 36
DRAWING NO. N.C.R. 117 / 732
DATE 5/23/60

ELEC. DETAILS & SCHEDULES

MATCH LINE B

MATCH LINE A

EXH. FAN #13-1/2 HP

EXH. FAN #12-1/2 HP

2' X 3' X 1/2" PLYWOOD FOR TEL. TERMINAL

ALL 7

INDOOR UNIT-HEAT PUMP 1Ø, 2 - 1/3 HP @ 208V

HEAT PUMP RM.

DUCT HEATERS-6 K.W. EA.

PANEL R

RESEARCH STOR.

U.H-1 5KW P2-3

U.H-2 5KW P2-5

U.H-3 5KW P2-7

HOT WTR. CIRC. PUMP 1/12 HP P1-17

P1-13 1/3 HP

EXH. FAN #11-1/12 HP

EXH. FAN #10-1/12 HP

EXH. FAN #9-1/12 HP

SPEAKER J.B.

PUBLIC WOMEN

PUBLIC MEN

OFFICE

RESEARCH

GROUND FLOOR PLAN A-B

SCALE: 1/4" = 1'-0"

ROOF

INFORMATION DESK

PROJECTION ROOM

TELEPHONE TERM. SPACE

UPPER FL.

KITCHEN, MT. 54" AFF

LOBBY, MT. 50" AFF

OFFICE

LAB.

GRD FL.

2" EC FOR TEL. SERVICE CABLE

TELEPHONE RISER DIAGRAM

NO SCALE

3'6" MAX.

1/8" DIA. RODS

12 = EVENLY SPACED 1/8" DIA. RODS.

FLUORESCENT LAMP

ROTATING CLIPS EVENLY SPACED BOTH SIDES

LIGHT FIXTURE & DETAIL

FULL SCALE

EXHIBIT LOBBY

AUDITORIUM LOBBY

FA TEST SWITCH

FA FUSES SEE RISER DIAGRAM

PAINT RED

1ST FL.

DINING & VENDING

LOBBY

NOTE
ALL CONDUIT 1/2"
ALL WIRE NO 12 AWG.

GROUND FL.

FIRE ALARM RISER DIAGRAM

NO SCALE

NORTH

ORIENTATION

BASIC DATA

SCALE

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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA RES. NO. 404V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY

PREPARED
DESIGNED
DRAWN
CHECKED

REGION
NATIONAL CAPITAL

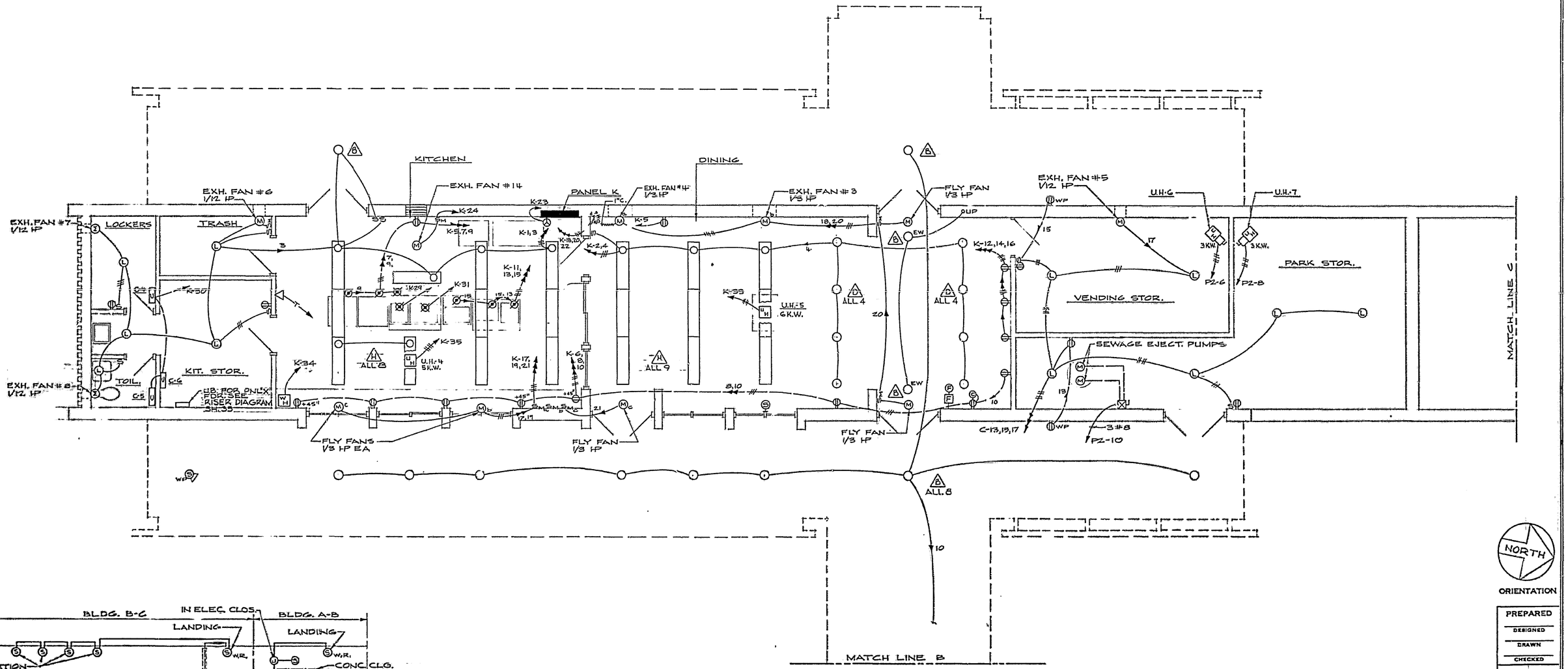
PCP 6-34,531

SHEET 33 OF 36

DRAWING NO.
N.C.R.
117.1.732

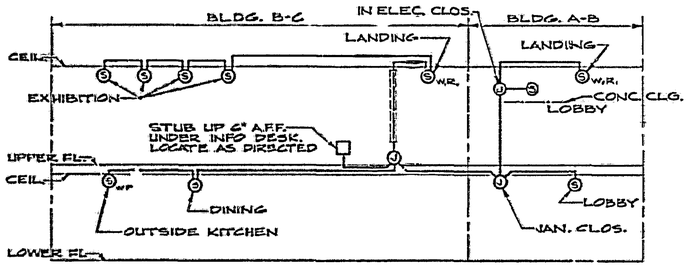
DATE 5/23/60

ELECTRICAL GROUND FLOOR A-B



GROUND FLOOR PLAN B-C

SCALE: 1/4" = 1'-0"



SPEAKER RISER DIAGRAM

NO SCALE

BASIC DATA

NORTH

ORIENTATION

PREPARED

DESIGNED

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DATE

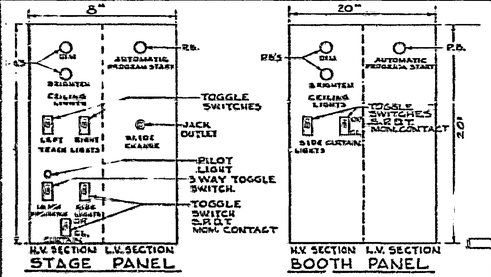
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VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA RES. NO. 404 V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

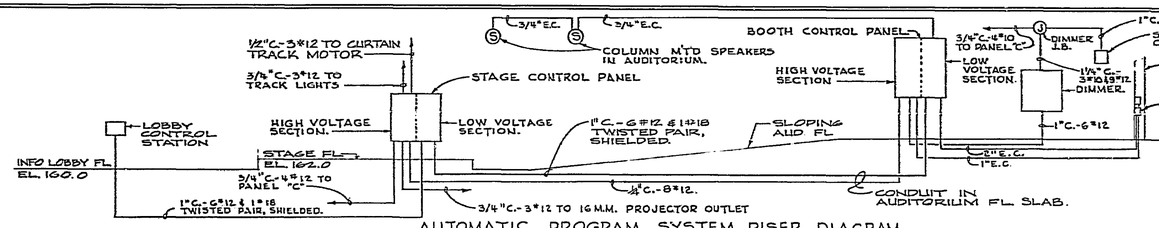
REGION
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DATE 5/25/66

ELECTRICAL GROUND FLOOR B-C



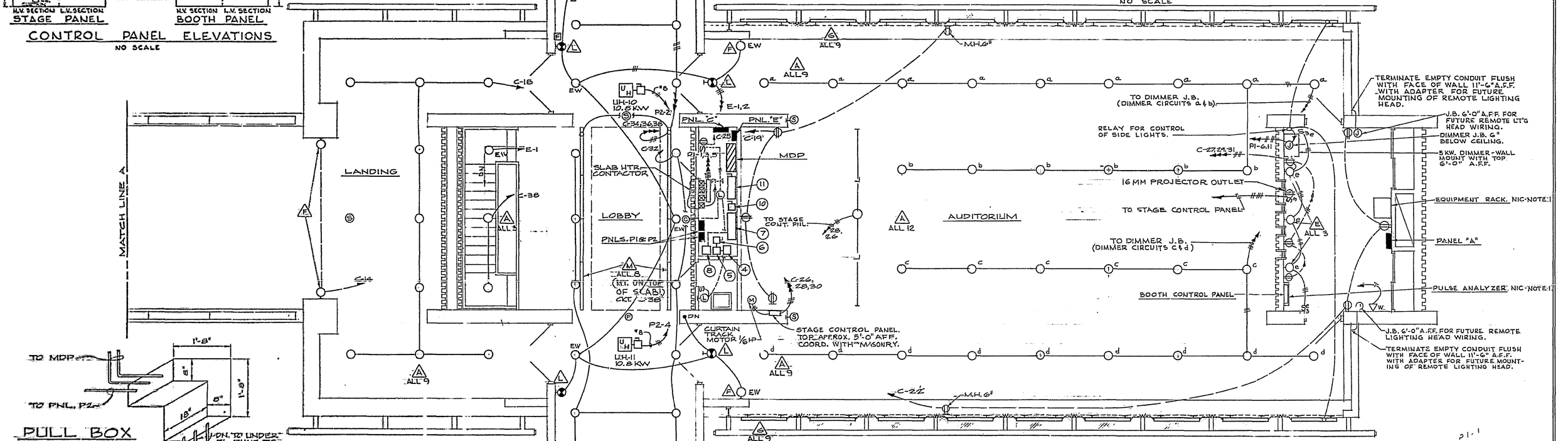
CONTROL PANEL ELEVATIONS

NO SCALE



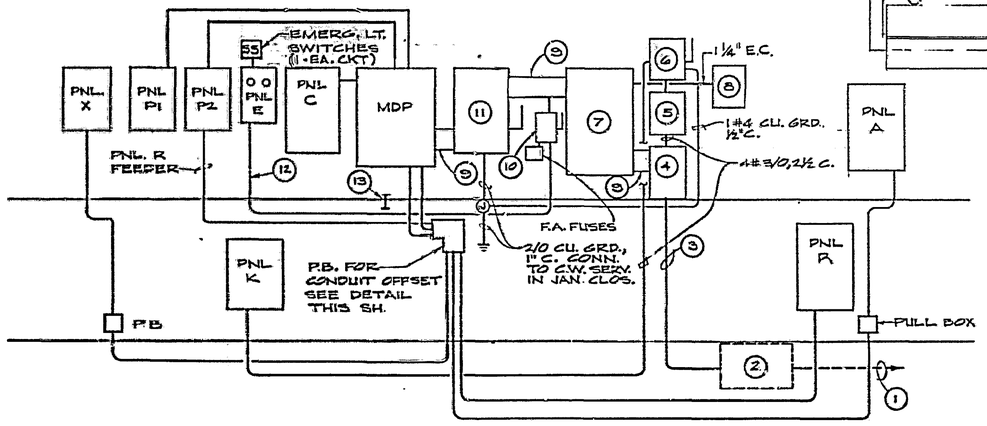
AUTOMATIC PROGRAM SYSTEM RISER DIAGRAM

NO SCALE



UPPER FLOOR PLAN A-B

SCALE: 1/4" = 1'-0"



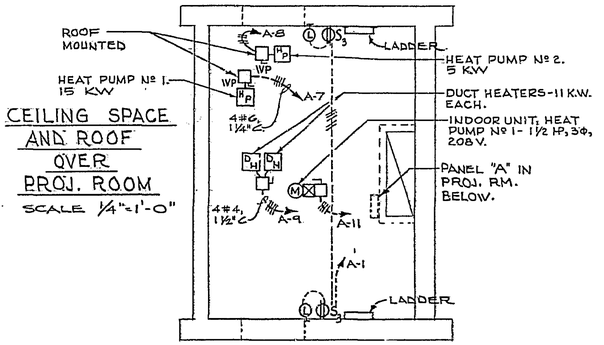
PULL BOX DETAIL

NO SCALE

POWER RISER DIAGRAM

NO SCALE

SERVICE EQUIP. SCHEDULE	
DESIG.	DESCRIPTION
1	SERVICE RACEWAY & CONDUCTORS TO TRANSFORMER-BY VEPCO
2	SERVICE HANDHOLE - BY VEPCO
3	3-3½" GALV. RIG. CONDUIT ENCASED IN 2" CONC. (EQUIV. FIREPROOF PLASTER ABV. GRADE). 2 SETS 3-500 MCM, 1-350 MCM NEUT. (1 E.C. FOR FUTURE).
4	SERVICE PULL BOX
5	CONCESSION METER-VEPCO PROVIDE, CONTR. INSTALL
6	CONCESSION SERVICE SW. (4W/SN 200, 150)
7	C.T. CAB.-VEPCO PROVIDE, CONTRACTOR INSTALL
8	METER-VEPCO PROVIDE, CONTRACTOR INSTALL
9	8X8 W.T. 2 SETS 3-500 MCM, 1-350 MCM NEUT.
10	EMERG. SERVICE SW. 60A, 2P, 50A FUSES
11	MAIN SERVICE SW. 800A, 3P, 4W, S/N, 800 FUSES
12	3 #8, ¾" C.
13	2-3" SPARE C. SLEEVES THRU SLAB





ORIENTATION

BASIC DATA

SCALE

RECOMMENDED — DATE

APPROVED

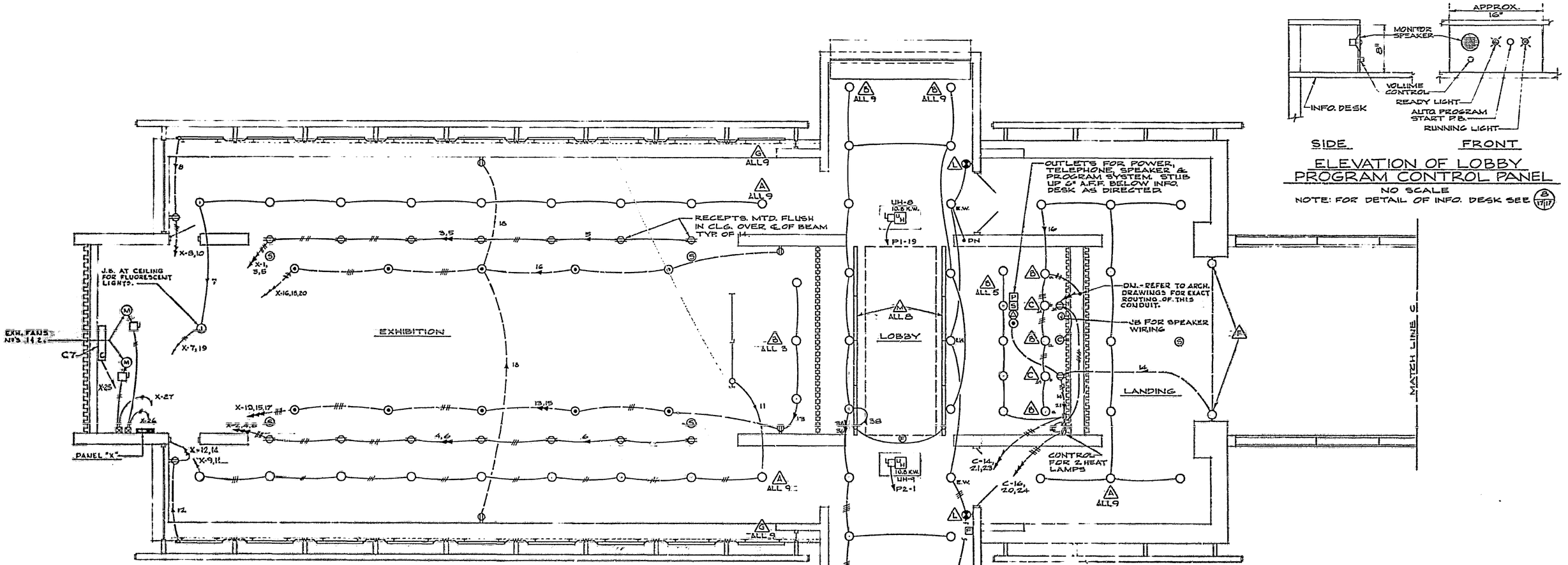
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS VIRGINIA RES. NO. 404V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED
DESIGNED
DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCP B-34, B-37
SHEET 35 OF 36
DRAWING NO. N.C.R. 117-732
DATE 5/25/66

ELECTRICAL - UPPER FLOOR A-B.



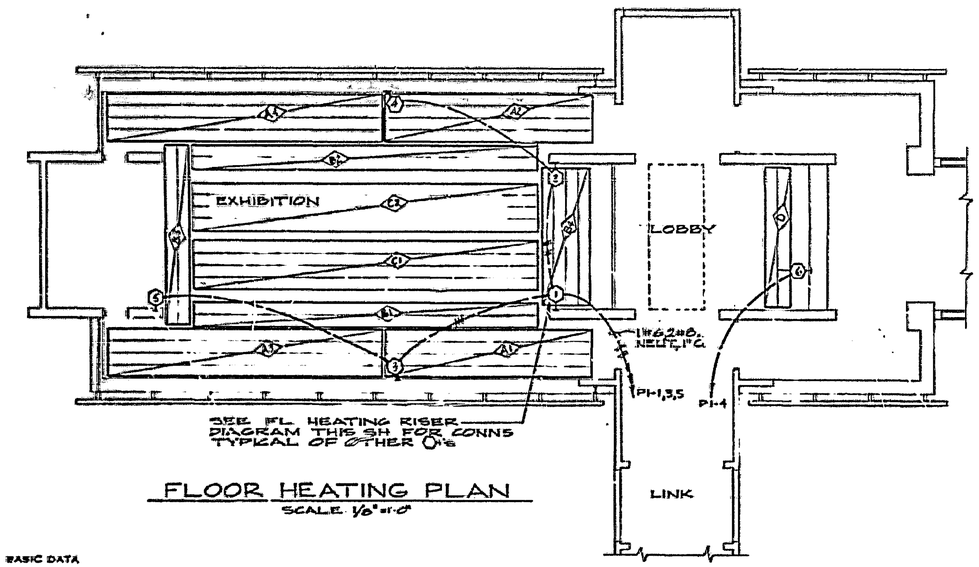
UPPER FLOOR PLAN B-C

SCALE: 1/4"=1'-0"

ELEVATION OF LOBBY PROGRAM CONTROL PANEL

NO SCALE

NOTE: FOR DETAIL OF INFO. DESK SEE (8/17/17)

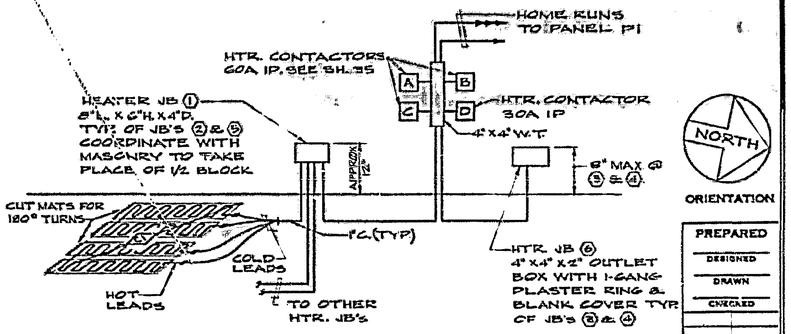


FLOOR HEATING PLAN

SCALE: 1/8"=1'-0"

FLOOR HEATING SCHEDULE

HEATER DESIG.	L	W	NO. OF MATS/ HTR.	MAT DIM. L	MAT DIM. W	NO. OF 180° TURNS/ MAT	TOTAL WATTS PER HTR	JB NO FOR COLD LEADS	VOLTAGE	PHASE	CONTROL BY CONTACTR NO-	CONTACTR LOAD WATTS
A1	22'-6"	5'-4"	2	45'	15'	1	1200	#3	120	A		
A2	22'-6"	5'-4"	2	45'		1	1200	#4		A	A	5,600
A3	30'-0"	5'-4"	2	60'		1	1600	#3		A		
A4	30'-0"	5'-4"	2	60'		1	1600	#4		A		
B1	30'-0"	2'-8"	1	75'		1	1000	#5		B		
B2	37'-6"	2'-8"	1	75'		1	1000	#2		B	B	3,300
B3	37'-6"	2'-8"	1	38'		1	500	#5		B		
B4	11'-6"	5'-4"	1	60'		2	800	#2		B		
C1	15'-0"	5'-4"	2	75'		1	2000	#1		C	C	4,000
C2	37'-6"	5'-4"	2	75'		1	2000	#2		C		
D	15'-0"	2'-8"	1	30'		2	400	#6		B	D	400



FLOOR HEATING RISER DIAGRAM

NO SCALE

BASIC DATA

SCALE

RECOMMENDED _____ DATE

APPROVED _____

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

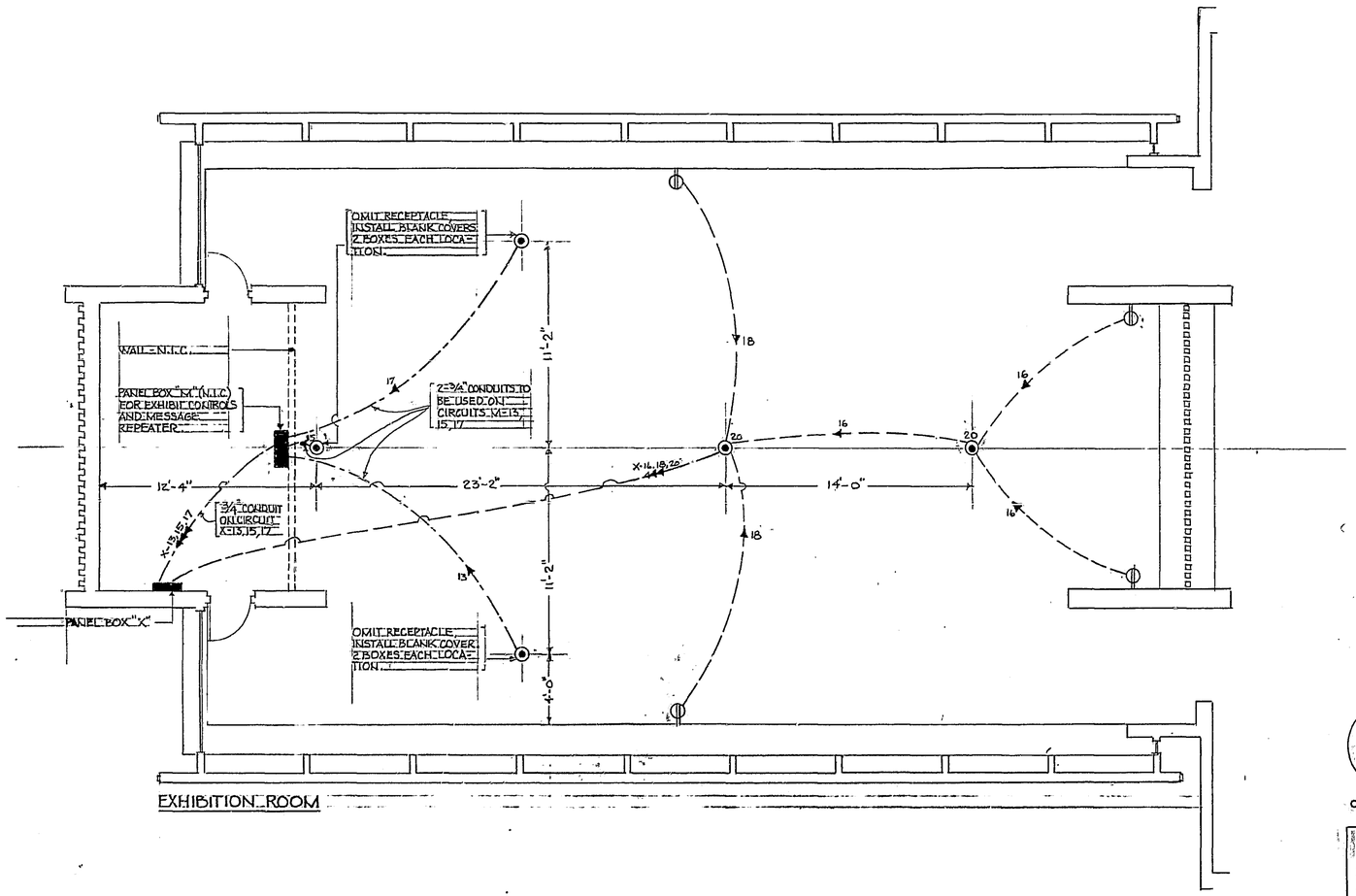
VISITOR CENTER
TITLE OF STRUCTURE
GREAT FALLS VIRGINIA
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

RES NO 404V

PREPARED
DESIGNED
DRAWN
CHECKED

REGION NATIONAL CAPITAL
PCP 834,837
SHEET 34 OF 36
DRAWING NO. N.C.P. 17.1-732
DATE 5/25/100

ELECTRICAL UPPER FLOOR B-C



ORIENTATION

REVISION DRAWING 1/4" = 1'-0"

DESCRIPTION OF REVISION	DATE	INITIAL
	REVISED 7-18-67	

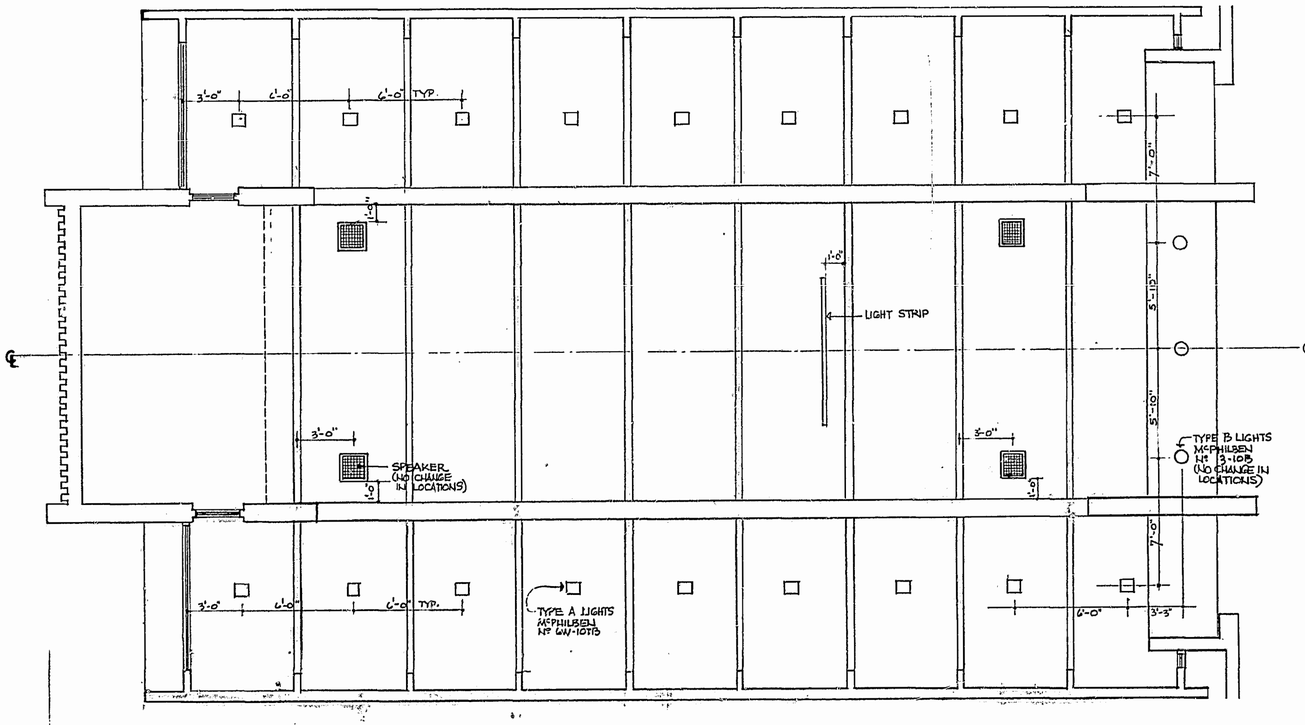
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON PLANNING AND SERVICE CENTER
PREPARED BY
DESIGN AND CONSTRUCTION

VISITOR CENTER ELECTRICAL SYSTEM - EXHIBITION ROOM
TITLE OF DRAWING
GREAT FALLS, VIRGINIA - REST. No. 404V
LOCATION WITHIN PARK
GEO. WASHINGTON MEMORIAL PKWY.
NAME OF PARK

PREPARED
DESIGNED A. MASSEY
DRAWN C. GILL
CHECKED

REGION NATIONAL CAPITAL
PCP B-347; B-37
SHEET 3 OF X
DRAWING NO. N.C.R. 117.1-732-36A
DATE JULY 18, '67

850180870



REFLECTED CEILING PLAN - EXHIBITION ROOM

ORIENTATION

BASIC DATA

SCALE 1/4"=1'0"

LOCATION OF TYPE "A" CEILING FIXTURES & LIGHT STRIP

RECOMMENDED

DATE

APPROVED

DESCRIPTION OF REVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON PLANNING AND SERVICE CENTER
PREPARED BY
DESIGN AND CONSTRUCTION

VISITOR CENTER ELECTRICAL SYSTEM - UPPER FLOOR B&C
TITLE OF DRAWING
GREAT FALLS, VA. RES. 404-V
LOCATION WITHIN PARK
GEORGE WASHINGTON MEMORIAL PARKWAY
NAME OF PARK

PREPARED
DESIGNED A. MASSEY
DRAWN
CHECKED

DATE INITIAL
REVISED
REGION

PCF B-34; B-37
SHEET 218 OF 36
DRAWING NO. N.C.R. 117.1-732-36B
DATE SEPT 6, '67

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APPENDIX B: HAZARDOUS MATERIALS SURVEY REPORT

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HAZARDOUS MATERIALS SURVEY REPORT
FOR THE
GREAT FALLS VISITOR CENTER
MCLEAN, VIRGINIA

Kirill Pivovarov
AIA, NCARB, LEED AP
CallisonRTKL Inc.
2101 L Street NW, Suite 200
Washington, DC 20037

Aerosol Monitoring & Analysis, Inc.
1331 Ashton Road, P.O. Box 646
Hanover, Maryland 21076
Phone: 410-684-3327
Fax: 410-684-3384



AMA Job# 21275

November 2021

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TABLE III: TOTAL SUSPECT ACM INVENTORY TABLE

APPENDIX A: ASBESTOS-CONTAINING MATERIAL DOCUMENTATION
APPENDIX B: LEAD-BASED PAINT DOCUMENTATION
APPENDIX C: AREA DESIGNATION DRAWING

1.0 EXECUTIVE SUMMARY

Aerosol Monitoring & Analysis, Inc. (AMA) was contracted to perform a hazardous materials survey of the accessible interior and exterior areas at the Great Falls Visitor Center in McLean, Virginia. No sub-grade assessments were conducted during this investigation. The purpose of the investigation was to identify potential hazardous materials such as asbestos-containing materials (ACM), lead-based paint (LBP), lead-containing surface coatings, and fluorescent fixtures containing mercury vapor lamps (MVL) and polychlorinated biphenyls (PCB) within the building. On October 25 and 26, 2021, AMA representatives, Mr. Ronald Stallard and Mr. Eric Hruska, were on-site to identify and evaluate ACMs, LBP, lead surface coatings, MVLs, and PCBs.

1.1 ASBESTOS-CONTAINING MATERIALS

AMA collected forty eight (48) bulk samples of suspect ACMs, which were identified throughout the accessible interior and exterior areas of the building. Of the 48 bulk samples collected, five (5) were identified as containing greater than or equal to one percent (>1%) asbestos by polarized light microscopy (PLM) analysis. The EPA and the Commonwealth of Virginia have determined that materials containing >1% asbestos are considered asbestos containing materials and must be treated as such.

Based on the results of the investigation, the following materials were found to be asbestos containing by laboratory analysis and/or assumption:

- Mudded pipe fitting insulation
- Expansion joint caulk
- Fire door (assumed ACM)

1.2 LEAD-BASED PAINT

Sixty five (65) surfaces finished with suspect lead-based paint (LBP) were tested during the screening with the use of a NITON model XLP 300 x-ray fluorescence spectrum analyzer (XRF). Eight (8) of the surfaces tested were determined to contain $\geq$1.0 milligram of lead per square centimeter (mg/cm^2) of surface area tested, the amount defined as a lead-containing substance according to the EPA and Commonwealth of Virginia. Refer to Table II at the end of the report for a listing of positive LBP components.

In general, the following building components were finished with lead based paint and/or lead surface coatings:

- Structural steel
- Metal ladders

- Ceramic/porcelain sinks
- Metal stair spindles
- Yellow concrete floor stripe

1.3 POLYCHLORINATED BIPHENYL'S

Small capacitors and fluorescent light ballasts manufactured after 1978 have been labeled "NO PCB's" by the manufacturers. Prior to 1978, small capacitors and fluorescent light ballasts were not labeled as to whether they contained PCBs; therefore, all unlabeled capacitors and ballasts were assumed to contain PCBs.

AMA performed a visual evaluation of representative light fixture ballasts utilizing a random selection method. Any ballast absent of the "No PCB's" label was assumed to contain PCBs. Based on this assessment, AMA did not identify any PCB containing light ballasts in the building. As some ballasts were inaccessible at the time of the inspection, each light fixture should be inspected and appropriately disposed of during renovation/ demolition activities. AMA identified approximately 44 light ballasts throughout the building.

1.4 MERCURY VAPOR LAMPS

Reportable quantities of mercury are often found in fluorescent lamps. Because of this fact, the fluorescent lamps located throughout the building should be considered a hazardous waste for mercury under the Resource Conservation and Recovery Act (RCRA); 40 CFR 261. Based on the observations at the site, it was determined that there are approximately 88 fluorescent lamps/ bulbs. It should be assumed that these lamps have mercury levels requiring proper waste disposal and the demolition contractor must perform TCLP testing to prove otherwise.

Unless Toxic Characteristic Leachate Procedure (TCLP) testing for mercury is performed, the light tubes located at the property should be assumed to exceed the regulatory limit of 0.2 milligrams per liter for mercury. These tubes/bulbs must be disposed of as mercury containing waste unless testing proves otherwise.

2.0 METHODOLOGY

2.1 ASBESTOS-CONTANING MATERIALS

2.1.1 SAMPLE COLLECTION

The initial phase of the evaluation for ACM involved the visual evaluation of the building. After reviewing and compiling

documentation pertaining to the materials in the building, a strategy to sample suspect materials was formulated. The sampling involved observing accessible areas of the building and collecting bulk samples of suspect materials. Sample results can be found in Table I, which is attached to this report.

Samples were collected with a core bore or utility knife which was driven through the suspect material to the substrate so as to obtain a sample containing each discrete layer. The samples were then placed in sterilized “whirl-pak” bags and assigned unique identifiers, which were recorded on the bags and the bulk survey sampling sheets.

2.1.2 BULK SAMPLE ANALYSIS

Bulk samples were submitted to AMA Analytical Services, Inc. in Lanham, Maryland. AMA Analytical Services, Inc. is accredited by the National Institute of Standards and Technology (NIST) through the National Voluntary Laboratory Accreditation Program (NVLAP #101143) for bulk sample analysis and by the American Industrial Hygiene Association (AIHA #8863.)

Samples of bulk material were analyzed using PLM following the EPA, “Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93-116). PLM is an optical microscopic technique used to distinguish the different types of asbestos fibers by their shape and unique optical properties. The technique is based on the refraction of light from the various crystalline asbestos structures and observing the corresponding color changes through the microscope. Sample analysis results are listed in Table I of this report.

2.1.3 CHAIN OF CUSTODY

A chain of custody form was completed for the bulk samples. The samples were logged in and assigned unique laboratory numbers. Upon completion of analytical services, AMA Analytical Services, Inc. retained the remaining sample materials.

2.2 LEAD-BASED PAINT

2.2.1 TESTING STRATEGY

The initial phase of the evaluation for LBP involved a visual evaluation of painted surfaces. After reviewing and compiling documentation pertaining to the materials inside the building, a

strategy to test suspect surfaces was formulated.

2.2.2 XRF TESTING

The screening was performed with a Niton XLp 300A X-Ray Fluorescence (XRF) lead-based paint analyzer, Serial #93050. This XRF contains a small Cadmium 109 radioactive source that releases radiation when the instrument is pressed flatly against a surface and the operator engages the trigger. If the paint contains lead, the radiation will stimulate the lead atoms to re-emit x-rays that are sensed by a detector in the unit. The XRF then converts these signals to a final reading in milligrams of lead per square centimeter of surface area (mg/cm^2). The Niton XRF is capable of achieving a ninety-five percent (95%) confidence level in the readings.

Calibration of the Niton XLp was conducted in accordance with the manufacturer's instructions. Prior to obtaining readings from suspect surfaces, three (3) calibration readings taken in K+ L Mode were performed on a calibration sheet and recorded. The calibration films used contains approximately 1.0 mg/cm^2. Calibration checks were performed prior to and at the end of the inspection.

The XLp features two modes of operation when in use: K+L Mode and Standard Mode. K+L Mode is a quantitative analysis which allows you to determine the statistical confidence of the reading to a 95% confidence level while allowing you to test longer. As stated in the XRF Performance Characteristics Sheet (PCS), Edition No. 1, developed under a contract with the U.S. Department of Housing and Urban Development (HUD), no substrate correction is needed when the XRF is in the K+L Mode. The K+L Mode was used during the course of the inspection.

Surfaces with lead levels $\geq$1.0 mg/cm^2 and/or > 0.50% lead are defined by the Commonwealth of Virginia and the EPA.

2.3 POLYCHLORINATED BIPHENYL'S/ MERCURY VAPOR LAMPS

During the assessment, AMA observed and light ballasts and mercury vapor lamps/bulbs associated with fluorescent light fixtures. No sampling was performed of the electric fluid within the equipment.

3.0 RESULTS

3.1 ASBESTOS-CONTAINING MATERIALS

AMA collected 48 bulk samples of suspect ACMs, which were identified

throughout the accessible interior and exterior areas of the building. Of the 48 bulk samples collected, 5 were identified as containing >1% asbestos by PLM analysis. The EPA and Commonwealth of Virginia have determined that materials >1% asbestos are considered asbestos containing materials and must be treated as such.

Based on the results of the inspection, ACM was identified within the following materials:

- Mudded pipe fitting insulation
- Expansion joint caulk
- Fire door (assumed)

The comprehensive table, contained within this report, lists the sample number, the type of material collected, sample location, and the results of the laboratory analysis (See Table I). For a detailed description of the locations where the bulk samples were collected, refer to the "Bulk Sampling Survey Sheets" located in Appendix A of this report. Asbestos material quantities and locations are located in the attached Total Suspect ACM Inventory, Table III.

3.2 LEAD-BASED PAINT

AMA tested 65 surfaces finished with suspect LBP and/or lead surface coatings throughout the building, with the use of a Niton XLp 300A XRF. Of the 65 surfaces tested, 8 tests/surfaces/building components were determined to contain $\geq$1.0 mg/cm^2 of surface area tested, the amount defined as a lead-containing substance according to the Commonwealth of Virginia.

In general, the following building components were finished with lead based paint and/or lead surface coatings:

- Structural steel
- Metal ladders
- Ceramic/porcelain sinks
- Metal stair spindles
- Yellow concrete floor stripe

Refer to the Niton XLp 300A XRF Field Forms for a description of the location of the tests, components tested, color of paint, substrate, condition of paint, and results of the tests located in Appendix B of this report. The building components finished with LBP/ lead surface coatings are listed in the Positive XRF Readings (Table II).

3.3 POLYCHLORINATED BIPHENYL'S

Small capacitors and fluorescent light ballasts manufactured after 1978 have been labeled "NO PCB's" by the manufacturers. Prior to 1978, small capacitors and fluorescent light ballasts were not labeled as to whether they contained PCBs; therefore, all unlabeled capacitors and ballasts were assumed to contain PCBs.

AMA performed a visual evaluation of representative light fixture ballasts utilizing a random selection method. Any ballast absent of the “No PCB’s” label was assumed to contain PCBs. Based on this assessment, AMA did not identify any PCB containing light ballasts. As all ballasts were not assessed at the time of the inspection, each light fixture should be inspected and appropriately disposed of during renovation/ demolition activities. AMA identified approximately 44 light ballasts throughout the building.

3.4 MERCURY VAPOR LAMPS

Reportable quantities of mercury are often found in fluorescent lamps/. Because of this fact, the fluorescent lamps/bulbs found in the building, should be considered a hazardous waste for mercury under the Resource Conservation and Recovery Act (RCRA); 40 CFR 261. Based on the observations at the site, it was determined that there are approximately 88 fluorescent lamps/bulbs located throughout the building.

4.0 CONCLUSIONS

4.1 ASBESTOS-CONTAINING MATERIALS

The identified asbestos materials located in the accessible interior and exterior areas of the building included:

- Mudded pipe fitting insulation
- Expansion joint caulk
- Fire door

In dealing with asbestos materials during demolition projects, the Environmental Protection Agency (EPA) regulation 40 CFR Part 61, Subpart M (NESHAP), the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101 (Asbestos in Construction Standard) and Commonwealth of Virginia Code of Virginia Title 54.1, Chapter 5 would be the primary regulations impacting the work.

The EPA defines a **"friable asbestos material"** as *"any material containing greater than one percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, PLM, that, when dry, can be crumbled, pulverized, or reduced to powder by hand*

pressure." The mudded pipe fitting insulation is considered a friable ACM.

Within the EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M,) the fire door and expansion joint caulk are classified as Category II non-friable ACMs.

OSHA's "Asbestos in Construction Standard" (29 CFR 1926.1101), defines work involving the disturbance of thermal system insulation (TSI) and surfacing materials as Class I work. Abatement of the mudded pipe fitting insulation is considered by OSHA to be a Class I removal operation. Disturbance and/or removal of these fittings must be performed in accordance with the requirements set forth in 29 CFR 1926.1101 for Class I work.

The asbestos abatement involving the remaining miscellaneous ACMs is considered by OSHA as Class II removal activities. All asbestos abatement of the miscellaneous ACMs must be performed in accordance with the requirements set forth for Class II work.

AMA cautions that additional forms of asbestos may be located within inaccessible areas, such as in wall chases, wall cavities, above fixed ceilings, or other inaccessible locations. Some mudded pipe fitting insulation was assumed present within wet walls of the building.

4.2 LEAD-BASED PAINT

For projects, which will disturb lead containing paint and lead surface coatings, the paint must be handled in accordance with the requirements established by the EPA and OSHA.

There is no federal or state requirement to remove lead paint prior to demolition or renovation activities, only that painted components be tested to determine the disposal requirements and that contractors be made aware of the existence of any paint containing lead in detectable amounts (lead containing paint, LCP), so their workers can be adequately protected.

Regulations established in OSHA's "Lead in Construction Standard" (29 CFR 1926.62) must be adhered to during demolition and renovation of the surfaces finished with paint containing lead in detectable amounts. This standard established the permissible exposure level (PEL) for lead at 50 micrograms per cubic meter ($u g/m^3$) as an eight hour time weighted average (TWA); the action level has been established at 30 $u g/m^3$ as an eight hour TWA. This regulation also requires employers to use engineering controls and special work practices to reduce worker lead exposure to, at, or below the PEL. It also triggers several requirements regarding exposure

monitoring, biological monitoring, and employee training when a worker is exposed to airborne lead levels at or above the action level.

Prohibited methods of lead paint removal include: sanding (except with equipment fitted with HEPA filters), burning with an open flame torch, or any methods, which produce uncontrolled dust or fumes. If components are to be removed and disposed of, 40 CFR 261 which is the RCRA, requires that the waste stream be tested by the Toxic Characteristic Leaching Procedure (TCLP) for lead in order to determine if the material must be disposed of as a lead hazardous waste. The waste shall be considered as hazardous when the concentration of lead exceeds 5 parts per million (ppm) by the TCLP. Metal components should be recycled, and glazed finishes are to be disposed of as general construction debris.

4.3 POLYCHLORINATED BIPHENYL'S

AMA performed a visual evaluation of representative light fixture ballasts throughout the building, utilizing a random selection method. Any ballast absent of the "No PCB's" label was assumed to contain PCBs. Based on this assessment, AMA did not identify any PCB containing light ballasts in the building. Any demolition contractor should check the labels all light ballasts in the building, for the "NO PCBs" logo. If the "NO PCBs" logo does not appear on the ballasts, the ballasts must be disposed of accordingly, following EPA regulations. There are two primary Federal laws that affect the disposal of PCB containing light ballasts, which are as follows:

- Toxic Substances Control Act (TSCA)
- Comprehensive Environmental Response, Compensation and Liability Act of "CERCLA" (Superfund)

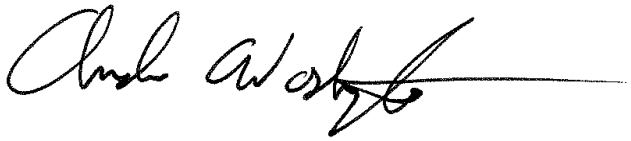
4.4 MERCURY VAPOR LAMPS

Reportable quantities of mercury are often found in fluorescent lamps/bulbs. Because of this fact, the fluorescent lamps/bulbs located throughout the building should be considered a hazardous waste for mercury under the Resource Conservation and Recovery Act (RCRA); 40 CFR 261. Based on the observations at the site, it was determined that there are approximately 88 fluorescent lamps/ bulbs.

Unless Toxic Characteristic Leachate Procedure (TCLP) testing for mercury is performed, the light tubes/ bulbs located at the property should be assumed to exceed the regulatory limit of 0.2 milligrams per liter for mercury. These tubes/bulbs must be disposed of as mercury containing waste unless testing proves otherwise. There are no specific training requirements for MVL removal and packaging; however, all workers should be trained in the hazards of mercury, as well as handling procedures.

If you should have any questions regarding this report, please contact our office at (410) 684-3327.

Sincerely,



Andrew Washington, CIH
Project Manager

TABLE I: ASBESTOS BULK SAMPLE RESULTS

Table I
Asbestos Bulk Samples Results
Great Falls Visitor Center
McLean, Virginia
November 2021

Sample Number	Material Sampled	Sample Location	Sample Result
212751026-01	**Mudded Pipe Fitting Insulation**	**AMA #21, Janitor Closet, SW Corner, ~4' High**	**10% Chrysotile, <1% Amosite**
212751026-02	**Mudded Pipe Fitting Insulation**	**AMA #21, Along West Wall, ~3' North at South Wall, ~5' High**	**10% Chrysotile, <1% Amosite**
212751026-03	**Mudded Pipe Fitting Insulation**	**AMA #21, Along West Wall, ~5' North of South Wall, ~4' High**	**10% Chrysotile, <1% Amosite**
212751026-04	White Duct Seam Sealant on Foil	AMA #6, Southeast Corner on Duct	No asbestos detected
212751026-05	White Duct Seam Sealant on Foil	AMA #6, Southeast Corner on Duct	No asbestos detected
212751026-06	Gray Duct Seam Sealant on Metal	AMA #6, Above ceiling, ~5' South of North Wall, ~8' West of East Wall on Duct	No asbestos detected
212751026-07	Gray Duct Seam Sealant on Metal	AMA #11, Above ceiling by ladder on Duct	No asbestos detected
212751026-08	Ceiling Plaster	AMA #5 at hatch to HVAC Room above on ceiling	No asbestos detected
212751026-09	Ceiling Plaster	AMA #11, Northeast corner of ceiling	No asbestos detected
212751026-10	Ceiling Plaster	AMA #22, Southwest corner of ceiling	No asbestos detected
212751026-11	Brown Carpet Mastic	AMA #1, Center of Auditorium	No asbestos detected
212751026-12	Brown Carpet Mastic	AMA #1 Southeast corner by Door	No asbestos detected
212751026-13	Cream Baseboard Mastic	AMA #2, At West Wall, ~4' South of North Wall	No asbestos detected
212751026-14	Cream Baseboard Mastic	AMA #14, At West Wall, ~10' North of South Wall	No asbestos detected
212751026-15	Tan Speckle Floor Coating	AMA #3, At Entrance threshold	No asbestos detected
212751026-16	Tan Speckle Floor Coating	AMA #4, At Entrance threshold	No asbestos detected
212751026-17	Gray Speckle Floor Coating	AMA #3, At Entrance threshold	No asbestos detected
212751026-18	Gray Speckle Floor Coating	AMA #4, At Entrance threshold	No asbestos detected
212751026-19	Drywall	AMA #2, At West Wall, ~5' South of North Wall, At Baseboard	No asbestos detected
212751026-20	Joint Compound	AMA #2, At West Wall, ~5' South of North Wall, At Baseboard	No asbestos detected
212751026-21	Drywall	AMA #25	No asbestos detected
212751026-22	Joint Compound	AMA #25	No asbestos detected

Table I
Asbestos Bulk Samples Results
Great Falls Visitor Center
McLean, Virginia
November 2021

Sample Number	Material Sampled	Sample Location	Sample Result
212751026-23	White Door Caulk	AMA #7, At South Wall, East Entrance Door	No asbestos detected
212751026-24	White Door Caulk	AMA #8, At North Wall, Double Door Entrance	No asbestos detected
212751026-25	2x2 Fissured Pinhole Ceiling Tile	AMA #13, Northwest corner of ceiling	No asbestos detected
212751026-26	2x2 Fissured Pinhole Ceiling Tile	AMA #18, Northwest corner of ceiling	No asbestos detected
212751026-27	Tan Stair Tread Mastic	AMA #20, 3rd Step from Top of Stairs	No asbestos detected
212751026-28	Tan Stair Tread Mastic	AMA #20, 4th Step from Top of Stairs	No asbestos detected
212751026-29	Window Glaizng	AMA #25, At West Wall Window, ~4' High	No asbestos detected
212751026-30	Window Glazing	AMA #26, At West Wall Window, ~4' High	No asbestos detected
212751026-31	Window Caulk	AMA #25, East Wall Window, ~4' High	No asbestos detected
212751026-32	Window Caulk	AMA #26, East Wall Window, ~4' High	No asbestos detected
212751026-33	Tan Carpet Mastic	AMA #10, At threshold to AMA #9	No asbestos detected
212751026-34	Tan Carpet Mastic	AMA #10, At threshold to AMA #9	No asbestos detected
212751026-35	White Pipe Seam Sealant	AMA #12, At West Wall, ~10' North of South Wall, ~3' High	No asbestos detected
212751026-36	White Pipe Seam Sealant	AMA #12, At South Wall, ~2' East of West Wall, ~4' High	No asbestos detected
212751026-37	Black Expansion Joint Tar	AMA #12, ~8' West of East Wall, ~12' South of North Wall at ceiling	No asbestos detected
212751026-38	Black Expansion Joint Tar	AMA #12, ~10' West of East Wall, ~12' South of North Wall at ceiling	No asbestos detected
212751026-39	Tan Door Caulk	AMA #12, East Wall Entrance Door, South Side at Door, ~4' High	No asbestos detected
212751026-40	Tan Door Caulk	AMA #12, East Wall Entrance Door, North Side of Door, ~4' High	No asbestos detected
212751026-41	Exterior Window Caulk	Exterior, West Building at Snack Bar, North Window, East Side of Building	No asbestos detected
212751026-42	Exterior Window Caulk	Exterior, East Building, West Side, Far North Large Window	No asbestos detected
212751026-43	Exterior Door Caulk	Exterior, East Building, West Side, Far North Door	No asbestos detected

Table I
Asbestos Bulk Samples Results
Great Falls Visitor Center
McLean, Virginia
November 2021

Sample Number	Material Sampled	Sample Location	Sample Result
212751026-44	Exterior Door Caulk	Exterior, West Building, East Side of Building, At Men's Room Entrance	No asbestos detected
212751026-45	**Exterior Expansion Joint Caulk**	**Exterior, East Building, West Wall, ~3' South of Women's Room Entrance, ~4' High**	**3% Chrysotile**
212751026-46	**Exterior Expansion Joint Caulk**	**Exterior, West Building, East Wall, ~1' North of Mech. Room, ~4' High**	**2% Chrysotile**
212751026-47	Exterior Vent Caulk	Exterior, East Building, ~10' South of Women's Room, ~7' High	No asbestos detected
212751026-48	Exterior Vent Caulk	Exterior, East Building, ~10' South of Women's Room, ~7' High	No asbestos detected

TABLE II: POSITIVE XRF READINGS TABLE

Table II - Positive XRF Table
Great Falls Visitor Center
McLean, Virginia
November 2021

Test Number	Area/ Location	Color	Component	Substrate	XRF Result (mg/cm^2)
11	AMA 5, Projection Room	Black	Ladder	Metal	4.0
12	AMA 5, Projection Room	Yellow	Floor strip	Concrete	1.6
13	AMA 5, Projection Room	Black	Ladder	Metal	4.5
15	AMA 6, HVAC Room above Projection Room	Orange	I-Beam	Metal	4.8
19	AMA 3, Janitor's Closet	White	Sink	Porcelain	43.5
21	AMA 7, Lobby	Black	Stair Spindle	Metal	7.3
31	AMA 11, Stage Storage	Black	Ladder	Metal	4.6
53	AMA 17, Bathroom/Storage	White	Sink	Porcelain	34.6

TABLE III: TOTAL SUSPECT ACM INVENTORY TABLE

Table III - Total Suspect ACM Inventory Table
Great Falls Visitor Center
McLean, Virginia
November 2021

Material Description	General Location	Analytical Result	Approximate Quantity	Unit	Comment
AMA Area 01	**Auditorium**				
Brown Carpet Mastic	Throughout flooring	No asbestos detected	1,800	SF	
AMA Area 02	**Auditorium Storage**				
Brown Carpet Mastic	Throughout flooring	No asbestos detected	136	SF	
Drywall & Drywall Joint Compound	All walls	No asbestos detected	500	SF	
Cream Baseboard	All walls	No asbestos detected	50	LF	
AMA Area 03	**Storage**				
Gray Speckle Floor Coating	Throughout flooring	No asbestos detected	25	SF	
AMA Area 04	**Electrical Room**				
Gray Speckle Floor Coating	Throughout flooring	No asbestos detected	50	SF	
Ceramic Tile Grout	Throughout wall	No asbestos detected	550	SF	
Drywall & Drywall Joint Compound	Throughout above drop ceiling	No asbestos detected	260	SF	
White Wall Caulk	Throughout at cmu to ceramic wall connection	No asbestos detected	72	LF	
AMA Area 05	**Projector Room**				
Plaster	Throughout ceiling	No asbestos detected	180	SF	
Door Caulk	East & West walls	No asbestos detected	50	SF	
AMA Area 06	**HVAC above Projection Room**				
Gray Duct Seam Sealant on Metal	Throughout space	No asbestos detected	100	SF	
White Duct Seam Sealant on Fiberglass	Throughout space	No asbestos detected	50	SF	
White Pipe Seam Sealant	Throughout space	No asbestos detected	8	LF	
AMA Area 07	**Corridor**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	630	SF	
White Door Caulk	South walls	No asbestos detected	2	Doors	2 @ 4x7
Drywall & Drywall Joint Compound	Throughout above drop ceiling	No asbestos detected	768	SF	
Ceramic Tile Grout	Throughout walls	No asbestos detected	576	SF	
Fire Door	**East wall**	**Assumed ACM**	**1**	**Doors**	**Wood, Labeled**
AMA Area 08	**Corridor Link**				
White Door Caulk	North wall	No asbestos detected	1	Door	1 @ 4x7
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	275	SF	
AMA Area 09	**Lobby Closet**				
Tan Carpet Mastic	Throughout flooring	No asbestos detected	96	SF	
AMA Area 10	**Exhibits/Lobby**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	2,500	SF	
Drywall & Drywall Joint Compound	Throughout Middle Partition Walls	No asbestos detected	512	SF	
AMA Area 11	**Exhibits Storage/HVAC**				
Gray Duct Seam Sealant on Metal	Throughout above fixed ceiling	No asbestos detected	125	SF	

Table III - Total Suspect ACM Inventory Table
Great Falls Visitor Center
McLean, Virginia
November 2021

Material Description	General Location	Analytical Result	Approximate Quantity	Unit	Comment
Plaster	Throughout ceiling	No asbestos detected	160	SF	
White Door Caulk	West wall	No asbestos detected	1	Door	1 @ 3x8
AMA Area 12	**Park Storage**				
White Pipe Seam Sealant on End Caps	Throughout space	No asbestos detected	10	LF	
Black Expansion Tar	Throughout ceiling	No asbestos detected	20	LF	
Gray Duct Seam Sealant on Metal	Throughout West wall	No asbestos detected	60	SF	
Tan Door Caulk	Throughout East wall	No asbestos detected	16	LF	
AMA Area 13	**Men's Bathroom**				
2'x2' Fissured Pinhole Ceiling Tile	Throughout ceiling	No asbestos detected	480	SF	
Mudded Pipe Fitting Insulation	**Assumed throughout North & South Wet walls**	**10% Chrysotile, <1% Amosite**	**10**	**Fittings**	**Assumed present**
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	480	SF	
White Pipe Seam Sealant on Fiberglass	Throughout above drop ceiling	No asbestos detected	20	LF	
AMA Area 14	**Emp. Office**				
Gray Speckle Floor Coating	Throughout flooring	No asbestos detected	391	SF	
Cream Baseboard Mastic	Throughout walls	No asbestos detected	80	LF	
Cream Window Caulk	Throughout East walls	No asbestos detected	2	Windows	2 @ 4x6
AMA Area 15	**Snack Bar**				
Rust Floor Coating	Throughout flooring	No asbestos detected	432	SF	
Window Caulk	Throughout East walls		3	Windows	2 @ 4x6; 1 @ 4x4
Tan Door Caulk	West wall		1	Door	1 @ 6x8
AMA Area 16	**Trash Room**				
No suspect ACM					
AMA Area 17	**Snack Bar Storage/Bathroom**				
Cream Baseboard Mastic	Throughout walls	No asbestos detected	140	LF	
Mudded Pipe Fitting Insulation	**Assumed South Wet wall**	**10% Chrysotile, <1% Amosite**	**10**	**Fittings**	**Assumed present**
AMA Area 18	**Women's Bathroom**				
2'x2' Fissured Pinhole Ceiling Tile	Throughout ceiling	No asbestos detected	384	SF	
Gray Duct Seam Sealant on Metal	Throughout above drop ceiling	No asbestos detected	100	SF	
Mudded Pipe Fitting Insulation	**Assumed throughout North & South Wet walls**	**10% Chrysotile, <1% Amosite**	**10**	**Fittings**	**Assumed present**
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	384	SF	
White Pipe Seam Sealant on Fiberglass	Throughout above drop ceiling	No asbestos detected	20	LF	
AMA Area 19	**Break Room**				
Tan Speckle Floor Coating	Throughout	No asbestos detected	225	SF	
Cream Baseboard Mastic	Throughout	No asbestos detected	40	LF	

Table III - Total Suspect ACM Inventory Table
Great Falls Visitor Center
McLean, Virginia
November 2021

Material Description	General Location	Analytical Result	Approximate Quantity	Unit	Comment
AMA Area 20	**Stair/Lift Area**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	210	SF	
Tan Stairtread Mastic	Throughout South Stairs	No asbestos detected	48	SF	
AMA Area 21	**Janitorial Closet**				
Mudded Pipe Fitting Insulation	**Throughout Elbows in Room**	**10% Chrysotile, <1% Amosite**	**15**	**Fittings**	
White Pipe Seam Sealant on Fiberglass	Throughout Pipes in Room	No asbestos detected	30	LF	
Gray Speckle Floor Coating	Throughout flooring	No asbestos detected	150	SF	
AMA Area 22	**Server Room/Bathroom**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	72	SF	
Mudded Pipe Fitting Insulation	**Assumed throughout North Wet wall**	**10% Chrysotile, <1% Amosite**	**10**	**Fittings**	**Assumed present**
Cream Baseboard Mastic	Throughout walls	No asbestos detected	36	LF	
Plaster	Throughout ceiling in Bathroom	No asbestos detected	24	SF	
AMA Area 23	**Women's Bathroom/Lockers**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	72	SF	
Cream Baseboard Mastic	Throughout walls	No asbestos detected	36	LF	
Plaster	Throughout ceiling in Bathroom	No asbestos detected	24	SF	
Mudded Pipe Fitting Insulation	**Assumed throughout South Wet wall**	**10% Chrysotile, <1% Amosite**	**10**	**Fittings**	**Assumed present**
AMA Area 24	**Corridor**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	42	SF	
Cream Baseboard Mastic	Throughout walls	No asbestos detected	28	LF	
AMA Area 25	**Park Ranger Office**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	200	SF	
Drywall & Drywall Joint Compound	Throughout Middle Partition Walls	No asbestos detected	130	SF	
Cream Baseboard Mastic	Throughout walls	No asbestos detected	60	LF	
Window Glazing	Throughout West walls	No asbestos detected	1	Window	1 @ 4x8
Door Caulk	Throughout West wall	No asbestos detected	1	Door	1 @ 4x8
Window Caulk	Throughout East and West walls	No asbestos detected	3	Windows	2 @ 1x8; 1 @4x8
AMA Area 26	**Research Office**				
Tan Speckle Floor Coating	Throughout flooring	No asbestos detected	200	SF	
Cream Baseboard Mastic	Throughout walls	No asbestos detected	56	LF	
Door Caulk	Throughout West wall	No asbestos detected	1	Door	1 @ 4x8
Window Caulk	Throughout East & West walls	No asbestos detected	3	Windows	1 @ 4x8; 2 @ 1x8
Window Glazing	Throughout West wall	No asbestos detected	2	Windows	2 @ 4x8

Table III - Total Suspect ACM Inventory Table
Great Falls Visitor Center
McLean, Virginia
November 2021

Material Description	General Location	Analytical Result	Approximate Quantity	Unit	Comment
AMA Area 27	**Heat Pump Room**				
No suspect ACM					
Exterior	**East Building**				
Door Caulk	Exits	No asbestos detected	5	Doors	
Window Caulk	Exterior walls	No asbestos detected	8	Windows	
Expansion Joint Caulk	**Courtyard wall at link**	**3% Chrysotile**	**150**	**LF**	
Vent Caulk	Near women's restroom	No asbestos detected	2	Vents	1'x3' each
Exterior	**Link**				
Window Caulk	Exterior walls	No asbestos detected	2	Windows	2 @ 10x10
Exterior	**West Building**				
Door Caulk	Exits	No asbestos detected	7	Doors	
Window Caulk	Exterior walls	No asbestos detected	7	Windows	
Expansion Joint Caulk	**Courtyard wall at link**	**3% Chrysotile**	**150**	**LF**	
Vent Caulk	West wall	No asbestos detected	1	Vent	1'x3' each

APPENDIX A: ASBESTOS-CONTAINING MATERIAL DOCUMENTATION

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

NVLAP TESTING
Lab Code 101143-0

Chain of Custody: 329351

Client: Aerosol Monitoring & Analysis, Inc

Address: PO Box 646
1331 Ashton Road
Hanover, MD 21076

Attention: Andrew Washington

Job Name: Great Falls Visitor Center

Job Location: 9200 Old Dominion Drive, VA 22102

Job Number: 21275

P.O. Number: Not Provided

Date Submitted: 10/26/2021

Date Analyzed: 10/29/2021

Report Date: 10/29/2021

Date Sampled: 10/26/2021

Person Submitting: Eric Hruska

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
329351-1	212751026-01	10	10	TR	--	--	20	--	--	--	--	70	Fitting	Gray	Homogeneous	PC	
329351-2	212751026-02	10	10	TR	--	--	20	--	--	--	--	70	Fitting	Gray	Homogeneous	PC	
329351-3	212751026-03	10	10	TR	--	--	20	--	5	--	--	65	Fitting	Gray	Homogeneous	PC	
329351-4	212751026-04	NAD	--	--	--	--	--	--	--	--	--	100	SSL	White	Homogeneous	PC	
329351-5	212751026-05	NAD	--	--	--	--	--	--	--	--	--	100	SSL	White	Homogeneous	PC	
329351-6	212751026-06	NAD	--	--	--	--	--	--	--	--	--	100	SSL	Gray	Homogeneous	PC	
329351-7	212751026-07	NAD	--	--	--	--	--	--	--	--	--	100	SSL	Gray	Homogeneous	PC	
329351-8	212751026-08	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	PC	
329351-8A	212751026-08	NAD	--	--	--	--	--	--	--	--	--	100	BC	Beige	Homogeneous	PC	
329351-9	212751026-09	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	PC	
329351-9A	212751026-09	NAD	--	--	--	--	--	--	--	--	--	100	BC	Beige	Homogeneous	PC	
329351-10	212751026-10	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	PC	
329351-10A	212751026-10	NAD	--	--	--	--	--	--	--	--	--	100	BC	Beige	Homogeneous	PC	
329351-11	212751026-11	NAD	--	--	--	--	--	--	TR	--	--	100	CM	Brown	Homogeneous	PC	
329351-12	212751026-12	NAD	--	--	--	--	--	--	TR	--	--	100	CM	Brown	Homogeneous	PC	
329351-13	212751026-13	NAD	--	--	--	--	--	--	--	--	--	100	MS	Cream	Homogeneous	PC	
329351-14	212751026-14	NAD	--	--	--	--	--	--	--	--	--	100	MS	Cream	Homogeneous	PC	
329351-15	212751026-15	NAD	--	--	--	--	--	--	--	--	--	100	Coating	Tan	Homogeneous	PC	
329351-16	212751026-16	NAD	--	--	--	--	--	--	--	--	--	100	Coating	Tan	Homogeneous	PC	
329351-17	212751026-17	NAD	--	--	--	--	--	--	--	--	--	100	Coating	Multi	Homogeneous	PC	
329351-18	212751026-18	NAD	--	--	--	--	--	--	--	--	--	100	Coating	Multi	Homogeneous	PC	
329351-19	212751026-19	NAD	--	--	--	--	--	--	10	--	--	90	DW	Multi	Layered	PC	
329351-20	212751026-20	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	PC	
329351-21	212751026-21	NAD	--	--	--	--	--	--	TR	--	--	100	DW	Multi	Layered	PC	
329351-22	212751026-22	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	PC	

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

Chain of Custody: 329351

Client: Aerosol Monitoring & Analysis, Inc

Address: PO Box 646
1331 Ashton Road
Hanover, MD 21076

Attention: Andrew Washington

Job Name: Great Falls Visitor Center

Job Location: 9200 Old Dominion Drive, VA 22102

Job Number: 21275

P.O. Number: Not Provided

Date Submitted: 10/26/2021

Date Analyzed: 10/29/2021

Report Date: 10/29/2021

Date Sampled: 10/26/2021

Person Submitting: Eric Hruska

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
329351-23	212751026-23	NAD	--	--	--	--	--	--	--	--	5	95	CK	Beige	Homogeneous	PC	
329351-24	212751026-24	NAD	--	--	--	--	--	--	--	--	5	95	CK	Beige	Homogeneous	PC	
329351-25	212751026-25	NAD	--	--	--	--	20	--	40	--	--	40	CT	Multi	Layered	PC	
329351-26	212751026-26	NAD	--	--	--	--	20	--	40	--	--	40	CT	Multi	Layered	PC	
329351-27	212751026-27	NAD	--	--	--	--	--	--	--	--	--	100	MS	Tan	Homogeneous	PC	
329351-28	212751026-28	NAD	--	--	--	--	--	--	--	--	--	100	MS	Tan	Homogeneous	PC	
329351-29	212751026-29	NAD	--	--	--	--	--	--	TR	--	--	100	GZ	Gray	Homogeneous	PC	
329351-30	212751026-30	NAD	--	--	--	--	--	--	--	--	--	100	GZ	Gray	Homogeneous	PC	
329351-31	212751026-31	NAD	--	--	--	--	--	--	--	--	2	98	CK	Gray	Homogeneous	PC	
329351-32	212751026-32	NAD	--	--	--	--	--	--	--	--	2	98	CK	Gray	Homogeneous	PC	
329351-33	212751026-33	NAD	--	--	--	--	--	--	--	--	--	100	CM	Tan	Homogeneous	PC	
329351-34	212751026-34	NAD	--	--	--	--	--	--	--	--	--	100	CM	Tan	Homogeneous	PC	
329351-35	212751026-35	NAD	--	--	--	--	3	--	--	--	2	95	SSL	White	Homogeneous	PC	
329351-36	212751026-36	NAD	--	--	--	--	5	--	--	--	2	93	SSL	White	Homogeneous	PC	
329351-37	212751026-37	NAD	--	--	--	--	--	--	10	--	--	90	Tar	Black	Homogeneous	PC	
329351-38	212751026-38	NAD	--	--	--	--	--	--	10	--	--	90	Tar	Black	Homogeneous	PC	
329351-39	212751026-39	NAD	--	--	--	--	--	--	--	--	2	98	CK	Tan	Homogeneous	PC	
329351-40	212751026-40	NAD	--	--	--	--	--	--	--	--	2	98	CK	Tan	Homogeneous	PC	
329351-41	212751026-41	NAD	--	--	--	--	--	--	--	--	2	98	CK	Gray	Homogeneous	PC	
329351-42	212751026-42	NAD	--	--	--	--	--	--	--	--	2	98	CK	Gray	Homogeneous	PC	
329351-43	212751026-43	NAD	--	--	--	--	--	--	--	--	2	98	CK	Gray	Homogeneous	PC	
329351-44	212751026-44	NAD	--	--	--	--	--	--	--	--	10	90	CK	Gray	Homogeneous	PC	
329351-45	212751026-45	3	3	--	--	--	--	--	--	--	--	97	CK	Gray	Homogeneous	PC	
329351-46	212751026-46	2	2	--	--	--	--	--	--	--	--	98	CK	Gray	Homogeneous	PC	
329351-47	212751026-47	NAD	--	--	--	--	--	--	--	--	--	100	CK	Gray	Homogeneous	PC	
329351-48	212751026-48	NAD	--	--	--	--	--	--	--	--	--	100	CK	Gray	Homogeneous	PC	

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Focused On Results.

CERTIFICATE OF ANALYSIS

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Client: Aerosol Monitoring & Analysis, Inc

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Job Name: Great Falls Visitor Center

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Date Submitted: 10/26/2021

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Person Submitting: Eric Hruska

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample Number	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

[1] TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

[2] MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993
NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23. All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analyst(s): Peerawut Chaikeenee



Technical Director Michael Greenberg

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AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA-LAP (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 329351

AMA Client Information:
1. Client Name: AMA
2. Address 1: 1331 Ashton Rd
3. Address 2: Hanover MD
4. Billing Email:
5. Phone #:

Submittal Information:
1. Job Name: Great Falls Visitor Center
2. Job Location: 9200 Old Dominion Drive, VA 22102
3. Job #: 21275 P.O. #:
4. Contact Person: Andrew Washington Cell:
5. Collected by: Eric Hruska Cell: 240 750 9082

If a TAT is not provided, AMA will assign a default of 5-Day. **Reports and Invoices provided by Email only.**

AFTER HOURS (must be pre-scheduled)
☐ 4 Hours ☐ Late Night
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ 4 Hours ☑ 3 Day ☐ Results Required By Noon
☐ Same Day (6-8 Hours) ☐ 5 Day +
☐ 1 Day Date Due: 10/29/21
☐ 2 Day

REPORT TO:
☑ Email 1: AWashington@AMAConsulting.com
☐ Email 2:
☐ Email 3:

Asbestos Analysis
*PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
*TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☑ EPA 600 – Visual Estimate 48 (QTY) ☐ Pos Stop
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
☐ Vermiculite
TEM Dust*
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☑ All samples received in good condition unless otherwise noted.
(TEM Water samples °C) **(For Lab Use Only)**

If field data sheets are submitted, there is no need to complete bottom section.
*It is recommended that blank samples be submitted with all air and surface samples

Metals Analysis
☐ Pb Paint Chip ☐ % by Weight (QTY) ☐ mg/kg (QTY)
☐ *Pb Dust Wipe (QTY) (Samples collected using ASTM approved media ☐)
☐ *Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
☐ *Spore-Trap (QTY)
☐ *Surface Swab (QTY)
☐ *Surface Tape (QTY)
☐ Other (Specify) (QTY)
☐ Surface Vacuum Dust (QTY)
Collection Apparatus for Spore Traps/Air Samples:
Collection Media

SAMPLE #	SAMPLE LOCATION/ ID	DATE	TIME	VOL (L) (Air Samples)	Wipe Area (Dust Samples)	TEM	PCM	PLM	LEAD	MOLD	COMMENTS / SPECIAL INSTRUCTIONS
21275|026-01	See field							X			
thru	Sheets							↓			
21275|026-48											

	Print Name	Signature	Date	Time
Relinquished by:	Eric Hruska		10/26/21	
Received by:			10/27/21	1220

Delivery Information (For Lab Use Only)
☐ UPS ☑ In-Person ☐ Other
☐ FedEx ☐ Drop Box
☐ USPS ☐ Courrier

Aerosol Monitoring & Analysis,

Bulk Sampling Survey Sheet

Date Collected: 10/26/21
Job Number: 21275
Job Site: NPS-Great Falls Visitor's Center
Address: 9200 Old Dominion Drive, McLean, VA 22102
Contact Person: Andrew Washington
Company: Aerosol Monitoring & Analysis, Inc.
Telephone Number: (410) 684 - 3327
Samples Taken By: R. Stallard/E. Hruska
Chain of Custody #: 329351

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 01	Mudded fitting	Area 21 (Janitor Closet) - SW Corner, ~4' high	☒ Yes ☐ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
02		Area 21 - Along W. wall, ~3' N of SWall, ~5' high	☒ Yes ☐ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
03		Area 21 - Along W. wall, ~5' N of SWall, ~4' high	☒ Yes ☐ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
04	White Duct seam Sealant (on Foil)	AmA Area 6 - ~~Above Ceiling~~, SE Corner on Duct	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
05		Same as 04	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275-1026-06	Gray Duct Seam Sealant (on metal)	AMA Area 6 - Above Ceiling, ~5' S of N wall, ~8' W of E wall, on Duct	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
07	↓	AMA Area 11 - Above Ceiling by ladder, on Duct	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
08	Ceiling Plaster	AMA Area 5 - at Hatch to HVAC Rm Above, on Ceiling	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
09		AMA Area 11 - NE Corner of Ceiling	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
10	↓	AMA Area 22 - SW Corner of Ceiling	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 11	Brown Carpet Mastic	AMA Area 1 - Center of Auditorium	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
12	↓	AMA Area 1 - SE Corner by Door	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
13	Cream Baseboard	AMA Area 2 - at W. wall, ~4' Sth N wall	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
14	↓	AMA Area 14 - at W. wall, ~10' N of S wall	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
15	Tan Speckled floor Coating	AMA Area - 3, at Entrance Threshold	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 16	Tan speckled floor Coating	AMA Area 4- at Entrance threshold	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
17	~~Beige~~ Gray speckled floor Coating	Same as 15	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
18	↓	Same as 16	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
19	Drywall	AMA Area 2 - at W. wall, ~5' S of N wall, at Baseboard	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
↓ 20	Joint Compound	Same as 19	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 21	Drywall	AMA Area 25 –	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
22	Joint Compound	Same as 21	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
23	White Door Caulk	AMA Area 7 – At S. wall, E. Entrance Door	☐ Yes ☒ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
24	↓	AMA Area 8 – At N. Wall Obl. Door Entrance	☐ Yes ☒ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
25	2x2 fissured Pinhole Ceiling Tile	AMA Area 13 – ~~At S. Wall, E. Entrance Door~~ NW Corner of Ceiling	☒ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Aerosol Monitoring & Analysis,

Bulk Sampling Survey Sheet

Date Collected: 10/26/21
Job Number: 21275
Job Site: NPS-Great Falls Visitor's Center
Address: 9200 Old Dominion Drive, McLean, VA 22102
Contact Person: Andrew Washington
Company: Aerosol Monitoring & Analysis, Inc.
Telephone Number: (410) 684 - 3327
Samples Taken By: R. Stallard/E. Hruska
Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 26	2x2 fissured pinhole ceiling	AMA Area 18 - NW Corner of Ceiling	☒ Yes ☐ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
27	Tan Stair Tread Mastic	AMA Area 20 - 3rd Step from top of Stairs	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
28	↓	AMA Area 20 - 4th Step from top of Stairs	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
29	Window Glazing	AMA Area 25 - At W. Wall Window, 4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
30	↓	AMA Area 26 - At W. Wall Window, 4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Aerosol Monitoring & Analysis,

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 31	Window Caulk	AMA Area 25 - E. Wall Window, ~4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
32	↓	AMA Area 26 E. Wall Window, ~4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
33	Tan Carpet Mastic	AMA Area 10 - At threshold to AMA Area 9	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
34	↓	Same as 33	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
↓ 35	White Pipe Seam Sealant	AMA Area 12 - At W. Wall ~10' N of S Wall, ~3' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 36	White Pipe Seam Sealant	AMA Area 12 - At S. Wall, ~ 2' E of W wall, ~ 4' high	☐ Yes ☒ No ☐ Potentially	☐ Good ☒ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
37	Black Expansion Joint Tar	AMA Area 12 - ~ 8' W of E wall, ~ 12' S of N wall, at Ceiling	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
38	↓	AMA Area 12 - ~ 10' W of E wall, ~ 12' S of N wall, at Ceiling	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
39	Tan Door Caulk	AMA Area 12 - E. Wall Entrance Door, S. Side of Door, ~ 4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
40	↓	AMA Area 12 - E. Wall Entrance Door, N. Side of Door, ~ 4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Bulk Sampling Survey Sheet

Date Collected: 10/26/21 **Address:** 9200 Old Dominion Drive **Company:** Aerosol Monitoring & Analysis, Inc.

Job Number: 21275 McLean, VA 22102 **Telephone Number:** (410) 684 - 3327

Job Site: NPS-Great Falls Visitor's Center **Contact Person:** Andrew Washington **Samples Taken By:** R. Stallard/E. Hruska

Chain of Custody #:

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 41	Exterior Window Caulk	Exterior – W. Bldg., at Snack Bar, N. Window, E. Side of Bldg.	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
42	↓	Exterior – E. Bldg., W. Side, far N. Large Window	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
43	Exterior Door Caulk	Exterior – E. Bldg., W. Side, far N. Door	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
44	↓	Exterior – W. Bldg., E. Side of Bldg., at Men's Rm Entrance	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
45	Exterior Expansion Joint Caulk	Exterior – E. Bldg., W. Wall, ~3' S of Women's Rm Entrance, ~4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

Aerosol Monitoring & Analysis,

Bulk Sampling Survey Sheet

Date Collected: 10/26/21
Job Number: 21275
Job Site: NPS-Great Falls Visitor's Center
Address: 9200 Old Dominion Drive, McLean, VA 22102
Contact Person: Andrew Washington
Company: Aerosol Monitoring & Analysis, Inc.
Telephone Number: (410) 684 - 3327
Samples Taken By: R. Stallard/E. Hruska
Chain of Custody #: 329351

Sample Number	Type of Material Sampled	Sample Location	Friable	Condition of Material	Accessibility	Photo	Comments
21275 1026 46	Exterior Expansion Joint Caulk	Exterior- W. Bldg.) E. Wall, ~1' N of Mech. Rm, ~4' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
47	Exterior Vent Caulk	Exterior- E. Bldg., ~10' SW of Women's Rm, ~7' high	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
48	↓	Same as 47	☐ Yes ☒ No ☐ Potentially	☒ Good ☐ Fair ☐ Poor	☒ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
			☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☒ No #	
			☐ Yes ☐ No ☐ Potentially	☐ Good ☐ Fair ☐ Poor	☐ Low ☐ Medium ☐ High	☐ Yes ☒ No #	

(Revised 8/01)

APPENDIX B: LEAD-BASED PAINT DOCUMENTATION

JOB NAME: Great Falls Visitors Ctr.

ADDRESS: McLean, VA

NITON XLP 300
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
01	Calibration						Self	001	2.57
02	Self - Calibration						SRM 2573	002	1.1
03	↓							003	1.1
04	↓							004	1
05	AMA 1, Auditorium	S.Wall	Blue	b/all	DW	I		005	0
06	↓	W.Wall	Brun Stain	↓	Wood	↓		006	0
07	↓	↓	↓	Support Column	↓	↓		007	0.01
08	AMA 5, Projection Rm	N.wall	White	Wall	CMU			008	-0.06
09	↓	Ceiling	↓	Ceiling	Plaster			009	0
10	↓	S.wall	↓	Electric Panel	Metal			010	0.08
11	↓	W.wall	Black	Ladder	↓		†	011	4
12	↓	floor	yellow	Floor strip	Concrete		†	012	1.6
13	↓	E.wall	Black	Ladder	Metal		†	013	4.5
14	↓	S.wall	white	Conduit	↓			014	0
15	AMA 6, HVAC Rm (Above Projection Rm)	center	Orange	I-BEAM			†	015	4.8
16	AMA 5, Projection Rm	Ceiling	White	hatch				016	0.02
17	↓	↓	↓	vent	↓			017	0
18	AMA 1, Auditorium	W.wall	Red	Display stand	Wood			018	0.4
19	AMA 3, Janitor Closet	N.wall	White	Sink	Porcelain		†	019	43.5
20	AMA 7, Lobby	Ceiling	Brown	Duct	Metal	↓		020	0

JOB# 21275

DATE: 10/25/21

JOB NAME: Great Falls Visitor's Ctr.

ADDRESS: McLean, VA

NITON XLP 300
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
21	AMA 7, Lobby	S. Side	Black	Stair Spindel	Metal	I	X	021	7.3
22	↓	↓	Brown Stain	Stair Handrail	Wood	↓		022	0.01
23			Red Brown Stain	Handrail Base	↓			023	0.1
24		N. Wall	Tan	Wall				024	0
25	AMA 8, Link	↓	↓	Window Case				025	0
26	AMA 10, Exhibits / Lobby	Center of Area	Blue	Wall	Dry		Partition	026	0
27	↓	E. Wall	Brown Stain	Column	Wood			027	0
28	↓	↓	↓	Wall	↓			028	0
29	AMA 11, Stage Storage	S. Wall	Lt. Blue	Wall	CMU			029	0.11
30	↓	↓	↓	Pipe	Metal			030	0.09
31		W. Wall	Black	Ladder	↓		†	031	4.6
33		E. Wall	Lt. Blue	Electric Panel	↓	↓		033	0
34	↓	Ceiling	White	Ceiling	Plaster	NI		034	0.02
35	AMA 12, Park Storage	E. Wall	Brown	Door	~~Metal~~ Wood	I		035	0.12
36	AMA 13, Men's Rm	N. Wall	Tan	Wall	CMU			036	0
37	↓	↓	↓	Wall	Ceramic Tile			037	0.04
38	↓	↓	White	Sink	Porcelain			038	0.03
39	↓	W. Side	Brown	Door	Metal			039	0
40	↓	↓	↓	Door Case	↓			040	0
41	AMA 14, Employee's Office	W. Wall	Tan	Wall	CMU	↓		041	0

JOB NAME: Great falls Visitor's Ctr

ADDRESS: McLean, VA

NITON XLP 300
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
42	AMA 14, Employee's office	floor	Gray	floor	Concrete	I		042	-0.37
43	↓	E.Wall	Tan	window sill	Wood	↓		043	0
44		W.Wall	↓	Duct	Metal			044	0.15
45		S.Wall	Brown	Door	↓			045	0
46		↓	↓	Door case				046	0
47	AMA Area 15, Snack Bar	E.Wall	Yellow	Wall	CMU			047	0.04
48	↓	↓	Brown	window case	Metal			048	0
49		Ceiling	White	Ceiling	Concrete			049	0
50	AMA Area 16, Snack Bar Storage	E.Wall		Wall	CMU			050	0.1
51	↓	↓	↓	Pipe	Metal			051	0.15
52	AMA 17, Bathroom/Storage	floor	Tan	floor	Concrete			052	0.02
53	↓	S.Wall	White	Sink	Porcelain		T	053	**34.6**
54	AMA 18, Woman's Rm	W.Wall	Beige	Wall	CMU			054	0.01
55	↓	↓	↓	↓	Ceramic Tile			055	0.02
56		↓	Brown	Door	Metal			056	0
57	↓	↓	↓	Door case	↓			057	0
58	AMA 20, Lift Lobby	S.Wall	Brown	Stair support	Metal			058	0.02
59	AMA 19, Break Rm	↓	Beige	Wall	Wood			059	0
60	↓	E.Wall	↓	window sill	↓			060	0
61	↓	↓	↓	window case	↓	↓		061	0.01

JOB# 21275

DATE: 10/25/21

JOB NAME: Great Falls Visitors Ctr.

ADDRESS: McLean, VA

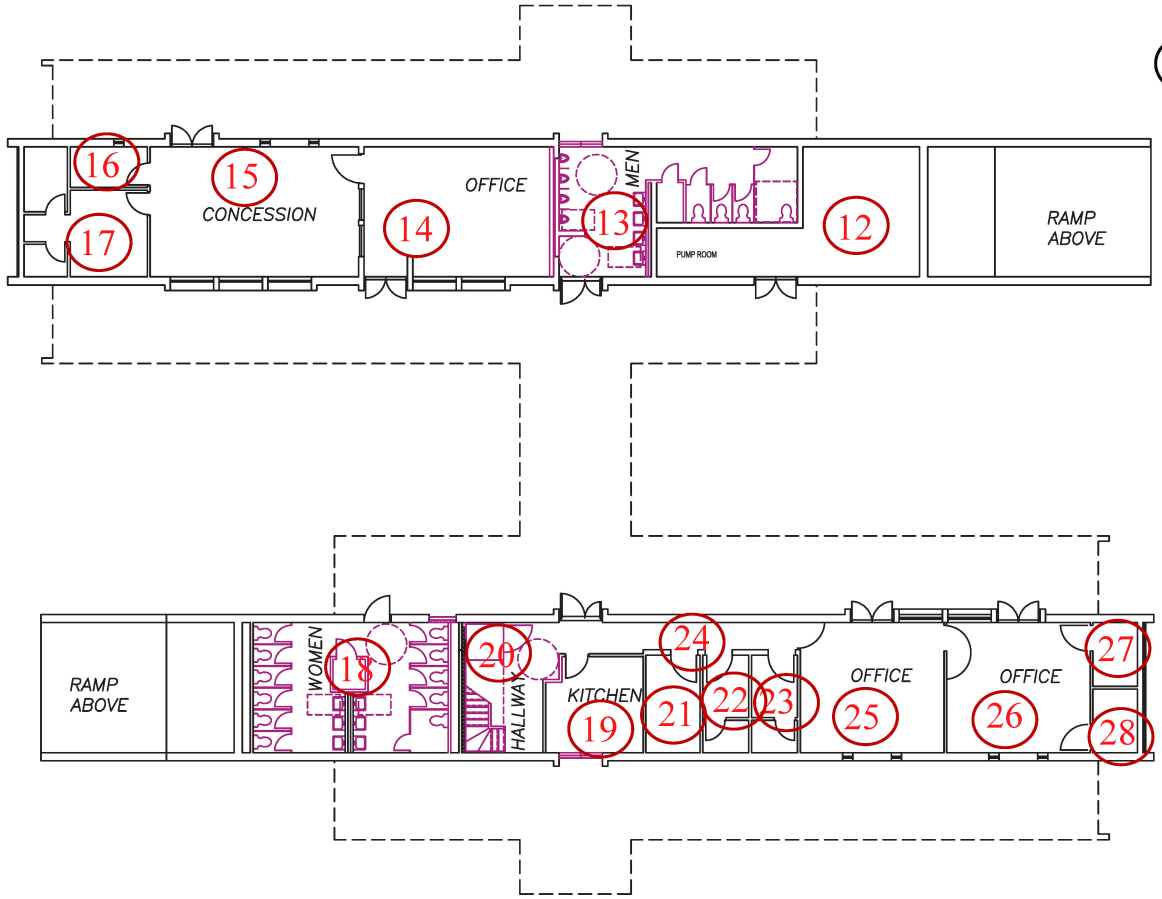
NITON XLP 300
FIELD FORM

TEST	ROOM	LOCATION	COLOR	COMPONENT	SUBSTRATE	CONDITION	COMMENTS	TEST NO./RESULT(mg/cm2)	
63	AHA 19, Break Rm	Ceiling	Beige	Ceiling	Concrete	I		063	0
64	AHA 21, Mech. Rm	Ceiling	Black	Ceiling (lower case)	Metal			064	0.05
65	Calibration							065	1
66	↓		N	A				066	1.1
67								067	1

JOB# 21275

DATE: 10/25/21

APPENDIX C: AREA DESIGNATION DRAWING



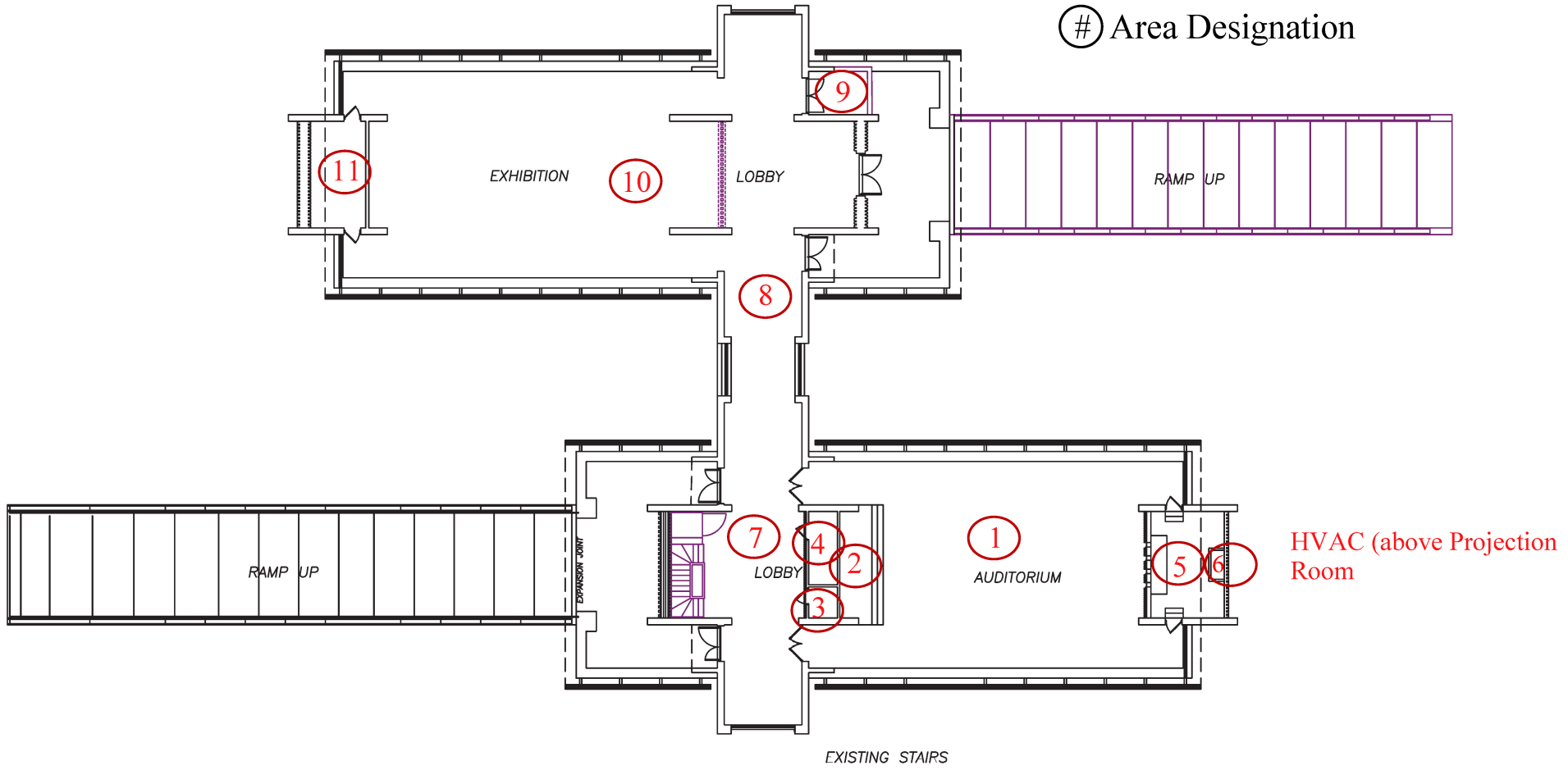
1 / A1 EXISTING FIRST FLOOR PLAN

16 0 16 32

SCALE OF FEET

1/16" = 1'-0"

DESIGNED:	SUB SHEET NO.	EXISTING FIRST FLOOR	DRAWING NO.
TECH. REVIEW:		GREAT FALLS PARK GEORGE WASHINGTON MEMORIAL PARKWAY	PMIS. NO. SHEET OF
DATE:			



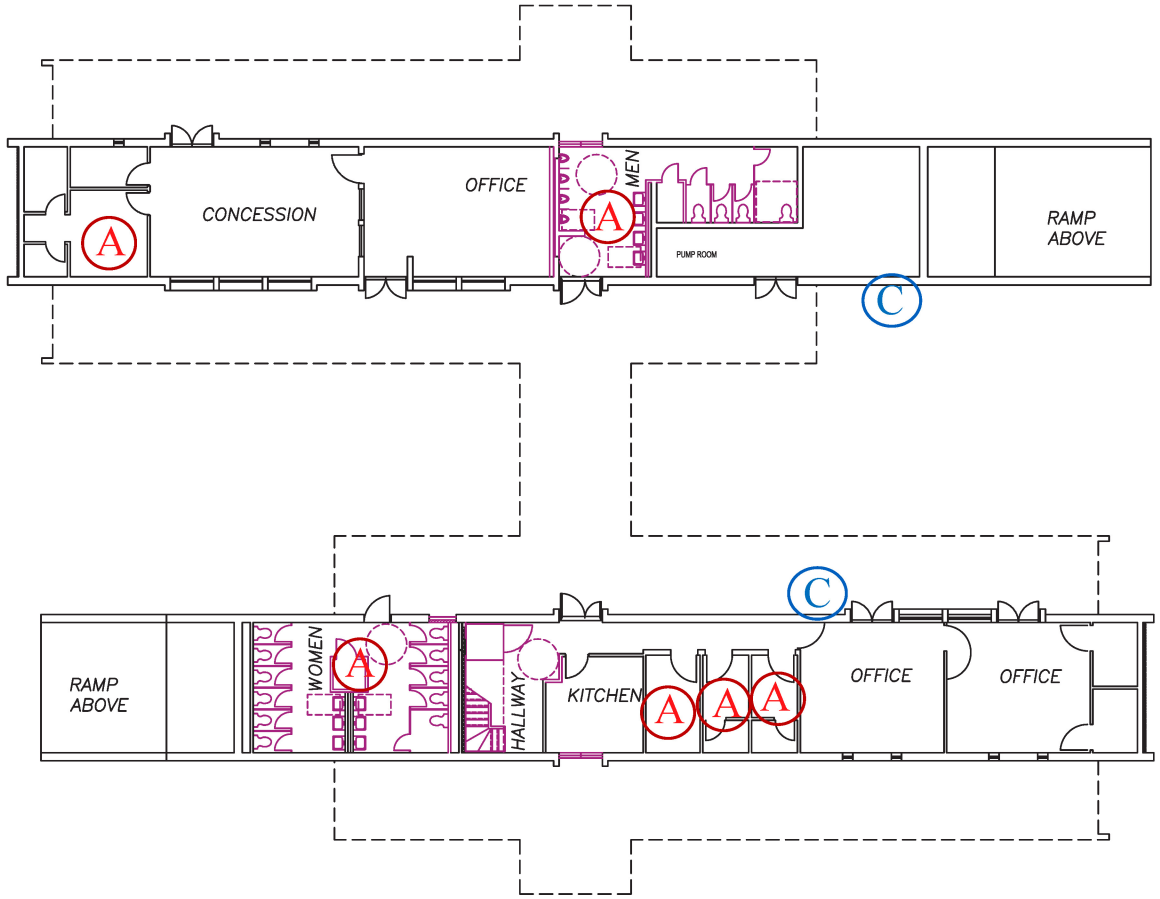
1 / A2 EXISTING SECOND FLOOR PLAN

16 0 16 32

SCALE OF FEET

1/16" = 1'-0"

DESIGNED:	SUB SHEET NO.	EXISTING SECOND FLOOR	DRAWING NO.
TECH. REVIEW:		GREAT FALLS PARK GEORGE WASHINGTON MEMORI-L PARKWAY	PMIS. NO. SHEET OF
DATE:			



A Mudded Pipe Fittings

B Fire Door

C Expansion Joint Caulk

1
A1

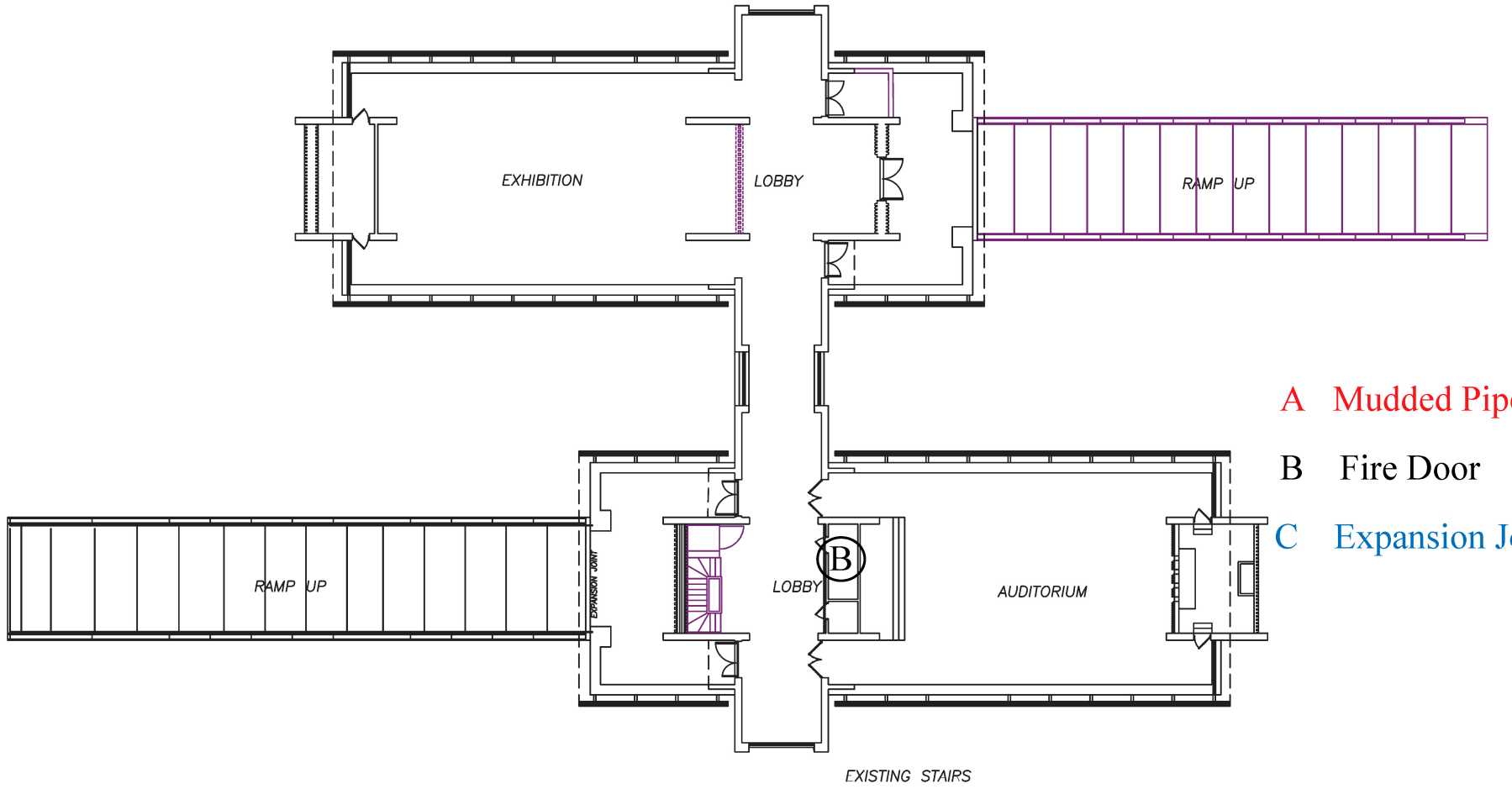
EXISTING FIRST FLOOR PLAN

16 0 16 32

SCALE OF FEET

1/16" = 1'-0"

DESIGNED:	SUB SHEET NO.	EXISTING FIRST FLOOR GREAT FALLS PARK GEORGE WASHINGTON MEMORIAL PARKWAY	DRAWING NO.
TECH. REVIEW:			PMIS. NO. / SHEET / OF
DATE:			



A Mudded Pipe Fittings

B Fire Door

C Expansion Joint Caulk

1
A2

EXISTING SECOND FLOOR PLAN

16 0 16 32

SCALE OF FEET

1/16" = 1'-0"

DESIGNED:	SUB SHEET NO.	EXISTING SECOND FLOOR	DRAWING NO.
TECH. REVIEW:		GREAT FALLS PARK GEORGE WASHINGTON MEMORI-L PARKWAY	PMIS. NO. SHEET OF
DATE:			

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APPENDIX C: DIAGRAMS OF THE OBSERVED LEAKAGE

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Water Leakage Photo 1



Staining of ceiling tiles observed by SGH

Leak No. 1

SGH performed a visual survey of interior spaces and identified areas of active and prior water leakage. We also observed areas of water leakage as reported by Ms. Susan Finta of NPS.

LEGEND

- Active Leak or Evidence of Leakage Reported by NPS on 26 October 2021
- Active Leak or Evidence of Leakage SGH Observed on 26 October 2021

Appendix XX - Water Leakage Locations

GROUND FLOOR PLAN A-B

KENT COOPER AND ASSOCIATES
ARCHITECTS
1856 33d STREET NW, WASHINGTON, DC

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS, VIRGINIA
GEORGE WASHINGTON MEMORIAL PARKWAY

REC. NO. 404V

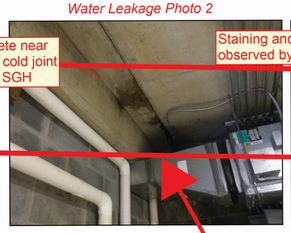
REGION
NATIONAL CAPITAL
PCR B-34, B-37
SHEET 5 OF 30
DRAWING NO.
N.C.R.
117 - 732
DATE 5/25/62

SGH performed a visual survey of interior spaces and identified areas of active and prior water leakage. We also observed areas of water leakage as reported by Ms. Susan Finta of NPS.

LEGEND

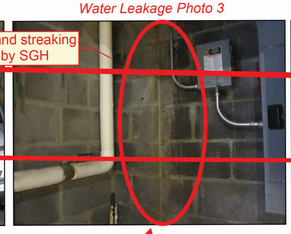
- Active Leak or Evidence of Leakage Reported by NPS on 26 October 2021
- Active Leak or Evidence of Leakage SGH Observed on 26 October 2021

Water Leakage Photo 2



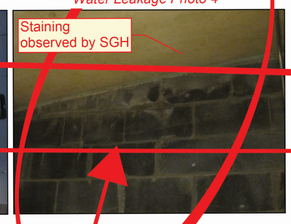
Damp concrete near the concrete cold joint observed by SGH

Water Leakage Photo 3



Staining and streaking observed by SGH

Water Leakage Photo 4



Staining observed by SGH

Leak No. 3

Leak No. 2

Leak No. 4

GROUND FLOOR PLAN B-C

PLAN BELOW SERVICE COUNTER

KENT COOPER AND ASSOCIATES ARCHITECTS 1556 33d STREET NW, WASHINGTON, DC

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
NATIONAL CAPITAL OFFICE

VISITOR CENTER,
GREAT FALLS, VIRGINIA FES. NO. 404V
GEORGE WASHINGTON MEMORIAL PARKWAY

REGION NATIONAL CAPITAL
PCP 5.34.B-31
SHEET 6 OF 36
DRAWING NO. N.C.R. 111-32
DATE 5/25/66

PREPARED K.L.A
DESIGNED R.L.B
DRAWN W.P.L
CHECKED

ORIENTATION

SCALE 0 1/4"=1'-0" 2'

RECOMMENDED — DATE

APPROVED

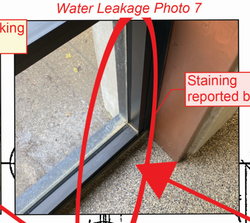
BASIC DATA

GROUND FLOOR PLAN B-C

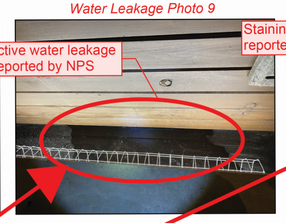
Appendix XX - Water Leakage Locations


Water Leakage Photo 5

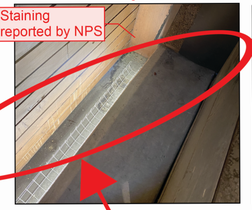

Water Leakage Photo 6


Water Leakage Photo 7


Water Leakage Photo 8


Water Leakage Photo 9


Water Leakage Photo 10


Water Leakage Photo 11


Water Leakage Photo 12

Staining and streaking observed by SGH

Staining and streaking observed by SGH

Staining reported by NPS

Staining and streaking reported by NPS

Active water leakage reported by NPS

Staining reported by NPS

Staining reported by NPS

Staining reported by NPS

Leak No. 5

Leak No. 6

Leak No. 7

Leak No. 8

Leak No. 9


Water Leakage Photo 13

Staining reported by NPS

SGH performed a visual survey of interior spaces and identified areas of active and prior water leakage. We also observed areas of water leakage as reported by Ms. Susan Finta of NPS.

LEGEND

- Active Leak or Evidence of Leakage Reported by NPS on 26 October 2021
- Active Leak or Evidence of Leakage SGH Observed on 26 October 2021

KENT COOPER AND ASSOCIATES
ARCHITECTS
1636 33rd STREET NW, WASHINGTON, DC

SCALE 1/4" = 1'-0"

RECOMMENDED ____ DATE

APPROVED ____

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY
NATIONAL CAPITAL OFFICE

VISITOR CENTER
TITLE OF DRAWING
GREAT FALLS, VIRGINIA RES. NO. 404 V
GEORGE WASHINGTON MEMORIAL PARKWAY
LOCATION
NAME OF PARK

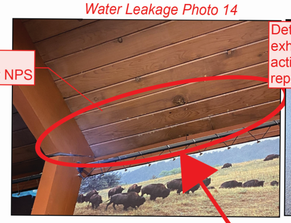
PREPARED HCA
DESIGNED RLB
DRAWN WPL
CHECKED

REGION NATIONAL CAPITAL
PCP 3.34.B.37
SHEET 7 OF 26
DRAWING NO. N.C.R. 17 - 732
DATE 5/23/2002

UPPER FLOOR PLAN A-B

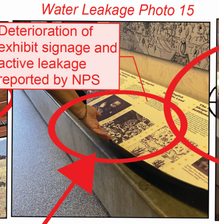
Appendix XX - Water Leakage Locations

Appendix XX - Water Leakage Locations



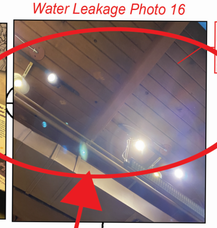
Water Leakage Photo 14

Staining reported by NPS



Water Leakage Photo 15

Deterioration of exhibit signage and active leakage reported by NPS



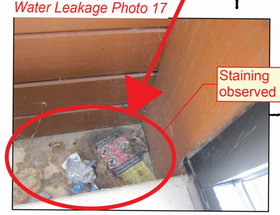
Water Leakage Photo 16

New ceiling leakage reported by NPS dripping onto floor, staining not visible

Leak No. 10

Leak No. 11

Leak No. 12



Water Leakage Photo 17

Staining observed by SGH

SGH performed a visual survey of interior spaces and identified areas of active and prior water leakage. We also observed areas of water leakage as reported by Ms. Susan Finta of NPS.

LEGEND

- Active Leak or Evidence of Leakage Reported by NPS on 26 October 2021
- Active Leak or Evidence of Leakage SGH Observed on 26 October 2021

KENT COOPER AND ASSOCIATES ARCHITECTS
1836 834 STREET NW, WASHINGTON, DC

RECOMMENDED — DATE
APPROVED

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DESIGN AND CONSTRUCTION
PREPARED BY NATIONAL CAPITAL OFFICE

VISITOR CENTER
GREAT FALLS, VIRGINIA — GEORGE WASHINGTON MEMORIAL PARKWAY — RES NO. 404 V

PREPARED KCA
DESIGNED FLG
DRAWN WFL
CHECKED

REGION NATIONAL CAPITAL
PCP 0-34.0-37
SHEET 8 OF 36
DRAWING NO. N.C.R. 171-732
DATE 5/25/66

UPPER FLOOR PLAN B-C

APPENDIX D: ROOF DRAINS AND RAIN LEADERS SIZING CALCULATIONS

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Roof Drains and Rain Leaders Sizing Calculations

The Sizing of the roof drains and downmspout are based on the Internation Plumbing Code (IPC) 2018. Refer to tables attached:

Sizing of Roof Drains: Table 1106.2
Sizing of Vertical Conductors and Leaders: Table 1106.3
General Information: (gallons per sq.ft. per minute)

- 1 cu.ft. = 7.48 gallons
- 1 sq.ft. x rainfall (3.2 inch per hour or 0.27 ft per hour) = 0.27 cu.ft.
- 0.27 cu.ft. x 7.48 gallons = 2.02 gallons per hour
- 2.02 gallons per hour / 60 minutes = 0.034 gallons per minute

Maximum gpm capacity per different pipe sizes

Downspout size	Square Inches	Gallon per minute
3"	7 sq.in.	87 gpm
2" x 6"	12 sq.in.	168 gpm
3" x 4 "	13.5 sq.ft.	192 gpm

TABLE 1106.2
STORM DRAIN PIPE SIZING

PIPE SIZE (inches)	CAPACITY (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		1/16 inch per foot	1/8 inch per foot	1/4 inch per foot	1/2 inch per foot
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

TABLE 1106.3
VERTICAL LEADER SIZING

SIZE OF LEADER (inches)	CAPACITY (gpm)
2	30
2 × 2	30
$1^1/_2 \times 2^1/_2$	30
$2^1/_2$	54
$2^1/_2 \times 2^1/_2$	54
3	92
2 × 4	92
$2^1/_2 \times 3$	92
4	192
$3 \times 4^1/_4$	192
$3^1/_2 \times 4$	192
5	360
4 × 5	360
$4^1/_2 \times 4^1/_2$	360
6	563
5 × 6	563
$5^1/_2 \times 5^1/_2$	563
8	1208
6 × 8	1208

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m.

1. Unit A-B Roof Summary

   The total roof area for this roof is 3,090 sq.ft. and/or 105 gpm. The existing roof sloped to the perimeter of the roof. There are (6) 3" x 6" Downspouts with a total of 515 sq.ft. and/or 17.50 gpm each with a transition to 2" x 6" downspouts. The existing 2" x 6" has the maximum capacity of 168 gpm which is more than it is required. The existing 2" x 6" downspouts spilled overhead to grade. Secondary storm system is not required.

2. Connector Roof Summary

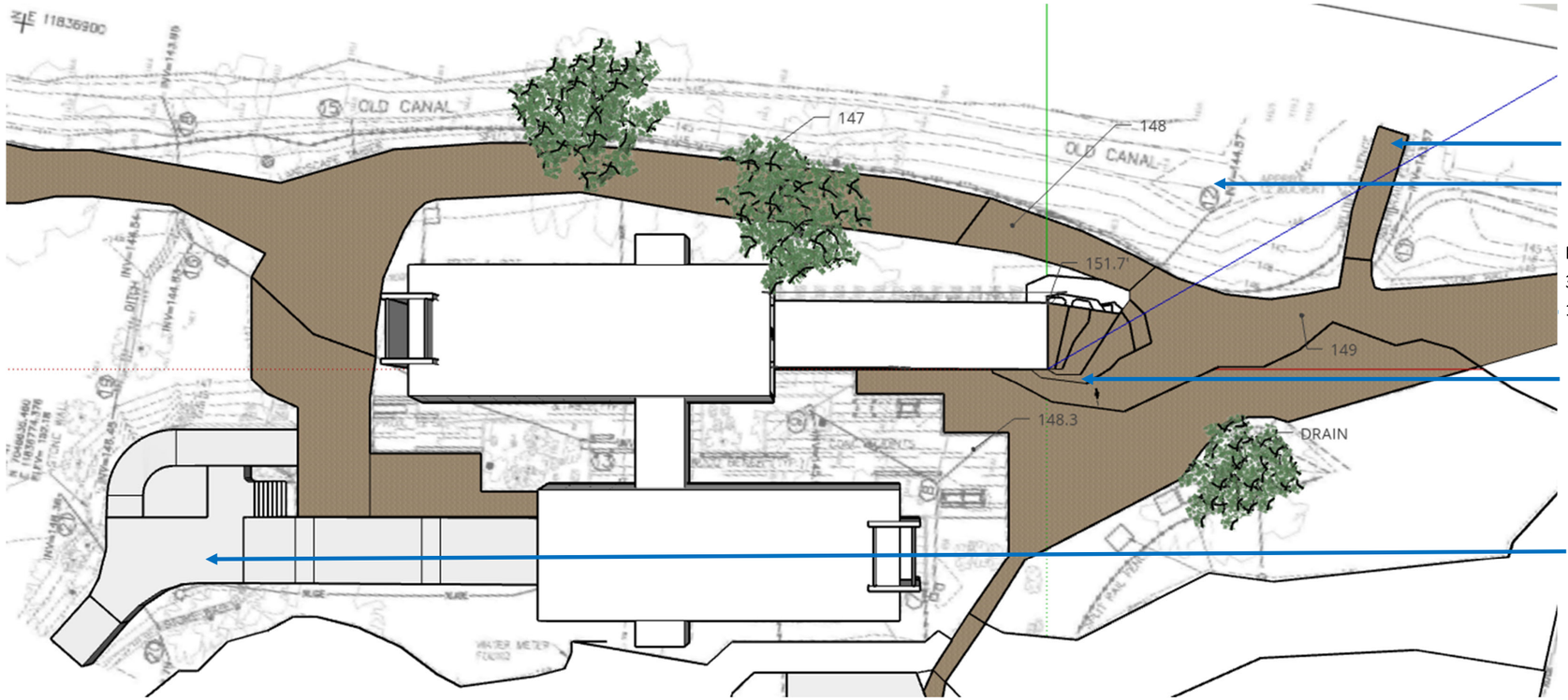
   The total roof area for this roof is 520 sq.ft. and/or 17.5 gpm. The existing roof sloped to the sides of the roof. There are (4) 3-inch roof drains with dome with a total of 130 sq.ft. and/or 4.42 gpm with 3-inch storm outlet. Secondary storm system is not required. The existing (4) 3-inch storm pipe spilled overhead to grade.

3. Unit B-C Roof Summary

   The total roof area for this roof is 3,090 sq.ft. and/or 105 gpm. The existing roof sloped to the perimeter of the roof. There are (6) 3" x 6" Downspouts with a total of 515 sq.ft. and/or 17.50 gpm each with a transition to 2" x 6" downspouts. The existing 2" x 6" has the maximum capacity of 168 gpm which is more than it is required. The existing 2" x 6" downspouts spilled overhead to grade. Secondary storm system is not required.

APPENDIX E: SOUTH RAMP ALTERNATIVES

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PATH TO OVERLOOK

HISTORIC PATOWMACK CANAL

EXISTING 75’-0” LONG NON-ACCESSIBLE SOUTH RAMP, 3/32 SLOPE (1:10 +/-). SURFACE DETERIORATED 1:12 MAX RAMP SLOPE ALLOWED PER ABAAS.

EXISTING ERODED, NON-ACCESSIBLE RAMP LANDING APPROACH . BOTTOM OF EXISTING RAMP AT 151.7. SURROUNDING GRADE AT 149.0. EXISTING APPROACH GRADES LESS THAN 1:10 (STEEPER THAN RAMP). 1:20 MAX SITE APPROACH ALLOWED PER ABAAS,

EXISTING ACCESSIBLE NORTH RAMP / LANDING /STAIRS CIRCA 2010 REMODEL

DEPARTMENT OF INTERIOR / NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH RAMP ACCESIBILITY STUDY

PARK / LOCATION:

GEORGE WASHINGTON MEMORIAL PARKWAY

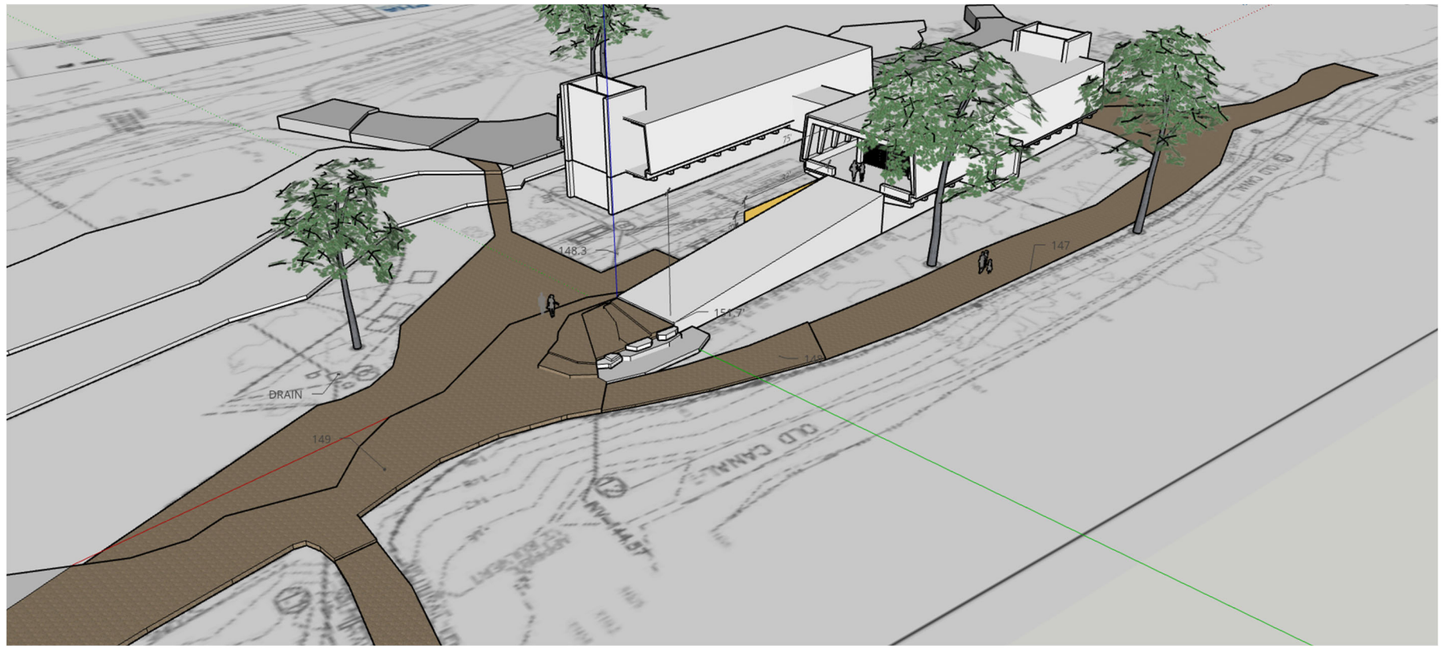
GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

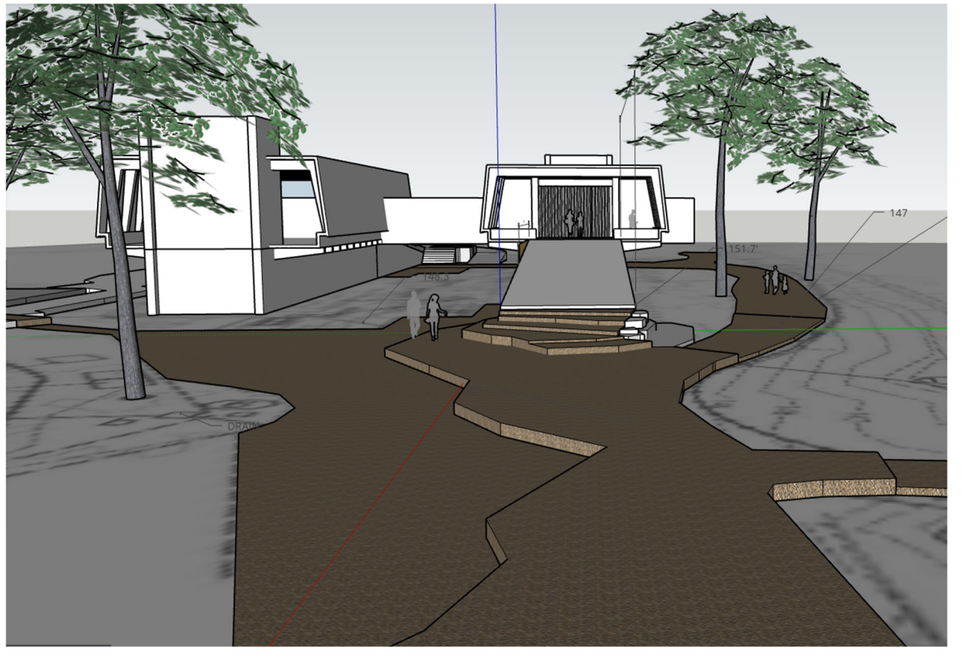
DRAFTED BY: SRK

SHEET: 1 OF 6

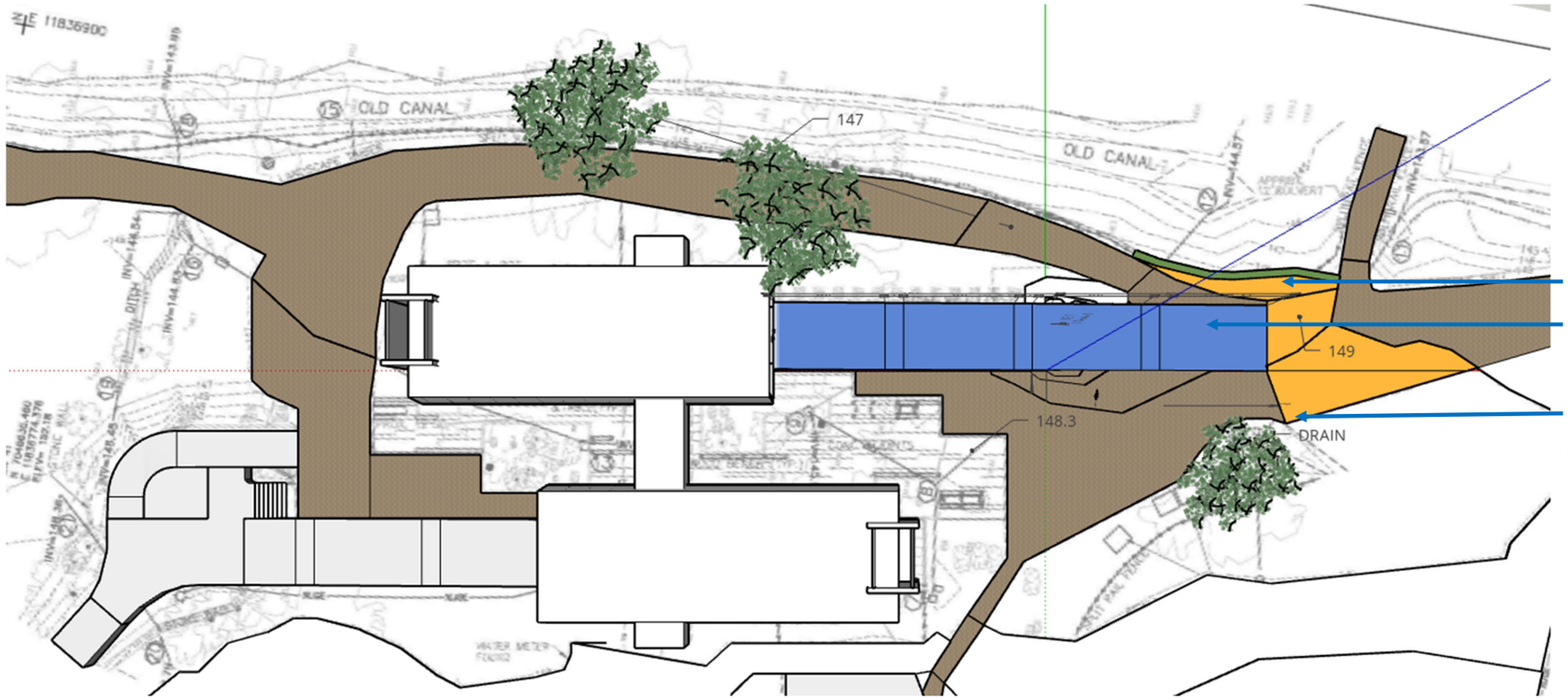
PLAN: VISITOR CENTER SOUTH RAMP, EXISTING CONDITION



ISOMETRIC: VISITOR CENTER SOUTH RAMP, EXISTING CONDITION



ELEVATION: VISITOR CENTER SOUTH RAMP, EXISTING CONDITION



KEY

RETAINING WALL

1:12 SLOPE ABAAS RAMPS/LANDINGS

1:20 SLOPE ABAAS SITE APPROACHES

ALTERATION OF PATH BEYOND EXISTING SPLIT-RAIL FENCE AT RAMP LANDING. RET WALL /GRADING REQ'D.

60'-0" (+/-) RAMP EXTENSION TO AREA OF EXISTING GRADE AT 149.0. 1:12 SLOPE, (4) 30' RUNS, 2'-6" RISE (REF SECTION 1, SHEET 6)

SITE GRADE ALTERATIONS REQ'D FOR LEVEL RAMP LANDING AT SITE APPROACH, MAX 1:20

DEPARTMENT OF INTERIOR / NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH RAMP ACCESIBILITY STUDY

PARK / LOCATION:

GEORGE WASHINGTON MEMORIAL PARKWAY

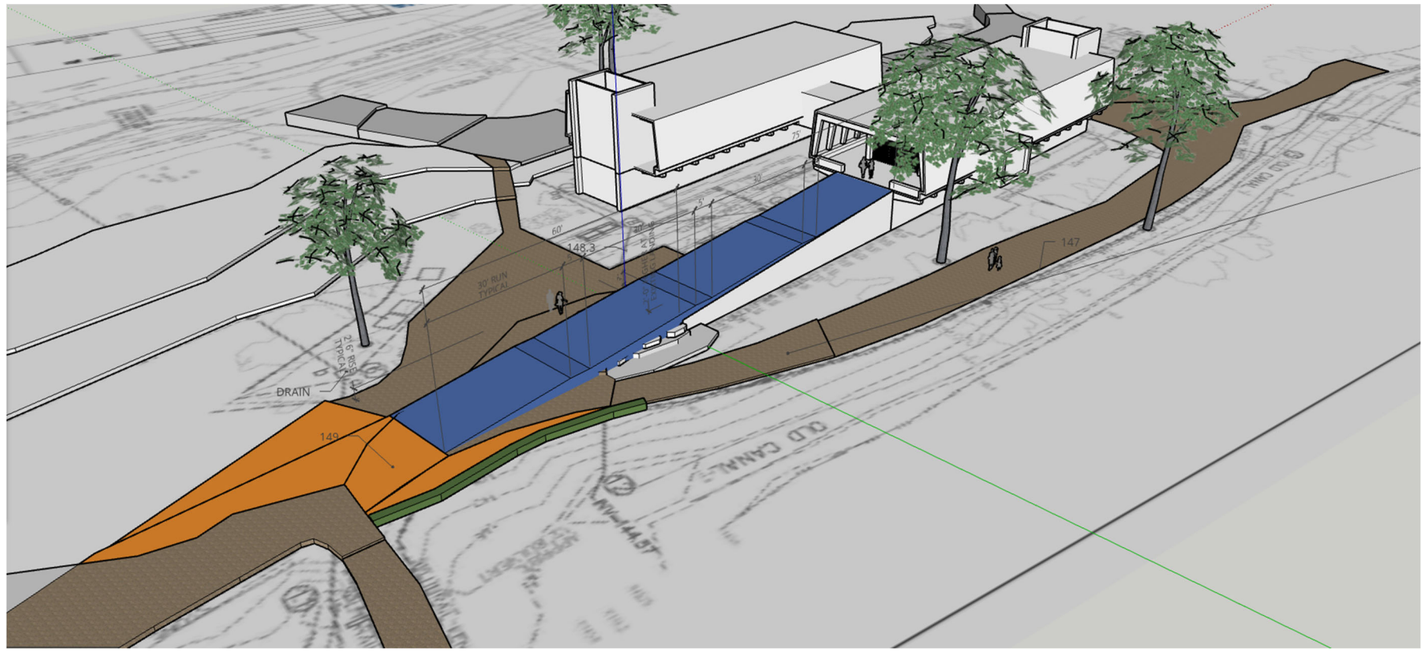
GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

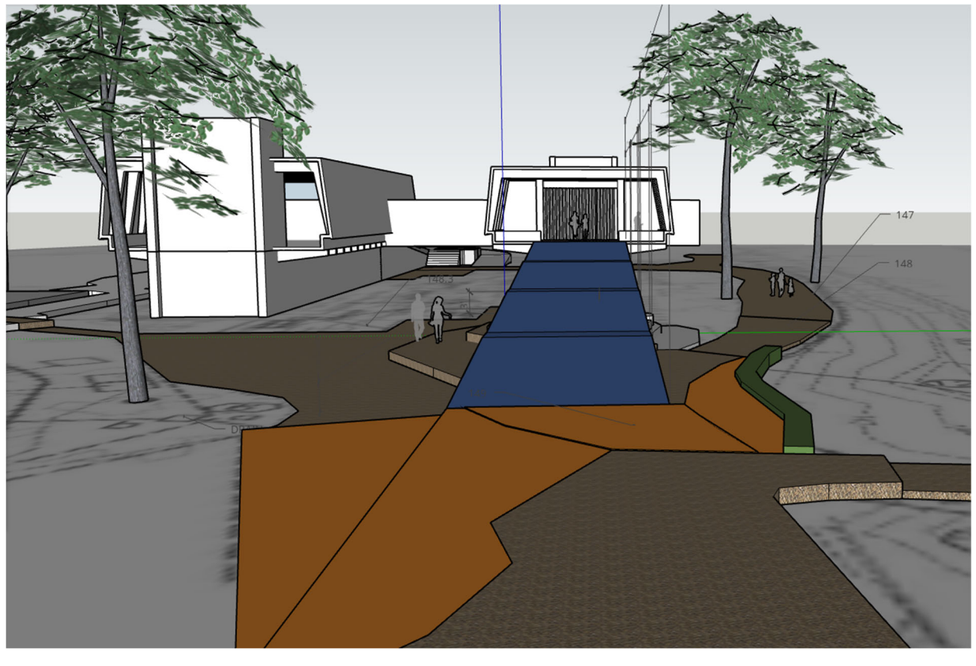
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SHEET: 2 OF 6

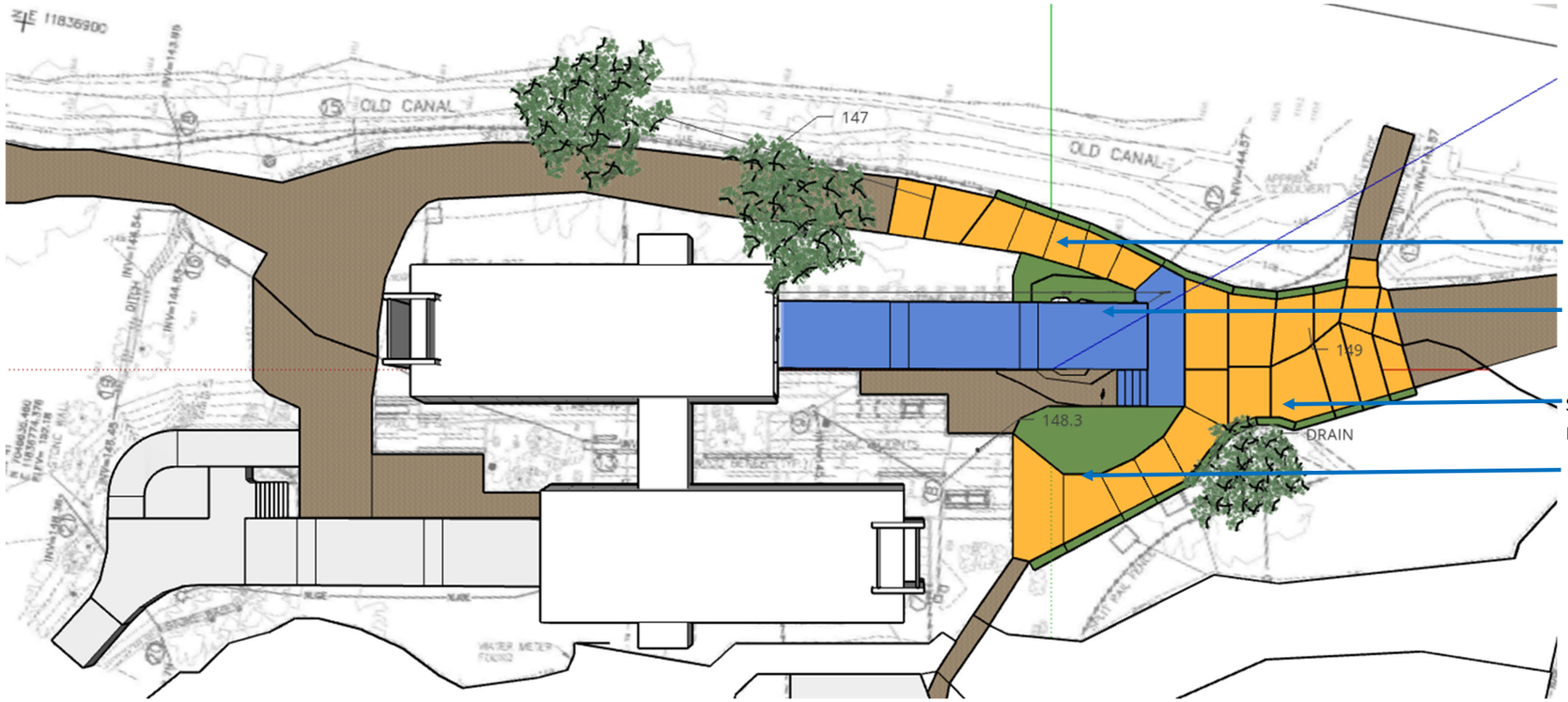
PLAN: VISITOR CENTER SOUTH RAMP, OPTION 1—LONG RAMP



ISOMETRIC: VISITOR CENTER SOUTH RAMP, OPTION 1



ELEVATION: VISITOR CENTER SOUTH RAMP, OPTION 1



KEY

RETAINING WALL/ LANDSCAPE STRUCT

1:12 SLOPE ABAAS RAMPS/LANDINGS

1:20 SLOPE ABAAS SITE APPROACHES

RAISED SITE APPROACH PATH WITH RET WALL /GRADING REQ'D (2' TO 4' HIGH). MAX 1:20 SLOPE

25'-0" (+/-) RAMP EXTENSION TO ALTERED RAMP LANDING (APROX 151.7). 1:12 SLOPE, (3) 30' RUNS, 2'-6" RISE STAIRS FROM LANDING TO COURTYARD. (REF SECTION 2, SHEET 6)

SITE GRADE ALTERATIONS (MAX 1:20 SLOPE) REQ'D FOR LEVEL RAMP LANDING. RET WALL REQ'D (2'/ 4' HIGH)

LANDSCAPE PLANTER (TYP OF 2)

DEPARTMENT OF INTERIOR / NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH RAMP ACCESIBILITY STUDY

PARK / LOCATION:

GEORGE WASHINGTON MEMORIAL PARKWAY

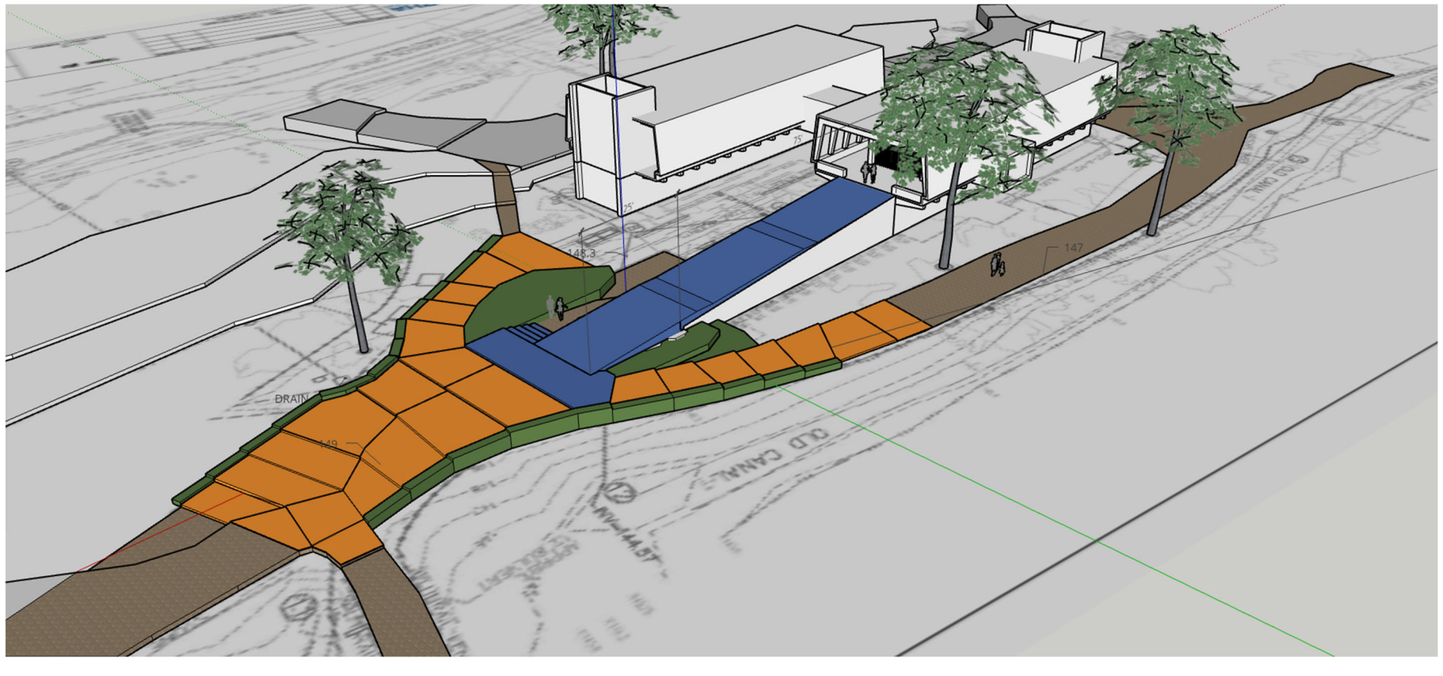
GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

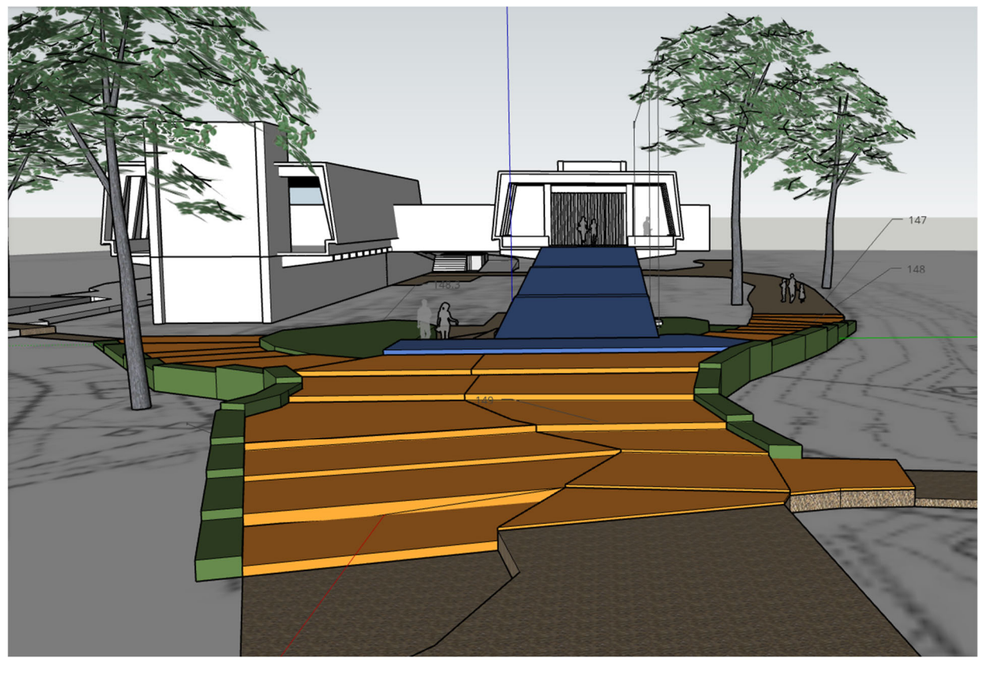
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SHEET: 3 OF 6

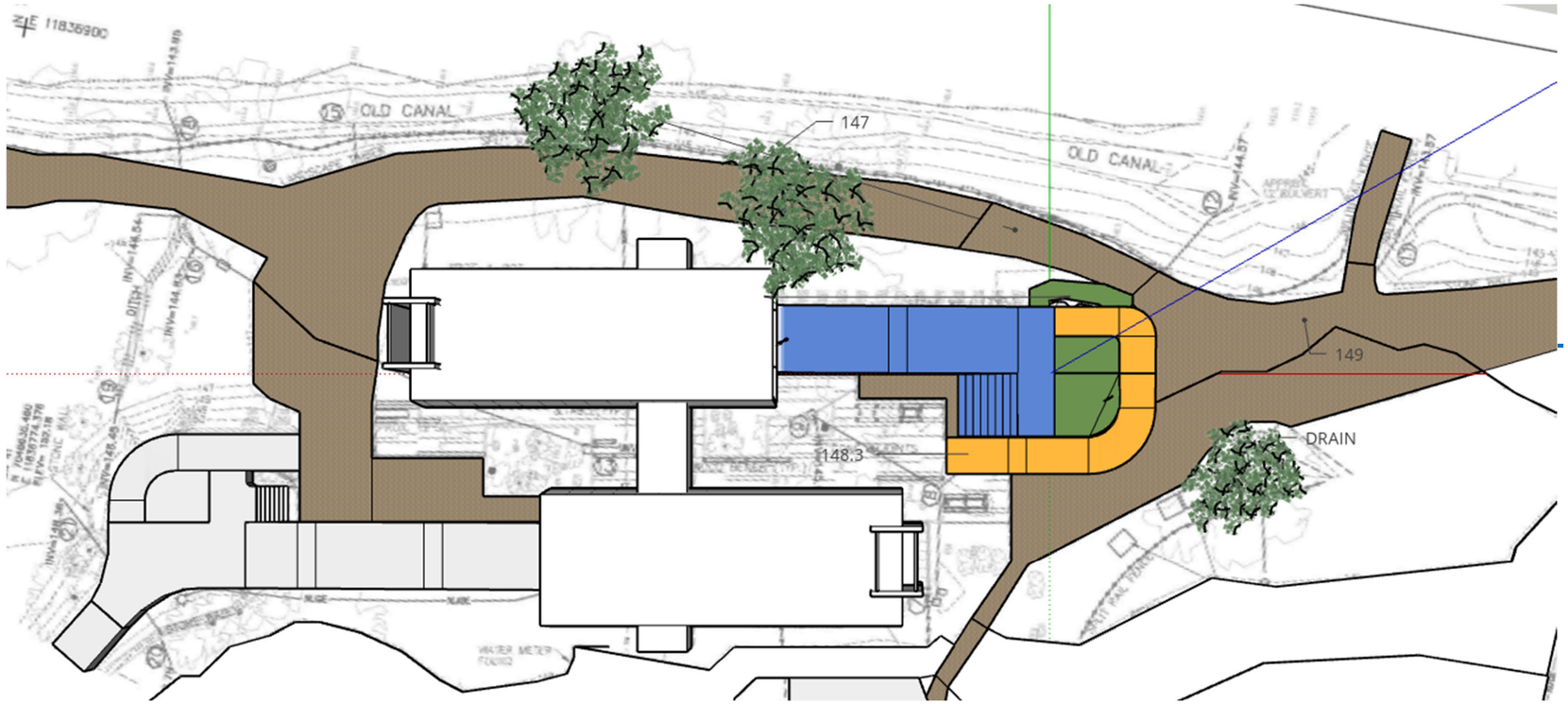
PLAN: VISITOR CENTER SOUTH RAMP, OPTION 2—SHORT RAMP, ALTERED SITE GRADES



ISOMETRIC: VISITOR CENTER SOUTH RAMP, OPTION 2



ELEVATION: VISITOR CENTER SOUTH RAMP, OPTION 2



KEY

RETAINING WALL/ LANDSCAPE STRUCT

1:12 SLOPE ABAAS RAMPS/LANDINGS

1:20 SLOPE ABAAS SITE APPROACHES

APROXIMATE CHANGES REQUIRED TO MIMIC 2010 ERA NORTH RAMP ALTERATIONS. 1:12 ABAAS RAMP CONSTRUCTED ON TOP OF EXISTING RAMP, LANDING AT APROX 153.5 (+/-), 100' LONG (+ / -) U-SHAPED SITE APPROACH RAMP AT MAX 1:20 SLOPE.

DEPARTMENT OF INTERIOR / NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH RAMP ACCESIBILITY STUDY

PARK / LOCATION:

GEORGE WASHINGTON MEMORIAL PARKWAY

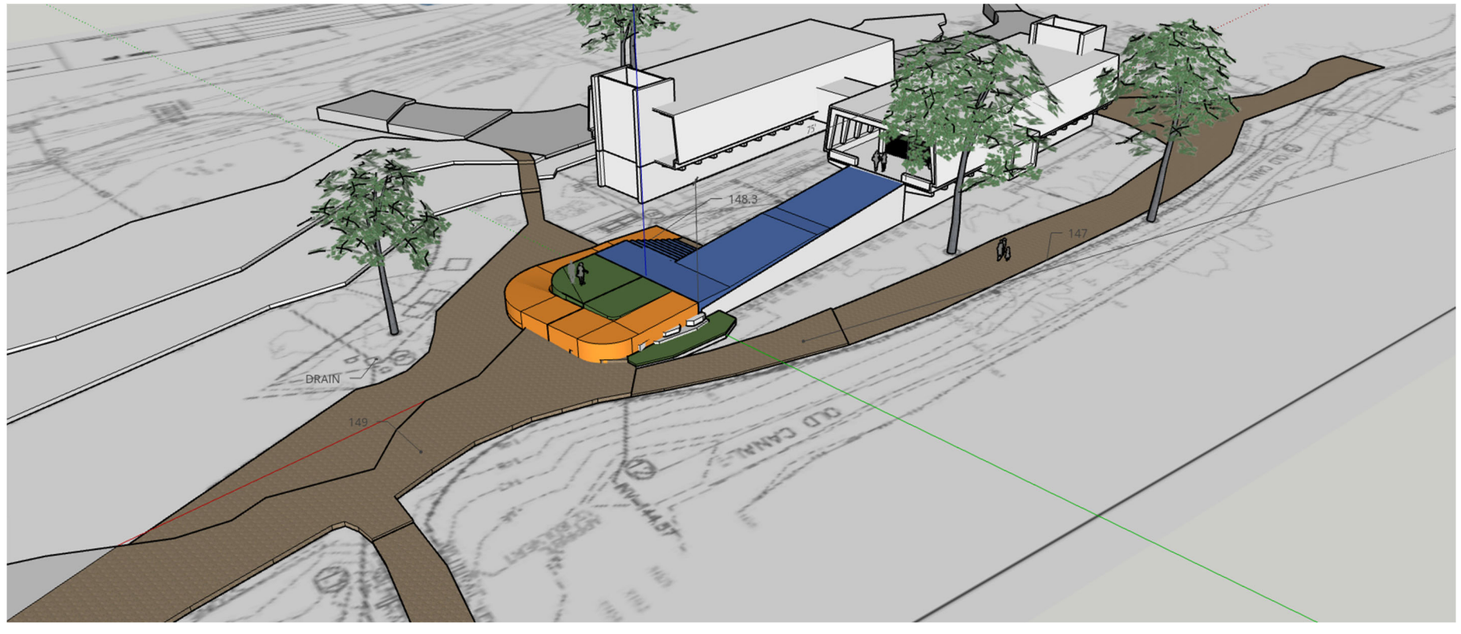
GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

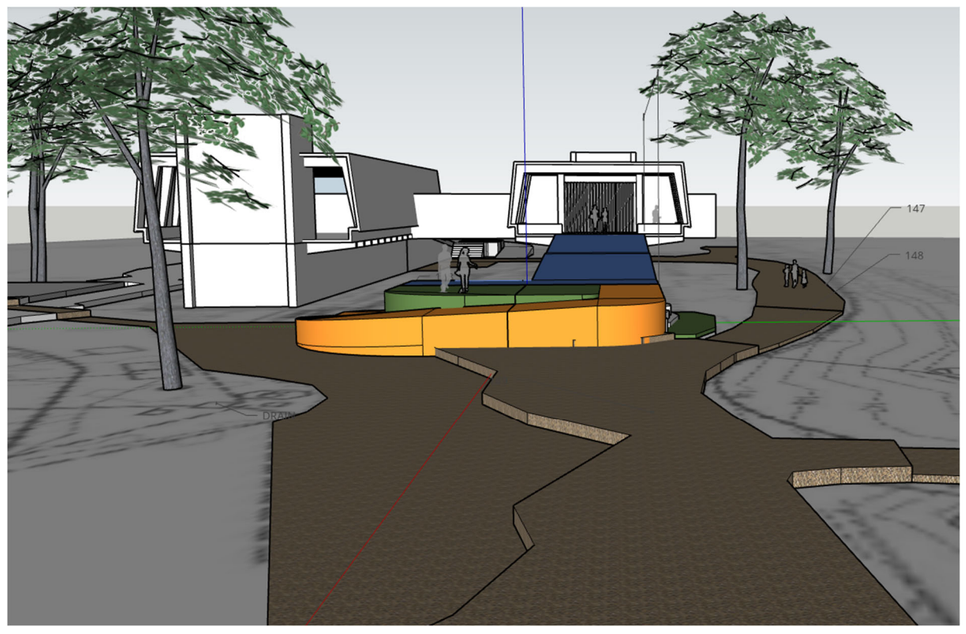
DRAFTED BY: SRK

SHEET: 4 OF 6

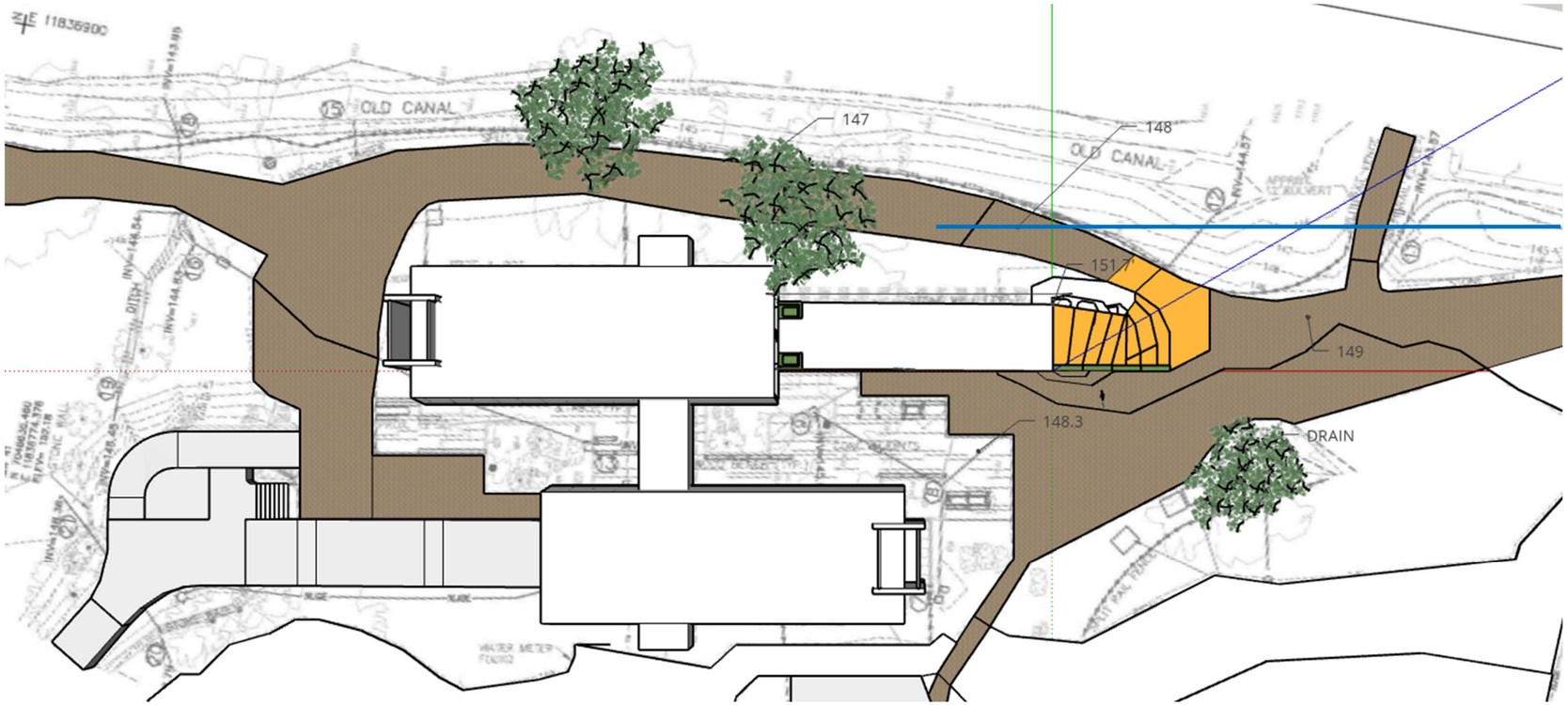
PLAN: VISITOR CENTER SOUTH RAMP, OPTION 3—MIMIC OF NORTH RAMP ALTERATION



ISOMETRIC: VISITOR CENTER SOUTH RAMP, OPTION 3



ELEVATION: VISITOR CENTER SOUTH RAMP, OPTION 3



PLAN: VISITOR CENTER SOUTH RAMP, OPTION 4

KEY

RETAINING WALL / ASSISTED RESCUE

1:20 SLOPE ABAAS SITE APPROACHES

IF ADVERSE EFFECTS ARE DEEMED TOO SIGNIFICANT TO PROCEED WITH OPTIONS 1,2,OR 3, RAMP SHOULD BE ALTERED IN THE FOLLOWING WAYS AT MINIMUM:

1. RESURFACE/REHABILITATE/RE-WATERPROOF EXISTING, NON-COMPLIANT, DETERIORATED RAMP
2. PROVIDE LEVEL "EXTERIOR AREA OF ASSISTED RESCUE" AT TOP OF RAMP (EITHER 1 ON EACH SIDE, OR 2 CENTERED) TO MEET IBC CHAPTER 10 EGRESS REQUIREMENTS, WITH PROVISIONS VERIFIED BY A/E AS PART OF FUTURE VISITOR CENTER RENOVATION.
3. RETAINING STRUCTURE TO MITIGATE EROSION AT RAMP LANDING WHERE EXISTING SITE SLOPE IS STEEPER THAN NON-COMPLIANT RAMP
4. RE-GRADE SITE APPROACH AT 1:20 WITH LEVEL SURFACE AT LANDING. PROVIDE SIGNAGE AT RAMP LANDING DIRECTING VISITORS TO ACCESSIBLE ENTRANCE LOCATION(S)

DEPARTMENT OF INTERIOR / NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH RAMP ACCESIBILITY STUDY

PARK / LOCATION:

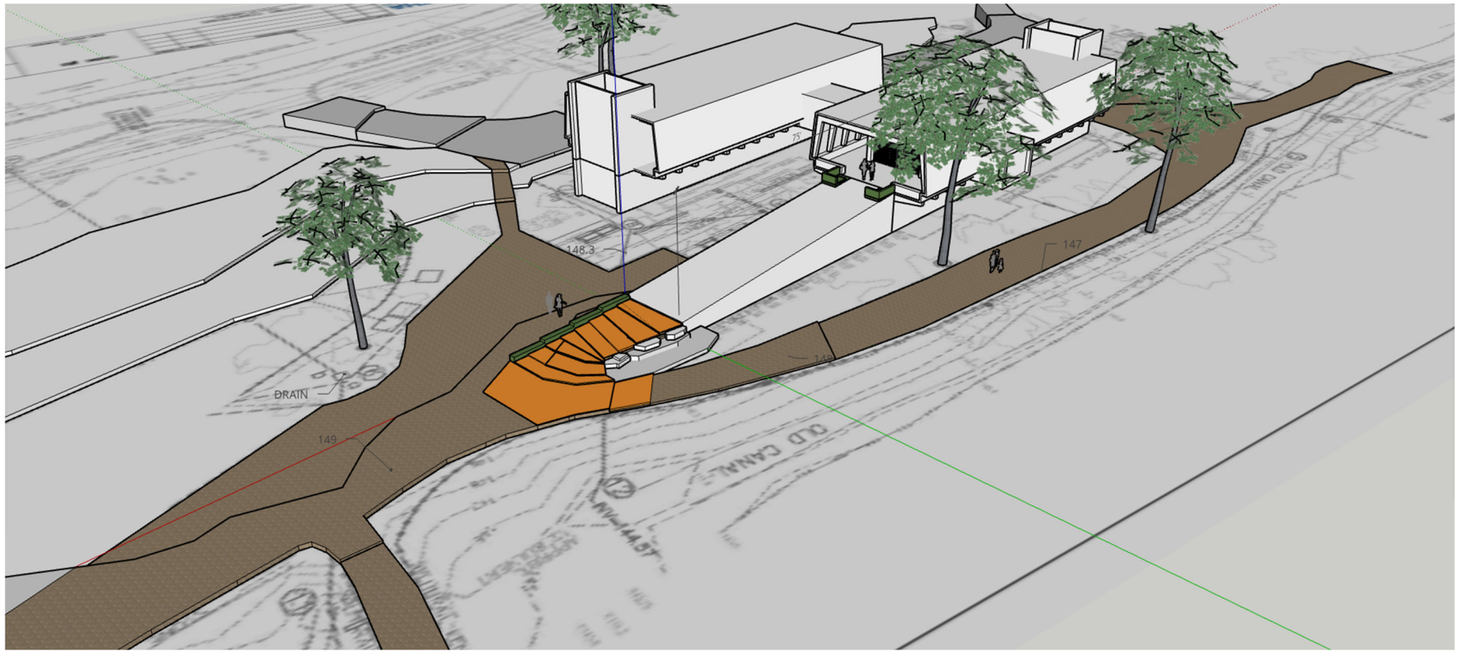
GEORGE WASHINGTON MEMORIAL PARKWAY

GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

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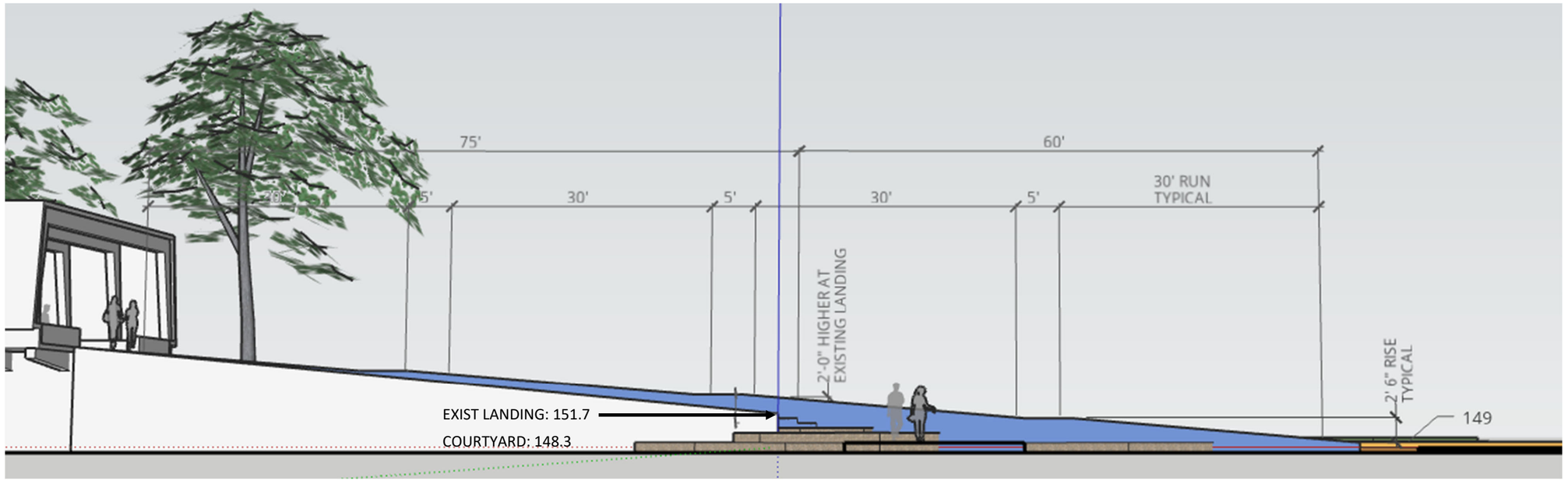
SHEET: 5 OF 6



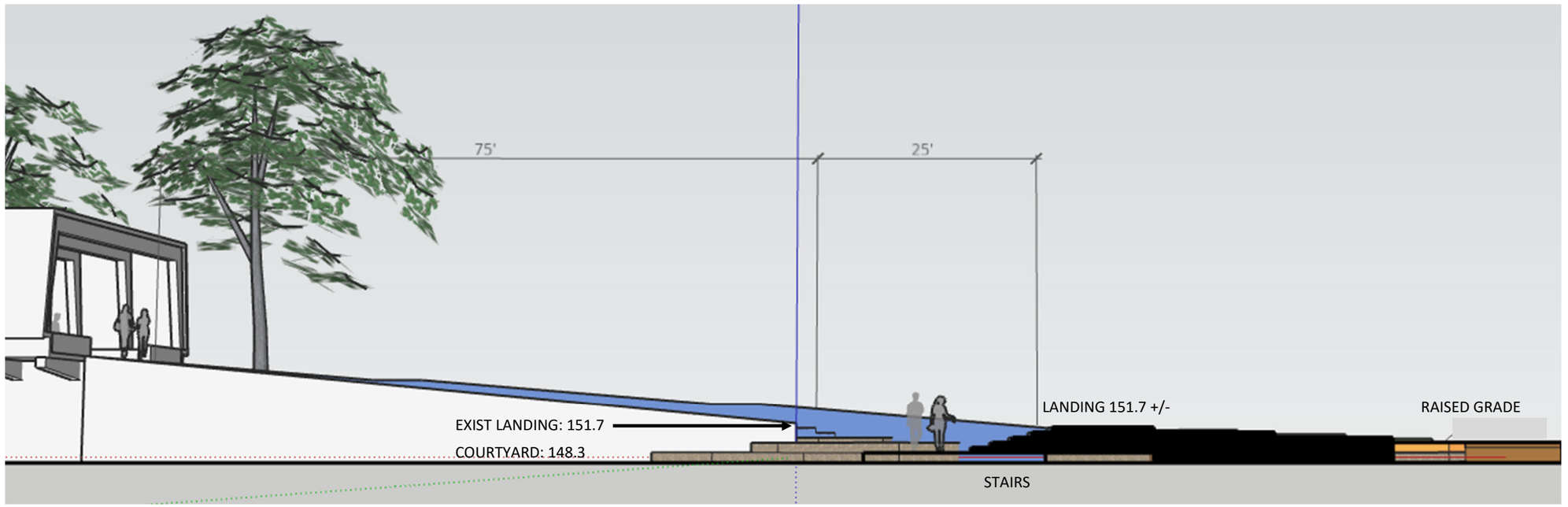
ISOMETRIC: VISITOR CENTER SOUTH RAMP, OPTION 4



ELEVATION: VISITOR CENTER SOUTH RAMP, OPTION 4



SECTION 1: VISITOR CENTER SOUTH RAMP, OPTION 1—LONG RAMP



SECTION 2: VISITOR CENTER SOUTH RAMP, OPTION 2—SHORT RAMP, RASIED GRADE

DEPARTMENT OF INTERIOR /
NATIONAL PARK SERVICE

TITLE:

VISITOR CENTER SOUTH
RAMP ACCESIBILITY STUDY

PARK / LOCATION:

GEORGE WASHINGTON
MEMORIAL PARKWAY

GREAT FALLS PARK
9200 OLD DOMINION DR.
MCLEAN, VIRGINIA 22102

DATE: *09.09.2022 — DRAFT*

DRAFTED BY: SRK

SHEET: 6 OF 6

Appendix E: South Ramp Accessibility Preliminary Design Study

The south ramp at the Great Falls Park Visitor Center does not meet current accessibility requirements and on several occasions the George Washington Memorial Parkway (GWMP) has considered making this ramp fully accessible. Each time, the potential adverse impacts to the historic Visitor Center and the adjacent National Historic Landmark (NHL) Patowmack Canal encouraged the park to find other means to meet accessibility requirements. To simplify these discussions in the future, this appendix, which includes three preliminary designs for a fully accessible ramp, as well as an assessment of the impact of these alterations upon the resources, has been included as a part of this report. The fourth option is a minor alteration that would allow the building to meet compliance requirements, with only minimal impact, but no without functional improvement. The first three options have the potential to cause an adverse effect to both NHL and National Register of Historic Places (NHRP) resources and are not recommended.

Designed in 1968 with north and south ramps to facilitate circulation for visitors of all abilities, Great Falls Park Visitor Center's design was unusually thoughtful and inclusive for the time. As accessibility standards developed into the 21st century, however, architect Kent Cooper's ramps at Great Falls Park fell out of compliance with some aspects of the accessibility code.

In 2011, the north ramp at Great Falls was rebuilt to meet contemporary accessibility requirements. The slope was decreased slightly (from 1:10 to 1:12), and a landing was added midway along its length. The existing natural grade at the north ramp is sloping toward the building, so with careful grading the designers were able to avoid increasing the overall length of the ramp, making little overall impact on the footprint or character of the site and structure. Historic guardrails, which incorporated areas for seating and evoked canal boat elements, were replaced with higher guardrails, and free-standing handrails were installed as well, so the guardrails can no longer double for benches. These changes at the north ramp brought the Great Falls Park Visitor Center into compliance with the requirements of the ABA.

The south ramp was not altered as a part of the 2011 project. At the south end, the natural grade is sloping away from the building. A compliant ramp, therefore, would require a much longer run than the original south ramp, potentially altering the symmetrical character of the building. Given the location of the ruins of the Potowmack Canal and its associated trail, a longer ramp could also impact that vital NHL resource. The Patowmack Canal is one of two NHLs administered by GWMP. Section 106 of the National Historic Preservation Act calls for the protection of NHLs, even beyond the level one uses to avoid, minimize, and mitigate adverse effects for properties listed on the NRHP. The Capper-Cramton

Act of 1930, which serves as the enabling legislation for the GWMP mentions ".... the preservation of the historic Patowmack Canal..." as one of the reasons for creating the park. Given that overwhelming significance, any actions which might adversely impact the canal must be avoided.

The NPS desires to make its facilities as accessible as possible, while also protecting natural and cultural resources. This 2022 HSR identifies three conditions concerns with the south ramp; the low historic guardrail; the deterioration of the concrete surface; and endemic erosion at the base of the ramp. Any rehabilitation of the structure will need to address these issues and will likely require some removal and replacement of historic fabric. Given the degree of intervention that will be required, park staff reconsidered the alteration of the south ramp to meet contemporary ABA requirements. In response, park designers developed preliminary designs for several ramp options, so impacts could be better understood by the full team.

Option 1 extends the length of the ramp to the south, requiring the insertion of three landings (as opposed to just two at the north ramp) nearly doubling the total length of the ramp, and significantly altering the symmetrical character of the design. This work will require a significant amount of grading at the base of the ramp that will impact the existing trail and require fill at the edge of the ruins of the Potowmack Canal. In addition to the ramp changes, the historic guardrails will be replaced with new guardrails to create a fully code-compliant ramp.

In Option 2, the ramp is lengthened less than in Option 1, but more extensive grading is required at grade, along the river side trail, from the trail to the first overlook, and from the courtyard leading up to the trail. River side grading will impact the canal ruins, and courtyard-side grading will impact the courtyard landscape. This option will also add a stair feature between the courtyard and the ramp. A similar stair does exist at the north ramp, added as a part of the 2011 project. As in Option 1, Option 2 will require the replacement of the current historic guardrails with new code-compliant members.

Option 3 does not increase the length of the wide historic south ramp but introduces an additional narrower curving ramp at the base of the historic run. This ramp will have the effect of altering the designed circulation, forcing all users to turn back into the courtyard before proceeding south to the falls. As in Options 1 and 2, the guardrails at the south ramp will have to be replaced in Option 3.

While Options 1, 2 and 3 alter the south ramp and guardrail to bring it into full compliance with current ABA requirements, Option 4 merely introduces an exterior area of assisted rescue at the top of the ramp and does not bring the ramp into ABA compliance. The current top landing is wide enough to serve as an area of assisted rescue, but the overhanging roof covers the area, disqualifying it from consideration as an exterior area. Option 4 creates two flat landings, on either side of the top of the ramp, that are code-

compliant areas of refuge. These areas will narrow the width of the ramp and new guardrails will surround them, creating a visual barrier. The non-compliant ramp will be repaired in this option, erosion at the base addressed, and the historic guardrails will be replaced with code-compliant versions.

Options 1, 2 and 3 creatively explore the accessibility problem at the south ramp, but all three will significantly impact the natural and cultural resources at the site. The length of the ramp at Option 1, and the requirement to grade within the basin of the canal ruin are significant changes that will alter the historic character and put archaeological resources at risk. Option 2's canal-side grading, and the introduction of the new stair element to the courtyard will also negatively impact the character of the space and will require considerable archaeological study. Option 3's alteration of the fundamental flow-through circulation pattern that drove Cooper's design will similarly negatively impact the character and function of the space, particularly when considering the guardrails that will be required for this solution. Option 4 will only moderately impact the character of the ramp and the building, but one may question the utility of such an area of assisted rescue.

Options 1, 2 and 3 present potential adverse effects to the historic character of the building, and Option 4's exterior area of assisted refuge is of questionable utility. Upon review, the addition of an interior elevator, recommended in this HSR, would seem to be a better means to improve accessibility. Although an elevator will require the removal of some historic interior fabric, it is significantly less likely to cause an adverse effect. This appendix recommends repairing the existing concrete south ramp, replacing the guardrails to meet current codes, and repairing the erosion conditions that occur at the base of the ramp.

This appendix, including the four preliminary designs for the south ramp, along with an evaluation of advantages and disadvantages for each, is included in this HSR as a means to memorialize the park's decision-making process and to inform future park staff that may revisit the question in the future.

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APPENDIX F: 75% HSR SUBMISSION TREATMENT OPTIONS

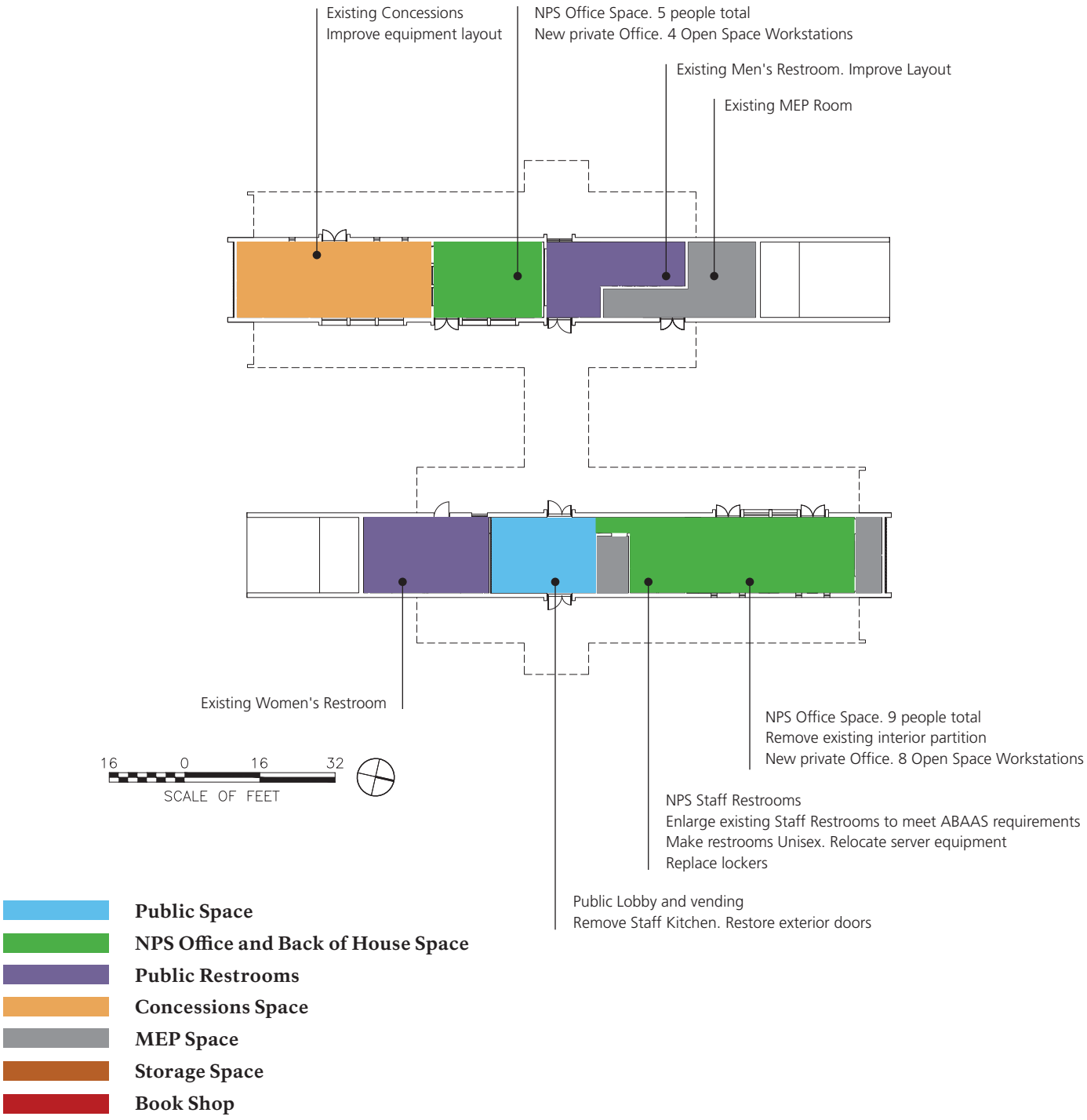


Figure 248. Treatment Recommendation Option 1 First Floor Program Diagram, (CRTKL 2022)

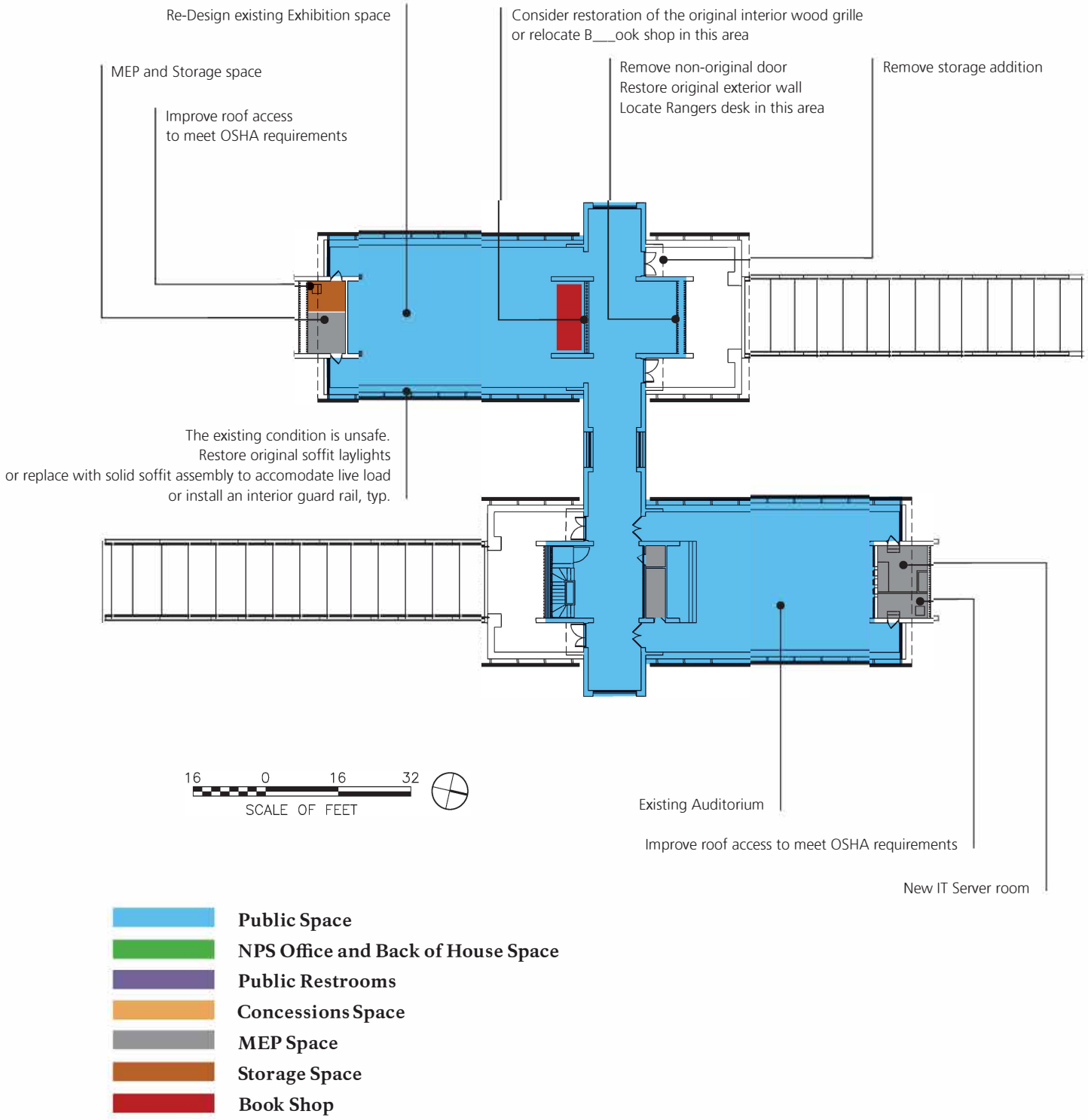


Figure 249. Treatment Recommendation Option 1 Second Floor Program Diagram, (CRTKL 2022)

SPECIALIZED TREATMENT RECOMMENDATIONS

Following the 22 November 2021 Planning Workshop with CRTKL, NPS/GWMP held a series of internal discussions, drawing in facilities, interpretation, and cultural resources staff to discuss the maintenance, use and significance of the Great Falls Visitor Center. On February 23, 2022, NPS issued to CRTKL a memo with direction regarding 3 potential Treatment Options Alternatives. The Design Team used this NPS memo to inform proposed Treatment Options included in this report.

OPTION 1: OPTIMIZE.

The intent of the Option 1 is to improve efficiency and function throughout the building while maintaining current uses. The main goal for the program and circulation adjustment is to partially restore original building circulation pattern as follows:

- Reconnect second floor public space to the reclaimed original ground floor public lobby in the Building A-B
- Restore the east-west public circulation on the second floor by re-locating book shop program and removing non-original ranger's desk.

PROGRAM AND GENERAL ARCHITECTURAL TREATMENT RECOMMENDATIONS (Figures 248 and 249)

Building A-B Ground floor

1. Reconfigure floor layout by removing staff kitchen area and interior partitions in the NPS office space. Replace staff kitchen program with public lobby program to match original design intent.
2. Provide one private office and 8 open space workstations in the NPS office area (9 people total).
3. Restore public lobby double doors on the east wall of the building.
4. Keep existing women's restroom layout.
5. Reconfigure NPS staff restrooms by moving CMU partitions and making restrooms larger to meet ABAAS requirements. Consider making both restrooms Unisex.

6. Consider relocating server equipment to a new IT room / server space inside the original auditorium projector booth space. The removal of the server equipment will allow for ABAAS compliant restroom access.
7. Reconfigure lockers located in the restroom lobby. Provide stacked lockers. Coordinate locker and space layouts to allow access for one of the proposed unisex restrooms to meet ABAAS requirements.
8. Repair exterior ramp rail.
9. Re-grade the courtyard and make drainage improvements to prevent flooding into ground floor office spaces.
10. Re-grade to provide ABAAS compliant condition at all exterior door thresholds.

Building B-C Ground floor

1. Keep existing floor layout and program distribution.
2. Reconfigure men's restroom to improve layout and function. Consider flipping uneven double leaf doors to improve interior circulation.
3. Retrofit restroom door hardware to provide power assist.
4. Reconfigure NPS office area to include a private office and 4 open workplace stations (5 people total). Consider Option for 3 open workplace stations and additional storage space.
5. Keep existing space configuration of the concessions area but consider improving equipment layout to avoid equipment blocking a fire exit.
6. Keep existing MEP space configuration.
7. Consider storage use for the underutilized back-of-house rooms of the concessions area.
8. Remove concessions exterior storage area and fence. Install landscape.
9. Re-grade along the west elevation to reduce flooding into the men’s restroom and reduce burden on CMU base-of-wall to prevent leakage into concealed spaces near the northwest building corner.

Building A-B and B-C Second floor

1. Reconfigure the main building entry (Building B-C) in the spirit of the original design. Remove the storage addition at the north ramp and non-original entry doors.
2. Relocate book shop program to the area between freestanding CMU walls connecting building lobby and exhibit space.
3. Consider option to restore original interior wood screen and seat between freestanding CMU walls between building lobby and exhibit space.
4. Relocate non original ranger's desk to open east-west corridor connecting the Buildings A-B and B-C.
5. Consider restoration of the original interior wood grille at the exhibition space entrance.
6. Consider reconfiguration of the exhibit to allow a fully enclosed back-of-house space along the south façade of Building B-C. This space could be used as MEP and Storage space.
7. Consider locating a new central IT / server room in the auditorium projection room.
8. Improve roof access in the Buildings A-B and B-C to meet OSHA requirements.
9. Keep existing non-original configuration of the communicating stair and lift.

ENCLOSURE TREATMENT RECOMMENDATIONS

Commensurate building enclosure measures to meet Option 1 goals of optimizing the building's use and function include the following:

Roof

To eliminate leakage around the roof perimeter, replace the roofing and reconfigure the perimeter flashings. NPS has undertaken a roof replacement project, as described in the 100% CD Set for the "Roof Replacement, HVAC Units Replacement, and HVAC Maintenance" project prepared by the National Park Service and dated 14 June 2021. The re-roofing design changes the roof slope and incorporates con-

temporary code-required amounts of insulation above the roof deck (average R-30 roof insulation). In general, the roof replacement design satisfies the goals of Option 1 – Optimize and will address leakage around the roof perimeter if constructed properly.

We have the following specific recommendations for Option 1:

1. The existing roof assembly is not original; the roof edge has a short parapet formed by wood blocking approximately 3 inches taller than shown on the original architectural drawings. The re-roofing drawings do not propose any further changes to the height of the perimeter parapet and incorporate gravel edge stops and cricketing to accommodate new roof insulation. We generally agree with the design approach shown in the re-roofing drawings; however, we recommend adjusting edge detailing so that the base ply of the modified bituminous roof laps onto exterior wall materials (Figure 250).

2. During re-roofing cover the tongue-and-groove decking with a self-adhered vapor retarder rather than red rosin paper.

3. The existing roof assembly suffers from bond loss and crushed insulation. For re-roofing Include a cover board on top of the tapered insulation to reduce incidence of crushed insulation in the new roof assembly.

4. To reduce air infiltration and potential for water leakage at roof truss joints which interface with the building enclosure, we recommend filling the gaps with sealant. Note the sealant will require periodic maintenance. Other solutions may require less maintenance while reducing air leakage but will have a greater aesthetic impact (e.g. metal flashing or silicone sheet flashing). We recommend prioritizing preservation of the historic appearance of the trusses while approaching modern performance goals for air infiltration using a low-viscosity, paintable sealant.

Fenestration

The existing conditions feature a wide variety of fenestration systems; some have recently been replaced, such as the windows on the second floor, but others are original, such as the narrow ground floor windows. We found instances where fenestration requires replacement for safety. Beyond life safety issues, Option 1 includes near-term maintenance to further the life cycle of units. We have the following specific recommendations for Option 1:

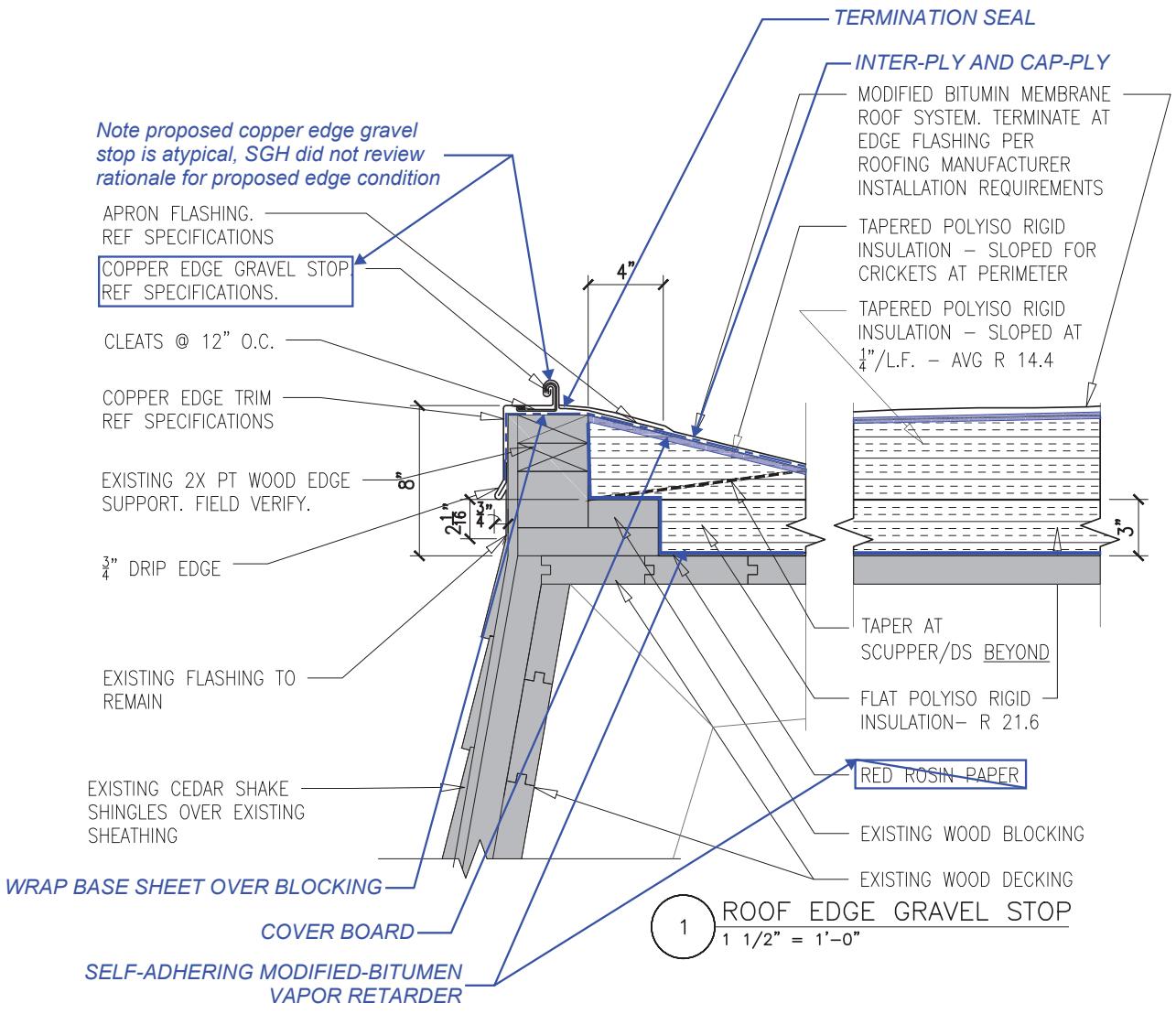


Figure 250. Treatment Recommendations Roof Edge Condition, (SGH 2022)

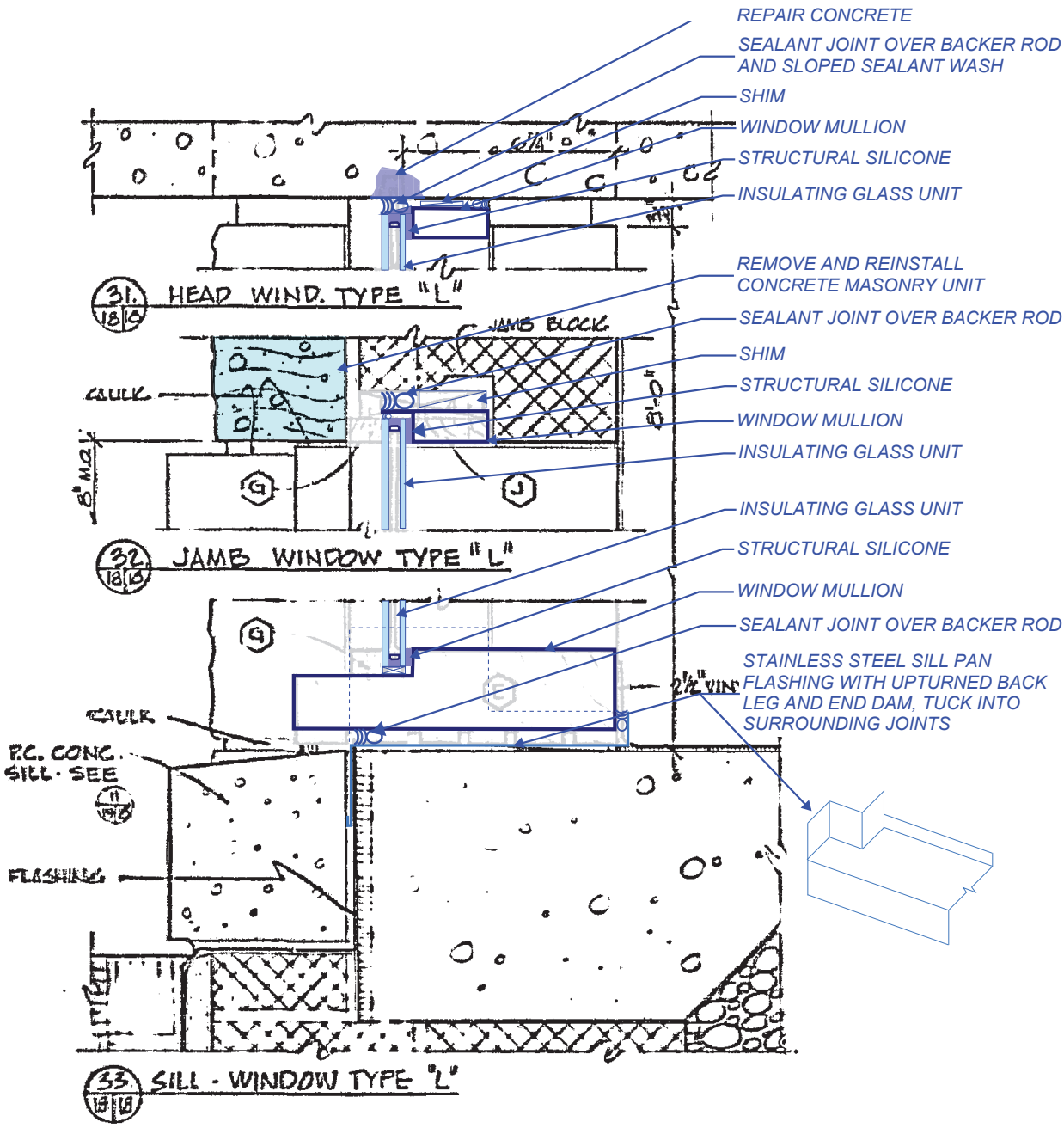


Figure 251. Treatment Recommendations Ground Floor Narrow Window Condition, (SGH 2022)

1. The narrow ground floor windows, soffit glazing in the theater and exhibit space, and some glazing near the second-floor entrances are at increased risk for breakage because the glass is in direct contact with concrete or separated from concrete by only a thin layer of sealant. The glass at these locations is unmarked, indicating it is likely not safety glazing. We recommend replacing all glass which is in direct contact with concrete with contemporary aluminum-framed windows with insulating glass units (IGU's). Window perimeter frames will alter the appearance of the building from both the interior and the exterior, but there are options available to blend in the appearance of the frames with the surrounding materials (Figure 251).

2. Soffit glazing and plastic paneling along the base of the cedar-shake clad walls is a fall hazard and must be addressed as part of the repair work. Replacement of the soffit glazing will require either designing the laylight or solid soffit assembly to accommodate occupant live loads or introducing fall protection to the interior space (e.g., grating or railing). We recommend designing a walkable laylight to replace the existing glazing and plastic infill panels to accommodate occupant live loads while reintroducing natural light. (Figure 252). for conceptual organization of a new laylight.

   Install operable shade / louver system or consider use of dynamic glazing (e.g., electrochromic or thermochromic) or electrochromic film to control the soffit laylight daylight. Coordinate daylight control systems with specific future use and programs.

3. Storefront systems along the bridge connecting Building A-B to Building B-C suffer from gasket shrinkage and air leakage. As part of Option 1, we recommend wet-sealing storefront units but planning for glazing and gasket replacement in the next five to ten years. Reducing air leakage will improve energy performance and reduce duration and severity of condensation.

Site

Although not part of this HSR scope, to reduce periodic flooding through ground floor door thresholds at grade into the restrooms and ground floor office spaces, we recommend re-grading the courtyard away from the building walls and increasing site drainage.

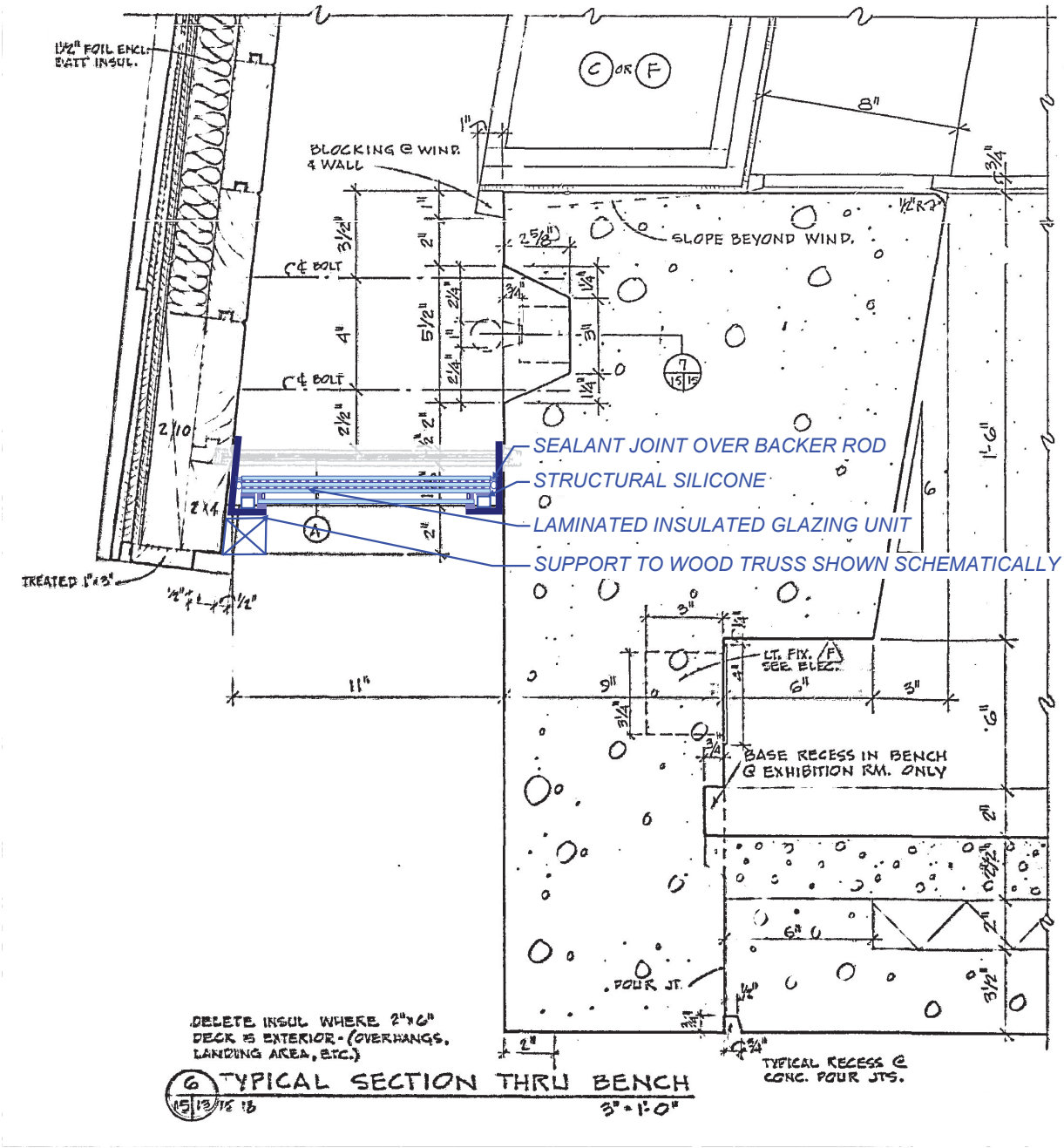


Figure 252. Treatment Recommendations Laylight Condition, (SGH 2022)

STRUCTURAL TREATMENT RECOMMENDATIONS

1. ***Second floor wood structure miter joint.***

   The recommendation is to monitor. If the roof loading is changed during re-roofing project, we recommend evaluation for required structural reinforcement. The gap and warping of the wood structure could be addressed only if structural members are replaced. The roof is currently a flexible system and therefore any changes to the second-floor building enclosure should accommodate required movements. The flexibility of the roof system comes from the way the miter joint connection is made because it allows rotation and when the roof members deflect vertically, horizontally or twist from warping this joint allows these movements to occur. The miter joint connection has two components that serve specific purposes: first are the two split ring connectors which is just a hollow steel pipe section that is cut into the cross-section of the ends of the wood members and transfers shear across the connection; second are the two bolts that go through the center of the split ring connectors and transfer tension across the connection. Both of these elements are located in the outside corner of the miter joint allowing the inside corner to open up a small amount as the joint rotates.

2. ***Concrete Repair.***

   Provide minor concrete repair around exposed concrete elevated slab & beam structure recommended to prevent further degradation while it is still in good condition. Conservator input is recommended for the concrete repair materials.

3. ***Slab on grade settlement.***

   The building wall foundations are sitting on rock. The slab on grade most likely is sitting on a thin layer of fill. It is unlikely the observed settlement is a result of soil compression. The settlement is more likely an issue related to the drainage. Therefore, if the site drainage is improved, then a leveling slab could be a viable option.

4. ***Stepped crack in CMU wall***

   The observed stepped crack does not currently present a structural concern because in the cracked condition it is still acting as a bearing element. Until the crack is repaired the small section of wall is not contributing to the lateral system, however there is so much existing wall intact that this is not an issue. The source of the crack is unknown. It is not likely a settlement issue because

the foundations should be sitting directly on rock according to original design documents. Repair the crack by repointing and correct the site drainage.

5. ***Laylights***

   Provide structural reinforcement of the existing structure and provide new structural framing and attachments to restore the second floor horizontal laylight. The new laylight system shall hold a live load to eliminate fall hazard.

ELECTRICAL TREATMENT RECOMMENDATIONS

1. The existing electrical distribution system in the building is at end of its service life and should be completely replaced. There are two service meters located in the main electrical room on the second floor in front of the Auditorium. The service serving the main building is rated at 800A, 208Y/120V, 3-phase, 4-wire. The service for the kitchen is rated at 200A, 208Y/120V, 3-phase, 4-wire. The main electrical room does not have code required access space for electrical distribution equipment and this requires immediate remedy solution to provide adequate access space for serving electrical equipment. Furthermore, the electrical distribution equipment in the room are at end of their service life and should be replaced. The main distribution panelboard is manufactured by Federal Pacific, a company that is no longer in business. The main electrical room should be enlarged to accommodate all electrical distribution equipment and maintain code-mandated access distance/space. A more suitable location for the main electrical room will be on the first floor closer to where the main utility service enters the building.

2. The electrical distribution systems should be replaced in its entirety as the equipment and wiring are of the original building vintage and are beyond their useful service life. Additionally, the existing panels are all indicated to be fully used without any spare circuits or capacity to accommodate any new circuits or loads.

3. The lighting system (both interior and exterior) is old and is recommended to be replaced with energy efficient lighting and control system meeting current energy code and standards.

4. New emergency lighting and exit signs are to be provided to meet life safety and building codes.

MECHANICAL TREATMENT RECOMMENDATIONS

1. Replace existing HVAC equipment on a one for one replacement basis and right size all units per updated HVAC load calculations that would be performed on the building.
2. Address air flow in men's restroom by simply removing dirt and debris from the existing makeup air louver in the exterior wall that serves this room. The louver is blocked up and is causing excessive negative pressure in the restroom.
3. Provide new mechanical systems layout for the new men's restroom layout.

PLUMBING TREATMENT RECOMMENDATIONS

1. The existing domestic water service piping and valves are old and are severely rusted. They must be replaced with new. A new backflow preventer will have to be installed on the incoming domestic water service to comply with code requirements.
2. It is recommended to replace any plumbing fixtures in spaces that are affected by this optimization phase to newer more water efficient and low flow fixtures.
3. Provide new plumbing systems and connections for the new men's restroom layout.

FIRE PROTECTION AND LIFE SAFETY TREATMENT RECOMMENDATIONS

Fire Alarm System Repair or Replacement

The existing fire alarm system is currently in poor condition, with numerous trouble signals and site personnel stating that the fire alarm system cannot transmit signals outside the site. Additionally, the fire alarm system was likely installed about 2006, making it 16 years old.

We recommend for a fire alarm technician to come in to find and repair the issues to have a functional fire alarm system.

There are number of the existing fire alarm system installation deficiencies outside of functionality, such as manual pull stations at an improper height, manual pull stations not located at each exit, lack of smoke detection in some parts of the building, and inadequate notification appliances. Address issues listed above by minor firealarm modifications to the existing system.

Consider replacing the fire alarm system with modern system, including voice notification. This will provide the Visitor Center with a more robust fire alarm sys-tem that is easier to repair and maintain, as older systems become more difficult to maintain as parts become less available. In addition, providing a new fire alarm system will allow the installers to fix existing issues, such as manual pull stations at an improper height, manual pull stations not located at each exit, lack of smoke detection in some parts of the building, and inadequate notification appliances.

Exit Door Updates

The exit doors serving the second floor and the doors serving the Auditorium are required to have panic hardware on the doors. In addition, egress doors are required to release locks upon egress without special effort. Neither the panic hardware nor lock releases are provided. It is recommended that the doors are modified to have panic hardware and lock releasing doors as applicable.

In addition, the exit doors to the center courtyard on the first floor do not have exit signs. Provide missing Exit signs to ensure that occupants know where to go in an emergency.

Update Stair Railing

The Building A-B communicating stair has several deficiencies:

- The stair hand rail is not returning to post, wall or floor and does not meet NFPA 101 requirement (NFPA 101, 2018 edition, section 7.2.2.4.5.9). The handrail height is a ABAAS issue (Section 505.4).
- The handrails are of different heights and do not meet ABAAS standard (Section 505.4).

It is recommended that the handrails be modified to return to post, wall or floor, and be at the same height.

Fire Extinguisher Inspections

The fire extinguishers are required to be inspected monthly and annually. However, the fire extinguishers in the Visitor Center are not inspected. It is recommended that an inspector be hired to come in monthly or annually.

New Sprinkler System Throughout

The Great Falls Visitor Center is not currently protected by a sprinkler system. A sprinkler system would help contain a potential fire, limiting the potential damage, and give occupants more time to egress. The sprinklers would help improve the exit remoteness justification for the Auditorium. In addition, a sprinkler system is necessary to meet the requirements for a convenience stair for the stair connecting the first and second floors. We recommend installing a sprinkler system.

VERTICAL TRANSPORTATION AND CIRCULATION

The existing non-original elevator platform and hoistway must be enlarged to fully meet ABAAS requirements. The larger hoistway may require removal or adjustment of the original wood grille at the back of the exterior wall adjacent to the elevator and potential reconfiguration of this exterior wall assembly to allow use of the full 5'-8" clear opening between second floor structural beams. The 5-feet dimension is a minimum recommended hoist-way depth dimension for any type of ABAAS compliant elevator system. The adjacent non-original stair presents a constraint for the platform and hoistway width.

We recommend keeping the existing elevator configuration for Treatment Option 1. The elevator replacement is considered in Treatment Options 2 and 3.

SIGNAGE

Improve wayfinding inside and out, consistent with the courtyard redesign and interpretive efforts.

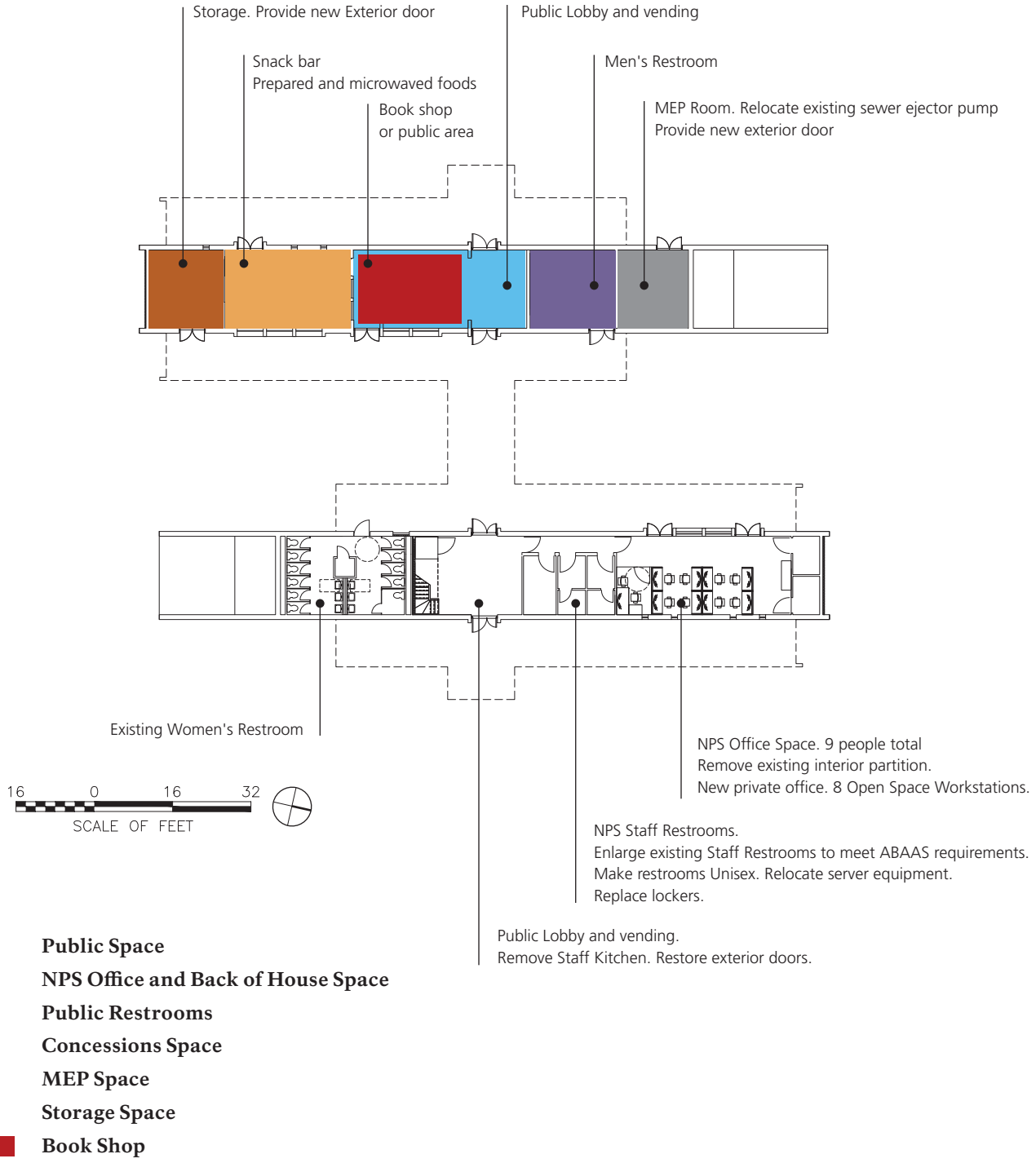


Figure 253. Treatment Recommendation Option 2 First Floor Program Diagram, (CRTKL 2022)

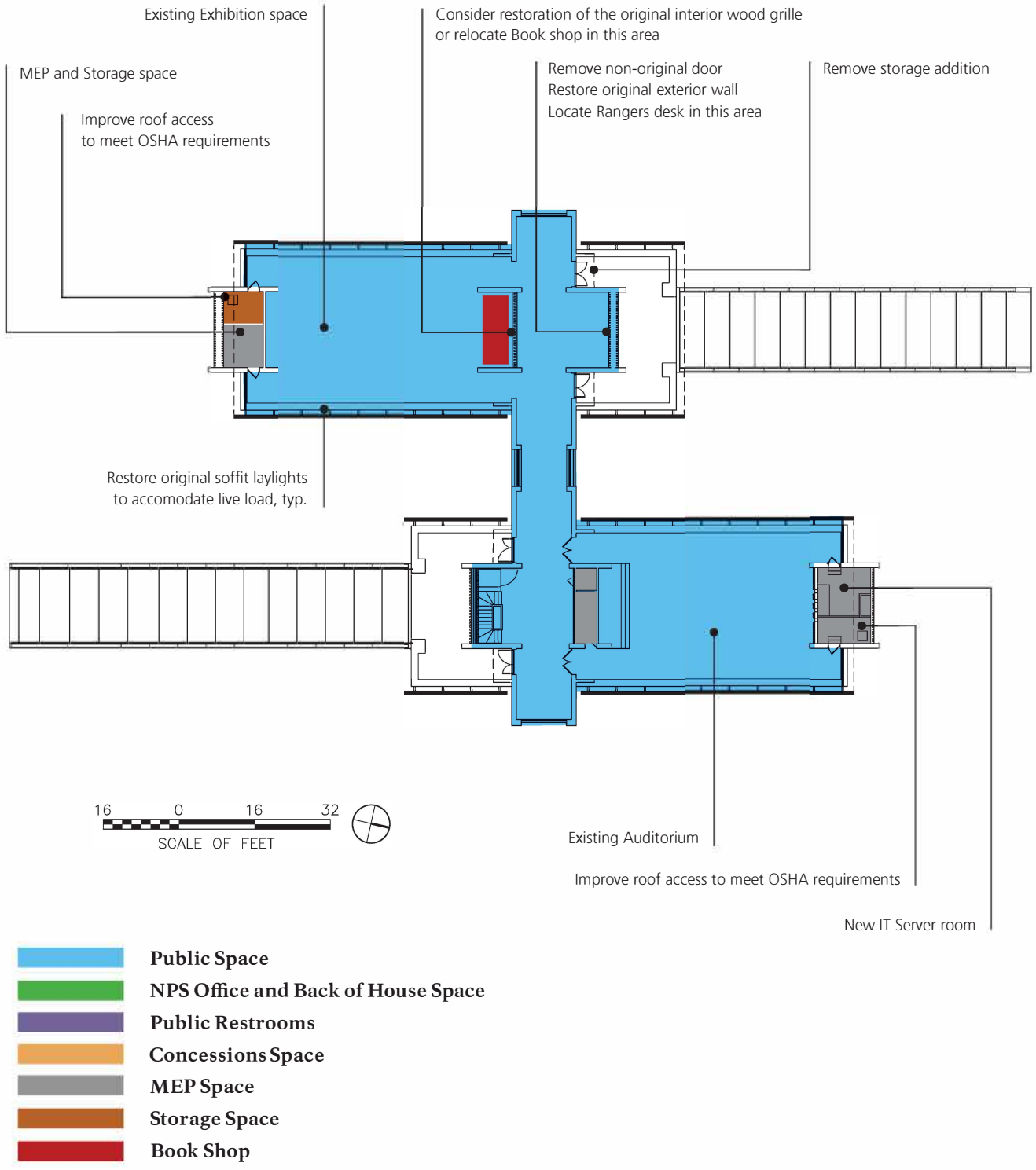


Figure 254. Treatment Recommendation Option 2 Second Floor Program Diagram, (CRTKL 2022)

OPTION 2: RESTORE

The intent of the Option 2 is to readjust the ratio of public and staff spaces closer to that intended in the original design while improving the function of the facility. The main goal for the program and circulation adjustment is to fully restore original building circulation pattern as follows:

- Restore an open public cross circulation in east-west direction on the ground floor connecting Building A-B and B-C with the adjacent outdoor spaces.
- Reconnect second floor public space to the reclaimed original ground floor public lobby in the Building A-B.
- Restore the east-west public circulation on the second floor by re-locating book shop program and removing non-original ranger's desk.

PROGRAM AND GENERAL ARCHITECTURAL TREATMENT RECOMMENDATIONS (Figures 253 and 254)

Building A-B Ground floor

1. Reconfigure floor layout by removing staff kitchen area and interior partitions in the NPS office space. Replace staff kitchen program with public lobby program to match original design intent.
2. Provide one private office and 8 open space workstations in the NPS office area (9 people total).
3. Restore public lobby double doors on the east wall of the building.
4. Keep existing women's restroom layout.
5. Reconfigure NPS staff restrooms by moving CMU partitions and making restrooms larger to meet ABAAS requirements. Consider making both Restrooms Unisex.
6. Consider relocating server equipment to the new IT room / server space inside the original auditorium projector booth space. The removal of the server equipment will allow for ABAAS compliant restroom access.
7. Reconfigure lockers located in the restroom lobby. Provide stacked lockers.

Coordinate locker and space layouts to allow access for one of the proposed unisex restrooms to meet ABAAS requirements.

8. Repair exterior ramp rail.
9. Re-grade the courtyard and make drainage improvements to prevent flooding into ground floor office spaces.
10. Re-grade to provide ABAAS compliant condition at all exterior door thresholds.

Building B-C Ground floor

1. Restore original public lobby program by removing NPS office use.
2. Consider using ground floor lobby for vending, book shop or amenity area related to concessions or Visitor Center programs.
3. Reconfigure men's restroom and MEP room layouts. Relocate existing sewer ejector pump to allow the new restroom layout. Reuse existing MEP space door opening for men's restroom but replace existing doors to meet ABAAS requirements. Retrofit new restroom door hardware to provide power assist. Provide new exterior door for the MEP space.
4. Reduce concessions program and change food service program to the snack bar serving prepared and microwaved foods only.
5. Reconfigure BOH concessions spaces located at the south end of the Building B-C and use this area for storage. Provide new exterior door for storage access.
6. Remove concessions exterior storage area and fence. Install landscape.
7. Re-grade along the west elevation to reduce flooding into the men's restroom and reduce burden on CMU base-of-wall to prevent leakage into concealed spaces near the northwest building corner.

Building A-B and B-C Second floor

10. Reconfigure the main building entry (Building B-C) in the spirit of the original design. Remove the storage addition at the north ramp and non-original entry doors.
11. Relocate book shop program to the area between freestanding CMU walls connecting building lobby and exhibit space.
12. Consider option to restore original interior wood screen and seat between freestanding CMU walls between building lobby and exhibit space.
13. Relocate non original ranger's desk to open east-west corridor connecting the Buildings A-B and B-C.
14. Consider restoration of the original interior wood grille at the exhibition space entrance.

15. Consider reconfiguration of the exhibit to allow a fully enclosed back-of-house space along the south façade of the Building B-C. This space could be used as MEP and Storage space.
16. Consider locating a new central IT / server room in the auditorium projection room.
17. Improve Roof access in the Buildings A-B and B-C to meet OSHA requirements.
18. Keep existing non-original configuration of the communicating stair and lift.

ENCLOSURE TREATMENT RECOMMENDATIONS

In addition to the items listed in Option 1, commensurate building enclosure measures to meet Option 2 goals of restoring the building's use and function include the following:

1. ***Ramps***

   The Building A-B women's restroom and Building B-C MEP room show signs of the ongoing water infiltration. To address water leakage, we recommend replacing the waterproofing above the ramps with a cold fluid-applied polyurethane based or poly-methyl methacrylate based waterproofing membrane. The A-B ramp has an existing waterproofing membrane that is suffering from perimeter leakage. Based on background documentation, the membrane is likely past its useful lifespan. Based on observations and review of repair project documentation, the B-C ramp may not have a waterproofing membrane at all, contributing to the widespread water infiltration in the mechanical room and storage area below. Replacement of the waterproofing will require demolition of the topping slab, which must be replaced to match the current appearance. Replacement waterproofing should include appropriate accessory components, including membrane-level drainage composite to quickly evacuate water that migrates past the topping slab (Figure 255).

STRUCTURAL TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 1, we recommend the following for the Option 2:

1. Add new openings in the CMU ground level structure to match architectural recommendations.

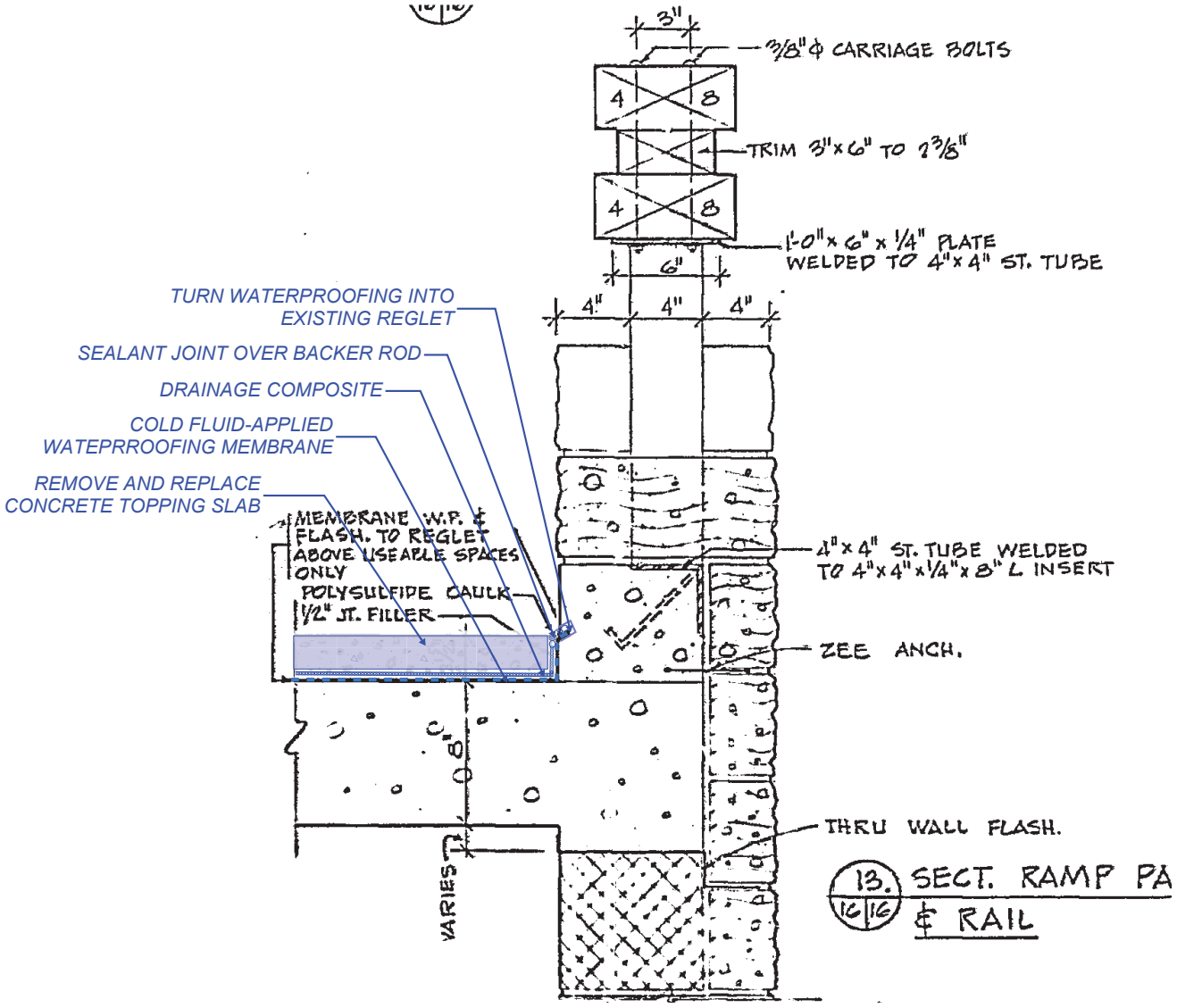


Figure 255. Treatment Recommendations Ramp Waterproofing Condition, (SGH 2022)

ELECTRICAL TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 1, we recommend the following for the Option 2:

1. Replace the lighting and the lighting control system throughout the building to reduce the building lighting energy consumption by at least 50% or more with energy efficient LED lighting, occupancy sensors, day light sensors and automatic exterior lighting controls.

MECHANICAL TREATMENT RECOMMENDATIONS

We recommend the following for Option 2 treatments:

1. ***Heating and Cooling.***

   Provide new heating and cooling systems consisting of the air cooled VRF (variable refrigerant flow) condensing units mounted on the roof that are connected to indoor VRF cassettes, vertical ducted air handling units, or above ceiling ducted horizontal air handling units.

2. ***Ventilation***

   Provide ventilation to each building by roof mounted DOAS (Dedicated Outside Air System) Rooftop units that would duct air and distribute air to the second and first floors. Locate shafts for ventilation (including second floor slab penetrations) in the MEP spaces at the Building A-B north end and Building B-C south end.

3. ***Toilet Exhaust***

   Provide toilet exhaust fans for exhausting and new toilets and janitors closets to code requirements.

4. ***Condensate drains***

   Route and connect condensate drains from any indoor evaporator coils to the nearest storm drain/gutter.

5. ***Control System***

   Integrate mechanical systems into a new DDC (direct digital controls) building

automation system that will allow for remote monitoring and automatic control of the new mechanical systems and room temperatures.

PLUMBING TREATMENT RECOMMENDATIONS

In addition to the items listed in Option 1 we recommend the following for the Option 2:

1. Relocate The sewage ejector pump to allow reconfiguration of the Building B-C men's restroom and MEP room.
2. Provide plumbing systems and systems for the new Building B-C men's restroom layout.
3. Reconfigure plumbing systems as required for reconfiguration of the snack bar area.

FIRE PROTECTION AND LIFE SAFETY TREATMENT RECOMMENDATIONS

See Option 1 recommendations.

VERTICAL TRANSPORTATION AND CIRCULATION

See Option 1 recommendations.

SIGNAGE

Improve wayfinding inside and out, consistent with the courtyard redesign and interpretive efforts.

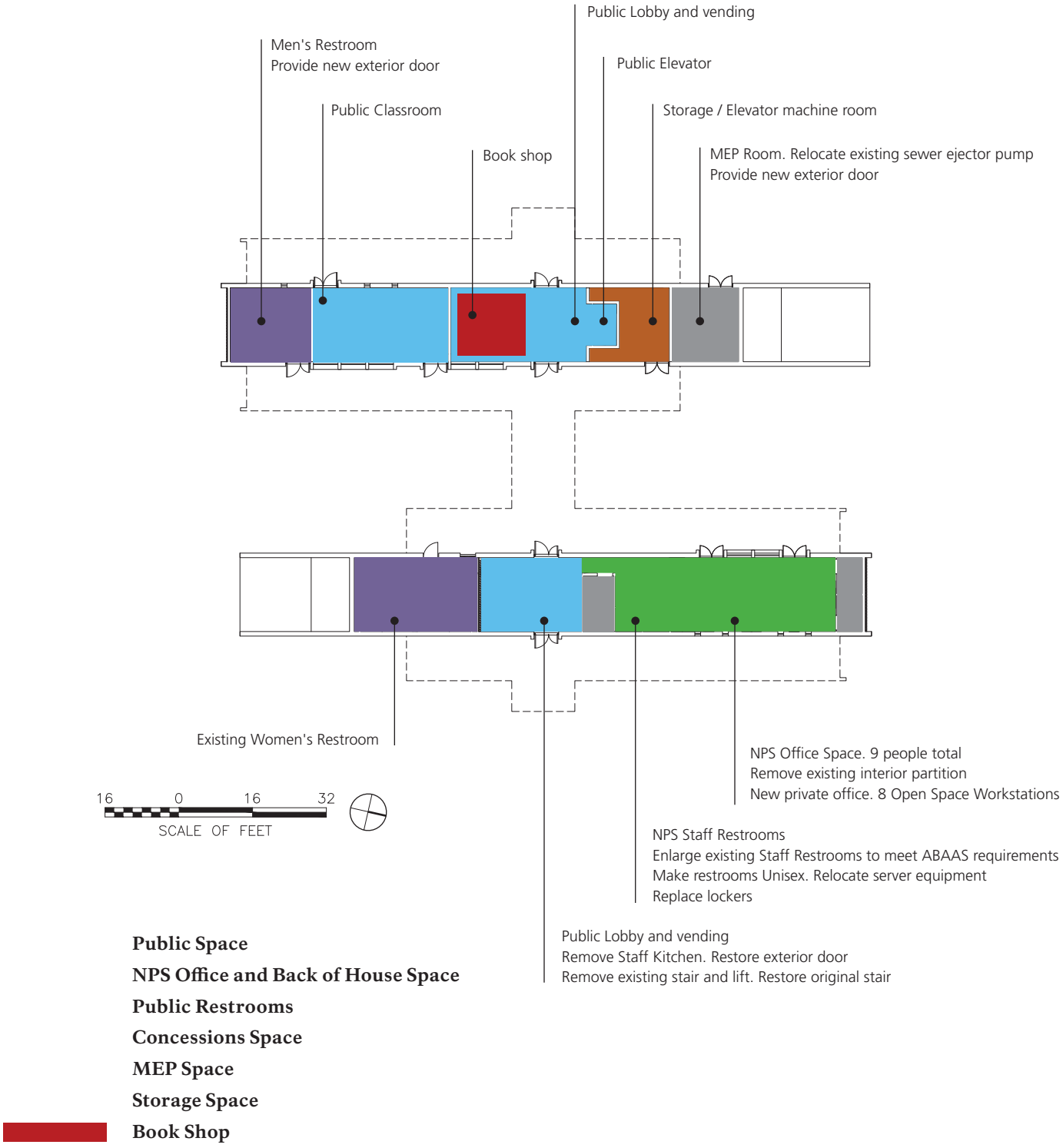


Figure 256. Treatment Recommendation Option 3 First Floor Program Diagram, (CRTKL 2022)

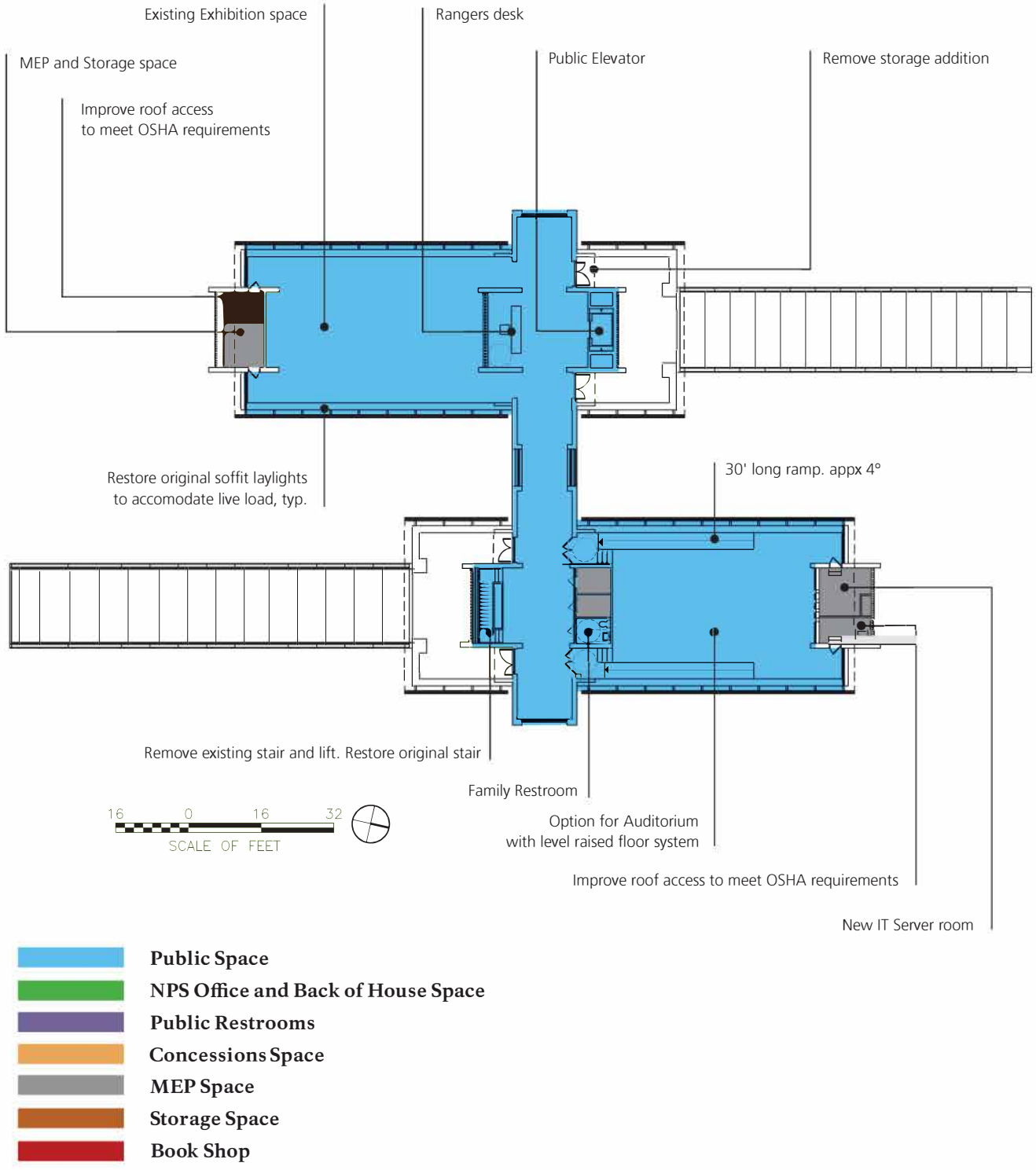


Figure 257. Treatment Recommendation Option 3 Second Floor Program Diagram, (CRTKL 2022)

OPTION 3: REVITALIZE

The intent of Option 3 is to return the original ratio of public and private space and also enhance the design to improve visitor use and experience with bold "revitalization" of the original design.

The main goal for the program and circulation adjustment is to fully restore and enhance original building circulation pattern as follows:

- Restore an open public cross circulation in east-west direction on the ground floor connecting Building A-B and B-C with the adjacent outdoor spaces.
- Provide more public space on the ground floor for Educational and Interpretive use. Integrate ground floor interior public space and courtyard space as one unified program system to enhance visitor experience.
- Reconnect second floor public space to the reclaimed original ground floor public lobby in the Building A-B.
- Provide ABAAS compliant passenger elevator to create a new public connection between Building B-C second level entrance and reclaimed ground floor public lobby.
- Restore the east-west public circulation on the second floor by re-locating book shop program and removing non-original ranger's desk.

Option 3 Treatment recommendations include option for NetZero Energy Building performance.

PROGRAM AND GENERAL ARCHITECTURAL TREATMENT RECOMMENDATIONS (see Figures 256 and 257)

Building A-B Ground floor

1. Reconfigure floor layout by removing staff kitchen area and interior partitions in the NPS office space. Replace staff kitchen program with public lobby program to match original design intent.
2. Provide one private office and 8 open space workstations in the NPS office area (9 people total).

3. Restore public lobby double doors on the east wall of the building.
4. Keep existing women's restroom layout.
5. Reconfigure NPS staff restrooms by moving CMU partitions and making restrooms larger to meet ABAAS requirements. Consider making both restrooms Unisex.
6. Consider relocating server equipment to the new IT room / server space inside the original auditorium projector booth space. The removal of the server equipment will allow for ABAAS compliant restroom access.
7. Reconfigure lockers located in the restroom lobby. Provide stacked lockers. Coordinate locker and space layouts to allow access for one of the proposed unisex restrooms to meet ABAAS requirements.
8. Repair exterior ramp rail.
9. Re-grade the courtyard and make drainage improvements to prevent flooding into ground floor office spaces.
10. Re-grade to provide ABAAS compliant condition at all exterior door thresholds.

Building B-C Ground floor

1. Restore original public lobby program by removing NPS office use. Reconfigure interior partition separating public lobby and adjacent space to allow 2 means of egress in the new adjacent public space.
2. Consider using ground floor lobby for vending, book shop or amenity area related to concessions or Visitor Center programs.
3. Provide new ABAAS compliant hydraulic elevator connecting Building B-C first floor level lobby and second floor entry lobby.
4. Relocate men's restroom to the south end of the Building B-C. Provide new exterior door for the restroom space.
5. Reconfigure MEP room layout. Relocate existing sewer ejector pump to allow the new storage / elevator room machine space. Provide new exterior door for the MEP space.
6. Reduce concessions program and change food service program to the snack bar serving prepared and microwaved foods only.
7. Reconfigure concessions spaces, remove food service program and use space as a public classroom or amenity space for educational or interpretation program.
8. Remove concessions exterior storage area and fence. Install landscape.
9. Re-grade along the west elevation to reduce flooding into the men's restroom and reduce burden on CMU base-of-wall to prevent leakage into concealed spaces near the northwest building corner.

Building A-B and B-C Second floor

1. Reconfigure the main building entry (Building B-C) in the spirit of the original design. Remove the storage addition at the north ramp and non-original entry doors.
2. Relocate book shop program to the first floor of the Building B-C.
3. Provide new ABAAS compliant hydraulic elevator connecting Building B-C first floor level lobby and second floor entry lobby.
4. Remove non-original ranger's desk to open east-west corridor connecting the Buildings A-B and B-C. Consider locating ranger's desk between existing freestanding CMU walls opposite to public elevator and building entrance.
5. Consider reconfiguration of the exhibit to allow a fully enclosed back-of-house space along the south façade of the Building B-C. This space could be used as MEP and Storage space.
6. Consider locating a new central IT / server room in the auditorium projection room.
7. Improve roof access in the Buildings A-B and B-C to meet OSHA requirements.
8. Remove existing non-original communicating stair and lift to restore original communicating stair.
9. Consider raised floor system for auditorium space to level the floor and allow flexible use of the space. Provide ramps and stairs to meet ABAAS requirements.
10. Consider exterior glass vestibules at Building B-C second floor entries to improve building performance.

ENCLOSURE TREATMENT RECOMMENDATIONS

In addition to the items listed in Option 1 and 2, commensurate building enclosure measures to meet Option 3 goals of enhancing the building's use and function include the following:

1. Roof

NPS may consider ways to reduce energy use by providing on site renewable energy generation, such as photovoltaic panels. Incorporating PV panels onto the existing roof will require reconfiguration of the roof assembly membrane, slope, and perimeter flashings. The structural evaluation is required to confirm the impact and required reinforcing because structural strengthening of supporting members is likely based upon the limited capacity of the existing roof framing members.

2. Fenestration

In addition to the recommendations in Options 1 and 2, we recommend modifying all remaining single-pane windows to accept contemporary IGU's, which will likely require new perimeter frames to accommodate the thicker glazing assembly. Any additional windows must incorporate a frame, including potential additional narrow windows at the ground floor. New windows must meet contemporary standards for frame and glass protection, and therefore may require altered appearance where frames, seals, and/or frit may introduce new sight lines around the window perimeter.

3. Glazing Behind Grilles at Second-Floor Entrances

Consider introducing glazing units and frames behind the exterior wall grilles at the B-C second-floor entrance to improve natural daylight and views between the exterior and interior. New glazing units will require new structural members to convey loads into the base structure, and the units must integrate with existing adjacent enclosure thermal, air, and water barriers. The option for new glazing must be coordinated with the proposed passenger elevator hoist-way located immediately behind Building B-C exterior wall at the entrance area.

Existing grilles may be preserved but will require support modification, as well, since they do not extend to the top of the ceiling or to the floor and the existing clerestory windows appear to bear directly on the grilles. We recommend independently supporting the grilles rather than hanging them from the fenestration. Offset the grilles from the glass by at least 4 inches to accommodate glass maintenance and cleaning. We recommend elevating new fenestration on a concrete curb to keep sills above the plane of water travel (Figure 258). All new grilles and wood framing can be painted to match the existing grille's appearance. Note that piping and conduit are currently installed between the grilles on the B-C second-floor entrance and will require relocation or modifications.

4. Skylights

Consider addition of skylights to the existing second level roof assembly to introduce more daylight. This option will require careful detailing to minimize risk for water leakage. The skylight system weight and loading must be evaluated and could require structural strengthening. In general, the roof should slope away from skylights, skylights should be raised on curbs, and the interior should incorporate a perimeter condensation gutter to collect incidental moisture.

Skylights are not in the scope of the upcoming roof replacement. If NPS decides to pursue new skylights, consider delaying the roof replacement project until the design of the skylights has progressed to the point they may be coordinated. If skylights are added where interior programming necessitates dim lighting, the skylights will require shading. Alternatively, the project team may consider dynamic glazing (e.g., electrochromic or thermochromic) to adjust opacity and visible light transmittance.

5. Exterior Wall

Although the exterior wall does not appear to be the source of current leakage and the cladding is generally in good condition, consider modifying the existing exterior walls to improve building energy performance and reduce air leakage by adding insulation and establishing a continuous air/water barrier. Contemporary codes for a wood-framed building either require R-20 insulation between studs, R-13 insulation between studs with R-3.8 continuous insulation, or a total U-Factor of 0.064 Btu/h·ft2·F. The original architectural drawings show 1-1/2 inch foil enclosed batt insulation installed over the tongue-and-groove wood decking in between battens. To meet contemporary energy codes, the wood shake wall assembly may require 3 to 5 inches of insulation, depending on the selected compliance path, which will increase the thickness of the wall assembly (Figure 259).

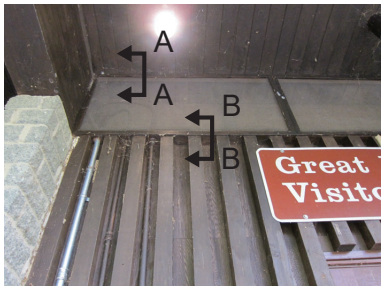
STRUCTURAL TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 1 and Option 2 we recommend the following for the Option 3:

1. Provide structural modifications required for installation of the proposed passenger elevator. Modifications would likely include cutting of a primary concrete beam member of the second floor and re-supporting on new columns to make space for the elevator slab opening.

2. Provide structural support for the proposed fenestration or grille and the Building B-C second floor north end wall. Support would need to be attached to the concrete slab edge on the interior side and span between roof/wall angled wood joists on the exterior side.

3. Restore the original cast-in-place structure for the communicating stair in the Building A-B.



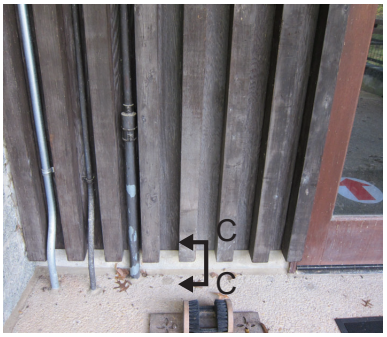


Figure 258. Treatment Recommendations Second Floor New Curtain Wall behind the Wood Grille Condition, (SGH 2022)

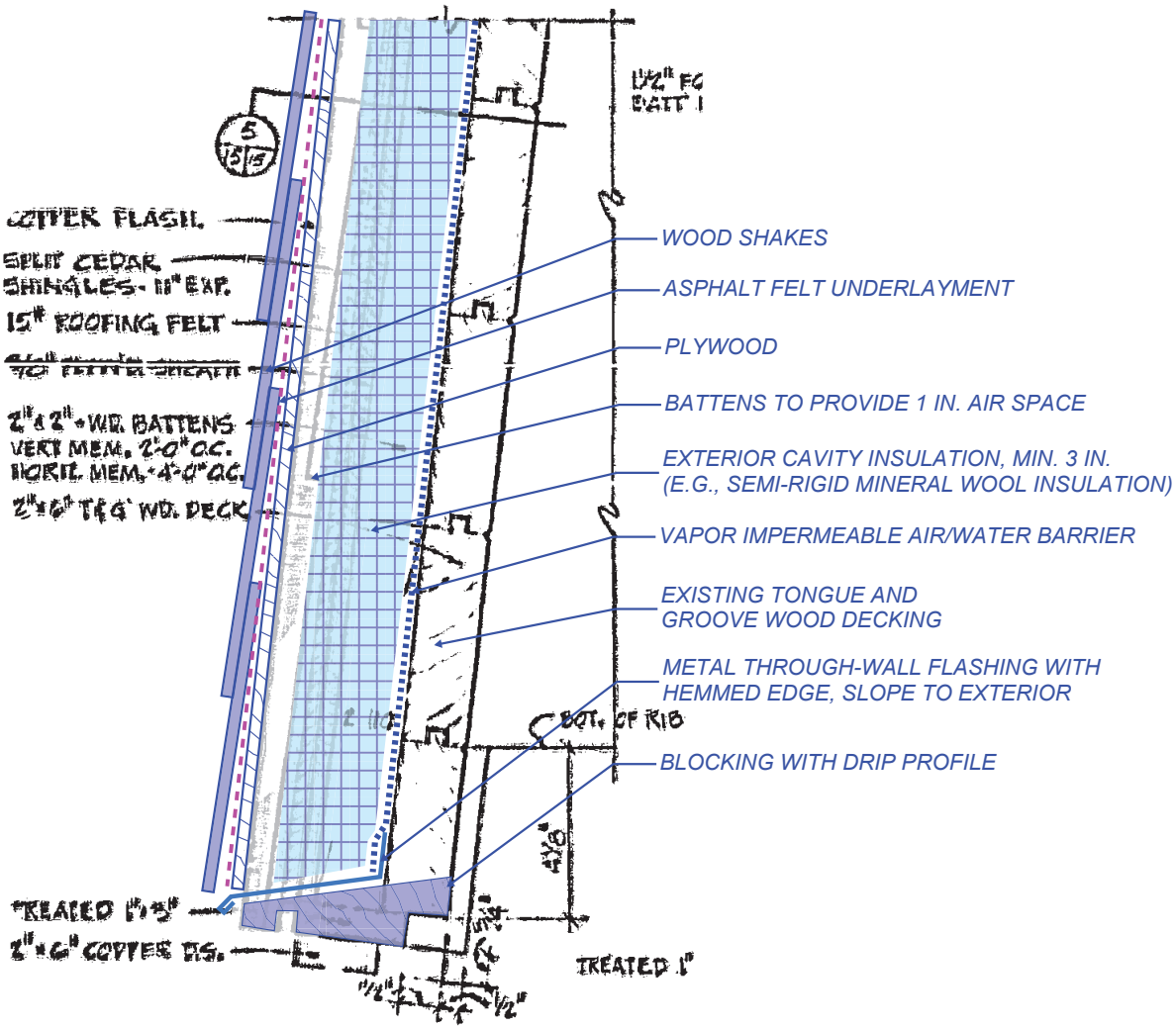


Figure 259. Treatment Recommendations Second Floor Wall Condition, (SGH 2022)

4. Provide slab penetrations for the second floor family restroom plumbing in Building A-B.

5. Add opening at the first floor CMU exterior wall as needed for architectural changes.

6. Consider adding second floor roof skylights. This is a challenging task because the existing roof joists, the miter joints, sloped members, and connection to the concrete structure would need to be reinforced or replaced. The existing roof assembly is very light, so a thermally broken insulated glass skylight would be a relative increase in weight and the enclosure performance of the skylight will be affected by the flexibility of the roof, as described in treatment Option 1 structural recommendations.

7. Evaluate structural capacity of the auditorium floor slab to add super imposed dead load of the raised floor system.

   Consider adding glazed vestibules at the Building B-C second floor. Structural evaluation is needed to confirm that vestibule glass walls do align with second floor structural beams, otherwise structural reinforcement may be added to distribute the load to the existing beams if the vestibule falls over slab alone.

ELECTRICAL TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 1 and Option 2 we recommend the following for the Option 3:

1. Provide generated on-site renewable energy. Based on the estimated building energy consumption and medium graded solar panels utilized. An approximate total area of 10,000 sq. ft of space will be required to accommodate solar panels and inverters to supply on-site renewable energy to the building to achieve a NetZero energy performance. However, a detailed energy modelling will be needed during design phase to validate the numbers. Detailed solar panel system design will also be required to ensure sufficient solar power can be generated. The solar panels will be mounted on the building roof area, if additional space is required, canopy should be built in the parking lot area to accommodate the required solar panels.

MECHANICAL TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 2 we recommend the following for the Option 3:

1. ***Provide the following Heating and Cooling systems:***

Heating and cooling shall consist of ground source heat pump air handling units fed from a geothermal wellfield system installed in the parking lot. Ground source heat pumps will either be vertical ducted air handling units located in closets or horizontal ducted air handling units located above the ceiling. First floor duct distribution would be located underground in new fiberglass duct system that would duct up to floor grilles.

2. ***Provide Geothermal Pumps:***

Water in the geothermal wellfield would be circulated by variable speed pumps located in the mechanical room.

3. ***Provide the following Domestic Hot Water system:***

Domestic hot water would be generated by a domestic water source heat pump connected to the geothermal distribution loop.

4. ***Consider NetZero Energy building perfromance goal by utilizing the following systems and elements:***
    a. Motorized Control Shades with reflective backing at each window and curtain wall
    b. Geothermal wellfield system with variable speed pumps
    c. High Efficiency Ground source Heat Pumps with variable speed compressors
    d. Demand control ventilation with C02 sensors and motorized dampers.
    e. LED lighting with occupancy and/or daylight dimming controls
    f. Receptacle plug load controls with automatic off-timers
    g. Photo-voltaic panel system shall be provided and will require approximately 10,000 sf of overall footprint to accommodate the system.

PLUMBING TREATMENT RECOMMENDATIONS

In addition to the items listed in the Option 1 and Option 2 we recommend the following for Option 3:

1. Provide plumbing systems and connections for the family restroom located on the second floor of the Building B-C.

FIRE PROTECTION AND LIFE SAFETY TREATMENT RECOMMENDATIONS

In addition to the items listed in Option 1 and Option 2 we recommend the following for Option 3:

1. Adjust systems to accommodate architectural changes.

VERTICAL TRANSPORTATION AND CIRCULATION

Consider the feasibility of adding a full-size ABAAS compliant hydraulic passenger elevator in Building B-C by the main building entry. The proposed elevator will connect the second-floor entry lobby and the ground-floor lobby areas. The intent is to mirror the original vertical circulation element (public stair) of Building A-B. The existing structural conditions will drive the feasibility of the elevator construction. The installation of the new elevator will require the construction of the elevator pit in the rock below the building and cutting openings in structural slabs of the first floor, second floor, and the floating structural slab above the entry area. The second-floor slab structural beams are spaced 6-feet o.c. with 5-feet clear dimensions between every two beams. This condition will present dimensional constraint for the elevator system. The 5-feet clear dimension of the elevator hoistway will require a custom elevator platform and cab construction to meet ABAAS requirements.

The elevator installation will require modifications to the adjacent exterior wall, including the existing wood grille on the interior side. But it is important to note that this wall was previously altered by the installation of the new entry door. The treatment recommendations call for the removal of this door. Careful consideration of this condition is required to recreate the original exterior appearance while accommodating elevator hoistway construction.

We also recommend to consider an option for a custom glass elevator cab and glass hoistway construction.

SIGNAGE

Improve wayfinding inside and out, consistent with the courtyard redesign and interpretive efforts.