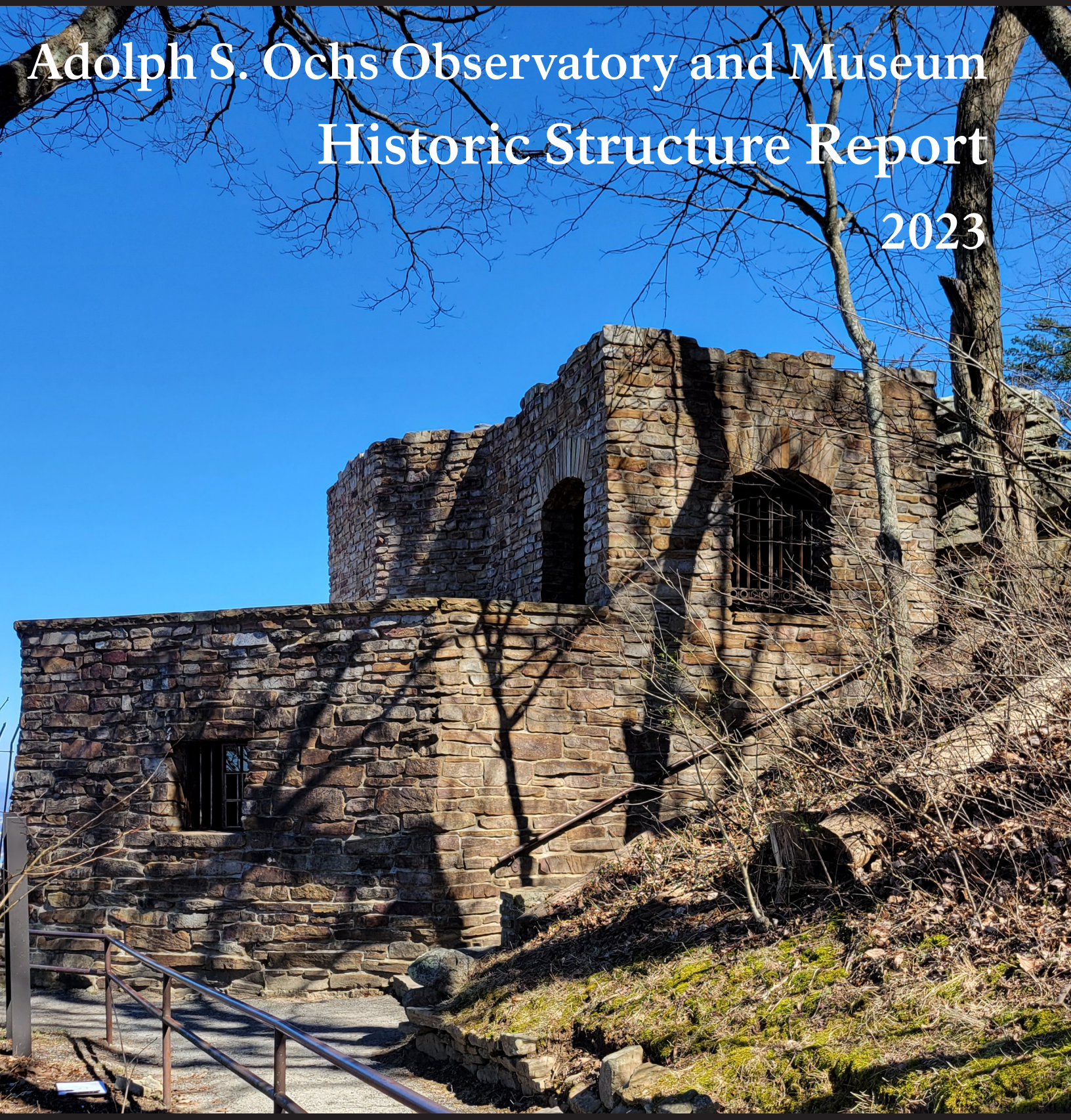
National Park Service
U.S. Department of the Interior

Chickamauga and Chattanooga National Military Park
Fort Oglethorpe, GA

Adolph S. Ochs Observatory and Museum
Historic Structure Report
2023



Cultural Resources Partnerships and Science Division

Interior Region 2

Adolph S. Ochs Observatory and Museum

Chickamauga and Chattanooga National Military Park

Historic Structure Report

2023

for

Chickamauga and Chattanooga National Military Park
Interior Region 2: South Atlantic-Gulf, National Park Service

by

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The historic structure report presented here exists in two formats. A traditional, printed version is available for study at the park, at the Interior Region 2: South Atlantic-Gulf office of the National Park Service (NPS), and at a variety of other repositories. For more widespread access, the historic structure report also exists in digital format through the IRMA Portal, Integrated Resource Management Applications, including the NPS Data Store, accessed at <https://irma.nps.gov/App/Reference/Welcome>, a website of the National Park Service.

February 2023
Historic Structure Report
Adolph S. Ochs Observatory and Museum
Chickamauga and Chattanooga National Military Park
(CHCH)

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91665 Ochs Walkway

Adolph S. Ochs Observatory and Museum
Chickamauga and Chattanooga National Military Park
Historic Structure Report
2022

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Foreword

We are pleased to provide this Historic Structure Report (HSR) for the Adolph S. Ochs Observatory and Museum at Chickamauga and Chattanooga National Military Park (CHCH). JKOA would like to thank the National Park Service and CHCH park staff for their assistance and valuable input during the preparation of this document. We hope that this report can serve as a valuable planning document for the park as they address the building's current and future needs.

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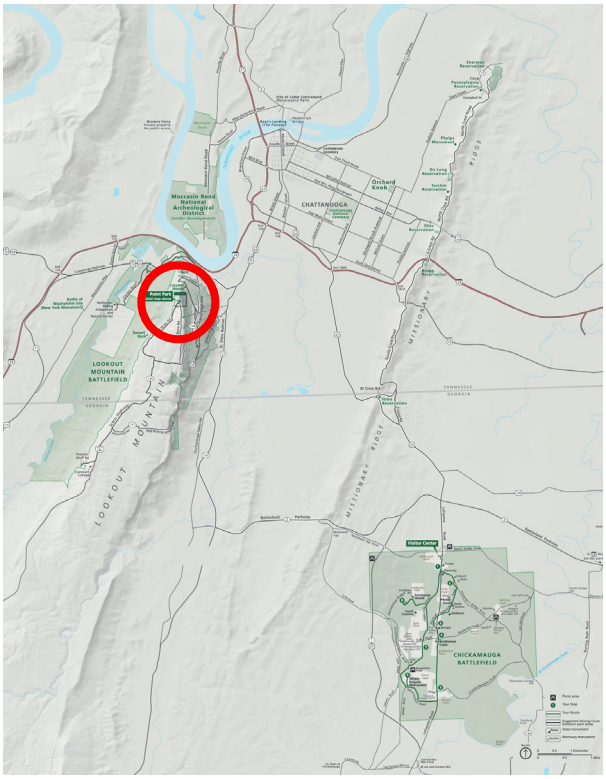


Figure M1. Map showing the four units of Chickamauga and Chattanooga National Military Park (CHCH). The park is in both Georgia and Tennessee, indicated by the horizontal line on the map. The Adolph S. Ochs Observatory and Museum is in Tennessee in the Lookout Mountain unit. (https://www.nps.gov/carto/hfc/carto/media/CHCHmap1.jpg)



Figure M2. The Adolph S. Ochs Observatory and Museum is the northernmost feature of Point Park, circled at the top of this map. It overlooks Moccasin Bend, a dramatic curve in the Moccasin River.

Management Summary



Figure M3. Visitors enjoy the view from the observation deck in July 1940 as construction was near completion. A ladder is visible through the window. (Image provided by park staff)

At the request of the National Park Service (NPS), Joseph K. Oppermann–Architect, P.A. (JKOA) has developed this Historic Structure Report (HSR) for the Adolph S. Ochs Observatory and Museum at Point Park on Lookout Mountain, TN. The building is part of the Chickamauga and Chattanooga National Military Park. On the facing page is a regional map showing the location of the Chickamauga and Chattanooga National Military Park (CHCH) and a map of CHCH's Point Park showing the location of the Adolph S. Ochs Observatory and Museum (*Figs. M1-M2*).

This HSR documents the development, use, and current condition of the building. The building was constructed in 1939-1940 as a memorial to Adolph S. Ochs, who championed and provided major financial support for the creation of an expanded Lookout Mountain unit of CHCH.

Following NPS protocol, this HSR is divided into two major segments, *Part I: Developmental History*, and *Part II: Treatment and Use*.

Part I: Developmental History, is a scholarly report containing a chapter providing historic background and context; a chapter documenting the initial construction and continued evolution of the building; a reference timeline; a chapter providing a detailed physical description of the exterior and interior on a room-by-room basis and assessing current conditions; and a chapter describing the significance and integrity of the building. These components of Part I are based on the combined analysis of documentary research and physical examination.

Part II: Treatment and Use, contains chapters that review the requirements for treatment and use; present the NPS administratively determined

ultimate treatment and use with an evaluation of alternative treatments; address resilience to natural disasters; and offer recommendations to achieve the ultimate treatment and use, coupled with recommendations for further enhancement. Recommendations reflect objectives identified by park management and an emphasis on preserving extant historic material and applying the new information gained.

A bibliography follows Part II. Appendices contain: (A) 1937-1940 construction drawings, (B) 1937 construction specifications, (C) scaled documentation drawings of the current foundation, floor, and roof plans; exterior elevations; and detail drawings of select architectural trim, (D) a treatment schedule for windows and doors, and (E) Implementation Projects.

Historical Overview

At a Civil War reunion in Chattanooga in 1889, veterans of both armies confirmed their wish for a national battlefield park. The year before, former Chattanoogan Adolph S. Ochs, publisher of the *Chattanooga Times* and later the *New York Times*, spearheaded a community effort towards such a park (*Fig. M4*). Ochs led the proceedings at the 1889 reunion during which the veterans and the local committee together formed the Chickamauga Memorial Association.

The next year, Congress authorized acquisition of approximately 7,600 acres to establish the Chickamauga and Chattanooga National Park, which was dedicated in 1895 with an estimated 40,000 veterans in attendance.[1]

In 1926, a local organization created the Chattanooga-Lookout Mountain Park on the sides of the mountain, with Ochs contributing the principal funding and inspiring others to further the effort.[2] Adolph Ochs died in April 1935. Soon after, the Chattanooga-Lookout Mountain Park organization donated the 2,700-acre Chattanooga-Lookout Mountain Park as an addition to the national park through the earlier efforts of Ochs and others.[3]

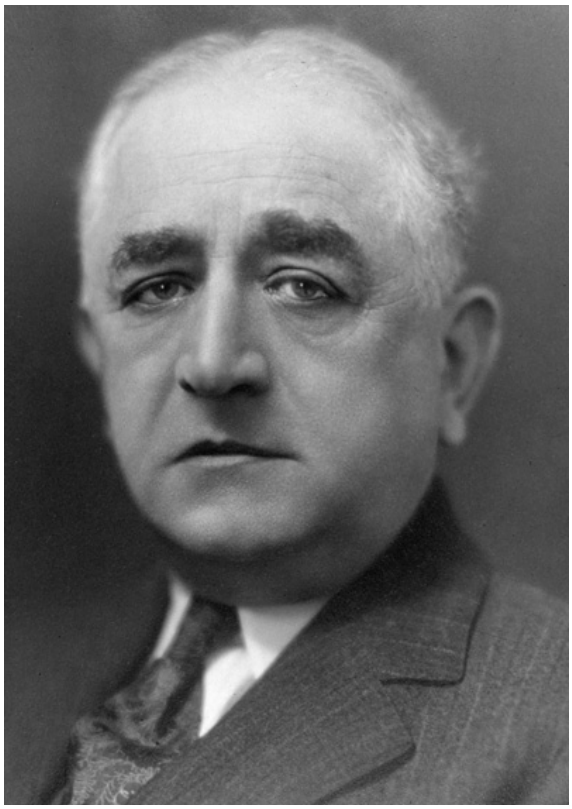


Figure M4. Adolph Ochs, photographed January 1915. (German Historical Institute, https://www.immigrantentrepreneurship.org/entries/adolph-ochs/)

The idea of an Ochs memorial of some sort began soon after Ochs's death, though its form and location were not determined. Historians at the national park had recommended a museum and observatory at the point for some years, and on October 18, 1938, plans for the Adolph S. Ochs Observatory and Museum on the point were announced.[4]

NPS provided the site and defrayed part of the cost by providing the labor. The remainder was paid by contributions from Chattanoogans and by a bequest from George W. Ochs-Oakes, one of Adolph Ochs's brothers.[5]

Construction began in 1939 and the building was completed the next year with a dedication held in November 1940. It was described in October as, "the attractive building, of native stone… completed by the National Park Service at a cost of approximately $25,000. Exhibits within the museum are now being arranged and are

1. Ronald F. Lee, *Origin and Evolution of the National Military Park Idea* (National Park Service, 1973), Chap. III; David W. Blight, *Race & Reunion: The Civil War in American Memory* (Cambridge: Harvard University Press, 2001), p. 205.
2. *Chattanooga Daily Times*, 18 September 1940, p. 14; John C. Paige and Jerome A. Greene, *Administrative History of Chickamauga and Chattanooga National Military Park* (National Park Service, Denver Service Center, 1983), p. 87.
3. Jill K. Hanson and Robert W. Blythe, *Chickamauga and Chattanooga NMP Historic Resource Study* (NPS Southeast Regional Office, January 1999), p. 36.
4. *Chattanooga Daily Times*, 6 June 1939, pp. 3, 14.
5. Ibid., 22 October 1940, p. 1; Paige and Greene, pp. 100-101. The reason for the brother's last name is not known.

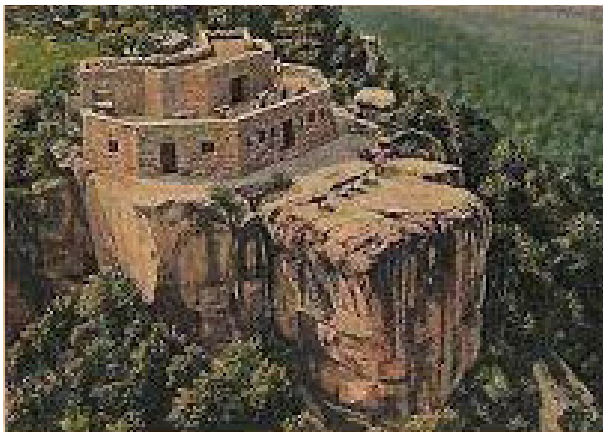


Figure M5. Hand-colored postcard of aerial photograph shows markers in front of the building encouraging visitors to go onto the point, an area now fenced off for safety. (public domain)

expected to be ready by the dedication date." The article explained that the museum was a memorial to Ochs, "to whom the development of Lookout [M]ountain was a dream to which he contributed the labors of many years of his life. Mr. Ochs, who had acquired several thousand acres on the slopes of Lookout [M]ountain, developed it into a park and then presented it to the national park service...."[6] (*Fig. M5*)

The building has undergone changes since construction, especially major interior alterations in the mid-1970s, though it appears that many features were covered rather than removed. Its greatest challenge is continued damage from insufficient drainage systems. The evolution of the building is discussed in the *Chronology of Development and Use* chapter.

Period of Significance

The 1998 National Register additional documentation for CHCH lists the district-wide period of significance as 1863-1942 but provides no specific date range for individual buildings. The Adolph S. Ochs Observatory and Museum is listed as a contributing structure within the district.

Ultimate Treatment and Use

The NPS administratively determined Management Category for the building is "Must Be Preserved and Maintained," and the Ultimate Treatment is Preservation. Further explanation can be found in the *Ultimate Treatment and Use* chapter.

6. *Chattanooga Daily Times*, 22 October 1940, p. 1.

Project Scope and Methodology

Purpose

The purpose of this HSR is to document the historical evolution, significance, and present condition of the Adolph S. Ochs Observatory and Museum and to provide clear information for use in the planning, repair, maintenance, and preservation of the building. The National Park Service will use this report to inform and guide its stewardship.

NPS Director's Order 28 (DO-28) recognizes an HSR as an optimal first phase of the preservation effort for an historic building, preceding design and implementation of its preservation, rehabilitation, restoration, or reconstruction. It is the primary guide to treatment and use of an historic structure, and considerable loss of information can result if an HSR is not completed. The information gleaned helps the preservation effort and provides information for interpretation. According to DO-28, "In no case should restoration, reconstruction, or extensive rehabilitation of any structure be undertaken without an approved HSR, Parts 1 and 2."[7]

DO-28 provides guidelines for recording and analyzing the history of a property from its construction through subsequent modifications to the present; to document the performance and condition of its materials, features, and stability; and to recommend an appropriate course of treatment based on those findings. NPS prepares a "Part III" completion report after the work is undertaken, which documents the repairs and changes made and becomes part of the HSR.

This HSR complies with those guidelines and offers a comprehensive, scholarly assessment of the history, fabric, and current condition of the building and makes recommendations for future actions. The project was conducted by the JKOA project team, which included Joseph K. Oppermann, FAIA, historical architect and principal-in-charge; Robert J. Hotes, AIA, historical architect; Jeffrey P. Anderson, Associate AIA; Langdon E. Oppermann, architectural historian/planner; and Christopher M. Woollard, Associate AIA. This team researched, investigated, documented, and assessed this building and wrote this HSR. The interdisciplinary approach broadens the understanding of the

7. *NPS Director's Order 28: Cultural Resources Management Guideline*, chapter 8.

structure and aids the development of appropriate treatment recommendations.

Document Research

Our findings and recommendations for preservation of the building rely on research of primary and secondary sources, early photographs, maps, drawings, and interviews, correlated with our physical investigation of extant building fabric. The Scope of Work for research prescribed by NPS for this HSR project was "limited," explained as "research in readily available published sources, usually of a secondary character; research in documentary sources that are easily accessible and known to be of high yield; brief interviews of readily available persons to answer specific questions… It is anticipated that most research will be within the park's archives." In accordance with the scope, we relied mostly on primary and secondary documents in Park archives and other easily accessible sources, and on brief interviews, though in order to gather information adequate for the report, we expanded our research to include additional records, both primary and secondary, in local and online sources. This research was performed to gather information about the original construction and past modifications and repairs.

Recording and Physical Investigation

Proceeding concurrently with the documentary research were the measured recording and investigation of the building. Detailed field drawings were made as the basis for digitized AutoCAD drawings of elevations as well as foundation, floor, and roof plans of the building, and selected historic interior features.

Physical investigation to determine evolutionary history, known as building archaeology, was a large component of the work of identifying the scope and time frame of various changes. These investigations were integrated with the documentary research in a correlative approach to determine how the building was used and adapted over its history, and to understand the people involved.

Condition Assessment

Specialized assessment methodology was used to survey the condition of each exterior feature and each interior room, itemizing features and elements, and photographing them in detail. Observations were documented with digital photographs, measured baseline field drawings, and field notes. In accordance with the NPS scope of work, no building system components were tested, and no invasive investigation methods were employed.

Development of History, Chronology of Construction, and Evaluation of Significance

The combined information from documentary research and physical investigations was analyzed, and a narrative context history and building-specific chronology of construction and alterations were written. The narrative physical description was prepared containing a systematic accounting of exterior and interior spaces, features, materials, and condition assessment. All narratives are supplemented by numerous photographs and drawings.

An evaluation of significance was prepared in accordance with the guidelines in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.[8] The seven aspects of historic integrity were assessed using the same guidelines. These evaluations of history, condition, significance, and integrity provided the basis for the development of recommended treatment alternatives.

List of Key Treatment Topics

This section outlines six areas of focus for treatment recommendations. Full recommendations addressing each of these items, as well as addressing other character-defining features, can be found in the *Recommendations for Achieving Ultimate Treatment and Use* chapter beginning on page 91.

1. Site and Building Drainage

Observations

Drainage from paths approaching the museum is currently directing water toward the building and contributing to erosion and water infiltration.

The drainage system for the observation deck is undersized and non-functional, resulting in moisture migrating into the structural slab and causing damage. Correcting this issue is critical

8. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: National Park Service, National Register of Historic Places, 1990, revised 1997).

and should be completed together with structural repairs before other work.

The downspouts draining the upper roof are clogged and share the same non-functional subsurface drainage system serving the observation deck. Water is backing up, saturating the ground south of the building and entering the crawlspace.

Recommendations

- See full recommendations in Part II.
- Direct water shed from paths away from the building by adjusting the paving at the southeast doorway and providing a trench drain at the base of the lower west pathway.
- Replace waterproof layer beneath existing pavers at observation deck. Reinstall historic pavers on top of new waterproofing.
- Replace entirety of the drainage system for the observation deck and downspouts serving the roof to restore original functionality. Trench a new subsurface drain at the lower level, providing cleanouts as necessary for maintenance.
- Enlarge drain openings at observation deck to accommodate larger volumes of water.

2. Structural Repairs

Observations

The failed waterproofing and drainage system, coupled with the use of road salt to deice the deck, have resulted in spalling of concrete and deterioration of rebar at the slabs and beams. This damage has resulted in the closure of the museum to visitors.

Door and window lintels are in overall poor condition; however, some lintels may be treatable in place.

- See full recommendations in Part II.
- Repair structural damage to concrete by removing unsound sections, splicing rebar, treating rust, and casting new concrete patches. See full recommendations in Part II of this report for more information.
- Opening-by-opening evaluations of doorway and window lintels are provided in *Appendix D*. Additional recommendations can be found in Part II.

3. Window and Door Repairs

Observations

The building retains original steel casement windows and with one exception, retains all original exterior wood doors. An opening-by-opening assessment of the windows and doors is included in Appendix D, and full recommendations can be found in Part II.

Exterior doors at the lower level require paint, and portions of the center door and frame have fallen from the opening due to failed fasteners, leaving the space vulnerable to vandals.

Recommendations

- See full recommendations in Part II.
- Explore feasibility of repairing select existing windows by treating rust and performing welded dutchman repairs.
- If replacement of window units is required, ensure that they closely match the originals in design and dimension.
- Rehang center paired doors at lower level, resecuring the frame with stainless steel anchors.
- Repair northwest door.
- Repaint all doors.

4. Masonry Repairs and Cleaning

Observations

The exterior masonry walls are in overall good condition; however, mortar is typically separated from the stone, particularly at the lower level. Extensive repointing is expected at the lower level, while spot repointing may be possible at the upper level. Repointing should be coordinated with structural repairs such as lintel replacement as well as window repairs or replacement.

Biologic growth is heavy at the lower level.

Recommendations

- See full recommendations in Part II.
- Repoint using mortar formula determined by recommended analysis. Additional guidance is provided in Part II.
- Clean exterior masonry using process described in Part II.

5. Consideration of Restoring Exhibit Space

Observations

The exhibit space has been heavily modified since construction. The footprint of the space has been reduced by the addition of furred-out walls and integrated display cases. Two small rooms at the south end of the space have been eliminated. Two window openings at the south end have been covered from the inside, and the firebox of the central fireplace has been covered and the surrounding casework removed. The original construction drawings, combined with photos taken shortly after construction was completed provide excellent detail to guide a restoration.

Recommendations

The following is a list of tasks required to restore missing character-defining features. A more detailed version is found in Part II.

- Remove added walls at perimeter to restore original footprint.
- Reopen windows to the interior to provide natural light.
- Uncover firebox thought to remain behind current finishes.
- Reconstruct casework and mantel based on original detail drawings and historic photographs.
- Consider reconstruction of the two partitioned rooms at the south ends of the space
- Replace the current steel door and frame with a paneled door more faithful to the original design while also conforming to modern accessibility requirements.
- Be cognizant of the style and character of the building in designing future exhibits. Strive to avoid the introduction of inappropriate details such as the moldings used in the current space. Similarly, displays should avoid closing off space in an already small room. The current exhibit space greatly reduces the floor area in favor of deep display cases and false walls that impact the overall sense of the interior.

6. Site Walkways

Observations

Site walkways and stairs accessing the Ochs site were assessed as part of this HSR. The stairs and walkways are in overall good condition; however, a few items that may relate to visitor safety were identified. See the map and photographs in the *Physical Description and Condition Assessment* chapter.

Recommendations

- See full recommendations in Part II.
- Refasten/tighten connections of all loose handrails.
- Consider adding handrails to stair 4D.
- Replace chipped stone paving at steps as necessary, or alternatively remove paving to expose the original stone tread.
- Add guardrail at east approach path.

Administrative Data

Locational Data

Building Name: Adolph S. Ochs Observatory and Museum
Location: Point Park, Chickamauga and Chattanooga National Military Park (CHCH)

County: Hamilton County

State: Tennessee

Real Property Information

Construction Date: 1939-1940

Numbering Information

CRIS: 91218 Ochs Observatory and Museum
91665 Ochs Walkway

Size Information

Floor Area: 1,850 square feet ±
Number of Stories: 2
Number of Rooms: 4
Number of Bathrooms: N/A

Cultural Resource Data

National Register Status: Administratively listed 1966;
Additional Documentation for Chickamauga and Chattanooga National Military Park accepted 1998, with the Ochs Observatory and Museum and its walkway listed as contributing resources.

Period of Significance of Historic District: 1863-1942

Proposed Treatment

• The NPS administratively determined management category for the Adolph S. Ochs Observatory and Museum is "Must Be Preserved and Maintained," and the Ultimate Treatment is Preservation. The treatment recommendations in this report continue the established Ultimate Treatment of Preservation. Specific measures that follow The Secretary of the Interior's Standards for Preservation are discussed in this report.

• The recommended ultimate use of the building has been defined in the 2015 amendment to the park's 1988 General Management Plan, calls for rehabilitation or restoration of the Adolph S. Ochs Observatory and Museum as well as permanent exhibits for the museum room. This report supports restoring missing character defining features as part of a refreshed exhibit space.

Part I: Developmental History

Historical Background and Context



Figure A1. View of Moccasin Bend from Lookout Mountain, ca. 1902. (Library of Congress, http://hdl.loc.gov/loc.pnp/ppmsca.18199)

This chapter provides the background and context of the Adolph S. Ochs Observatory and Museum and the point on which it is built. The next chapter discusses construction of the building itself and its later changes.

The dramatic view overlooking the Tennessee River Valley and its winding Moccasin Bend has long brought people to the point of the aptly named Lookout Mountain (*Fig. A1*). A nineteenth-century event brought more widespread attention and subsequent changes to the area, including construction of the Adolph S. Ochs Observatory and Museum on the point.

On November 24, 1863, Union troops defeated the Confederates in the Civil War's Battle of Lookout Mountain; soldiers were stationed on the mountain for weeks or months as they concentrated for an advance on Atlanta.[1] In December, soon after the battle, Ohio photographer Robert "Royan" M. Linn established a photograph studio on the summit and took hundreds of photographs of Union officers and soldiers posing on the point (*Figs. A2-A3*). These photographs, brought home to distant states by the soldiers, helped spread the word of the magnificent views and furthered Lookout Mountain's reputation as a popular tourist attraction.[2]

1. For example, Union surgeon James Reeve was stationed there for two months; Jeffrey Kraus and Bob Zeller, "The Perils of Photography at Point Lookout—R.M. Linn," https://antiquephotographics.com/the-perils-of-photography-at-point-lookout-r-m-linn/.
2. Ibid.

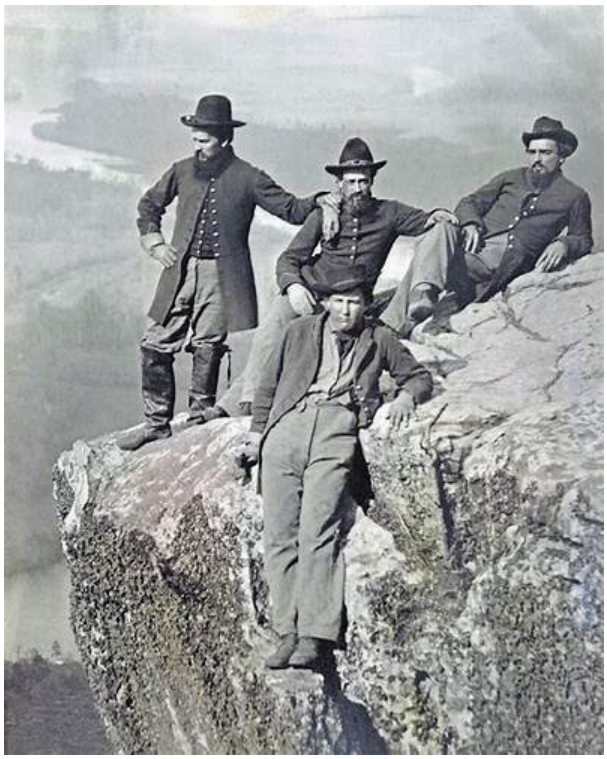


Figure A2. Union soldiers from 78th Pennsylvania Infantry on the point, 1863, Royan M. Linn & Brother, photographer. (Library of Congress, https://www.loc.gov/item/2011648546/)



Figure A3. Daring visitor posing on the point, ca. 1875, Royan M. Linn & Brother, photographer. (Getty Coll. https://data.getty.edu/museum/collection/object/deae9d6f-e2a5-4ccc-860a-84ead64f02a1)

Activity on the point was also greatly influenced by a young woman who came to the area in the 1840s. Harriet Leonora Straw grew up in Virginia and attended school in Salem, North Carolina (today's Winston-Salem) before becoming a music teacher in Chattanooga. She taught the daughter of recently widowed Colonel James Whiteside, an attorney, politician, and owner of much property, including the north end of Lookout Mountain. In 1844 they were married; she was just twenty years old.[3]

In 1852, Col. Whiteside constructed the first public road to the Lookout summit, a toll road commonly called the Whiteside Turnpike, and in 1857 built the first hotel nearby for visitors enjoying the impressive views and healthy air. At his death in 1861, Harriet Whiteside inherited his considerable estate.[4]

Her wealth was short-lived. She lost both her property and her money during the Civil War and was forced to flee with her children. After the war, she worked tenaciously to reclaim her property, including the Lookout Mountain land, and became a shrewd businesswoman.[5]

The flourishing post-war tourism brought heavy traffic to the Turnpike, one of Harriet Whiteside's few sources of income, as her hotel had burned during the war. She therefore increased the toll and entered into an exclusive contract with a livery service, which provided additional income and prevented competing means of access to the summit. Widespread grumbling about her high tolls led a group of entrepreneurs to construct a second road up the mountain, charging lower tolls. In response, Mrs. Whiteside increased access fees to the point for those not using her road, and eventually denied access to all, even fencing the property and employing guards.[6]

3. "A Sketch of Mrs. Whiteside Giving her Varied Experiences in Business and Home Circles," *The Chattanooga News,* 21 February 1903; "Lookout Mountain and the Forgotten Incline Railway," https://www.visitchattanooga.com/blog/post/forgotten-incline-railway/.
4. American Society of Mechanical Engineers, program for "Lookout Mountain Incline Railway, 100th National Historic Mechanical Engineering Landmark," 11 September 1991, p. 2; "Forgotten Incline Railway."
5. Kay Baker Gaston, "The Remarkable Harriet Whiteside," *Tennessee Historical Quarterly,* vol. 40, No. 4 (Winter 1981, pp. 333-347, http://www.jstor.org/stable/42626231.
6. "Forgotten Incline Railway."



Figure A4. Incline railway photographed 1886. (Chattanooga Public Library, Paul A. Hiener Coll. 00001586)

In a move to match hers, investors in 1885 constructed an incline railway to a spot just below the point, and others built an imposing modern hotel where, from its top floor, guests could enjoy the same view as from the point (*Figs. A4-A5*). Mrs. Whiteside was further damaged by passage of a state law prohibiting exclusive contracts with liverymen, and in 1885, was ordered to open the gates of the point to all.[7]

7. Ibid., Mechanical Engineers program, p. 3.

Sale of the Point

In 1887, Mrs. Whiteside sold the property, about 1,000 acres, to a syndicate of New Orleans and Chattanooga businessmen for $250,000. They expected the land to become "the most popular and finest resort on the continent," and in 1890 opened the grand and luxurious 600-room Lookout Inn advertised as the "Great Historic Health and Pleasure Resort of the South."[8]

1890s: National Park

The veterans who visited Lookout Mountain contributed to the creation of what became Chickamauga and Chattanooga National Military Park.[9] Annual reunions of Civil War veterans began in the 1870s in large cities where veterans from the same side gathered. By the 1880s, Union and Confederate soldiers began to meet jointly, both in cities and in encampments on their old battlefields. Many of these "Blue-Gray" reunions took place in Chattanooga in the 1880s and 1890s and included photographs on the point (*Fig. A6*).[10]

8. *Chattanooga Daily Times*, 20 February 1887, p. 8; 25 February, p. 9; "President J.W. Thomas Returning from a Tour of Inspection he talks of His Trip," *Nashville Banner*, 27 September 1889, p. 2; "A Luxury Hotel on Lookout," *CityScope Magazine*, https://cityscopemag.com/city-scope/ask-hamilton-the-lookout-inn/. The hotel was destroyed by fire in 1908.
9. The name was National Park, only later named National Military Park; Ronald F. Lee, *Origin and Evolution of the National Military Park Idea*, National Park Service, 1973, Chap. III.
10. David W. Blight, *Race & Reunion: The Civil War in American Memory* (Cambridge: Harvard University Press, 2001), p. 172.



Figure A5. Hand-colored postcard showing the Point Hotel sited immediately below Mrs. Whiteside's property. (public domain)



Figure A6. Veterans on Lookout Mountain on September 18, 1889 during the Chattanooga reunion that began the idea for the national park. (Chattanooga Public Library Photograph Collection)

In a joint reunion in Chattanooga in 1889, veterans strengthened their hopes for a national battlefield park. The year before, Chattanoogan Adolph S. Ochs, publisher of the *Chattanooga Times* and later the *New York Times*, led a community effort with local attorney Alexander W. Chambliss towards such a park. Ochs led the proceedings at the reunion during which veterans and the local committee joined to form the Chickamauga Memorial Association (*Fig. A7*).

Early the next year, Representative Charles H. Grosvenor of Ohio, a former Union general, introduced H.R. 6454 to establish the Chickamauga and Chattanooga National Park. Congress authorized acquisition of approximately 7,600 acres, for the first time authorizing the federal purchase of historic property from private owners and, if necessary, use of eminent domain to protect such property for the nation.[11] Owners were permitted to occupy and cultivate their holdings upon condition that they would "preserve the present buildings and roads, and the present outlines of field and forest...." [12] The park was dedicated in 1895 with an estimated 40,000 veterans in attendance.[13]

Ochs also implemented the transfer of the 16½-acre Point Park to the national park.[14] The earliest development placed markers and cannon, and by 1905 included a crenelated wall and entrance gate (*Fig. A8*).[15] Monuments and additional markers and artillery pieces were added, as well as a visitor comfort station and caretaker's lodge constructed in 1933 by Civilian Conservation Corps (CCC) laborers.[16]

Harriet Whiteside remained an active participant in developments on the mountain, and at her death in 1903 was known as "the most successful and possibly the wealthiest woman in Tennessee."[17]

1933: National Park Service

On August 10, 1933, responsibility for the national park was transferred from the War Department to the National Park Service (NPS).[18] NPS initiated a new era of development to upgrade interpretation programs and improve landscaping and

11. Lee, Chap. III.
12. Ibid.
13. Blight, *Race & Reunion,* p. 205.
14. John C. Paige and Jerome A. Greene, *Administrative History of Chickamauga and Chattanooga National Military Park* (Denver: National Park Service, Denver Service Center, 1983), pp. 65, 85-87.
15. Hanson and Blythe, *Chickamauga and Chattanooga NMP Historic Resource Study,* NPS Southeast Regional Office, January 1999, Chap. 2, p. 35.
16. Hanson and Blythe, Chap. 2, p. 35.
17. Gaston, "The Remarkable Harriet Whiteside."
18. Lee, Chap. IV.



Figure A7. Adolph S. Ochs, ca. 1918. (T*he Cyclopædia of American Biography*, 1918)

maintenance, and Depression-era programs helped make the improvements and construct buildings.[19]

Land donations added large acreages to the park. In 1926, a local organization created the Chattanooga-Lookout Mountain Park, with Ochs contributing the principal funding and inspiring others to continue. His brother Milton directed the venture. Among projects was construction of a "hanging garden."[20] Adolph Ochs died in April 1935, and in June, the Chattanooga-Lookout Mountain Park organization donated the 2,700-acre Chattanooga-Lookout Mountain Park to the national park through the earlier efforts of the two Ochs brothers and others.[21] The same year, a citizens' group initiated plans for construction of a memorial to Ochs at Point Park.[22] The next chapter of this report is devoted to the history of the building.

19. Paige and Greene, pp. 87, 99.
20. *Chattanooga Daily Times*, 18 September 1940, p. 14; Paige and Greene, p. 87; Hanson and Blythe, pp. 35-36.
21. Hanson and Blythe, p. 36.
22. Paige and Greene, pp. 87, 100-101. The hanging gardens were partially constructed in the Eagle's Nest area of the park.



Figure A8. Crenelated stone entrance gate to Point Park, Charles D. McGuffy, photographer, 1905. (Chattanooga Public Library picture file 00005895)

NPS Planning Documents

An Administrative History of the National Military Park was completed in 1983 and provides information on the creation and development of the park to that time. According to the report, a six-year Master Plan first prepared in 1939 envisioned the restoration of the battlefields. Subsequent construction projects in a Master Plan approved in 1941 were later rejected. The Master Plan of 1964, developed as part of preparations for Mission 66, concentrated on roads in the park and a fight against a proposed four-lane highway through the park. A 1975 General Management Plan was followed in 1976 by a refurbishing of the Ochs memorial building.[23]

The "General Management Plan [GMP], Development Concept Plan and Environmental Assessment" of 1988 proposed an evaluation of wayside exhibits and exhibits at the Adolph S. Ochs Observatory and Museum and anticipated that the recently completed visitor center would draw higher visitation to Lookout Mountain, at that time about 2,000 visitors per month.[24]

The 2015 GMP recommends rehabilitation or restoration of the Adolph S. Ochs Observatory and Museum as well as development of permanent exhibits for the museum room."[25]

23. Paige and Greene, *passim*.

24. 1988 General Management Plan, pp. 13, 26.
25. "General Management Plan Amendment/ Environmental Assessment, Lookout Mountain Battlefield Unit of Chickamauga and Chattanooga National Military Park," January 2015, pp. 20, 55, 66, 59, 72, 128.

Chronology of Development and Use



Figure B1. Architect's sketch of initial building design showing a cantilevered roof viewed from below. (*The Chattanooga News,* 19 October 1938, p. 8)

This chapter discusses construction of the Ochs Observatory building and its later changes. The preceding chapter introduced the background and context of the building and the point on which it is built.

The idea of an Ochs memorial of some sort began soon after Adolph Ochs's April 1935 death, though its form and location were not determined. Historians at the national park had recommended a museum and observatory at the point for some years, and on October 18, 1938, plans for the Adolph S. Ochs Observatory and Museum on the point were announced.[27]

NPS provided the site and defrayed part of the cost by providing the labor. The remainder was paid by contributions from Chattanoogans and by a bequest from George W. Ochs-Oakes, one of Adolph Ochs's brothers. The local Memorial committee donated $12,000 towards construction.[28]

An architect's sketch of the building was included in the next day's newspaper. The drawing shows the north elevation of the stone building with a covered or partially covered upper terrace.[29] Local architects Crutchfield & Law assisted NPS division architects in designing the building (*Fig. B1*).

Ten sheets of drawings prepared in 1937 and 1938 (and two 1940 supplemental detail sheets) show plans, elevations, and details and are consistent with the sketch. The building is U-shaped, built

27. *Chattanooga Daily Times*, 6 June 1939, pp. 3, 14.

28. Ibid., 22 October 1940, p. 1; Paige and Greene, pp. 100-101. The reason for the brother's last name is not known.
29. *The Chattanooga News*, 19 Oct 1938, p. 8.

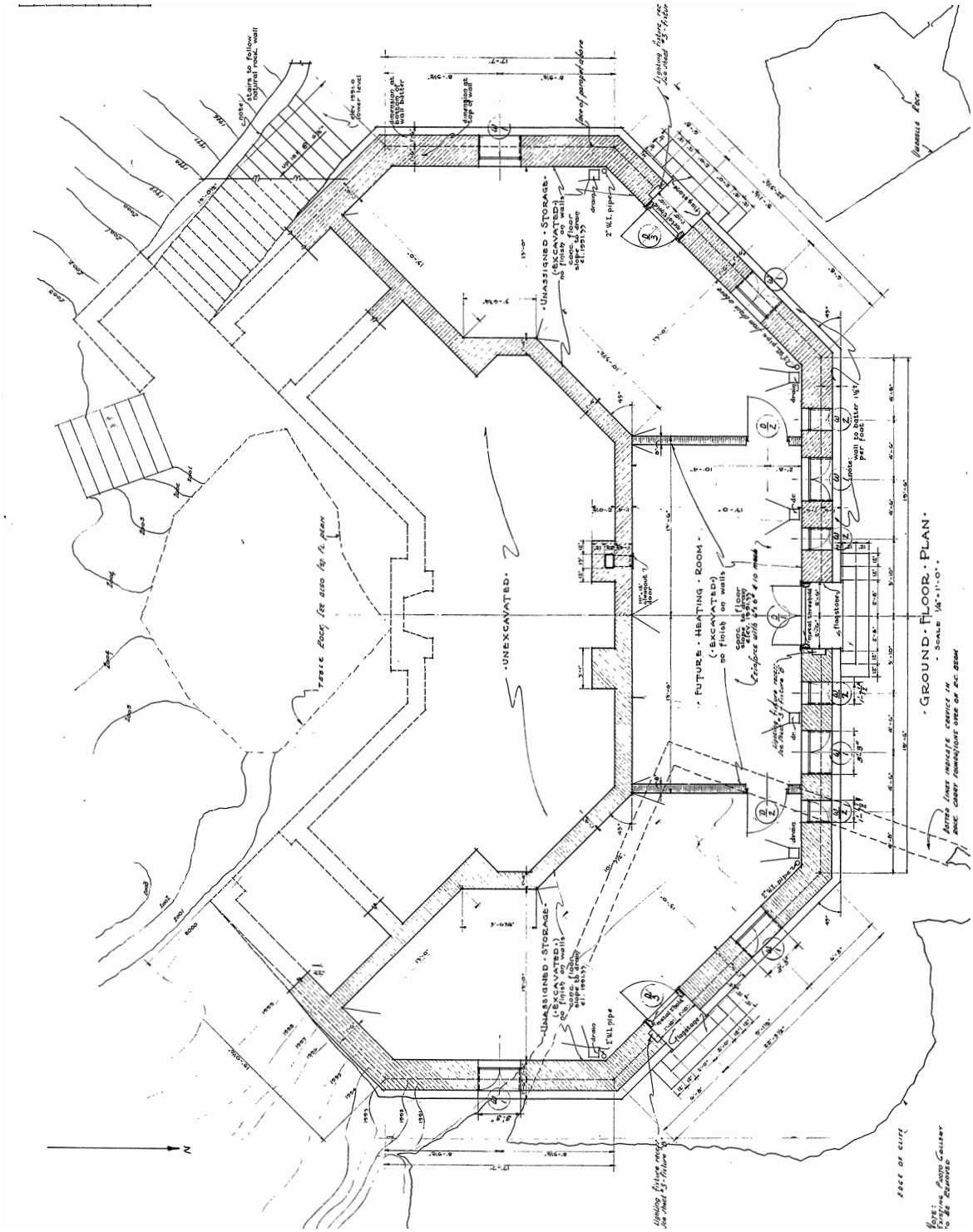


Figure B2. Original drawings, 1938, Sheet 1. (NPS etic file CHCH_301_1112C) Plan sheets are in Appendix A.

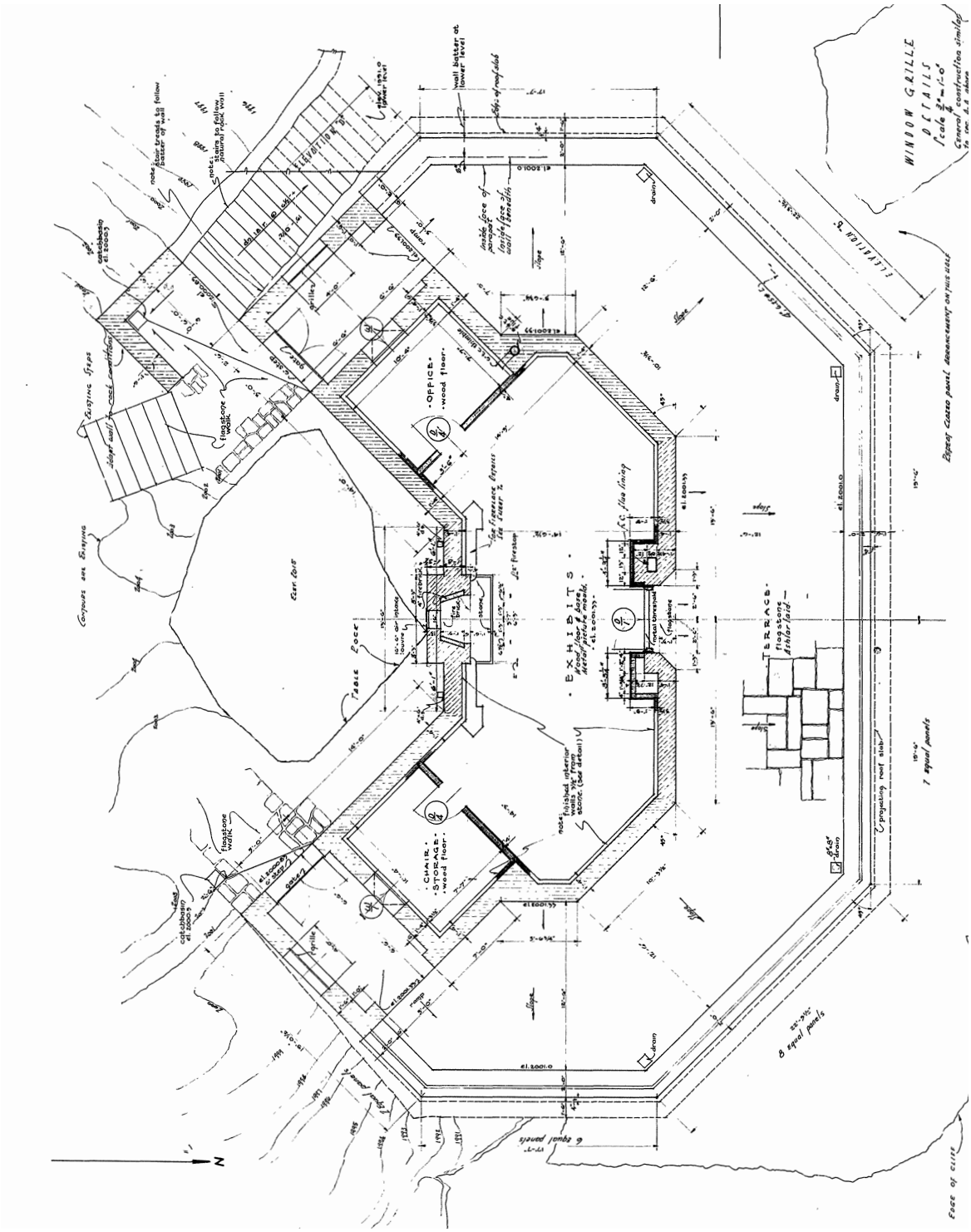


Figure B3. Original drawings, 1938, Sheet 2. The sink and stove are shown on sheet 6. (NPS etic file CHCH_301_1112C) Plan sheets are in Appendix A.

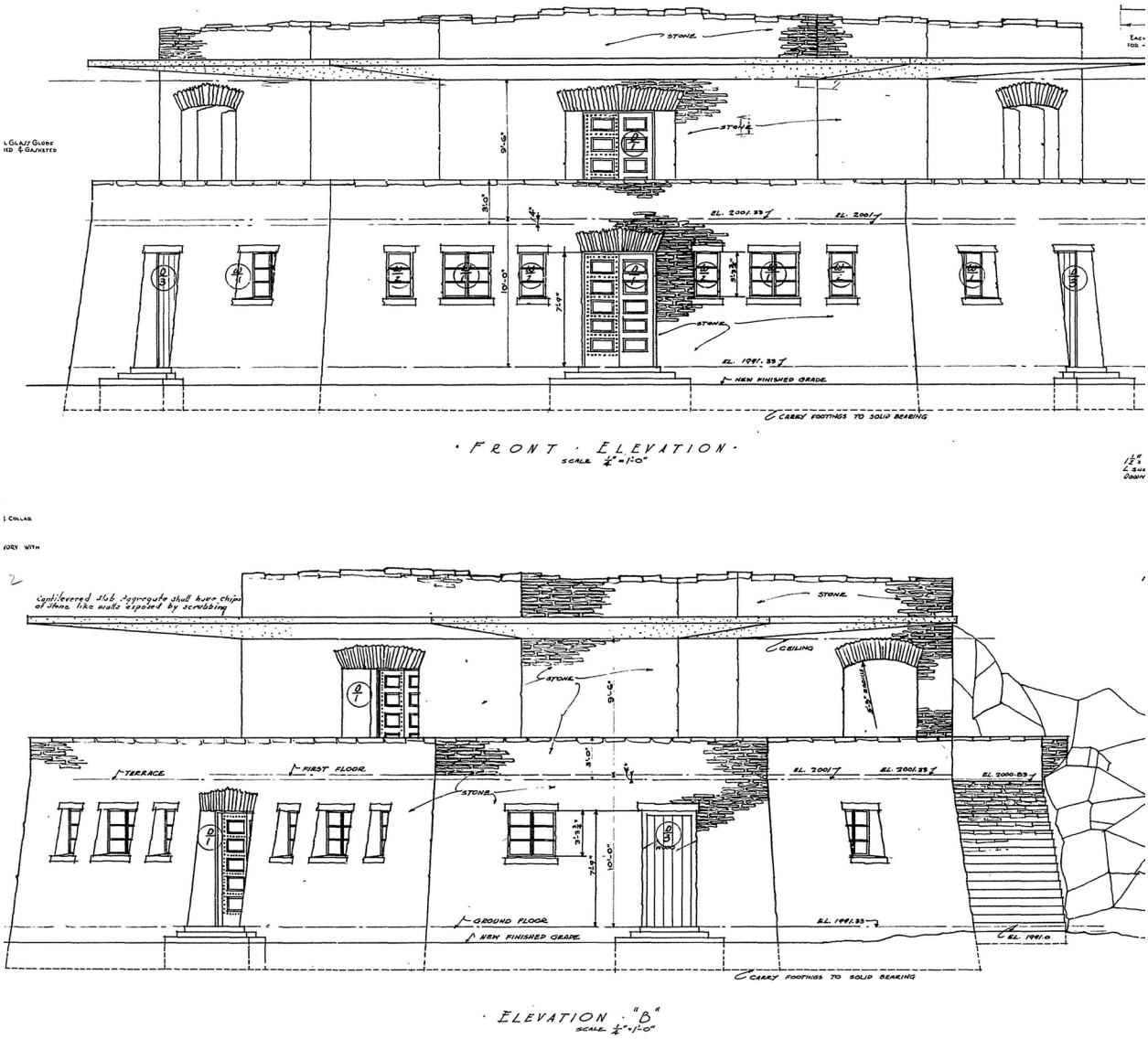


Figure B4. Original drawings, 1938, portion of Sheet 3. (NPS etic file CHCH_301_1112C) Plan sheets are in Appendix A.

into the slope of the mountain, thus requiring entrances on two levels. The lower level depicted in the drawings is much as built, with rustic stone walls and symmetrical fenestration with central front entrance (*Fig. B2*; All plan sheets are included in *Appendix A*).

On the interior of the lower level are three rooms, the center rectangular room identified as the "future heating room." Both diagonal side wings are designated for unassigned storage. All three rooms were to be excavated but without finish on walls. This level was built into the mountain and the central area therefore unexcavated. Dotted lines on the plan create a path travelling south into the building footprint before turning east and continuing beyond the east foundation. The label reads, "dotted lines indicate crevice in rock. Carry foundations over on R.C. [reinforced concrete] beam."[30]

The upper level shows a design later amended (*Fig. B3*). Above the three lower rooms is a flagstone terrace, the observatory. The interior space above the lower-level crawlspace is devoted to exhibits. This was the museum portion of the building, shown with a wood floor, though the room was built with a stone floor that remains today. A metal picture mould is indicated for the museum room. Walls were to be finished, presumably with plaster, furred out 3½ inches from the stone wall. A fireplace is centered in the south wall with flanking casework. Southeast and southwest of the museum

30. The rock cleavage is addressed in HECO Engineers' 2022 "Geotechnical Services for Ochs Museum" Report.

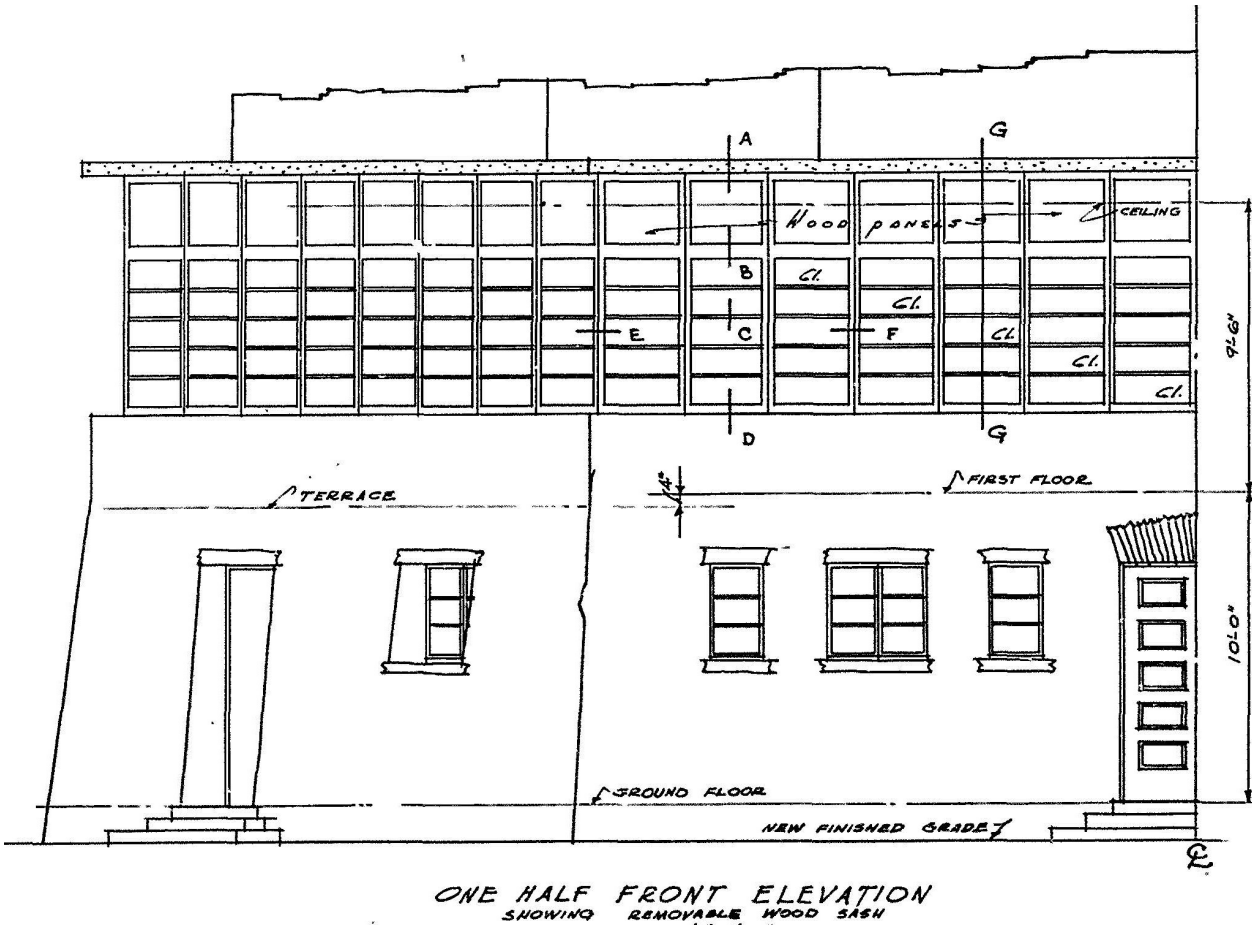


Figure B5. Original drawings, 1938, portion of Sheet 8 showing removable wood sash enclosing the space. (NPS etic file CHCH_301_1112C) Plan sheets are in Appendix A.

room are two small rooms, the eastern for chair storage, the other an office with small sink and heating stove.

It is the design of the upper-level terrace that saw such extreme divergence. The elevation shows a large cantilevered concrete slab with "chips of stone like walls exposed by scrubbing" forming a full roof cover over the terrace. The slabs were to be covered with composition roofing (*Fig. B4*).

Also shown are walls of removable wood sash enclosing the terrace with a row of wood panels above five rows of glass lights (*Fig. B5*). The top of the terrace parapet was to contain dowels every three feet "to allow for expansion shields for future installation of metal or wood sash."

"Outline specifications or the Construction of the Museum at Point Rock," prepared in September 1937 indicate some of the materials intended for the building. Doors were to be red oak with a natural finish, and hardware is specified as "wrought" bronze, though certainly denotes cast bronze. The pavers of the observation deck are stipulated as laminated quartzite.[31]

NPS Rustic Design

Although no information was found on deliberations regarding the design of the building, it was in line with long-established Park Service precedents. In the 1920s, NPS established a policy of rustic design for its new construction emphasizing natural materials and associations with the landscape. Buildings were to harmonize with their surroundings without needless disruption of the scene. Using materials such as native stone and logs, the Park Service built rustic fences, bridges, entrance gates, signage and even bathroom and maintenance sheds. The rustic style became a hallmark of national parks.

31. "Outline Specifications for the Construction of the Museum at Point Rock," NPS Branch of Plans and Designs, 25 September 1937, provided by CHCH staff. (See Appendix B)



Figure B6. Composite of three photographs showing north front of building from the point, dated 5 August 1940. ([Robert T.?] Frost, photographer, CHCH_301_P11_[143442])

Another design concept for Park Service buildings was a philosophy of harmonizing with local architecture. For instance, in 1935 the Park Service built a Moravian Revival-style superintendent's residence and visitor center at Guilford Courthouse, copying the Germanic architecture of the nearby Moravian town of Salem, and in 1937, built an adobe office building in Santa Fe and a Spanish mission style museum at Tumacacori in Arizona. All of these were modeled after the historic architecture of neighboring communities.

The Ochs building's location and purpose were well suited to a rustic design, thus meeting both the NPS policy and the wishes of local citizens.

1939: Construction Begins

Work began in late May 1939 under the direction of Charles S. Dunn, superintendent of the park. The small frame building earlier used as the photography shop was moved forward onto the point to serve as a supply room during construction. Excavation of the foundation was completed within two weeks, and the stone for construction was to be "brought up from 600 feet down" over a cableway laid over a bluff four miles south.[32]

The project met with immediate difficulties. Cracks in the rock, possibly those noted on the lower-level plan, necessitated construction of an unexpected special foundation amid apprehension from area residents that the work would damage the mountain. The Garden Club of Lookout Mountain, of which Ochs had been a member, expressed concern that the building would ruin the view and promoted instead a location near the park's hanging gardens, which they felt were more intimately associated with Ochs. Discussions were held and construction proceeded.[33]

As part of the approved program, labor was provided largely by CCC workers, but after some time the unions demanded that all labor be by union members. In addition, the project ran out of money temporarily, and the inspecting architect resigned. With the union taking over construction and because CCC involvement was required, labor was split into construction work and landscape work, a solution that proved successful.[34]

That lack of funding was documented by the superintendent in his December 1939 Narrative Report, stating that construction on the Ochs building was stopped on October 6 due to shortage of funds and had not resumed. His efforts towards funding were successful; the following month, he reported that a special allotment of $4,490 of CCC funds was made available for completion of the building. The work was to be under the direction of "Mr. Dodd" and supervised by Resident Landscape Architect Robert T. Frost of the Branch of Plans and Design and was to resume after the danger of serious freezes had passed.[35]

A March 1940 newspaper reported that the building was expected to be completed by the end of June, and that for completion, "a few skilled laborers will be used, and the common labor will

32. *Chattanooga Daily Times*, 6 June 1939, pp. 3, 14.

33. Ibid.

34. Paige and Greene, pp. 101, 158.

35. Memoranda for the Director, 9 January 1940, p. 2, and 8 February 1940, pp. 1-2. (Documents provided by CHCH staff)



Figure B7. Display cases in museum room photographed at completion of construction, dated 5 August 1940. (Frost, photographer, CHCH_301_P11_[143442])

be supplied by the CCC."[36] Perhaps an amended agreement was reached to allow use of CCC laborers as completion neared.[37]

The building was "practically complete" not in June but by mid-September 1940, and plans for an October 1 dedication were underway, though that date was soon postponed to mid-November due to "unexpected developments." A newspaper reported in late October that the approaches to the building had to be changed from the original to place the walkway on the west side rather than the center of the ridge because of the building's placement on the mountain, and indeed, a plan for "Adjustment of West Approach" was prepared in 1940.[38]

Changes were apparently made to the east side of the lower level as well. The poured slab in the east room is about 8 inches higher than other floors, requiring a step up from the exterior entrance and from the adjacent center room. It appears the rock was higher there than originally anticipated, requiring a higher floor. The exterior stairs to the east door shown on the 1938 plan were never built, as the rock surface extends nearly to the level of the threshold.

36. *Chattanooga Daily Times*, 12 March 1940, p. 3.
37. Paige and Greene, pp. 101.
38. *Chattanooga Daily Times*, 18 September 1940, p. 1; 25 September 1940, p. 3; 22 October 1940, p. 1; plan for Adjustment of West Approach, 1940, CHCH_301_1112D_[26741] (See Appendix A).

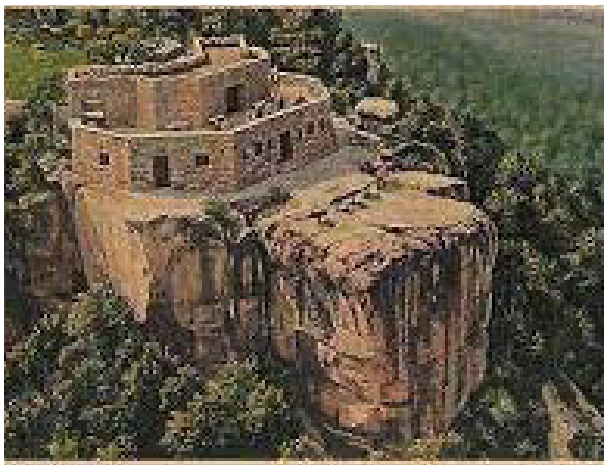


Figure B8. Hand-colored postcard of aerial photograph shows markers in front of the building encouraging visitors to go onto the point, an area now fenced off for safety. (public domain)



Figure B9. Children drink from the fountain in west exterior wall, photographed at completion of construction, dated 5 August 1940. Parapet design and flagstone pattern of terrace floor are visible. (Frost, photographer, CHCH_301_P11_[143442])



Figure B10. Entrance door in north wall of museum room flanked by copper sconces, photographed at completion of construction, dated 5 August 1940. (Frost, photographer, CHCH_301_P11_[143442])



Figure B11. Stone fireplace with flanking walls of casework, photographed at completion of construction, dated 5 August 1940. (Frost, photographer, CHCH_301_P11_[143442])

NPS was reported to have,

> …spent much time in selecting a location and designing a building that would not change the contour of this nationally-known scenic spot. Photographs were taken from all angles and the building laid out so that it fits in with the general outline of the point.
>
> To conform to the sloping terrain, the building is one story high at the rear, where the entrance is located, and two stories high in front. It faces the north and is in the form of an octagon…. The museum is located in the center of the building and windows look out on all sides.[39]

39. *Chattanooga Daily Times*, 22 October 1940, pp. 1, 13.

Completion

The building was completed with a dedication planned for November. It was described in October as, "the attractive building, of native stone… completed by the National Park Service at a cost of approximately $25,000. Exhibits within the museum are now being arranged and are expected to be ready by the dedication date." The article explains that the museum was a memorial to Ochs, "to whom the development of Lookout [M]ountain was a dream to which he contributed the labors of many years of his life. Mr. Ochs, who had acquired several thousand acres on the slopes of Lookout [M]ountain, developed it into a park and then presented it to the national park service as a part of the …military park."[40]

The dedication ceremony was held on November 12, 1940.[41] With the museum in place, Lookout Mountain became the prime focus of park interpretation, providing initial visitor orientation to all the park battlefields. The first, temporary, exhibits were installed in the museum room on the upper level and covered a range of topics, including several on local Civil War battles, and continued to the terrace where four battlefield maps were placed. Markers on the rock in front identified vista points of scenic and historic interest (*Fig. B8*).[42]

The completed building had a terrace open to the sky rather than covered. However, the drainage system was designed for covered space protected from rainfall and was not amended to reflect the lack of roof and the resulting increase in drainage needs. The original 8-inch by 8-inch drains could not handle the rains from the start and led to immediate and continuing leaks to the lower spaces.

A 1939 drawing for a "Sewage Disposal System, Ochs Memorial—Point Park" includes plans and sections for a septic tank adequate for one toilet and one lavatory but gives no indication of their placement in the building. The 1938 building plans show only a small sink in the upper-level office and a drinking fountain on the exterior wall. (*Fig. B9*) However, at some time, perhaps originally, a toilet in a wood stall was placed in the center room of the lower level and remains today. The office sink has been removed.[43]

40. Ibid., p. 1.
41. Paige and Greene, p. 101.
42. Ibid., p. 158.
43. 1938 plans, sheet 7, CHCH_301_1112C.

Repairs and Alterations

In 1948, the building was closed for repairs and its exhibits removed. Plans for a heating system prepared in 1947 suggest that that work was part of the 1948 repairs.[44] Physical evidence indicates that the radiators on the upper level were likely placed as designed. The boiler below was ultimately installed in the center room at the lower level that was reserved for "future heating" in the 1938 drawings, most likely because the alternate proposed location required excavation. This plan also labels the rock crevice beneath the east foundation.

Temporary exhibits were installed in 1950 and permanent displays in 1952.[45]

An August 1962 newspaper reported that "new lighting, new paint and new counters" were added at the museum.[46] This may be when many of the original light fixtures were removed. Beside each exterior door at the lower level was a sconce in a niche in the stonework; their design details are included in the original plans. The lights have been removed; the niches and boxes remain. A stone has been mortared over the niches for two pathway lights on the west wall. Two original exterior fixtures remain on the building at the covered entryways at the east and west ends of the upper level. They are of the same design as the removed doorway sconces, though with a ceiling-mounted variant.

The original ceiling lights in the lower level may also have been removed at this time. They were set in metal boxes in concrete and had rusted. The fixture boxes were retained, and new ceramic lamp holders were placed in nearby locations in the ceilings.

In 1963, Point Park interpretive materials were updated with new aluminum and glass signs and refurbished exhibits in the museum in time for the battle centennial in November.[47] The park superintendent may not have been a fan of the building; he wrote that "Little by little, this important visitor contact point is losing its jail-like appearance and beginning to resemble a NPS museum."[48]

44. Paige and Greene, p. 162; plans for Heating System, 1947, CHCH_301_5301_[141777].
45. Paige and Greene, p. 162.
46. *Chattanooga Daily Times*, 16 August 1962, p. 2.
47. Paige and Greene, pp. 164-165.
48. Ibid., p. 103.

1976 Renovations

In line with the 1975 General Management Plan, the museum was "refurbished" inside and out the next year and new exhibits installed.[49] The focus of the project was a badly needed overhaul of exhibits, which brought substantial changes to the upper level and removal of significant original features and covering of others.

In effect, a new room was built. The original partition walls were removed to incorporate the museum room and the two side rooms into one larger space. The walls were furred out with a new stud wall, and the ceiling was similarly lowered, and acoustic tiles installed. The casework flanking the fireplace was removed and the firebox opening covered (*Fig. B11*). The hearth was retained as well as the original stone floors, which provide evidence that the original walls and doorways were placed as shown on the 1938 plan.

49. Ibid., p. 105.



Figure B12. One of this pair of studded doors in the center north doorway fell due to failure of anchors in spring 2022. (Undated photograph provided by CHCH park)

It is likely that features remain behind the 1976 walls. For example, the east and west windows of the former small rooms were covered with drywall as a visual continuation of the interior wall surface, leaving no indication of their presence.

The lighting was fully replaced to complement the exhibit design, and the electrical system was upgraded.

Although new heating and air conditioning are not shown on the 1976 plans, this may be when the 1947 heating system was replaced. Physical evidence indicates the boiler and radiators were removed, leaving small portions of piping at the lower level and crawlspace, and a new forced-air ducted system was installed. To accommodate the new system, a large 2-foot by 4-foot hole was cut in the exterior door at the northeast elevation, and the lower-level east casement window was replaced with a louvered opening for air intake.

Later Changes

Changes made after the 1976 project are identified only from physical evidence, the dates of the alterations unknown. The second generation ducted forced-air heating system was replaced with a mini-split system that provides heating and cooling, probably in the 2010s. This remains active today.

The electrical system appears to have been fully replaced since the 1976 overhaul, and the acoustical tile ceiling of that project has since been replaced with gypsum wallboard.

A severe rust problem was caused by salt being used on the observatory platform and elsewhere as a de-icing measure. All windows on the lower level are severely rusted, some to the extent the glass is barely supported, and sash have detached. The extreme rust of the metal anchors of the center door caused the eastern leaf and a portion of the jamb to fall (*Fig. B12*). The fallen door and jamb are stored in the building.

Drainage

A series of changes to the drainage system have made a bad situation worse. As discussed above, drainage for the building was designed for a roofed space and not amplified when the decision was made to have an open terrace. The inadequate sizing and quantity of drainage components caused leaking from the start. Drainage flowed into cast iron pipes that went below grade. These became clogged and were abandoned.

A complex network of PVC pipes was later assembled that combine in the lower level to a single 3-inch pipe, far too small to handle drainage of the building.

Deterioration of the floor structure of the observation terrace has resulted in the building's being closed to public access until repairs can be completed.

After eighty years, drainage remains the prime cause of damage to the building.

Recent Technical Reports

In 2021, HECO Engineers completed a report titled "Condition Assessment Report - Structural Evaluation for Ochs Museum," which includes a cost estimate for structural and envelope repairs. The report places specific focus on deterioration of the concrete slab and beams supporting the observation deck. Deterioration was mapped on reflected ceiling plans included in their report. Recommendations for structural repairs as well as representational repair details are provided. An evaluation of these repair recommendations is included in the *Structural Recommendations* section of this report, beginning on page 93.

HECO, together with Golder Associates, Inc., also completed a report titled "Geotechnical Services for Ochs Museum - Visit, Analysis, Recommendations, and Schematic Level Design" in 2022 that included ground penetrating radar surveys of the floor slabs as well as an assessment of the natural vertical slots in the rock face that partially extend beneath the building. The report notes no obvious signs of distress in the slabs or masonry as a result of geotechnical issues. The report does, however, stress the importance of improving site drainage to reduce erosion potential.

Timeline

1844	Harriet Leonora Shaw marries the wealthy Col. James A. Whiteside, whose Lookout Mountain property includes the point.
1852	Col. Whiteside constructs what is known as Whiteside Turnpike toll road to the Lookout summit, and in 1857 builds first hotel nearby.
1861	Death of Col. Whiteside; Harriet Whiteside loses her inherited property and wealth during the Civil War, then gains it back through legal fights, business transactions, and management.
1863	Union defeats Confederates in Battle of Lookout Mountain; photographer Royan Linn operates photography service on the point popular with Union soldiers.
1870s	Harriet Whiteside creates fees and exclusive contracts to recoup losses.
1885	Her competition constructs Incline Railway to the summit and imposing hotel just below Whiteside property with similar view. She increases tolls and access fees; ultimately fences the point property and closes access.
1885	Whiteside is ordered to open the gates of the point to all.
1887	Whiteside sells Lookout Mountain property to a business syndicate.
1889	Adolph S. Ochs leads proceedings at reunion of Civil War veterans, who join with local committee to pursue national park status for battlefields.
1890	Chickamauga and Chattanooga National Park is authorized.
1890	New owners of Whiteside property open 600-room hotel.
1895	National Park is dedicated.
1903	Death of Harriet Whiteside, whose business management made her “the most successful and possibly the wealthiest woman in Tennessee.”
1926	Local citizens create Chattanooga-Lookout Mountain Park with Ochs contributing major funding, and inspiration.
1933	The War Department transfers national park to the National Park Service.
1935	Death of Adolph Ochs, who gives his mountain park to be added to national park.
1935	Citizens begin effort towards memorial to Ochs.
1937	Outline specifications for "Museum at Point Rock."
1937-38	Ten sheets of drawings include plans, elevations, details, and two 1940 supplements.
1938	Plans announced for Adolph S. Ochs Observatory and Museum on the point.

1939	Drawing for septic tank and sewage system.
1939	Construction begins in May.
1939	Master Plan for the park, updated 1941.
1940	Construction was completed in fall, dedicated in November.
1948	Hot water radiator heating system installed.
1950	Temporary exhibits installed; permanent displays installed in 1952.
1962	Much early lighting is replaced, and additional lighting installed.
1963	Interpretive materials updated in museum.
1964	Master Plan.
1975	General Management Plan.
1976	Major renovations and interior alterations to the building; original features covered; others removed.
post-1976	Electrical system replaced; acoustical tile ceiling replaced.
1983	Administrative History of CHCH.
1988	General Management Plan.
1999	Historic Resource Study of CHCH.
~2010s	Mini-split HVAC system installed.
~2010s	Network of PVC pipes installed, designed to drain to single 3-inch pipe, continuing long-existing drainage problems.
2015	General Management Plan Amendment (GMPA) for the Lookout Mountain Battlefield unit of CHCH.
2021	Structural Evaluation and Title 1 Condition Assessment Report.
2022	Draft Geotechnical Services Report.
2022	Historic Structure Report.

Physical Description and Condition Assessment



Figure C1. The Adolph S. Ochs Observatory and Museum as viewed from the northwest. All photos in this section were taken by JKOA in March 2022.

General Description

Site Overview

The Adolph S. Ochs Observatory and Museum is situated on the promontory of Lookout Mountain, overlooking the Tennessee River and the city of Chattanooga to the northeast (*Figs. C1-C2*). The building is part of the Point Park Unit and is about one thousand feet north of the Point Park entrance gate. A network of paved walkways descends north from the Point Park carriage drive and connects to the museum building at the upper level. The building itself completes the walkway circuit, allowing visitors to approach the building from either direction, experience the view and exhibits, and return south without retracing their steps.

The rock face extends north of the building at the lower level and a secondary trail extends west of the building accesses another observation area separate from the building. The walkways and staircases were visually assessed as part of the site investigation and are described after the physical description and condition assessment of the museum building.

Grade meets the upper level of the observatory at the south elevation, allowing access to the observation deck and museum space. A stacked stone formation lies immediately adjacent to the south elevation (*Figs. C2-C3*). Grade drops steeply at the sides of the building and the lower level of the building is accessed from an exterior stair along



Figure C2. View looking north from the promontory of Lookout Mountain. The City of Chattanooga is visible at right.



Figure C5. "Table" rock south of the building as viewed from the southeast.



Figure C3. View of the building from the southwest. Note grade meeting the base of the south elevation and the proximity of the "table" rock formation behind the building.



Figure C4. Umbrella Rock just northwest of the building.

the west elevation. The lower level is not open to the public and is secured by an iron fence and gate. Just beyond the fence is Umbrella Rock, which lies northwest of the building (*Fig. C4*). The top surface of the rock face is exposed at the northernmost point of the mountain (*Fig. C2*).

Architectural Description

The Ochs Observatory and Museum is a symmetrical, U-shaped two-level masonry structure constructed of local sandstone laid in rough courses (*Fig. C6*). The rustic character of the building is consistent with National Park Service structures of the period, being reflected in the rustic masonry, the use of masonry arches, and the irregular parapet at the upper-level roof. The masonry walls of the lower level increase in thickness as they approach grade, giving an impression of weight and solid footing. The upper level is set back from the northern edge of the lower level, creating a paved observation deck surrounded by a stone wall parapet that wraps the northern facets of the upper level. Covered entryways, each with two arched doorways, provide access to the observation deck at the east and west ends of the south elevation.

Major doorways are spanned by a mixture of shallow round arches and jack arches, with smaller openings, such as windows, spanned by single stones. The majority of openings are at the lower level, where each facet of the northern elevation has punched masonry openings containing steel casement sash. Three doorways at the lower level, each containing original wood doors, are accessed by stone steps. At the upper level, a single doorway is centered on the north elevation, while a single



Figure C6. North elevation at lower level.

window opening is on each of the southeast and southwest elevations, looking into the symmetrical covered entryways. The roof of the upper level is surrounded by an irregular stone parapet, furthering the rustic character of the building.

Façade Organization

The observatory is nearly symmetrical about its north-south axis, though there are some variances at the lower level due to differences in grading.

North Elevation at Lower Level

The north elevation is the largest of the exterior walls and contains the greatest number of openings (*Fig. C6*). Centered on the elevation is a doorway spanned by a jack arch and holding a pair of original five-horizontal panel wood doors. A total of six window openings, three on either side of the doorway, are spaced across the elevation. The center window openings on each side hold a pair of six-light steel casement sash, while the two flanking openings have single six-light casement sash. Two stone steps access the exterior doorway from grade and the elevation is capped with a flat stone coping that projects slightly from the front face of the wall.

Northeast and Northwest Elevations at Lower Level

The northeast and northwest facets of the lower level are mirror images of each other. An exterior doorway is located at the southern end of the wall, while a window opening with paired six-light casement sash is at the northern end (*Fig. C7*). The northeastern doorway is accessed from grade, while the northwestern doorway is accessed by two stone steps. The same coping observed on the north elevation continues across the elevations at the observation deck.

East and West Elevations at Lower Level

The east and west elevations at the lower level are mirror images of each other and each have a single



Figure C7. Northeast elevation at lower level. Note that the northwest elevation isn't fully viewable due to the proximity of the rock edge, but is a mirror image of the northeast elevation.



Figure C8. East Elevation at Lower Level



Figure C10. Southeast elevation as viewed from the southwest walkway.

window opening holding a pair of casement sash. Each elevation is capped with stone coping at the observation deck level (*Figs. C8-C9*).

Southeast and Southwest Elevations

The southeast and southwest elevations differ at the lower level due to the presence of an exterior stair that engages the west elevation that does not exist on the east, as grade directly abuts the building and slopes north. The stair has stone risers and treads and has an original cheek wall along its



Figure C9. West Elevation at Lower Level



Figure C11. Southwest elevation as viewed from the southeast walkway.



Figure C12. South elevation, east end.

west side and an original iron handrail mounted to the building along its east side. At the upper level, each elevation has an identical arched opening holding a pair of decorative iron shutters (*Fig. C11*).

South Elevation

The south elevation is exposed only at the upper level and consists of three sections that create a segmented C-shape (*Figs. C12-C13*). The outermost sections at the east and west ends have arched masonry openings that provide access to the observation platform. The center of the south elevation has a masonry chimney that is integrated into the parapet of the roof. Two scuppers with collection boxes and downspouts flank the chimney.



Figure C13. South elevation, west end and center section.

North Elevation at Upper Level

Similar to the lower level, the north elevation at the observation platform is faceted and symmetrical; however, the north elevation at the upper level lacks window openings (*Figs. C14-C19*). An exterior doorway accessing the museum is at the middle of the center facet and is spanned by steel lintels and a stone jack arch. Each of the east and west ends of the elevation have arched masonry



Figure C14. Center of north elevation at upper level as viewed from the northeast.



Figure C15. Detail of west end of north elevation of center section.



Figure C16. Northeast facet of north elevation at upper level. Note that the northwest facet is identical.



Figure C17. Western facet of the north elevation at upper level featuring drinking fountain. The eastern facet is similar but has no fountain.

openings that provide access to the observation level (*Figs. C18-C19*). The western facet of the north elevation has a built-in water fountain with stone step (*Fig. C17*). Integrated stone benches typically centered on each facet and to the east and west of the north doorway (*Fig. C16*).

East and West Elevations at Upper Level

The east and west ends of the upper level each have a covered vestibule that accesses the observation deck from the approaching walkways (*Figs. C20-C21*). The outermost walls of those entryways have arched masonry openings with cast iron window



Figure C18. West end of north elevation at upper level. West entryway vestibule visible through the archway.



Figure C19. East end of north elevation at upper level. East entryway vestibule visible through the archway.



Figure C20. Overview of the east entryway to the observation deck looking south. Note plywood barrier installed to prevent public access to the observation deck.



Figure C21. Overview of the west entryway to the observation deck looking south. Note plywood barrier installed to prevent public access to the observation deck.

shutters. The inner walls of the vestibules each have a pair of typical six-light steel casement sash windows. The underside of the concrete roof slab is finished with embedded exposed aggregate.

Construction Characteristics

Structural System

Floor Systems

The lower level has a slab on grade throughout (*Fig. C22*). The floor in the east room lies about 8" higher than the floor of the rest of the lower level but appears original (*Fig. C23*). The raising of this slab level may have been the result of unforeseen site conditions discovered during construction.

The floor at the upper level and observation deck consists of a reinforced concrete slab with integrated reinforced beams on the underside that are exposed at the ceiling of the lower level (*Figs. C24-C26*). The beams span between the north and south walls in a radiating pattern and typically measure 11½" wide by 1'-0½" deep with 1"-wide



Figure C22. Typical poured-in-place concrete floor at lower level.



Figure C23. Interior step at northeast exterior doorway, indicated the raised level of the concrete slab in the east room. This depression allowed the door to swing inward.



Figure C24. Overview of underside of concrete slab at lower level and typical concrete beam.



Figure C25. Overview of underside of concrete slab at lower level. Note example of extensive spalling and exposed steel reinforcement.



Figure C26. Concrete beam spanning atop tile interior partition wall at lower level.

chamfers. Concrete spalling is common on the underside of the area beneath the observation deck at both the slab and northern end of select beams. See the *Condition Assessment* section for more information.

Wall Systems

Exterior Walls

The walls of the observatory are of load-bearing masonry construction and are exposed to the interior at the lower level (*Fig. C27*). The thickness of the walls at the lower level tapers from 2'-6" thick at the base to 1'-10" thick at the parapet, while walls at the upper level measure about 1'-4"



Figure C27. Typical stone exterior wall exposed at lower level.



Figure C28. Typical reinforced concrete lintels at the lower level as viewed from the interior.



Figure C30. Three steel lintels above upper-level north doorway. Note rusting.

thick. Exterior wall construction is concealed at the upper level; however, the construction drawings suggest that they are also load-bearing masonry.

Window and door openings are spanned by reinforced concrete beams on the interior face of the walls, where observable (*Fig. C28*). Steel lintels are exposed at the head of the openings on the exterior and span beneath the exterior masonry. The lower-level windows have single L-shaped steel lintels, while the upper and lower-level north doorways have three and two steel lintels, respectively (*Figs. C29-C31*). The window openings at the upper level appear to lack steel lintels. The condition of the lintels varies and is discussed in the *Condition Assessment* section.

Round masonry arches span the openings of the two exterior entryways as well as the southeast and southwest window openings with iron shutters (*Fig. C32*). Jack arches are found above the north



Figure C31. Two steel lintels above lower-level north doorway. Note rusting.



Figure C29. Typical steel lintel at lower-level window opening. Note heavy rust.



Figure C32. Typical example of rounded arch at upper level.



Figure C33. Example of pointed jack arch, in this case at the upper-level north doorway. The lower-level north doorway is similar.

exterior doorways, supported by multiple steel lintels below (*Fig. C33*).

Interior Walls

Interior partition walls at the lower level consist of combed-face structural tile measuring 8" wide by 8" tall by 4" thick and are laid in a running bond pattern (*Fig. C34*). The walls extend to the underside of the concrete ceiling and beams above. The upper level has no remaining interior partitions.

Roof System

The roof of the upper level consists of a reinforced concrete slab that is concealed on both sides by roofing and interior ceiling finishes. Gypsum wallboard in the exhibit space is likely installed on furring to allow for the installation of current building systems.



Figure C34. Detail of typical structural tile partition wall at lower level.

Utility Systems

Mechanical Systems

The upper level consists of one space (Room 201) and is heated and cooled by a split system with two wall-mounted indoor units and two corresponding outdoor units (*Figs. C35-C36*). The lower level currently has no form of climate control. The



Figure C35. Typical indoor unit in exhibit space (Room 201).



Figure C36. Outdoor units at east side of the building.



Figure C37. Refrigerant lines passing through the east elevation window opening to the outdoor units. The duct on the right is related to the previous mechanical system.

indoor units are Mitsubishi model MSZ-GE18NA cassettes. Refrigerant and condensate lines pass through the furred-out interior walls into the crawlspace below. The refrigerant lines exit the building through the east elevation window opening at the lower level, while the condensate drain exits through the east exterior door at the lower level (*Fig. C38*). Outdoor units are placed on a plastic base east of the building, along the edge of the rock outcropping, and are Mitsubishi model MUZ-GE18NA. Each unit is capable of providing 18,000 BTU of heating and cooling. No obvious manufacture date was indicated on the units themselves; however, both the indoor and outdoor appear to be in serviceable condition with some signs of cosmetic wear.



Figure C38. Condensate drain (left) passing through east exterior door, as viewed from exterior.

The majority of components from a previous ducted forced air system are abandoned in place at the lower level (*Figs. C39-C40*). An electric air handling unit is mounted on a ceiling rack in the center room (Room 102), while the outdoor unit for the system is in the east room (Room 101) and is mounted on a raised CMU platform that allows the unit to exhaust air through the east



Figure C39. Abandoned air handler in Room 102.



Figure C40. Abandoned outdoor unit near window opening in Room 101.



Figure C41. Abandoned return air duct and exhausts fan mounted in east exterior doorway in Room 102.



Figure C42. Typical abandoned return air grille in Room 201.



Figure C43. Typical abandoned supply air grille in Room 201.

window opening. An outdoor air intake louver is also connected to the east window opening (*Figs. C36-C37*). Insulated ducts are typical within the crawlspace and ceiling and wall registers and diffusers are consistent throughout the upper level (*Figs. C42-C43*). A large exhaust fan is mounted to the east exterior doorway but appears to no longer be used (*Fig. C41*).

The building is thought to have originally had a radiator-based hot water or steam heating system. A flue pipe and cleanout for a boiler remain on the south wall of the center room (Room 102) (*Figs. C44-C45*).

Electrical System

The main electrical service approaches the building below grade and enters the building at the south elevation and passes through the crawlspace in



Figure C44. Abandoned flue opening on south wall of Room 102.



Figure C45. Cleanout beneath the flue opening in Room 102.

large diameter plastic conduit. A large disconnect switch is adjacent to the crawlspace opening in the east room of the lower level (Room 101) (*Fig. C46*). A conduit then exits the switch and connects to the main panel mounted on the east wall of the center room (Room 102) (*Figs. C47-C48*). The main panel has about two-thirds of the breaker positions filled. A second disconnect switch is on the south wall of Room 102 and is connected to the abandoned ducted air handler.

Receptacles and switches throughout the lower level are surface mounted and connected by plastic conduit (*Fig. C49*). Ceramic lamp holders are typical on the ceiling; however, heavily rusted recessed boxes that once served the original light fixtures are visible on the ceiling. At the upper level, modern track lighting is typical, and switches and receptacles are recessed.



Figure C46. Main disconnect switch on south wall of Room 101.



Figure C47. Main electrical panel on east wall of Room 102.



Figure C48. Inside of main electrical panel showing available panel space.

Plumbing System

The building has one toilet installed in a wood stall in the center room of the lower level (Room 102); however, it may no longer be active (*Fig. C50*). A water fountain on the northwest elevation of the upper level has been disconnected. Two toilets and one wall-mounted sink are stored in Room 103. The sink may have originally been installed in the upper-level office as shown in the original construction drawings.



Figure C49. Typical ceramic lamp holder and surface-mounted plastic conduit. Note rusted smoke alarm at left and abandoned original recessed fixture box at right.



Figure C50. Wood stall containing a toilet in Room 102.

Fire Protection and Life Safety Systems

The building has wired smoke detectors and a fire alarm system with control panel located in a closet west of the doorway in the upper-level exhibit space (Room 201) (*Fig. C51*). A fire extinguisher is mounted on the wall east of the doorway in Room 201. Smoke detectors at the lower level are mounted to the underside of the concrete ceiling slab (*Fig. C49*).

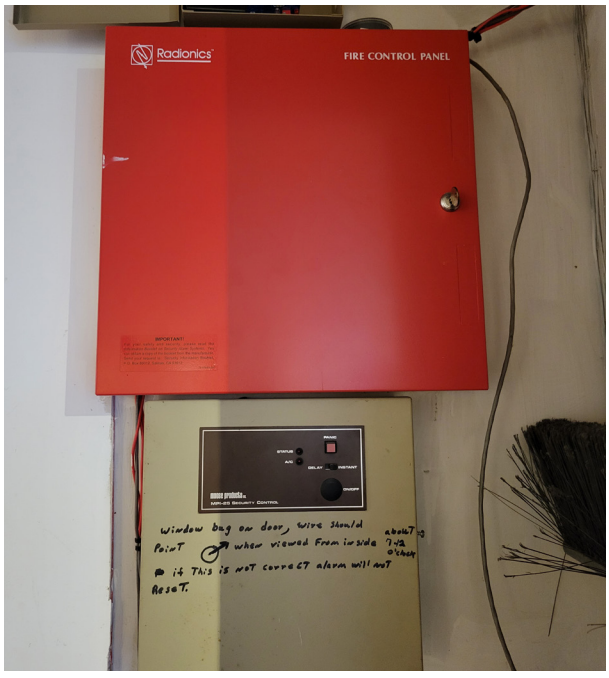


Figure C51. Fire alarm control panel (above) and display case security panel (below) in closet of Room 201.

Security System

Room 201 is equipped with four security cameras that provide full coverage of the exhibit space. A computer in the closet west of the exterior door supports the cameras (*Figs. C53-C54*). Each of the glass display cases has an alarm to alert of tampering or glass breakage. The control box for this system is also located in the closet near the door (*Fig. C51*). Motion detectors for the security system are mounted at the east and west ends of the room and a magnetic lock secures the exterior door.

The center and western rooms of the lower level each have motion detectors mounted near the ceiling (*Fig. C52*).



Figure C52. Typical motion detector above HVAC unit in Room 201.



Figure C53. Typical security camera in Room 201.



Figure C54. Computer associated with security cameras in Room 201.

Exterior Features

Masonry Walls

The masonry exterior walls are constructed of load bearing, rough-cut coursed stone of varying sizes. Larger stones range from about 1'-8" long to 2'-7" long to as much as 2'-10" long by typically about 5" to 8" tall. Medium sized stones range from 9" to 11", to 14" in length by 3" tall, and smaller stones range from 8" to 10" to 12" long by 1½" tall. Stones are generally golden brown in color, though some have orange, red, and pinkish tones (*Figs. C55-C56*).

Rounded arches top the doorways accessing the observation deck from the approaching site walkways, as well as the east and west window openings with iron shutters (*Fig. C58*). The north doorways are spanned by jack arches that are made up of wedge-shaped stones that increase in height as they reach the center (*Fig. C57*). Smaller window and door openings are spanned by a single stone, though these openings are backed by a reinforced concrete beam on the interior face of the wall.

Exterior Doors

The building has six exterior doorways, three at the upper level and three at the lower level. Each doorway at the lower level retains original wood



Figure C56. Detail of typical masonry wall.



Figure C57. Example of typical jack arch.



Figure C55. Overview of typical masonry exterior wall.



Figure C58. Example of typical rounded arch.

exterior doors and casings. Original doors are identified in the construction specifications as being red oak with a natural finish. The principal lower-level doorway, centered on the north elevation, holds a pair of five horizontal panel doors with each measuring 2'-0" wide by 6'-11 ½" tall by 2 ¼" thick (*Figs. C59-C60*). The primary leaf and associated jamb have detached from the masonry opening and are stored inside the building but are intact. The door stiles at the latch side measure 4⅞" wide, while the top, middle, and bottom rails measure 4¾", 3⅞", and 10" wide, respectively. The secondary leaf has a 1⅞"-wide by ¼" thick rounded astragal. Square-edged applied sticking surround each flat panel and measures 1 ¼" wide. The sticking is set back about ¼" from the face of the stiles and rails and the flat panels are set about ¼" from the face of the sticking. Pyramidal square studs measuring 1" by 1" are consistent on the stiles and rails of both doors.

The doors are each hung with three five-knuckle ball-pin hinges measuring 6" tall and the secondary leaf is secured on the interior by head and foot bolts measuring 6" tall by 1¼" wide (*Figs. C61-C62*). Exterior handles measure 9" tall and are consistent on both doors (*Fig. C63*). The primary leaf has a functional thumb latch, mortised lockset, and deadbolt, while the secondary leaf has a



Figure C59. North doorway at lower level. Note missing left leaf and jamb. Also note that right leaf is stuck in position.



Figure C60. Intact door leaf and jamb stored in Room 102.



Figure C61. Original door handle at north doorway.



Figure C62. Typical original head and foot bolt.



Figure C63. Original door handle on north exterior door at lower level. The removed leaf has a similar handle.



Figure C64. Typical original door casing at north doorway. Note rusted lintel above.

dummy handle and keeper. The deadbolt cylinder and escutcheon are missing and the door, before it detached from the opening, was secured with a padlock hasp. All original hardware is described in the specifications as being cast bronze.

The northeast and northwest exterior doorways at the lower level hold original flush-panel doors made up of varying-width flush tongue-and-groove boards (*Figs. C65-C67*). The doors were originally identical; however, the east door has been modified to allow building system elements to pass through it. Each of the doors measures 3'-0" wide by 7'-0" tall by 2" thick and is hung with three five-knuckle ball-pin hinges measuring 6" tall. Hardware includes a mortised lockset with beveled rectangular escutcheon measuring 3" wide by 10" tall on the exterior and 2" wide by 7" tall on the interior. Doorknobs are missing from each door. All original hardware is described in the specifications as being cast bronze.

Original molded exterior casings are consistent at all lower-level doorways (*Fig. C64*). The casing of the north doorways is a mitered ovolo molding measuring 1⅞" wide by 2⅜" thick. The northeast and northwest doorways have similar ovolo molded casings.

At the upper level, one doorway accesses the exhibit space (Room 201) from the center of the



Figure C65. Original northwest doorway and casing.



Figure C66. Typical original escutcheon at interior of northeast and northwest doorways.



Figure C67. Original northeast doorway at lower level. Note holes cut in door for building systems.

north elevation. The opening retains and early casing and partial jamb, but the door has been replaced with a modern flush-panel single-light door measuring 3'-9 ½" wide by 6'-11 ½" tall by 1 ¾" thick (*Figs. C68-C70*). The door is hung with three 5"-tall butt hinges and has a single light measuring 1'-10" wide by 2'-6" tall containing security glass. Hardware includes a 6" handle on the exterior and a 4"-wide by 16"-tall push plate. The door has a deadbolt, a closer, and a magnetic lock that can also be released by a button on the interior. The original exterior casing is a mitered ovolo molding measuring 1⅞" wide by 2⅜" thick that matches the casing found at the north opening at the lower level.



Figure C68. North exterior doorway at upper level. Note replacement steel door.



Figure C69. Remaining original casing at upper-level north doorway. Note modern steel frame at right.



Figure C70. Inside face of modern steel door at upper level.

The south elevation has two masonry openings that each once held a pair of wood doors, as indicated in the original construction drawings, that measure 5'-0" wide by 7'-6" tall overall. The original wood frames and portions of door hardware remain in place. The remaining wood frames each measure 6" wide overall, including a 1½" wide cove molding at the exterior and a 1" quarter round at the interior (*Figs. C71-C73*). The frame measures 2" thick and have evidence of three hinge pintles on each side of the jambs on the north face that measure 2¾" tall. A head bolt keeper remains at the top of the openings. Both doorways currently have plywood panels installed that prevent access to the observation deck.

Each Exterior doorway's condition, coupled with interior and exterior photographs of each, are documented with treatment recommendations in *Appendix D*.

Windows

Original steel six-light casement windows are consistent throughout the entire building. The windows are identical in design and dimension but vary between single and two-sash configuration.



Figure C71. Inside face of typical south doorway, in this case at the west entryway. Note early or original frame.



Figure C72. Early headbolt keeper at south exterior doorway.



Figure C73. Detail of early south doorframe and remaining early hinge pintle.



Figure C74. Intact example of original paired six-light casement sash at lower level. Note rusted lintel, frame, and sash.

Openings with paired sash measure 3'-5" wide by 3'-1" tall (*Figs. C74, C76*). The masonry opening for the single-sash window openings measure about 1'-7½" wide by 3'-1" tall (*Fig. C75*). Window sash sizes are consistent at each opening and measure 1'-6½" wide by 3'-0" tall by 1¼" thick. Window muntins measure ⅞" wide and each sash has a pivot hinge at top and bottom. The mullion between the paired sash measures 3⅞" wide, while



Figure C75. Example of typical single-sash casement window at lower level. NOte missing glass and deterioration. Also note typical bars at interior.



Figure C76. Paired sash at upper level in protected entryway. Note lack of steel lintel.



Figure C77. Typical casement sash hinge.



Figure C78. Typical casement sash handle.

typical perimeter frames measure 1½" wide by 1¼" deep at the masonry opening (*Fig. C77*). Hardware includes a rotating handle measuring 4¾" long that engages the center mullion on paired-sash opening and the window frame of single-sash openings (*Fig. C78*). Two ¾" vertical bars are at the interior of each sash opening at the lower level (*Fig. C75*). Exterior sills vary in dimension but typically measure about 4" to 6" thick and extend about 1" from the face of the wall and about 2" beyond the masonry opening.

Each window opening's condition, coupled with interior and exterior photographs of each, is documented in *Appendix D*.

Arched openings on the southeast and southwest elevations each hold cast iron shutters that were likely installed shortly after the construction was completed (*Fig. C78-C81*). The shutters vary in design from those shown in the construction drawings and each leaf measures 2'-0" wide by 4'-1 tall at the low end and 4'-10" at the high point of shutter. The perimeter frame measure ¾" wide by 1¾" deep and the vertical bars measure 1" square positioned on-point. The circles at top and bottom of the shutters measure 3¼" in diameter.



Figure C80. Example of wrought iron window shutter on west elevation.

The shutters are each hung with two pintle hinges measuring 3¼" tall and are secured with a padlock. A wedged shaped block at the sill measures 3" long and 2" wide and prevents the shutters from opening outward (*Fig. C81*). The stone sill at the base of the openings measure about 4" thick.



Figure C79. Example of wrought iron window shutter on west elevation.

Exterior Steps and Site Walls

Stone exterior steps access the north and northwest doorways at the lower level. The north doorway has two steps and three risers accessing the threshold level. The lowest step measures about



Figure C81. Wedge shape stop at exterior side of sill.



Figure C82. North exterior stair.



Figure C83. Detail of north stair showing loss of grade beneath.

9'-2" wide overall while the upper step measures about 7'-2" wide (*Figs. C82-C83*). The treads measure 1'-0" deep and the risers measure 6", 7 ½" and 5 ½" tall from top to bottom. The treads have an approximately 1" deep nosing. The stairs have shifted out of position due to grade loss caused by erosion.

One step within the northwest doorway's masonry opening access the threshold level (*Fig. C84*). The



Figure C84. Stair at northwest exterior doorway at lower level.

tread measures about 1'-2" deep and the risers measure 1'-2" and 6" tall from top to bottom. The lower riser height has been increased due to loss of grade due to erosion.

A linear stone staircase descends along the west elevation of the building and connects the upper and lower levels of the site (*Fig. C85*). The stair measures about 5'-11" inches wide and has

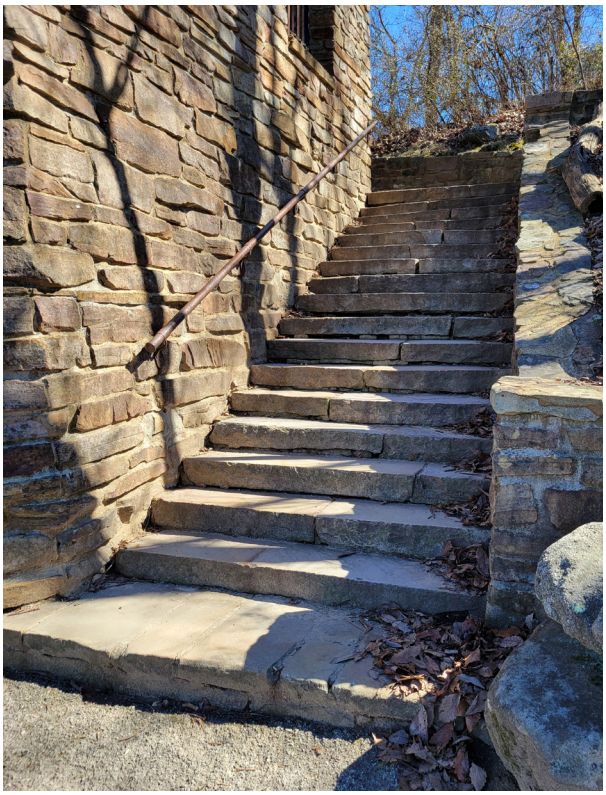


Figure C85. Stair along west elevation.



Figure C86. Southwest stair. Approach walkway visible beyond.



Figure C87. Southwest stair as viewed from the west.



Figure C88. Southeast stair as viewed from the north. Water from the walkway beyond sheds down the stair to the walled area below.



Figure C89. Walled southeast approach pathway. Note chain barrier at left.

seventeen treads and eighteen risers. The treads are made up of mortared stones and each measure about 1'-0" deep with approximately 6 ½"-tall risers. A 1'-4" wide cheek wall with stone coping extends the length of the stair along its west side and turns at the top to form the cheek wall of a second set of stairs at the upper level. An original 2"-diameter pipe rail is mounted to the building at a height of 2'-8" tall.

The upper set of stairs southwest of the building connect to the walkway network that descends from the carriage drive (*Fig. C86-87*). The stair measures about 6'-0" wide and has six 1'-0" treads and six risers. The uppermost tread is even with the level of the walkway above. The risers measure 6" tall typically, except the lowest riser, which measures 4" tall. An early pipe rail measuring 1 ½" in diameter lines the south side of the stair at a height of about 2'-6" tall.

The exterior steps southeast of the building connect to the eastern approach walkway and consist of three threads measuring 6'-0" wide with four 1'-0" deep treads and four 6" risers (*Fig. C88*). The top tread is level with the walkway. An early pipe rail measuring 1 ½" in diameter lines the south side of the stair at a height of about 2'-6" tall. Stone cheek walls on each side of the stair line the walkway match those on the west approach and ultimately connect to the building at each side of the southeast doorway (*Figs. C89, C91*).

The southeast approach slopes toward the building and is intended to be drained by a 3½" wide by 2" tall drain on the northwest wall (*Fig. C90*). The drain is undersized, and the surrounding flagstone paving is not sloped to the drain, allowing water to



Figure C90. Drainage hole in wall at southeast approach.



Figure C91. View of southeast approach looking west toward the building. Note dirt indicating water backup.

back up and flow onto the observation deck or into the crawlspace.

Stone cheek walls connect the stairs and approaching paths at the southeast and southwest approaches. The walls measure 1'-4" about 2'-4" tall at their highest point (*Fig. C91*). Flagstone paving is typical at the pathways adjacent to the building. Along the north side of the southeast stair, an early chain railing with two 2"-diameter posts discourages visitors from leaving the path (*Fig. C89*).

Exterior Lighting

The majority of exterior light fixtures have been removed; however, evidence remains at the location of each fixture. Two original fixtures remain within the covered vestibules at the upper level and are ceiling-mounted pill-shaped fixtures



Figure C93. Typical niche for original sconce fixture at lower-level doorways. Note remaining fixture box.

with protective cages (*Fig. C92*). According to the original drawings, similar fixtures were once installed within the masonry openings of each of the lower-level doorways. Each location retains a recessed fixture box and a recess in the masonry prevented the fixture from projecting into the doorway (*Fig. C93*). Each recess measures 2'-1" tall by 10" wide at the outside face and 1'-7" tall at the rear of the recess. The overall depth of the recess



Figure C92. Typical remaining original light fixture found in the east and west entryways at the upper level.



Figure C94. Infilled pathway lighting location on west stair.



Figure C95. Exterior light switches in west entryway.



Figure C96. Observation deck looking northeast.

is about 5½" and the beveled masonry wash at the base measures about 6" tall. Three light switches are on the west wall of the west exterior entryway at the upper level and likely controlled exterior lighting (*Fig. C95*). The switches appear to have been abandoned.

Two additional original fixture locations are along the west elevation, just above the level of the exterior stair treads (*Fig. C94*). These lights were recessed rectangular fixtures that were aimed downward to light the stairs. Patches in the stone indicate the location of these fixtures on the exterior, and one of the fixture locations retains a junction box and conduit on the interior, though no longer in service.



Figure C97. Observation deck looking west.

Finishes

The majority of the building is made of natural stone. The majority of the trim, windows, and exterior doors are painted reddish brown. The two south elevation door jambs and casings are painted black, as are the east and west casement windows and the east and west elevation iron window shutters.



Figure C98. East entryway, note that the west entryway is a mirror image.

Observation Deck and Rainwater Dispersal

The 12'-4"-deep observation deck wraps the north side of the upper-level exhibit space and extends into two outdoor entryways that connect the building to the approaching walkways at grade (*Figs. C96-C99*). The entryways are mirror images of each other and measure 6'-7" by 10'-1" and have floor-to-ceiling heights of about 9'-0" tall. The ceilings are finished with textured exposed aggregate at the underside of the roof slab.

The surface of the observation deck is finished with pavers laid in a semi-regular ashlar pattern



Figure C99. West end of observation deck and opening to west entryway.

with a perimeter band and diagonal separators where the deck turns with the building shape (*Figs. C100-C101*). The pavers appear to be a type of sandstone and have slight variations in color, but are generally shades of tan, orange, and gold that complement the colors of the exterior walls. A sampler of paving sizes includes 2'-11" by 2'-6", 3'-3" by 2'-0", 2'-6" by 1'-8", 2'-0" by 2'-0", 3'-0" by 1'-6", and 8" by 6". Perimeter pavers measure 10" wide by 2'-10" long and diagonals measure 1'-0" wide by 2'-10" long.

The parapet at the outside perimeter of the observation deck measures 3'-0" tall by 2'-2" wide and has a 4 ½"-thick stone coping that extends about 1" from the face of the wall (*Figs. C96-C97*). Coping stones vary in width between 2'-0", 4'-0", and about 5'-0" long.



Figure C101. Stone paving showing typical example of deterioration.

The observation deck is drained by four internal drains along the parapet wall that have grilles measuring 4" in diameter but drain to pipes openings measuring 3" in diameter (*Fig. C102*). Drains are located in the outside corners of the parapet and larger mortar patches are visible around the drains indicating that larger drains were once installed. The drainage system and waterproofing layer beneath the observation level is not functioning and is causing ongoing damage to the structure and envelope below.

Four stone benches engage the exterior walls along the northern faces of the upper level (*Fig. C103*). Each bench measures about 5'-0" long by 1'-5" deep by 1'-5½" tall. The seat of the bench consists of a single stone measuring 4½" thick, while the two stone piers supporting the seat measure 1'-2" wide by 1'-4" deep and are spaced 1'-6" apart. Holes in the top of the seat indicate where the stone is pinned to the piers below.

A stone drinking fountain is integrated into the west elevation of the upper level (*Fig. C104*). The



Figure C100. Typical stone paving.



Figure C102. Typical drain.



Figure C103. Typical stone bench.

fountain has a stone basin measuring 1'-4" by 9" by 3" deep at a height of 3'-2" above floor level. The top of surface of the fountain extends about 10" from the face of the wall and measures 2'-0" wide. A niche in the wall behind the basin measures 1'-3" wide by 1'-6" tall by 4" deep. A wedge-shaped stone step accesses the south side of the fountain and has an 11"-tall riser. The waterspout has been removed but is stored in the lower level. Supply and drain plumbing have been disconnected.



Figure C104. Water fountain.

Roofing and Rainwater Dispersal

The roof of the upper level is a low-sloped concrete slab with perimeter parapet and a coated membrane (*Figs. C105-C106*). Multiple layers of roofing appear to be installed on the roof surface and are contributing to the difficulty to stop leaks. A fiberglass mesh reinforced coating is applied to the inside face and tops of the parapet and chimney. The parapet measures 2'-0" tall and has an irregular top surface. Flashing at the base of the parapet wall measures 4" tall and lies about 8" above the roof surface. 1" square spikes measuring 1'-4" long are centered on the south parapet and have been added to discourage visitors from jumping from the table rock onto the roof (*Figs. C105, C110*). The spikes are embedded in holes drilled in the masonry and are held in place with a mixture of mortar and epoxy.

The main stone chimney along the south wall measures about 3'-4" north-south by 6'-6" east west and extends about 1'-10" above the parapet (*Fig. C107*). The chimney holds one flue that is



Figure C105. Overview of roof looking west. Note leaves at right.



Figure C106. Overview of roof looking northeast.

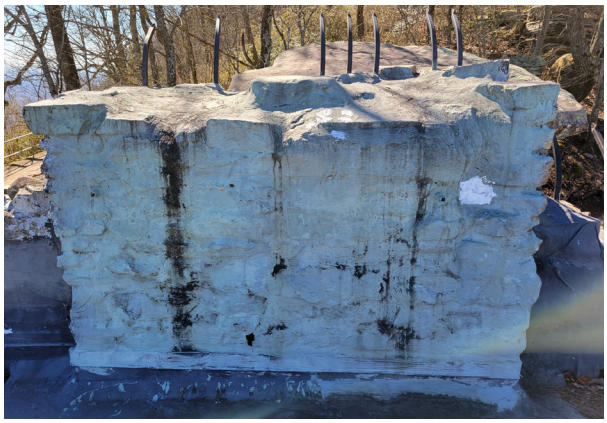


Figure C107. Main chimney. Note coatings applied.



Figure C108. Chimney near west end that once served office stove. The boiler chimney is similar.



Figure C109. Typical scupper, collection box, and downspout on south elevation. Note clogged filter.

capped, but once served the fireplace in the exhibit space. Two smaller chimneys, each measuring about 2'-0" wide, engage the north parapet, one toward the west end of the building and one closer to the center (*Fig. C108*). The west chimney and flue served a stove in the original upper-level office, while the more central chimney served the boiler. Both have been capped and are not visible from grade.

Four 4" vents pass through the roofing and presumably ventilate the furred-out space above the ceiling in the exhibit space (*Figs. C105-C106*).

Remnants of what was likely an early lightning protection system remain on the parapet (*Fig. C111*).

The roof is drained by two scuppers that flank the main chimney along the south parapet (*Fig. C110*). The scuppers each measure 8" wide by 4 ½" tall and drain to collection boxes on the south



Figure C110. Typical scupper as viewed from the roof. Note spikes installed on south parapet.

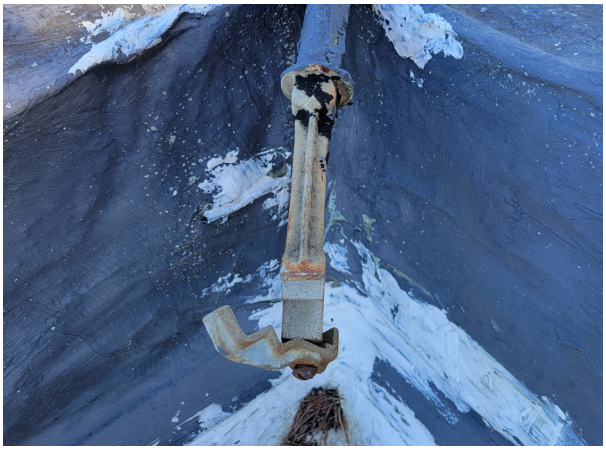


Figure C111. Bracket possibly from former lightning protection system.

elevation. Two depressions in the roof measuring 1'-8" long by 1'-0" wide help to direct water to the scuppers. The collection boxes drain to copper downspouts each measuring 5 ½" by 4" that connect to drainpipes that cross the crawlspace and eventually to a subsurface drainage system (*Fig. C109*). These drains appear to be clogged and nonfunctional, allowing water from the roof to collect at the rear of the building.

Other Features

A modern cast iron fence extends perpendicular from the west elevation and prevents visitor access to the lower level and rock face north of the building (*Fig. C112*). The bars of the fence measure ¾" square and are spaced at 6" on center. Curved points at the top of the fence measure 1'-0" long. Horizontal bars measuring ½" by 2" stabilize the bars, while three stabilizing posts measure 2 ¼" in diameter and are spaced at 6'-0" on center. A gate near the east end of the fence measures 2'-0" wide by 6'-7" tall and is hung with two pintle hinges. The gate is secured with a padlock. The fence has been repeatedly added to the west end to better prevent access.



Figure C112. Barricade fence west of the building.

Room-by-Room Description

Lower-Level Overview

The lower level consists of three rooms, each accessed by exterior doorways and connected internally (*Fig. C113*). A crawlspace extends along the majority of the south wall of the lower level and is accessible from the east and center rooms

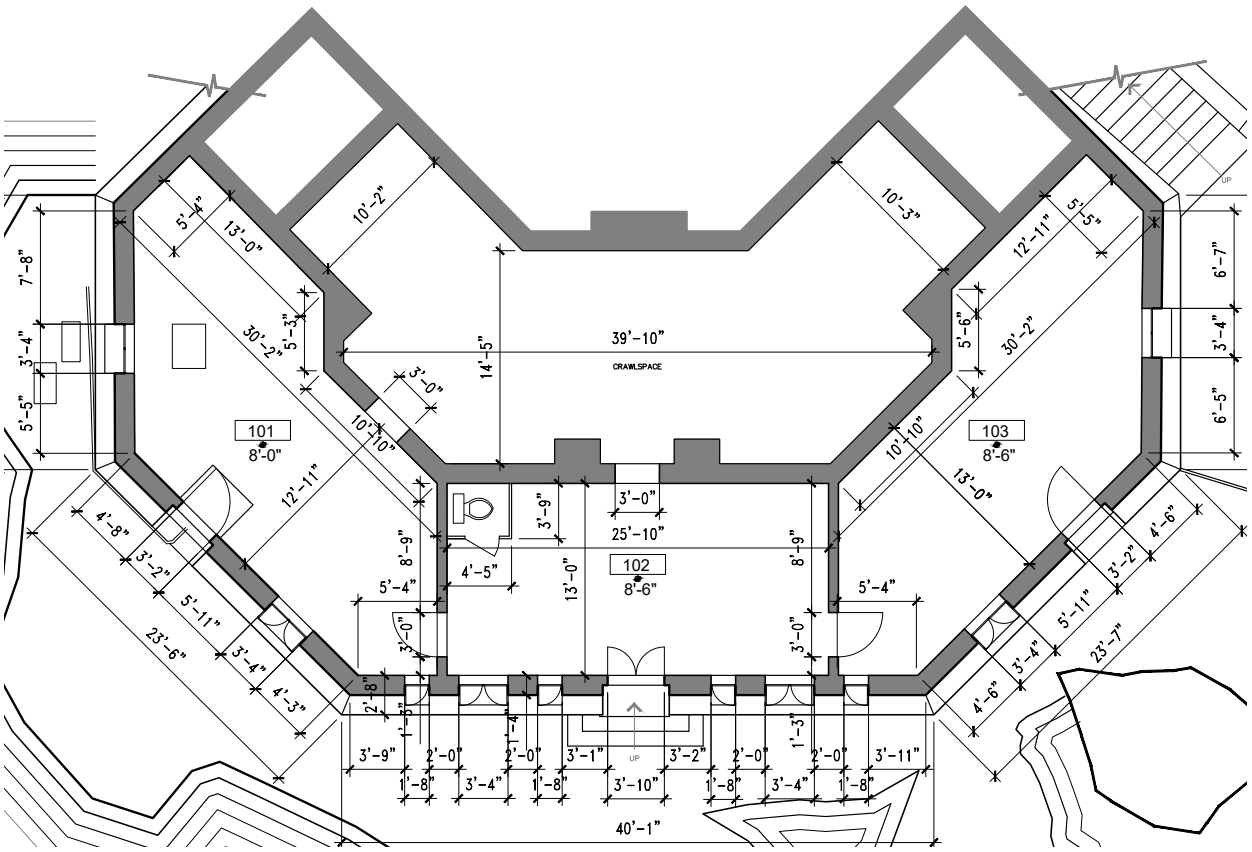


Figure C113. Lower-level plan. A larger version of this plan is found in Appendix C.

(Rooms 101 and 102). The lower level serves as mechanical and storage space and is not open to the public.

Room 101 – East Room at Lower Level

Room 101 is at the east end of the lower level and is slightly L-shaped. The room measures about 30'-2" by 12'-11" at its widest points and has a floor-to-ceiling height of 8'-0" tall (*Figs. C114-C117*).

Flooring

A poured-in-place concrete slab is consistent throughout the room and lies about 8" higher than the concrete floor of the adjacent Room 102 to the west. A step is located at the threshold of the west interior door and the exterior door has a 3'-10" by 3'-3" depression in the slab that allows the door to swing inward (*Fig. C118*). The raised flooring in this space is not indicated in the plans but is thought to be the result of adjustments made during construction due to site conditions.

Baseboard

The room has no baseboard.

Walls and Ceiling

The same stone found on the exterior of the building is consistent on all but the west interior partition. The exterior stone is described in the exterior features section. Each window opening is spanned by a reinforced concrete lintel. The west wall is original and is constructed of combed-face clay structural tile measuring 12" by 12" by 8" that are laid in a running bond pattern. The tile wall terminates at the ceiling beam above.

The poured-in-place reinforced concrete slab and beam structural system is exposed at the ceiling and has five exposed reinforced concrete beams that span between the inner walls and the exterior walls. The structural system is described in detail in the *Construction Characteristics* section.

Doorways

The room has two doorways, one on each of the northeast and west walls. The northeast doorway is an exterior door that is described in the *Exterior Features* section. The west doorway accesses



Figure C114. Room 101 - View looking north.



Figure C116. Room 101 - View looking southeast.



Figure C115. Room 101 - View looking northeast.



Figure C117. Room 101 - Southeast end.



Figure C118. Room 101 - Step at exterior door. Note large drain lines connecting to observation deck drainage system. Note also smaller condensate drain.

Room 102 and holds an original flush-panel wood door measuring 2'-11 ½" wide by 6'-8" tall by 2" thick that is hung with three five-knuckle ball-pin hinges measuring 6" tall (*Figs. C119-C123*). The door is made up of random-width vertical flush boards varying between 4¼", 5½", and 7½" wide. Hardware includes a mortised lockset with integrated deadbolt. A beveled rectangular



Figure C120. Room 101 - Original hardware on Room 101 side of interior door.



Figure C119. Room 101 - Original interior door.



Figure C121. Room 101 - Original hardware on Room 102 side of interior door.



Figure C122. Room 101 - Original casing on Room 101 side of interior doorway.



Figure C123. Room 101 - Original casing on Room 102 side of interior doorway.

escutcheon measures 2" wide by 7" tall on the Room 101 face and 3" wide by 10" tall on the Room 102 face.

The Room 101 side of each of the doors has an original lintel-cut plank board casing measuring 3½" wide by ¾" thick. The Room 102 side of the west doorway has an original mitered molded casing measuring 1 ¼" wide by 1⅜" thick (*Figs. C122-C123*).

Windows

The Room has three window openings, one on each of the east, northeast, and north elevations. Each opening holds six-light steel casement sash. The east and northeast openings each originally held a pair of sash and each have masonry openings measuring about 3'-5" wide by 3'-1" tall. The masonry opening for the single-sash window on the north wall measures about 1'-7½" wide by 3'-1" tall. Window sash sizes are consistent at each opening and measure 1 '-6½" wide by 3'-0" tall by 1¼" thick. Window muntins measure ⅞" wide and each sash has a pivot hinge at top and bottom. The mullion between the paired sash measures 3⅞" wide, while typical perimeter frames measure 1½" wide by 1¼" deep at the masonry opening. Hardware includes a rotating handle measuring 4¾" long that engages the center mullion on paired-sash opening and the window frame of single-sash openings. Stone windowsills vary between 1⅜" and 1¾" thick. Two ¾" vertical bars are at the interior of each sash opening. The southern window sash in the east window opening has been removed and replaced with a louver for the now-abandoned ducted mechanical system (*Fig. C124*).

Images of each window type can be found in the *Exterior Features* section and in *Appendix D*.

Other Features

A masonry opening accessing the crawlspace is on the southwest wall and measures about 3'-0" wide by 2'-4" tall (*Fig. C116*).

Finishes

Most surfaces are unpainted. The exterior door, exterior door casing, and the window sash and frames are painted reddish brown.



Figure C124. Room 101 - East window modified to hold mechanical system elements.

Mechanical Systems

Evidence remains of the abandoned ducted mechanical system that once served the exhibit space above. Remaining elements include a return air duct that connects to an opening cut in the northeast exterior door, an insulated duct that connects to the louver installed in the east window opening, and insulated supply ducts that cross the room to connect to the air handler in Room 102. The outdoor unit that once served the system is mounted on a CMU stand near the east window opening, allowing the unit to exhaust air through the remaining window sash, which lacks glass (*Fig. C124*). Refrigerant lines serving the current mini-split system cross the ceiling near the east end of the room and exit through the east window sash. Condensate lines from the mini split units exit the crawlspace, descend the south wall, and cross the floor to exit through a hole cut in the east exterior door (*Fig. C118*).

Remnants of what appear to be former steam or hot water lines for the initial radiator-based heating system are along the south wall at the ceiling.

Photos of utility system elements are found in the *Utility Systems* section.

Electrical System

Two surface-mounted ceramic lamp holders are on the ceiling and are connected by plastic conduit. A surface mounted receptacle is on the northeast wall, also connected by plastic conduit.

The main electrical service passes through the crawlspace access opening on the south wall and connects to the large disconnect switch just east of the opening. A 2" plastic conduit runs along the south wall and passes through the west wall to the main panel located in Room 102.

A second disconnect switch is on the northeast wall near the window opening and appears to serve the two active outdoor units for the mini-split system (*Fig. C124*).

Two rusted recessed ceiling boxes on the ceiling indicate the location of the original light fixtures.

Photos of utility system elements are found in the *Utility Systems* section.

Plumbing System

Two drains serving the observation platform are at the ceiling along the north wall. Remnants of a 3"-diameter cast iron drainpipe remain at the floor and ceiling. The sections at the floor have y-shaped cleanouts (*Fig. C125*). Both original cast iron drain stacks have been removed and replaced with PVC pipes that extend to the floor and turn horizontally to connect near the east exterior door. The PVC and cast iron are held together with compression collars with a metal tightening strap. The PVC pipe serving drains on the west side of the observation platform exits the crawlspace and crosses the floor. All the pipes combine into a single 3"-diameter outlet that passes through a hole cut in the east exterior door (*Fig. C118*).

Fire Protection and Life Safety

A wired smoke detector is mounted on the ceiling. The detector is heavily rusted and may no longer be functional.



Figure C125. Room 101 - Original drainpipe and cleanout (arrow) bypassed by new PVC drain.

Room 102 – Center Room at Lower Level

Room 102 is the center portion of the lower level and is accessed by the large, paired doors on the north elevation. The room is currently used as storage but appears to have once contained the boiler for the initial radiator-based heating system based on the flue opening remaining on the south wall. The room measures about 13'-0" north-south by 25'-10" east-west and has a floor-to-ceiling height of 8'-5½" tall (*Figs. C126-C129*).

Flooring

A poured-in-place concrete slab is consistent throughout the room.

Baseboard

The room has no baseboard.

Walls and Ceiling

The same stone found on the exterior of the building is consistent on all but the east and west interior partition. The exterior stone is described in the *Exterior Features* section. Each window opening is spanned by a reinforced concrete lintel. The east and west walls are original and are constructed of combed-face clay tiles measuring 12" by 12" by 8" that are laid in a running bond pattern.

The poured-in-place reinforced concrete slab and beam structural system is exposed at the ceiling and has two exposed reinforced concrete beams that span between the inner walls and the exterior walls. An addition beam spans above each of the east and west interior partition walls. The structural system is described in detail in the *Construction Characteristics* section.

Doorways

The room has three doorways, one on each of the north, east, and west walls. The north doorway is an exterior door that is described in the *Exterior Features* section. The east doorway accesses Room 101 and holds a flush-panel door described in the *Room 101 – East Room at Lower Level* section. The east doorway holds an original door that shares an identical design and identical hardware but measures 2'-11½" wide by 6'-11" tall by 2" thick (*Fig. C130*). The door is hung with three five-knuckle ball-pin hinges measuring 6" tall. The door is made up of random-width vertical flush boards varying between 4¼", 5½", and 7½" wide. Hardware includes a mortised lockset with integrated deadbolt. A beveled rectangular escutcheon measures 3" wide by 10" tall on the Room 102 face and 2" wide by 7" tall on the Room 103 face. The doorknob is missing.

The Room 102 side of the east and west doorways have original mitered molded casings measuring 1 ¼" wide by 1⅜" thick (*Fig. C123*). The north doorway has an original lintel-cut plank board casing measuring 3½" wide by ¾" thick; however,



Figure C126. Room 102 - View looking southeast.



Figure C128. Room 102 - View looking north at west end.



Figure C127. Room 102 - View looking north at east end.



Figure C129. Room 102 - View looking west.



Figure C130. Room 102 - Original west interior door as viewed from Room 103.

the eastern jamb and casing have detached and are stored within the room.

Windows

The Room has four window openings on the north wall, two on each side of the exterior doorway (*Figs. C127-C128*). The masonry openings closest to the doorway each measure 1'-7½: wide by 3'-1" tall and each hold single six-light casement sash. The openings at the east and west ends of the north wall each measure 3'-5" wide by 3'-1" tall and each hold a pair of six-light casement sash. Window sash sizes are consistent at each opening and measure 1 '-6½" wide by 3'-0" tall by 1¼" thick. Window muntins measure ⅞" wide and each sash has a pivot hinge at top and bottom. The mullion between the paired sash measures 3⅞" wide, while typical perimeter frames measure 1½" wide by 1 ¼" deep at the masonry opening. Hardware includes a rotating handle measuring 4¾" long that engages the center mullion on paired-sash opening and the window frame of single-sash openings. Stone windowsills vary between 1⅜" and 1¾" thick. Two ¾" vertical bars are at the interior of each sash opening.

Other Features

An 8"-diameter flue opening is on the south wall and has a cleanout below. This flue likely served a boiler for the initial steam or hot-water radiator heating system.

A partial height wood stall in the southeast corner conceals a toilet and has a door on its north face (*Fig. C131*). The stall measures 3'-9" north-south by 4'-4" east-west. The stall door measures 2'-4" wide by 6'-2" tall, is hung with three surface-mounted hinges, and has a pull handle.

A masonry opening accessing the crawlspace is on the south wall and measures about 3'-0" wide by 2'-4" tall (*Fig. C132*).

Finishes

Most surfaces are unpainted. The exterior doors, exterior door casing, and the window sash and frames are painted reddish brown.

Mechanical Systems

Evidence remains of the abandoned ducted mechanical system that once served the exhibit space above. The air handler for the system is mounted on a rack near the center of the south wall, adjacent to the crawlspace opening (*Fig. C132*). Insulated supply ducts cross the ceiling and pass into the crawlspace.

Electrical System

The main electrical panel is mounted on the east wall and is supplied from the disconnect switch on



Figure C131. Room 102 - Wood toilet stall in southeast corner.



Figure C132. Room 102 - Crawlspace opening. Note PVC drainpipe, abandoned air handler, and ducts.

the south wall of Room 101. A second disconnect switch on the south wall of Room 102 is connected to the abandoned air handler and is turned off.

Two surface-mounted ceramic lamp holders are on the ceiling and are connected by plastic conduit. Surface-mounted receptacles and switches on the north wall are also connected by plastic conduit.

Two rusted recessed ceiling boxes on the ceiling indicate the location of the original light fixtures.

Photos of utility system elements are found in the *Utility Systems* section.

Plumbing System

Added PVC piping intended to drain the western half of the observation deck passes through the west doorway and crosses the room to enter the crawlspace (*Figs. C128*, *C132*). The pipe is hung with metal straps and further secured with vertical wood members.

A toilet is installed in a wood stall partition in the northeast corner.

Fire Protection and Life Safety

A wired smoke detector is mounted on the ceiling. The detector is heavily rusted and may no longer be functional.

Security System

A motion detector is mounted above the north doorway.

Room 103 – West Room at Lower Level

Room 103 is at the west end of the lower level and is slightly L-shaped. The room measures about 30'-2" by 12'-11 at its widest points and has a floor-to-ceiling height of 8’-5½” tall (*Figs. C133-C136*).

Flooring

A poured-in-place concrete slab is consistent throughout the room.

Baseboard

The room has no baseboard.

Walls and Ceiling

The same stone found on the exterior of the building is consistent on all but the east interior partition. The exterior stone is described in the *Exterior Features* section. Each window opening is spanned by a reinforced concrete lintel. The east wall is original and is constructed of combed-face clay structural tile measuring 12” by 12” by 8” that are laid in a running bond pattern. The tile wall terminates at the ceiling beam above.

The poured-in-place reinforced concrete slab and beam structural system is exposed at the ceiling and has five exposed reinforced concrete beams that span between the inner walls and the exterior



Figure C133. Room 103 - View looking north. Note PVC drain blocking doorway.



Figure C134. Room 103 - View looking northeast.



Figure C135. Room 103 - View looking southwest at west end.



Figure C136. Room 103 - View looking southeast.

walls. The structural system is described in detail in the *Construction Characteristics* section.

Doorways

The room has two doorways, one on each of the northwest and east walls. The northwest doorway is an exterior door that is described in the *Exterior Features* section. The east doorway accesses Room 102 and is described in the *Room 102 – Center Room at Lower Level* section. Each doorway has an original lintel-cut plank board casing measuring 3½" wide by ¾" thick.

Windows

The Room has three window openings, one on each of the west, northwest, and north elevations. Each opening holds six-light steel casement sash. The west and northwest openings each hold a pair of sash and each have masonry openings measuring about 3'-5" wide by 3'-1" tall. The masonry opening for the single-sash window on the north wall measures about 1'-7½" wide by 3'-1" tall. Window sash sizes are consistent at each opening and measure 1 '-6½" wide by 3'-0" tall by 1¼" thick. Window muntins measure ⅞" wide and each sash has a pivot hinge at top and bottom. The mullion between the paired sash measures 3⅞" wide, while typical perimeter frames measure 1½" wide by 1¼" deep at the masonry opening. Hardware includes a rotating handle measuring 4¾" long that engages the center mullion on paired-sash opening and the window frame of single-sash openings. Stone windowsills vary between 1⅜" and 1¾" thick. Two ¾" vertical bars are at the interior of each sash opening.

Finishes

Most surfaces are unpainted. The exterior door, exterior door casing, and the window sash and frames are painted reddish brown.

Mechanical Systems

Insulated supply ducts remaining from the previous ducted mechanical system cross the ceiling near the south wall. The condensate line for the abandoned air handler in Room 102 is mounted on the south wall and connects to the drain of the former drinking fountain of the observation deck above (*Fig. C138*).

Electrical System

Two surface-mounted ceramic lamp holders are on the ceiling and are connected by plastic conduit (*Fig. C137*). Surface mounted receptacles on the north wall are also connected by plastic conduit.

Two rusted recessed ceiling boxes on the ceiling indicate the location of the original light fixtures.



Figure C137. Room 103 - Ceramic lamp holder and adjacent abandoned original fixture box.



Figure C138. Room 103 - Remaining plumbing on south wall.



Figure C139. Room 103 - Connection of original observation deck drain to new PVC pipe. Note deteriorated slab and exposed rebar.

Plumbing System

Supply piping on the south wall once served the drinking fountain at the observation deck and based on the construction drawings, potentially connected to a sink in the office that was once at the west end of the upper level (*Fig. C138*). A plumbing drainpipe extends through the floor slab. Two drains serving the observation platform are at the ceiling along the north wall (*Fig. C133*, *C139*). Remnants of 3”-diameter cast iron drainpipe remain at the floor and ceiling. The sections at the floor have y-shaped cleanouts. Both original cast iron drain stacks have been removed and replaced with PVC pipes that connect and pass through the east doorway into Room 102. The drainpipes eventually make their way through the crawlspace and connect to the PVC piping in Room 101 before exiting through the northeast exterior doorway.

Fire Protection and Life Safety

A wired smoke detector is mounted on the ceiling. The detector is heavily rusted and may no longer be functional.

Security System

A motion detector is mounted on the east wall.

Crawlspace

The crawlspace is located at the south end of the lower level, beneath the exhibit space above (*Figs. C140-C142*). The area is partially excavated, with grade increasing in height approaching the south wall along the north wall, the ceiling height is about 5'-9" tall, while along the south wall it is about 3'-6" tall. Supply and return ducts for the previous mechanical system cross the space. Refrigerant and



Figure C140. Crawlspace - View looking east. Note abandoned ductwork and current PVC drain line.



Figure C141. Crawlspace - View of south wall. Note moisture near where downspouts pass into the crawlspace.



Figure C142. Crawlspace - Y shaped connection of south downspouts to large 6" pipe that turns down below grade.

condensate lines for the current mini-split units descend from exhibit space above at the east and west ends of the crawlspace.

The added PVC drainage system enters the crawlspace through the opening to Room 102 on the south wall and exits through the opening in the south wall of Room 101.

Cast iron drainpipes measuring 4" in diameter downspouts south of the building and combine near the center of the south wall into a 6"-diameter pipe that turns downward and presumably passes under the concrete slab of the first floor to a subsurface drainage system (*Fig. C142*).

Upper-Level Overview

The upper level consists of one room accessed from the observation deck to the north (*Fig. C143*). The observation deck is described in the *Exterior Features* section.

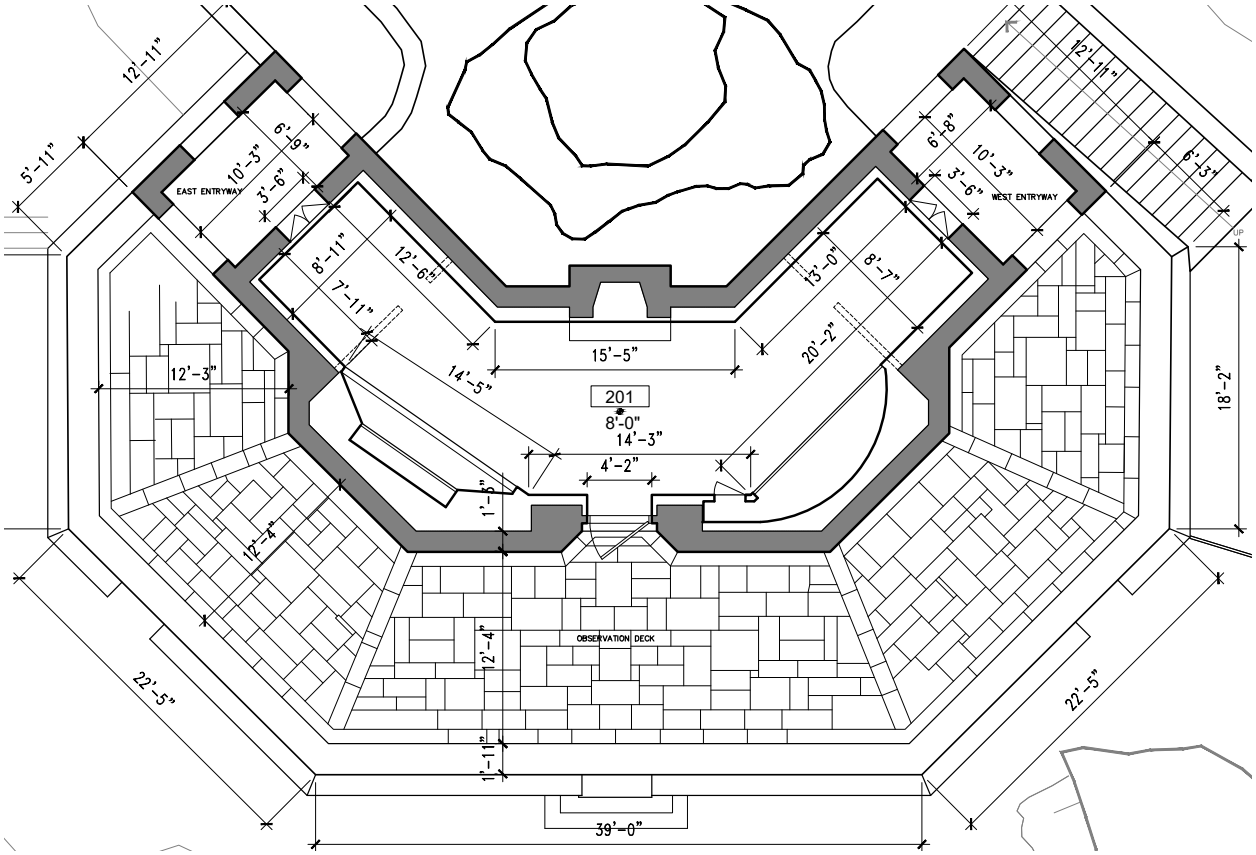


Figure C143. Upper-level plan. A larger version of this plan is found in Appendix C.

Room 201 – Exhibit Space

Room 201 is a U-shaped space that contains museum exhibits and is the only publicly accessed space in the building (*Figs. C144-C149*). The room measures about 15'-5" wide at its center, 8'-11" wide at the east end, and 8'-7" wide at the west end. The floor-to-ceiling height is 8'-0" tall. Originally, the far east and west ends of the room were each separated into individual rooms by partition walls. The south wall opposite the exterior door originally featured a fireplace with surrounding casework. The firebox and stone fireplace surround likely remain behind the current finishes.

Flooring

Original stone tile flooring is consistent throughout the room and ranges in color from brown to golden brown to pinkish brown (*Figs. C150-C152*). The field tiles vary in size from 11" by 12" and 12" by 12" and are laid in a running bond pattern parallel to the walls of the room. Diagonal tiles where



Figure C146. Room 201 - View looking southwest.



Figure C144. Room 201 - View looking northwest.



Figure C147. Room 201 - View looking east.



Figure C145. Room 201 - View looking west.



Figure C148. Room 201 - View looking southeast.



Figure C149. Room 201 - View of south center wall.



Figure C151. Room 201 - Original stone hearth along south wall.

the room turns to the south measure 8" wide by between 12" and 24" long. Similar 8"-wide tiles are consistent at the perimeter of the room; however, the walls have been furred out in most locations, partially obscuring the original footprint of the space. The same partition tiles are found at the location of the previous interior wall partitions. The location of the interior doorways in each wall are apparent in the flooring patches and match the size and locations of the doorways shown in the original drawings. Similar patching is also found where the original casework once sat (*Figs. C150-C151*).

The stone fireplace hearth is visible along the south wall and measures 4'-11 ½" wide and extends about 1'-4" from the current wall surface (*Fig. C151*). The hearth is trimmed with 8" wide tiles as found at the perimeter of the room.

Baseboard

A molded modern baseboard and ½" tall shoe molding is consistent at the perimeter of the room and measures 5½" tall by ¾" thick overall with a 1½" integrated cap (*Fig. C152*).

Walls and Ceiling

The walls are finished with gypsum wallboard likely applied to a 2x4 stud wall constructed within the original footprint of the upper level. The northeast and northwest walls each have modern built-in display cases protected behind glass panels. The ceiling is also finished with gypsum wallboard and is likely attached to furring strips, allowing wiring to pass above the finished ceiling.

The northeast case is inset within an overall opening in the wall that measures about 13'-6" wide by 6'-0" tall and sites 1'-4" above the floor (*Fig. C147*). The sides of the opening angle inward to surround three hinged glass panels measuring



Figure C150. Room 201 - Original stone tile flooring. Note location of previous partition wall and doorway threshold. Similar conditions are found at both wall locations.



Figure C152. Room 201 - Typical modern baseboard. Note patch in flooring at location of removed casework on center south wall.



Figure C153. Room 201 - Typical modern crown molding, supply air grille, and smoke detector base. Note that a smoke detector was not observed at any of the locations in Room 201.

7'-5 ½" wide by 6'-0" tall. Each of the three panels has 1" metal frames. A wood handrail measuring 5" wide by 1" thick spans the opening in the wall, has a 5" tall by 2 ½" thick skirt, and is supported by two 2½" square posts. A 2½"-wide by ½"-thick modern mitered casing surround the opening.

The northwest case opening holds three fixed glass panels and measures 11'-2" wide by 6'-8" tall (*Fig. C146*). The overall opening has a metal frame measuring 1¾" wide while the mullion between each panel measures ¾" wide. The rear of the case is curved and opens to the closet located to the immediate east of the case.

A modern crown molding is consistent throughout the room and measures 3" tall overall including a 1"-tall cove at its base (*Fig. C153*).

Doorways

The room has one doorway on the north wall that accesses the room from the observation deck. The door is fully described in the *Exterior Features* section and retains a partial section of original casing at the perimeter measuring about 2" wide.

A closet doorway on the north wall lies west of the exterior doorway holds a modern flush-panel hollow-core door 2'-0" wide by 6'-8" tall by 1⅜" thick (*Fig. C154*). The door is hung with three 4" modern butt hinges and is secured with a deadbolt. The threshold of the doorway sits about 8" above floor level and has a 2½"-wide modern mitered casing.

Windows

The Room has no windows; however, two typical paired six-light casement sash at the southeast and southwest ends of the room are concealed behind modern finishes on the interior but remain in place and are visible on the exterior. The windows are described in the *Exterior Features* section.

Finishes

The walls and ceiling are painted off white, while the baseboard, crown molding, and most other trim elements are painted white. The baseboard and display frame of the center south wall as well as the railing and other elements of the northeast display case have a clear finish.

Mechanical Systems

Wall-mounted indoor cassettes are centered on each of the southeast and southwest walls and are controlled by a thermostat in the closet west of the exterior doorway. The mechanical system is described in detail in the *Utility System* section.

Abandoned air return and supply grilles are found throughout the room and are associated with the previous ducted mechanical system (*Fig. C153*). Return grilles are in the floor in the southwest and northeast corners, while three supply grilles are in the east, west, and north walls near the ceiling. Two



Figure C154. Room 201 - Closet on north wall.

additional supplies are within the baseboard on the south center wall (*Fig. C149*).

Photos of the mechanical system elements are found in the *Utility Systems* section.

Electrical System
Three modern halogen track light fixtures light the main portion of the room, one centered in the northern area and one at each of the southeast and southwest ends (*Fig. C155*). Each of the two display cases have a single halogen light fixture of similar design.

Recessed receptacles are consistent throughout the room and recessed switches east of the exterior doorway control lighting fixtures (*Fig. C156*).

Two switches and surface-mounted junction boxes are in the closet west of the exterior doorway.

Plumbing System
There is no visible evidence of any plumbing system elements.

Fire Protection and Life Safety System
The fire alarm control panel is mounted in the closet west of the exterior doorway. Bases for wired smoke detectors are on each of the east, west, and north walls; however, the units themselves appear to have been removed (*Figs. C153-C154*).

An illuminated exit sign is mounted above the exterior doorway and is equipped with emergency lighting.

A fire extinguisher is mounted to the north wall just east of the exterior doorway (*Fig. C157*).

Security System
Four security cameras, two near the west wall and one on each of the east and west walls provide full coverage of the exhibit space. A computer in the closet west of the exterior door supports the cameras. Each of the glass display cases has an alarm to alert of tampering or glass breakage. The control box for this system is also located in the closet west of the exterior door. Motion detectors for the security system are mounted at the east and west ends of the room and a magnetic lock with release button secures the exterior door.



Figure C155. Room 201 - Typical modern halogen fixture.



Figure C156. Room 201 - Recessed switches and release for magnetic door lock.



Figure C157. Room 201 - Fire extinguisher on north wall.

Character-defining Features

Exterior Features

- The overall massing of the structure and the stone exterior walls;
- The rustic character of the parapet at the upper level, with stones ending at an uneven line at the top;
- The stone arches above the covered entryway doors;
- The stone jack arches above the center doorways on the north elevation;
- The stone chimney;
- The integrated stone benches at the observation deck;
- The integrated drinking fountain at the observation deck;
- The ashlar-patterned pavers of the observation deck;
- The remaining early exterior casings at the south doorways and the associated remaining pintle hinges;
- The remaining original casing and jamb at the north elevation doorway at the upper level;
- The cast iron window shutters in the arched masonry openings of the east and west elevations;
- The six-light casement sash that look into the covered entryways at the upper level;
- The original flush-panel exterior doors at the lower level;
- The original five-horizontal-panel paired doors at the center of the north elevation at the lower level;
- The original exterior casings at all lower-level doorways;
- The six-light single and paired steel casement sash windows at the lower level;
- The exterior stone steps accessing the lower-level doorways;
- The exterior steps along the west elevation, including the original pipe rail and cheek wall;
- The exterior steps with to the southwest of the building that connect to the walkway network, including associated original pipe rail and cheek walls;
- The retaining walls along the southeast approach to the observation level;
- The flagstone paving to the southeast and southwest of the building.
- The original pill-shaped exterior ceiling fixtures in the south entryways.

Interior Features

- The exposed masonry walls at the lower level;
- The exposed reinforced concrete slab and beams at the ceiling;
- The exposed concrete floor slab at the lower level;
- The combed-tile interior partitions at the lower level;
- The flue opening and cleanout in Room 102;
- The original flush-panel interior doors;
- The original interior door casings at all interior and exterior doorways;
- The early or original wood stall with wood door in Room 102;
- The original stone tile flooring at the upper level;
- The remaining original stone hearth inlaid in the stone flooring at the upper level;
- The stone fireplace and firebox likely remaining behind existing finishes at the upper level;
- The remaining partial interior casing at the north exterior door at the upper level.
- Potential remaining original plaster walls behind the existing finishes at the upper level.

Condition Assessment

Site

This section addresses site features immediately adjacent to and associated with the museum building. The elements associated with the walkway network approaching the museum from the carriage drive are described at the end of this section.

Site Drainage

Water shedding from the paved walkway to the west has caused erosion along the northwest side of the building at the lower level (*Figs. C158-C160*). Based on soiling and remaining paving on the building, it appears that grade has dropped about 6”. Holes have opened in the promontory just northwest of the building and may be related to this erosion. The area is currently barricaded with a rope and is in an area that is not open to the public.

At the southeast entrance to the observation deck, water is collecting at the south exterior doorway and is unable to effectively drain. The flagstone paving in this area is not slopped appropriately to direct water to the nearby drain at the base of the wall. The drain itself is also clogged. As a result,



Figure C158. Walkway to the west of the lower level. Water from this surface sheds toward the building and contributes to erosion.



Figure C159. Pavement wrapping northwest corner of the building. Based on ghost lines on the masonry, grade has dropped about 6" in this area.



Figure C160. Loss of grade along building. Arrows indicate what is thought to be original grade level.



Figure C161. Erosion at grade northwest of the building.



Figure C162. Undersized and clogged drain near southeast doorway.



Figure C164. View of open mortar joints at west stairway.

the water gathering in this area migrates into the crawlspace or onto the observation deck and ultimately into the lower level of the building (*Figs. C162-163*).

Exterior Steps

The west exterior stair is in overall good condition; however, mortar joints are commonly open at the base of the risers. A single stone is missing at the coping of the west cheek wall and is associated with a crack (*Figs. C164-C165*). The small set

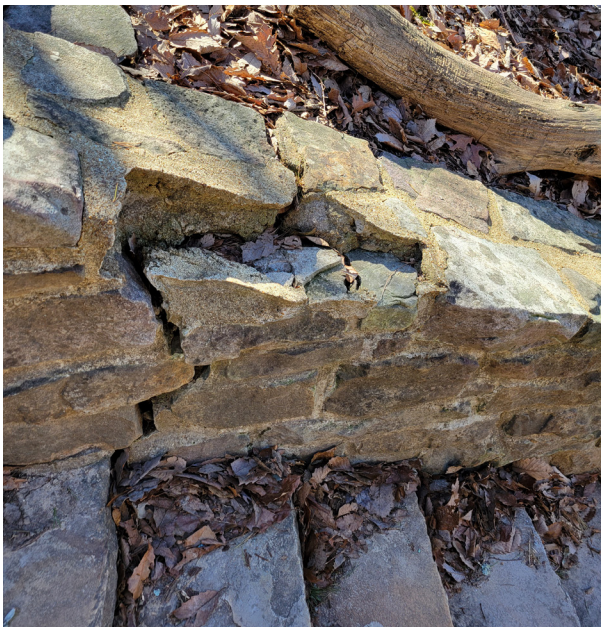


Figure C165. Missing stone and crack at west cheek wall.



Figure C163. Overview of paved area at southeast doorway. Note mud indicating locations where water commonly stands.



Figure C166. Separation at top of stair at north doorway where stair has shifted downward.



Figure C167. Stair at north doorway undermined by erosion.

of stairs ascending west toward the walkway network is in good condition.

Mortar has typically failed at the steps accessing the northwest doorway.

The stair at the north doorway at the lower level has been undermined by loss of surrounding grade. The steps have dropped and detached from the threshold (*Figs. C166-C167*).

Structural System

The load-bearing masonry walls are in overall good condition with almost no observed cracking. The floor slab beneath the observation deck has been subject to water infiltration and salt due to an ineffective drainage system likely since the building's construction. The underside of the reinforced concrete slab is spalling due to rusted reinforcement, and similar damage is occurring at the structural beams (*Fig. C168-C169*). One beam in Room 101 has significant coverage loss at the reinforcement. Solving the drainage issues at the observation deck is a critical first step to repairing and stabilizing the structure.

The roof slab is concealed but may be experiencing damage from water infiltration from the failed roofing.

Steel lintels at the lower level have heavily rusted due to water infiltration from the observation deck, and most require replacement. The large lintels above both north elevation doorways may be able to be treated for rust and re-coated in place (*Figs C170-C171*).



Figure C168. Typical example of spalling and exposed rebar at ceiling of lower level.



Figure C169. Example of most severe beam deterioration found in Room101 at the exterior wall. Note exposed steel reinforcement. Also note proximity to failed drain at left.



Figure C170. Rusting steel lintels at upper-level north doorway.



Figure C173. Chipped stone and crack on northwest elevation.



Figure C171. Typical heavy lintel rusting at lower-level openings.

Exterior Features

Exterior Walls

The stone masonry is in overall good condition and free of cracking; however, the mortar has separated from the stones in many locations and requires repointing. A small portion of lost stone was observed on the northwest elevation. Biologic growth and soiling are heavy at the lower level (*Figs. C172-C173*).

The coping at the observation deck has a number of anchor holes remaining in the coping stones from previous signage (*Figs. C174-C175*). The current signs are also mounted directly to the stone using ferrous fasteners. These holes provide areas for water to enter, freeze, and potentially damage the stone. The current fasteners will rust and expand over time and could cause stone cracking. A few instances of failed patches were also observed.

Exterior Doors

The original exterior doors at the lower level vary in condition but are largely intact and repairable. Fasteners holding the jambs to the masonry opening have failed at the north doorway due to



Figure C172. Example of mortar failure at stone. Also note soiling.



Figure C174. Patch at stone parapet cap at coping stones. Note non-matching color.



Figure C175. Typical fastener holes at coping.

extensive rust, resulting in the eastern leaf and jamb falling out of place (*Fig. C176-C177*). The door, jamb, and casings are stored in Room 102 and are suitable for repair and reinstallation. The deadbolt and deadbolt escutcheon are missing on the east leaf and the west leaf binds at the floor, likely due to lack of solid support at the frame due to rusted fasteners.

The northwest flush-panel door is in overall good condition but has little paint remaining to protect the door from the weather.



Figure C176. North doorway at lower level. Note that missing left leaf and jamb are stored on the interior.



Figure C177. Failed fasteners at north doorway at lower level.

The northeast door has been heavily modified to accommodate building systems and repair is likely not feasible. Original hinges, hardware, and casings remain for reuse.

At the upper level, the original paired wood door accessing the exhibit space has been replaced with a single flush-panel steel door with steel frame. The original exterior casings and part of the original interior casing remain in place. The current door exhibits rust and detracts from the historic character of the building.

The two south elevation doorways that access the covered entryways to the observation deck have been removed; however, original jambs and casings remain in place, as do original hinge pintles.

Windows

The failed drainage system of the observation deck, exposure to weather, and decades of salt being used to melt ice on the deck, have resulted in extensive damage to all the lower-level windows (*Fig. C178*). Many of the windows throughout the lower level are damaged beyond repair, with several of the frames having little stable material remaining. Several window sash have detached from the frames and those that remain are no



Figure C178. Example of extensively deteriorated window sash and frame at lower level.

longer operable. The windows at the upper level remain intact and in good condition, as does one example of sash stored in the basement. These intact examples should be used to model any replacements.

The paired cast iron window shutters mounted in the east and west elevation openings exhibit only minor rusting and coating failure and are in overall good condition.

Observation Deck and Rainwater Dispersal

The observation deck does not have a functioning drainage system, nor does the paving have a functional waterproof barrier beneath, resulting in water migrating into the concrete slab and north exterior wall below the deck level. Resolving these drainage and waterproofing issues at the top side of the slab is the critical first step in approaching the larger repairs needed at the concrete slab and beams below. See the *Structural System* condition assessment section for more information.

The four existing drains at the observation deck are undersized and the design of the drain covers causes them to clog easily. The original construction drawings show larger drains with 8" by 8" collection boxes at the floor level; however, the drawings also indicate that the observation deck was to be covered by a cantilevered concrete slab and enclosed with wood sash. The cantilever slab and window sash were eliminated from the design; however, the drainage design remains the same, meaning that the current drainage design was intended to handle a fraction of the amount of water it is asked to accept.

The current system relies on a network of PVC drain lines that bypass the original subsurface drainage system and instead cross the lower level and crawlspace (*Fig. C181*). The pipes have filled with dirt, sediment, and water and are not able to drain. The added weight has caused the pipes to sag at the center, preventing the system from draining any amount of water. The remaining original cast iron drainpipes that connect to the subsurface drainage system are likely completely clogged.

The paving of the observation deck has isolated areas of damage where the stone pavers are



Figure C179. Stone paving showing typical example of deterioration.



Figure C180. Typical clogged drain.



Figure C181. PVC piping crossing lower level. Note that the pipes prevent doors from closing. The pipes are no longer pitched to drain due to being filled with filled with sediment.

cracking and dissolving, likely due to moisture being retained (*Figs. C179-180*).

Roofing and Rainwater Dispersal

The existing roof of the upper level has failed and is leaking into the museum below. Multiple layers of roofing appear to be installed and air or debris seems to be trapped between the layers, resulting in large bubbles in the membrane.

The existing perimeter counter flashing appears to be in good condition.

The entirety of the membrane, flashing, inside face and top of the parapet and chimneys have been repeatedly coated with waterproofing (*Fig. C182*).

Remnants of what appears to have been a lightning protection system remain on the inside of the parapet and have ferrous anchors that could potentially cause damage to the stone.

Two scuppers drain the roof at the center of the south elevation, one on each side of the chimney. Two downspouts with collection boxes descend from below the scuppers and connect to a drainpipe that passes through the crawlspace. The collection boxes and filters are clogged with leaves, causing the water to back up and saturate the ground adjacent to the building. Moisture was evident in the crawlspace at this location (*Fig. C183*).

Solving rainwater drainage issues at the observation deck and roof, as well as the site the site drainage issues described at the beginning of this section, is a critical first step in correcting the ongoing structural issues, window and door deterioration, and water infiltration at the museum level.



Figure C182. View of roof with applied coatings on membrane, parapet, and chimney.

Other Features

The drinking fountain has been disconnected and is no longer functional.

The built-in benches are in good condition; however, the mortar plugs that once covered the



Figure C183. Moisture on south wall of crawlspace.



Figure C184. Patch in flooring at location of previous casework in Room 201.

pegs holding the caps in place are missing, allowing water infiltration.

Interior Features

Flooring

The concrete slab at the lower level is in good condition and no major cracks were observed.

The original stone flooring at the upper level is in good condition but has some areas of discoloration and non-matching grout where the original built-ins and interior partitions were removed (*Fig. C184*).

Walls and Ceiling

The walls at the lower level are in overall good condition; however, the north wall shows signs of being wet on a regular basis. Minor spalling of concrete lintels above the window and door openings was observed. This deterioration is related to drainage issues at the observation deck above.

Ceilings at the lower level have areas of spalling concrete at both the slab and concrete beams, leaving rebar exposed in multiple areas. Structural conditions are described in more detail in the *Structural System* condition assessment section.

At the upper level, there is minor water damage to the gypsum wallboard, primarily at the west end of the center south wall, below a roof leak above. The baseboard is also damaged in this area (*Figs. C184-C185*).



Figure C185. Typical water damage at ceiling of Room 201.

Interior Doors

The original doors at the lower level are in overall good condition. The added PVC drain system prevents the west door from closing (*Fig. C181*). The east doorway binds on the concrete floor and is inoperable. Both doors are missing their doorknobs.

The modern closet door at the upper level is in good condition; however, the deadbolt does not lock properly, allowing the door to be opened without a key.

Mechanical Systems

The current mini-split system appears to be in serviceable condition. The units have a few cosmetic defects. The current system does not serve the lower level.

Abandoned mechanical system units and ductwork are present in the basement and crawlspace.

Electrical System

The electrical system has been updated and elements of the system appear to be in good condition based on visual inspection.

Fire Protection and Life Safety Systems

Smoke detectors at the lower level are in poor condition due to water infiltration through the ceiling slab causing rust (*Fig. C186*).

Smoke detectors at the upper level have been removed from their mounts and are therefore not functional.

Security System

The security cameras and associated monitoring equipment appear fairly new and are in good condition. Motion detectors remain in place and appear to be in serviceable condition.



Figure C186. Typical rusted smoke detector at lower level.

Walkway Description and Condition Assessment

This section addresses the circuit of stairs and walkways that connects the Ochs site to the carriage road to the south. Each stair system has been given a number keyed to the existing plan drawing found below (*Fig. C187*). Individual sets of stairs within that system are given an identifying letter. Conditions are described with each stair. The stairs are in overall good condition with only a few minor areas of observed deterioration.

Paving

Paving varies between asphalt and poured concrete.

Condition

Uneven conditions were observed but no major issues were found with the paving. Park visitors should be made aware that uneven paving must be traversed to access the museum or lookouts along the walkway and that trip hazards could be encountered.

Stair 1

Stair 1 consists of a single run of stairs with seven treads measuring 15" deep and seven risers measuring 6" tall. A 2" diameter early pipe rail on each side of the stair measures 2'-5" tall (*Fig. C188*).

Condition

Open mortar joints are typical at each tread. The railings have been secured with tap-con screws and are somewhat loose.



Figure C188. Stair 1 Overview.

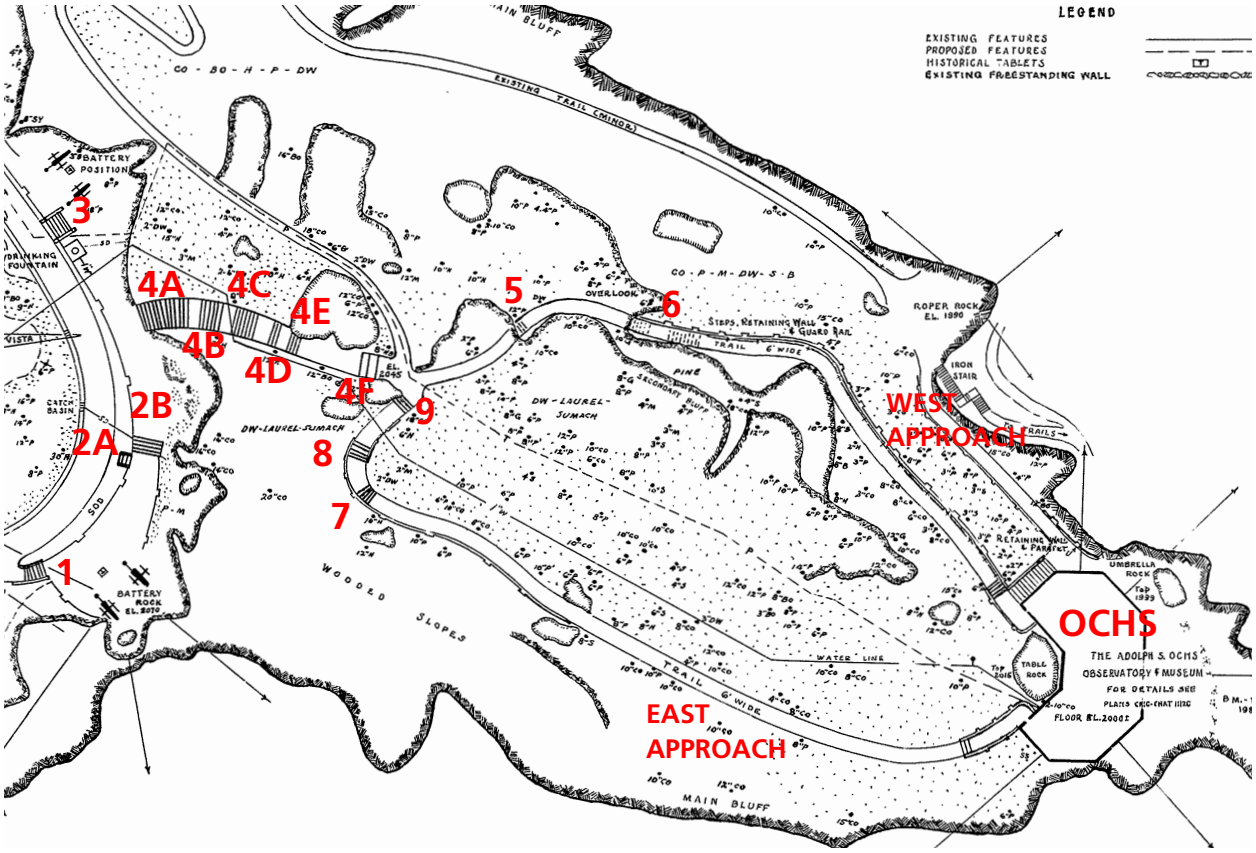


Figure C187. 1941 site plan showing walkway network between the carriage road and the Adolph S. Ochs Observatory and Museum. Red numbering corresponds to stair identification in the assessment. (CHCH_301_2089_[144448])

Stair 2A

Stair 2A descends from the carriage road and has four treads measuring 10" deep and four risers measuring 4" tall. Pipe rails measuring 2'-5" tall are at each side of the stair. The eastern rail is newer (*Fig. C189*).

Condition

The stair is in good condition, though the treads angle backward, creating a trip hazard.

Stair 2B

Stair 2B is perpendicular to stair 2A and has four treads measuring 14" deep and four risers measuring 6" tall. A typical pipe rail is on the north side only (*Fig. C190*).

Condition

Mortar joints at the treads have failed. The stair lacks a handrail along the southern side.

Stair 3

Staircase three descends from the carriage road and has seven treads measuring 14" deep and seven risers measuring 6" tall. The treads have been faced with 1"-thick stone paving. Typical pipe rails are found at each side of the stair and measure about 2'-5" tall (*Fig. C191*).



Figure C189. Stair 2A Overview.



Figure C191. Stair 3 Overview.

Condition

The added stone facing is chipped and separated from the stone beneath. The railings are somewhat loose.

Stair 4A

Stair 4A is the first in the sequence of stairs that descend to the walkway loop connecting to the museum. The stair has thirteen treads measuring 16" deep and risers measuring 6" tall. An early pipe rail is on the east side and measures 2'-8" tall, while a newer rail on the west side measures 3'-0" tall (*Fig. C192*).

Condition

Mortar joints have typically failed.

Stair 4B

Stair 4B has five treads measuring 15" deep and five risers measuring 6" tall. Handrails are similar to those at stair 4A (*Fig. C193*).



Figure C190. Stair 2B Overview.



Figure C192. Stair 4A Overview.



Figure C193. Stair 4B Overview.

Condition
Mortar joints have typically failed.

Stair 4C
Stair 4C has seven treads measuring 14" deep and seven risers measuring 6" tall. Handrails are similar to those at stair 4A (*Fig. C194*).

Condition
No issues observed.

Stair 4D
Stair 4D has two treads measuring 14" deep and two risers measuring 6" tall. The stair has no handrails (*Fig. C195*).

Condition
The lack of handrails presents a potential life safety risk. Mortar joints have typically failed.

Stair 4E
Stair 4E has three treads measuring 14" deep and two risers measuring 6" tall. Handrails are similar to those at stair 4A (*Fig. C196*).



Figure C194. Stair 4C Overview.



Figure C195. Stair 4D Overview.

Condition
Mortar joints have typically failed.

Stair 4F
Stair 4E has three treads measuring 17", 2'-5" and 145" from the top. Four risers measure 6" tall. Handrails are similar to those at stair 4A (*Fig. C197*).



Figure C196. Stair 4E Overview.



Figure C197. Stair 4F Overview.

Condition
Mortar joints have typically failed.

Stair 5
Stair 5 is the first staircase of the western loop accessing the museum site. The stair has ten risers measuring 15" deep and ten treads measuring 6" tall. An early pipe rail on the east side of the stair measures 2'-6" tall and is secured to the rock face with two straps. The treads have been covered with 1"-thick stone paving (*Fig. C198*).

Condition
The stair appears to be in good condition. Rock formations on the west side make introducing a second railing difficult.

Stair 6
Stair 6 has a landing and descends in a narrow space along the rock face. The first run of stairs has seven treads measuring 15" deep and eight risers measuring 7" tall. The treads are covered with 1"-thick stone paving. The landing measures about 3'-0" wide and has a small stone bench on the east side. Twenty-two treads and risers descend from the landing and vary in size but typically are about 13" deep. The risers are about 7" tall. The treads have been covered with 1"-thick stone paving. A modern handrail is on the south side of the stair (*Figs. C198-C201*).



Figure C198. Stair 5 Overview.



Figure C199. Stair 6 upper portion.

Condition
The stairs appear to be in good condition.

West Museum Approach
The west walkway extends to the southwest doorway of the museum and stairs turn to descend to the lower level. These stairs are described with the building.

A guardrail lining the paved walkway descending from Stair 6 is modern and measures 3'-3" tall. Posts on the back of the railing provide additional rigidity (*Fig. C202*).

Condition
The walkway and railing appear to be in good condition.



Figure C200. Stair 6 landing and bench.



Figure C201. Stair 6 lower portion.

East Museum Approach

The east walkway extends to the southeast doorway at the museum, where flagstone paving begins, and a stair brings visitors down to a walled section of path. These stairs, walls, and walkway are described with the building (*Fig. C203*).



Figure C203. Overview of east walkway looking toward museum. Note guardrail at right.

The walkway extends between the museum site and Stair 7. A newer stainless-steel railing extends on the east side of the walkway for the majority of the distance between the museum and stair and measures about 3'-2" tall. The railing stops short of Stair 7 by a fair distance (*Fig. 204*).

Condition

The railing and walkway appear to be in good condition; however, the railing does not extend to Stair 7, leaving a large gap that could pose safety concerns.



Figure C202. Guardrail at west museum approach.



Figure C204. Area along east walkway with no guardrail.

Stair 7

Stair 7 is the northernmost stair on the east walkway descending to the museum. The stair has five treads measuring 17" deep and five risers measuring 6" tall. A pipe rail on the west side measures 2'-8" tall. Holes remain for a matching railing on the east side (*Fig. C205*).

Condition

Mortar joints have typically failed. The railing on the east side of the stair has been removed.

Stair 8

Stair 8 has four treads measuring 13" deep and four risers measuring 7" tall. A handrail exists on the north side only and measures 3'-0" tall (*Fig. C206*).

Condition

Mortar joints have typically failed.

Stair 9

Stair 9 has three treads measuring about 16" deep and three risers measuring 6" tall. The stair has been widened by about 1'-0" on the north side and has a newer pipe railing measuring 3'-0" tall on one side (*Fig. C207*).



Figure C205. Stair 7 overview.



Figure C206. Stair 8 overview.



Figure C207. Stair 9 overview.

Other Features

Two stone benches, likely dating from the walkway's construction are at the intersection of the two paths at the base of Stair 4 (*Figs. C208-C209*).

The eastern bench measures 5'-2" long by 1'-3" deep by 1'-4" tall, while the western bench measures 5'-9" long by 1'-2" deep by 11" tall. Each is supported by two stacked stone piers.



Figure C208. East bench.



Figure C209. West bench.

Character-defining Features

- The overall route of the walkways through the landscape, which is largely unchanged since construction;
- The stone treads and risers;
- The early metal pipe rails;
- The stone benches.

Summary

The walkways and stairs connecting the museum to the carriage road are in overall good condition. Minor repointing needs were observed, and a few locations would benefit from additional railings to ensure visitor safety. Treatment recommendations associated with the walkways can be found in *Part II: Treatment and Use*.

Significance and Integrity

National Register of Historic Places

The National Register of Historic Places is the official list of the nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966 and overseen by the National Park Service, it is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.[50]

The significance evaluation identifies the important historical associations of a property and comments on its architectural, archaeological, and social value as they relate to the National Register. A property's significance is tied to a discrete period of time in which its important contributions were made, and to relevant national, state, and local historic contexts.

Significance Criteria

In order for a property to be eligible for inclusion in the National Register, it must possess significance under at least one of four criteria. The Criteria for Evaluation for listing state:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That has yielded, or may be likely to yield, information important in prehistory or history.
>
> *Criteria Considerations*
> Ordinarily cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
>
> a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
>
> b. A building or structure removed from its original location, but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
>
> c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life; or
>
> d. A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
>
> e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
>
> f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
>
> g. A property achieving significance within the past 50 years if it is of exceptional importance.[51]

50. National Park Service, "National Register of Historic Places." https://www.nps.gov/subjects/nationalregister/index.htm.

51. Code of Federal Regulations, Title 36, Part 60, "The National Register Criteria for Evaluation" (36 CFR Part 60).

National Register Status of the Ochs Observatory and Museum

The park was administratively listed in the National Register of Historic Places on October 15, 1966, with the passage of the National Historic Preservation Act. Documentation as the Chickamauga and Chattanooga National Military Park historic district was approved and accepted on July 15, 1986, and included the Adolph S. Ochs Observatory and Museum.[52]

The 1986 National Register documentation lists three areas of significance for CHCH: conservation, military, and sculpture.[53]

An Additional Documentation filing was entered into the Register on November 24, 1998. For the Historic District, it lists the Period of Significance as 1863-1942. The Ochs Observatory and Museum is listed as a contributing resource, specifically as a "commemorative/development period structure." The documentation indicates the following specific Significance Criteria for the building:[54]

A. "Property is associated with events that have made a significant contribution to the broad patterns of our history"; and,

C. "Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction."

Period of Significance

The 1998 additional documentation for the historic district lists the district-wide period of significance as 1863-1942 but provides no specific date range for the individual buildings.[55]

Assessment of Integrity

An assessment of integrity is to be based on an evaluation of the existence and condition of the physical features that date to a property's period of significance, taking into consideration the degree to which the qualities of integrity are present. The *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* defines integrity as "the ability of a property to convey its significance."[56]

The property must retain the essential physical features that enable it to convey its historical significance, those features that define both why a property is significant (National Register criteria) and when it was significant (period of significance).[57]

The seven aspects of integrity as defined in the National Register Criteria for Evaluation are location, design, setting, materials, workmanship, feeling, and association. These are explained in *Bulletin 15:*

> Location is the place where the historic property was constructed or the place where the historic event occurred. . . . Design is the combination of elements that create the form, plan, space, structure, and style of a property. . . . Setting is the physical environment of a historic property. . . . Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. . . . Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. . . . Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. . . . Association is the direct link between an important historic event or person and a historic property.[58]

JKOA investigations and evaluations for this HSR include an assessment of the historic integrity of the Ochs Observatory and Museum.

Integrity of Location

The building retains integrity of location, remaining on the site where it was originally constructed.

Integrity of Design

With the exception of few modifications to the original floor plan (removal of office and storage room at upper level, obscuring of fireplace), the building retains a high degree of integrity of design in its overall form, plan, space, structure, and style

52. NRHP Nomination Form.
53. NRHP Nomination Form, section 7, p. 6 and section 9, p.1.
54. Ibid., Additional Documentation, pp. 4, 13, 43.
55. Ibid., Additional Documentation p. 4.
56. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, (Washington, D.C.: National Park Service, National Register of Historic Places, 1990, revised 1997). pp. 44– 45.
57. Ibid.
58. Ibid.

during the period of interpretation. The intended use of the interior space has not changed.

Integrity of Setting
The building retains integrity of setting at the point of Lookout Mountain, overlooking the Tennessee River Valley. The historic viewsheds for which the building was constructed are maintained.

Integrity of Materials and Workmanship
The building retains integrity of materials and workmanship. Its basic composition and specific material components remain true to the original design intent.

Integrity of Feeling
The building retains integrity of feeling. The structure was originally built as an observatory and museum. It actively maintains the same use today.

Integrity of Association
The building retains integrity of association as a memorial to Adolph S. Ochs, the man largely responsible for the transfer of the land of Point Park to the National Park Service. The building continues to serve as a memorial today, thereby maintaining this association.

Part II: Treatment and Use

Requirements for Treatment and Use

The treatment and use of all historic properties maintained by the NPS are guided by federal laws and regulations as well as NPS policies, directives, and functional requirements. In addition to protecting cultural resources, they address safety, fire protection, energy conservation, universal accessibility, and abatement of hazardous materials. If rigidly interpreted, some of these requirements may be contradictory or at cross purposes. Any treatment must be carefully considered to ensure that the historic fabric including character, form, construction techniques, and overall authenticity of the structure is preserved.

The National Historic Preservation Act

The 1966 National Historic Preservation Act (NHPA), as amended, establishes programs for the preservation of historic and cultural properties, including buildings, landscapes, and archaeological sites. Its implementation has established laws and authorities that are binding on the NPS.

Section 106

Section 106 of the NHPA requires a consultative process prior to any federal agency undertaking, or federal involvement in an undertaking, that might affect historic properties listed or eligible for listing in the National Register of Historic Places. The regulations are codified at 36 CFR Part 800, "Protection of Historic Properties." The agency must initiate consultation; identify and evaluate historic properties; assess effects to historic properties; take steps to avoid, minimize, or mitigate adverse effects; and give the Advisory Council on Historic Preservation "a reasonable opportunity to comment with regard to such undertaking."



Figure II-1. View from Lookout Mountain north of the building. City of Chattanooga at right.

Section 106 strives to ensure that all interested parties have a voice in the preservation of our nation's cultural heritage. The published regulations require, among other things, consultation with State Historic Preservation Officers (SHPOs) and other appropriate parties, which may include local governments, government or nongovernment applicants, Tribal Historic Preservation Officers (THPOs) and tribal leaders, other parties, the general public, and the Advisory Council.

The regulations establish criteria under which the Advisory Council may comment, but the vast majority of federal undertakings do not involve Advisory Council review.

A programmatic agreement between the Advisory Council for Historic Preservation, the National Conference of State Historic Preservation Officers, and the NPS expedites the Section 106 review process. With certain conditions, routine repairs and maintenance that do not alter the appearance of the historic structure or involve widespread or total replacement of historic features or materials are not subject to review outside the NPS.

Director's Order 28

Director's Order 28 is the NPS Cultural Resources Management Guideline, which requires planning for the protection of cultural resources on park property.

The Secretary of the Interior's Standards

The Secretary of the Interior's Standards for the Treatment of Historic Properties articulate best practices for protecting a wide range of historic properties. They provide a philosophical rationale for historic preservation that is almost universally accepted in the United States and applies to a wide variety of resource types, including buildings, sites, structures, objects, and districts. Revised in 2017, the Standards are codified at 36 CFR Part 68.

The Standards describe four broad approaches to the treatment of historic properties: Preservation, Rehabilitation, Restoration, and Reconstruction. Definitions of each of these treatments are found in the *Alternatives for Treatment and Use* subsection of this report (p. 87).

Americans with Disabilities Act of 1990 and Architectural Barriers Act of 1968

The 1990 Americans with Disabilities Act (ADA) establishes comprehensive civil rights protection for disabled Americans, both in employment and in their right to free, unaided access to public buildings.

The 1968 Architectural Barriers Act (ABA) applies to facilities designed, built, altered, or leased with certain federal funds. The law is intended to provide unaided access to federal buildings. While people with restricted mobility have benefited most, the protections of ADA and ABA extend to those with impaired vision, hearing, or other disabilities.

Requirements for full compliance with ADA and ABA regulations are extensive and easiest to apply to new construction. Full compliance for historic buildings is more difficult. When a project would require significant alterations to their historic character, the regulations authorize a process for arriving at alternatives that can preserve historic character while maximizing disabled visitors' access.

Director's Order 42

Director's Order 42 concerns the NPS goal to ensure that all people have the highest reasonable level of accessibility to NPS programs, facilities, and services in conformance with relevant regulations and standards. The level of accessibility to be provided will be consistent with the obligation to conserve park resources and preserve the quality of the park's experience. A fundamental principle of the order is to "seek to provide the highest level of accessibility that is reasonable, and not simply provide the minimum level that is required by law. Consequently, managers are encouraged to exceed the requirements for visitor accessibility through innovative techniques and partnerships whenever possible and reasonable."

The five objectives of the Director's Order are:

- Incorporate the long-range goal of providing the highest level of accessibility that is reasonable for people of all abilities in all facilities, programs, and services, instead of providing "separate" or "special" programs;

- Implement this goal within the daily operation of the NPS, its policies, organizational relationships, and implementation strategies;
- Provide further guidance and direction regarding the NPS interpretation of laws and policies;
- Establish a framework for the effective implementation of actions necessary to achieve the highest level of accessibility that is reasonable; and,
- Ensure the implementation of "universal design" principles within the national park system.

Building Code Requirements

Treatment of the Adolph S. Ochs Observatory and Museum may be guided by the following codes:

- International Building Code (IBC), 2018
- International Existing Building Code (IEBC), 2018
- International Energy Conservation Code (IECC), 2018
- International Plumbing Code (IPC)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA) Code 914
- NPS Guiding Principles of Sustainable Design

The NPS is not legally bound to local or state building codes. The 2018 IBC and its appendices, as well as the 2018 IEBC with appendices and Resource A, are currently referenced by the NPS Denver Service Center for design and construction.

The National Fire Protection Association (NFPA) has promulgated codes for historic buildings, most notably NFPA 909, “Code for the Protection of Cultural Resources Properties - Museums, Libraries, and Places of Worship,” and NFPA 914, “Code for Fire Protection of Historic Structures.” As a matter of policy, NPS provides a reasonable level of fire protection for all historic buildings and structures.[59]

59. NPS Structural Fire Reference Manual 58, 2015, https://www.nps.gov/subjects/fire/upload/reference-manual-58.pdf.

Threats to public health and safety must be eliminated, but alternative ways to prevent them are always sought when full code compliance would needlessly compromise the integrity of a historic building.

Consulting with the NPS Branch Chief of Structural Fire located at the National Interagency Fire Center (NIFC) in Boise, Idaho regarding the requirements of fire protection for this historic structure is recommended. NPS Regional Structural Fire Managers (RSFMs) are also responsible for NPS structural fire program management within their regions and should also be consulted.

Abatement of Hazardous Materials

The building was constructed and renovated in an era when hazardous materials such as lead-based paint and asbestos were commonly used. Asbestos, considered a miracle product for decades, was used as an additive to provide fireproof qualities and additional strength to a wide variety of building materials through the late 1970s. Examples of building materials commonly containing asbestos include, but are not limited to:

- Plaster and Stucco
- Flooring tiles and tile mastic or grout
- Insulation
- Gypsum wallboard
- Mortar
- Acoustic ceiling tiles
- Electrical wire insulation

If left undisturbed, lead-based paint and asbestos-containing materials pose no threat to building occupants. However, appropriate abatement measures should precede any future work on building elements suspected to contain hazardous materials.

NPS Management Policies

NPS General Management Policies (2006), especially chapter 5, “Cultural Resource Management,” guide its oversight of historic properties. Based on the authority of some nineteen Acts of Congress and many more Executive Orders and regulations, these policies require planning to ensure that decision-making

and priority-setting processes integrate information about cultural resources and consultation and collaboration with outside entities. They also support good stewardship to ensure that cultural resources are preserved and protected, receive appropriate treatments (including maintenance), and are made available for public understanding and enjoyment.

Section 5.3.5, Treatment of Cultural Resources
This section of NPS General Management Policies provides specific directives, including a stipulation that "the preservation of cultural resources in their existing states will always receive first consideration."

It also states:

> ... treatments entailing greater intervention will not proceed without the consideration of interpretive alternatives.... Pending treatment decisions reached through the planning process, all resources will be protected and preserved in their existing states. Except for emergencies that threaten irreparable loss without immediate action, no treatment project will be undertaken unless supported by an approved planning document appropriate to the proposed action. (p. 50)

The park's *Long Range Interpretive Plan* (LRIP) is an example of an approved planning document. HSRs and CLRs are intended to inform the planning process.

Park Planning Documents Addressing Treatment of the Ochs Observatory and Museum

An Administrative History of the National Military Park was completed in 1983 and provides information on the creation and development of the park to that time. According to the report, a six-year Master Plan first prepared in 1939 envisioned the restoration of the battlefields. Subsequent construction projects in a Master Plan approved in 1941 were later rejected. The Master Plan of 1964, developed as part of preparations for Mission 66, concentrated on roads in the park and a fight against a proposed four-lane highway through the park. A 1975 General Management Plan was followed in 1976 by a refurbishing of the Ochs memorial building.[60]

The "General Management Plan [GMP], Development Concept Plan and Environmental Assessment" of 1988 proposed an evaluation of wayside exhibits and exhibits at the Adolph S. Ochs Observatory and Museum and anticipated that the recently completed visitor center would draw higher visitation to Lookout Mountain, at that time about 2,000 visitors per month.[61]

The 2015 GMP Amendment recommends rehabilitation or restoration of the Adolph S. Ochs Observatory and Museum as well as development of permanent exhibits for the museum room."[62]

60. Paige and Greene, *passim.*
61. 1988 General Management Plan, pp. 13, 26.
62. "General Management Plan Amendment/ Environmental Assessment, Lookout Mountain Battlefield Unit of Chickamauga and Chattanooga National Military Park," January 2015, pp. 20, 55, 66, 59, 72, 128.

Ultimate Treatment and Use



Figure II-2. The Adolph S. Ochs Observatory and Museum as viewed from the northeast.

This chapter presents the Ultimate Treatment and Use, introduced by the NPS Alternatives considered.

Alternatives for Treatment and Use

The United States Department of the Interior is responsible for establishing professional standards and providing advice on the preservation and protection of all cultural resources listed in or eligible for listing in the National Register of Historic Places. Accordingly, the National Park Service developed The Secretary of the Interior's Standards for the Treatment of Historic Properties ("Secretary's Standards," or "Standards"), which are intended to be applied to a wide variety of resource types, including buildings, sites, structures, objects, and districts.[63]

The Standards address four treatments: preservation, rehabilitation, restoration, and reconstruction. These are neither technical nor prescriptive but are intended to promote responsible preservation practices.[64] The NPS defines the four major treatments as follows:

> ***Preservation*** is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical,

63. The Standards were developed in 1978, updated in 1983 and again in 1995 before the most recent 2017 revisions. They are codified at 36 CFR Part 68.

64. Anne E. Grimmer, *The Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings* (Washington, DC: National Park Service, Technical Preservation Services, rev. 2017).

electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.[65]

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 portions or features which convey its historical, cultural, or architectural values.[66]

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.[67]

Reconstruction is defined as the act or process of depicting by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.[68]

Ultimate Treatment and Use

For the Adolph S. Ochs Observatory and Museum, the NPS administratively determined Management Category is "Must Be Preserved and Maintained," and the Ultimate Treatment is ***Preservation***. This Management Category is defined by the NPS Cultural Resources Inventory System (CRIS). This treatment allows for the efforts necessary to preserve, maintain, and repair historic materials and features, and permits minor modifications as needed to address new information regarding historic integrity and to meet the needs of contemporary interpretation. The ***Preservation*** treatment retains historic features, permits removal of non-historic features, and allows selective restoration of character-defining elements where missing or altered, when appropriate archival or physical documentation is available.

Rehabilitation focuses on working towards a compatible use for a property and may be a viable option for the building. Rehabilitation of the interior could allow the building to be used for a number of different activities. Currently, the use of the building as exhibit space at the upper level and storage at the lower level is expected to continue.

Restoration would return the building to its appearance during the period of significance. The exterior appearance remains largely consistent with the original construction. The interior of the exhibit space has been heavily modified, though photographic and documentary evidence exists to support an accurate restoration. Selective restoration of missing character defining features is allowed under the Preservation treatment.

Reconstruction does not apply as the building is in place.

JKOA recommendations determined during the investigations and assessments for this HSR for achieving the NPS administratively determined treatment of ***Preservation*** are found in the *Recommendations for Achieving Ultimate Treatment and Use* chapter that follows.

A summary of the recommended ultimate treatments and uses is as follows:

• The NPS administratively determined management category for the Adolph S. Ochs Observatory and Museum is "Must Be Preserved and Maintained," and the Ultimate Treatment is Preservation, as indicated by the NPS Cultural Resources Inventory System (CRIS). The treatment recommendations in this report continue the established Ultimate Treatment of Preservation. Specific measures that follow The Secretary of the Interior's Standards for Preservation are discussed in this report.

• The recommended ultimate use of the building has been defined in the 2015 amendment to the park's 1988 General Management Plan, which calls for rehabilitation or restoration of the Adolph S. Ochs Observatory and Museum as well as permanent exhibits for the museum room. This report supports restoring missing character defining features as part of a refreshed exhibit space.

65. **Preservation** Treatment Standards, www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm.
66. **Rehabilitation** Treatment Standards, www.nps.gov/tps/standards/four-treatments/treatment-rehabilitation.htm.
67. **Restoration** Treatment Standards, www.nps.gov/tps/standards/four-treatments/treatment-restoration.htm.
68. **Reconstruction** Treatment Standards, www.nps.gov/tps/standards/four-treatments/treatment-reconstruction.htm.

Standards for Preservation Treatment

The Secretary of the Interior's Standards include individual standards addressing each of the four treatments. The *Standards for Preservation* are to be applied taking into consideration the economic and technical feasibility of each project. They are as follows:

1. 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.
2. 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.
3. 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 inspection and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. 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.
7. 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.
8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.[69]

The Recommended Ultimate Treatment for the Adolph S. Ochs Observatory and Museum is Preservation, as administratively determined by the National Park Service.

69. Preservation Treatment Standards, https://www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm.

Recommendations for Achieving Ultimate Treatment and Use

Guidelines for Treatment

Recommendations have been formulated based on the guidelines provided by The Secretary of the Interior's Standards for Preservation and reflect the administratively determined ultimate treatment. The full list of Preservation standards is provided in the *Ultimate Treatment and Use* chapter. Other guiding documents are outlined in the *Requirements for Treatment and Use* chapter.

Recommendations that further enhance the ultimate treatment of preserving the building are based on the findings of this HSR and are included in the *Recommendations for Further Research* subsection at the end of this chapter. That discussion includes recommendations for performing additional studies and addressing matters relating to restoration of the interior.

Implementation of the recommendations provided by this report should adhere to the following guidelines:

- Undertake all work in compliance with The Secretary of the Interior's Standards for Preservation.
- Retain the historic character of the building and its surroundings by protecting the building and significant site features.
- Ensure that any proposed new elements or construction are compatible with the historic character of the building and site.
- Protect adjacent natural resources during construction projects.
- Document through photography, written narratives, and detailed as-built drawings, all changes and treatments to the building and its immediate site. Maintain records of treatments and preserve documentation according to professional archival standards. Maintain a copy of these records in NPS archives.
- Retain features and materials of both the exterior and interior of the building that survive from the period of significance to the greatest extent possible. See listing of Character-defining features on pages 62 and 77.
- Incorporate sustainable design principles in future projects that respect preservation principles.

Recommendations

The actions recommended below are organized by feature and are intended to provide a conceptual framework for achieving the recommended ultimate treatment and use. They do not and are not intended to provide the detailed guidance of architectural/engineering plans and specifications.

Site and Site Drainage

Observations

The building sits at the northern point of Lookout Mountain and is accessed from the carriage drive by a loop of descending paths and stairs. Water sheeting off the approaching paths is impacting the building and immediate site. This issue is compounded at the east side by water from the roof backing up on the south elevation due to blocked downspouts.

From the east side, water is collecting at the base of the entrance and is unable to drain, allowing water to migrate into the crawlspace as well as on to the observation deck. The pavement in this area is not sloped to the nearby scupper and the scupper itself is too small and is clogged (*Figs. II-3 - II-4*).

From the west side, the path approaching the lower level is directing water toward the base of the building and has caused erosion at the base of the exterior wall, undermining the north exterior stair at the lower level, and contributing



Figure II-3. Overview of paved area at southeast doorway. Note mud indicating locations where water commonly stands.

to erosion just northwest of the building, which has been roped off (*Figs. II-5 - II-8*).

A 2022 report titled "Geotechnical Services for Ochs Museum - Visit Analysis, Recommendations and Schematic Level Design" prepared by Golder Associates, Inc. (hereafter Golder Geotechnical Report), examined the stability of the underlying rock on which the museum sits. Natural fissures exist in the rock that are bridged by the building. The report found no signs of obvious stress to the building but recommends addressing issues of site drainage to reduce the impact of water on the underlying rock.



Figure II-4. Undersized and clogged drain near southeast doorway.

Recommendations

- At the west approach to the lower level, provide a trench drain near the approach to the museum, before reaching the base of the west exterior stair. This water should be discharged to the northwest such that water does not impact the rock promontory or the trails lower on the mountain. Recommended study of potential impact of runoff is discussed in the *Recommendations for Further Research* section on p. 112.
- Following redirection of water, restore grade level along the north and west elevations of the lower level. This work should be done at the same time as repairs to the north exterior stairs, currently undermined and detached, are repaired. See the *Exterior Stairs* recommendations section.
- At the east approach to the museum, redirect the water currently pooling at the museum entrance by taking the following actions:
  - Removing existing flagstone for reinstallation.
  - Pitch underlying pathway bed such that the low point is at the scupper and directing water away from the doorway.



Figure II-5. Walkway to the west of the lower level. Water from this surface sheds toward the building and contributes to erosion.



Figure II-6. Loss of grade along building. Arrows indicate what is thought to be original grade level.



Figure II-7. Stair at north doorway undermined by erosion



Figure II-8. Erosion at grade northwest of the building.

- Enlarge existing through-wall scupper at landscape wall to be wider and less likely to clog with debris.
- Ensure that water passing through the scupper does not in any way flow toward the rock promontory, the water should be directed down the mountain. Recommended study of potential impact of runoff is discussed in the *Recommendations for Further Research* section on p. 112.
- Reinstall existing flagstone paving.

- Reference the Golder Geotechnical Report for additional information regarding the site.
- Implement regular monitoring of site drainage at intervals indicated in the *Monitoring Checklist* found on p. 113.

Relevant NPS Preservation Briefs

- Preservation Brief 36: *Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes*

Structural System

Observations

The building structure consists of load-bearing stone masonry walls with reinforced concrete floor and ceiling slabs. Deterioration of the floor slab and beams beneath the observation deck have resulted in the temporary closure of the building to the public.

Walls

The load-bearing masonry walls appear to be in good condition; mortar deterioration is discussed in the *Masonry Recommendations* section.



Figure II-9. Typical example of spalling and exposed rebar at ceiling of lower level.



Figure II-10. Example of most severe beam deterioration found in Room 101 at the exterior wall. Note exposed steel reinforcement. Also note proximity to failed drain at left.

Concrete Slabs

The floor slab at the basement level appears to be in good condition and free of any major cracking.

The concrete slab of the observation deck is visible from the lower level and has significant damage from water infiltration from the deck above (*Figs. II-9 - II-10*). The waterproofing has failed at the deck above and the drainage system is non-functional. As a result, water migrates through the slab and has caused rusting of rebar and spalling of concrete at both the slabs and integrated beams. Road salt previously used to de-ice the deck accelerated the rust damage.

The water infiltration has also migrated into the exterior walls along the north, northeast, and northwest elevations at the lower level. The infiltration has led to rusting of windows, window and door lintels, and mortar deterioration (*Figs. II-11, II-13*).



Figure II-11. Typical heavy lintel rusting at lower-level openings.

The roof slab at the upper level is concealed but there are no obvious signs of distress. See the *Roofing Recommendations* section for information regarding the roof.

A report titled "Condition Assessment Report - Structural Evaluation for Ochs Museum" (hereafter HECO Assessment) was completed in 2021. Their report includes recommendations for structural repairs to the slab and structural beams. Points of disagreement between the HECO Assessment and this HSR are outlined in the recommendations below.

Lintels

The steel lintels at door and window openings vary in condition from moderately to heavily rusted. A few of the lintels are deflecting at the center; however rust jacking of the masonry does not appear to be common.

The lintels are addressed on an opening-by-opening basis in the *Door and Window Assessment and Treatment Schedule* located in *Appendix D*. Two approaches to lintel treatment are presented based upon both condition and whether the steel window beneath the lintel is thought to be in potentially repairable condition.

Recommendations

Concrete Slab at Observation Deck

- Complete repairs to structural slab in conjunction with work to restore the waterproofing layer and drainage at the observation deck. See recommendations in the *Observation Deck* section.
- Complete structural repairs as outlined in the HECO Assessment. Repair procedures include cutting out sections of concrete at rusted rebar, treating the rust, splicing in new rebar at those locations to restore continuity, then casting concrete patches around the repair. See the report for more information and see additional concerns below.
- The HECO Assessment recommends blasting the underside of the slab and applying an elastomeric coating after repairs are complete

(see HECO Assessment p.33). Blasting is not recommended for any historic material, as it inherently involves material loss and may have other long-term implications. The repairs described in the HECO Assessment (and summarized above) could be completed at the rebar and slabs/beams without requiring blasting. An elastomeric coating will trap any water that migrates through the slab from above and will eventually cause damage as the new waterproofing layers at the deck inevitably break down. Application of such a coating is also not reversible, will hamper the ability to closely monitor the slab for moisture intrusion, and is ultimately unnecessary if the waterproofing and drainage systems are functioning appropriately. Proceed with completing the other repairs outlined in the HECO Report, including cutting out sections of concrete at rusted rebar, treating the rust, splicing in new rebar at those locations to restore continuity, then casting concrete patches around the repair.

- Prohibit use of road salt for de-icing of observation deck. Alternatively, it may be preferable to close the museum during inclement weather to avoid the need to de-ice. The proposed reinstallation of the south exterior doors would help in controlling access when the building is closed.
- Implement regular monitoring of structural system at intervals indicated in the *Monitoring Checklist* found on page 113.

Lintels

- **Approach 1:** At locations where windows may be repairable (see Appendix D), scrape and treat rusted lintels with rust inhibitor, prime, and repaint according to findings of paint analysis. See the *Recommendations for Further Research* section on p.112.
- **Approach 2:** Support the stone above and remove the existing steel lintel. Replace with stainless steel lintel and repoint area. This approach should be used at the exterior doors at the lower level, which can more easily be removed, as well as at window openings where the frames are damaged beyond repair and require replacement, such as windows W2, W9, and W10. See *Appendix D* for identification of windows thought to require replacement. Prime and repaint according to findings of paint analysis. See the *Recommendations for Further Research* section on p.112.
- Perform approach 1 at the triple lintel above the second-floor doorway to the exhibit space. These lintels are in fair to good condition.
- Explore the feasibility of performing Approach 1 at the central doorway at the lower level. Replacement of the three lintels at this location would require careful removal of the jack arch above. If the lintels are found to require replacement, proceed with Approach 2, taking care to ensure that the original stones are numbered and reinstalled to match the existing configuration.
- These approaches attempt to balance retaining historic fabric (the steel windows) with ensuring that the masonry openings are adequately bridged.

Exterior Features

Masonry

Observations

Overall, the sandstone masonry exterior walls are in very good condition. Very few examples of deteriorated or cracked stone were observed. The most notable was at the base of the northwest elevation (*Fig. II-12*). Mortar in many locations, especially at the lower level, has detached from the stones (*Fig. II-13*). The hairline cracks at the intersection of stone and mortar allow water infiltration and provide more opportunity for biologic growth to form. The mortar at the upper level exhibits similar cracking but is less prevalent.



Figure II-12. Chipped stone and crack on northwest elevation.

Holes for previous signs have been drilled in the coping stones at the observation deck. Most of these holes have not been filled and can hold water, which could eventually lead to deterioration due to freeze-thaw cycles. Failing and non-matching patches are also observed at the coping (*Fig. II-14*).

Biologic growth is widespread at the lower level, particularly at the north elevation, and has resulted in a very dark appearance (*II-15*). This growth is promoted by a relative lack of sun reaching the north elevation as well as moisture likely draining through the masonry from the failed observation deck waterproofing.

Recommendations

- Regularly monitor stone for new and worsening cracks.
- Perform mortar repair at crack on northwest elevation and optionally patch or replace damaged stone.
- Following repairs to the drainage and waterproofing systems at the observation deck, allow the exterior walls to dry out before completing repointing. Extensive spot repointing is required at the lower level, while comparatively less spot repointing is necessary at the upper level. Depending on the amount of repointing found to be necessary at the lower level, it may be more efficient and provide a more consistent appearance to repoint the entirety of the lower level, while electing to spot repoint the upper level.
- Perform mortar analysis on a sample of original mortar to determine formula for repairs. See the *Recommendations for Further Research* section on p.112 for more information. The repointing mortar should have the same performance characteristics and coloration as the original mortar to prevent damage to the stone or an inconsistent appearance. Care should be taken to ensure that mortar joints maintain the original appearance of the masonry. Repointing that covers too much of the projecting stones will diminish the three-dimensionality of the stonework and will call unwanted attention to the mortar joints.
- Ensure that electric saws and grinders are not used to remove mortar from historic masonry. These tools are imprecise and pose a high risk of damage to historic material. Repointing should be performed by skilled masons with experience working with historic buildings. Appropriate methods of mortar removal include the use of hand tools or a combination of hand tools and small pneumatic chisels.



Figure II-13. Example of mortar failure at stone. Also note soiling.



Figure II-14. Patch at stone parapet cap at coping stones. Note non-matching color as well as additional holes at right.



Figure II-15. Dark biologic growth at lower level.

- Patch holes in coping stones with appropriately colored patching material to avoid water infiltration. Remove existing patches and replace them with patches that better match the surrounding stone.
- Clean biologic growth from surfaces, testing a wide range of cleaning methods and materials before use of a chosen cleaning system.
- Always test cleaning methods in a small, inconspicuous area to gauge effectiveness.
- Test cleaning methods by progressing from the gentlest solution, such as presoaking with warm water, to mild non-ionic detergents, and finally to more aggressive commercial cleaners as necessary to remove soiling or staining. All methods should be agitated with a soft, natural bristle brush to prevent damaging the surface of the material being cleaned.
- Clean masonry elements using the lowest level of abrasion and mildest cleaning solution possible while achieving the desired results.
- Ensure that pressure washing with water is performed at a low psi (garden hose level up to about 300-400psi) with a fan-tip nozzle and a minimum distance of 30 inches from nozzle tip to masonry surface.
- Prohibit use of high-pressure washing (more than 400 psi) to clean historic masonry. The pressure exerted on the surface by a pressure washer can result in damage or loss of material and exposes historic materials to large volumes of water.
- Blasting with hard material (sand, nutshells, glass beads, etc.) should never be considered as an option for cleaning or removing coatings from masonry.

Relevant NPS Preservation Briefs:

- Preservation Brief 1: *Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*
- Preservation Brief 2: *Repointing Mortar Joints in Historic Masonry Buildings*
- Preservation Brief 6: *Dangers of Abrasive Cleaning*

Wood Elements

Observations

Exterior wood elements include exterior doors, door frames, and door casings. Specific recommendations for doors and hardware can be found in the *Exterior Doors* recommendation section. The recommendations described here address the general treatment approach for exterior wood elements.

Wood elements across the entire exterior are thought to date to the original construction. During the assessment, wood surfaces were found to exhibit little if any rot but were largely without sound protective coatings.

Recommendations

- Maintain protective coatings on exterior face of all wood elements, including exterior doors, jambs, and casings. Select paints and finishes based on the finding of recommended paint and finish analysis. See the R*ecommendations for Further Research* section on p.112.
- Prepare surfaces appropriately to achieve a sound protective coating. Painted surfaces should be scraped to remove loose paint, the edges feathered, and sound paint cleaned of dirt, oil, and moisture before repainting. Clean painted wood surfaces using mild detergents and a natural bristle brush. Rinse with tap water to remove residue.
- Ensure that pressure washing with water is performed at a low psi (garden hose level up to about 300-400psi) with a fan-tip nozzle and a minimum distance of 30 inches from nozzle tip to wood surface.
- Prohibit use of high-pressure washing (more than 400 psi) to clean wood. The pressure exerted on the surface by a pressure washer can result in damage or loss of material and exposes historic materials to large volumes of water.
- Follow manufacturer's instructions for chosen coating and stay within one system, as paint formulations are frequently evolving.
- Ensure that any future replacement material and patches are primed on all six faces to maximize the life of the wood and applied coatings by sealing it from moisture.
- Use more durable species of wood or treated wood in areas exposed to moisture when new material is required. Considering the difference in quality between early and

mid-20th-century woods and those available today, it is not always preferable to match the existing wood species.

- Utilize wood which is relatively free of knots and checks to assure a longer life for replacement materials.
- Ensure that any replacement material is installed such that it integrates well with the early material. For example, while it is generally preferred to retain as much early material as possible when making repairs, the use of very small pieces is not advisable in areas commonly exposed to moisture.
- Any new elements should be in-kind replacements matching the existing dimensions and profiles. Given that the exterior wood elements present at the Ochs are historic, replacement should only be considered as a last resort if patching or dutchman repairs are not feasible.

Relevant NPS Preservation Briefs

- Preservation Brief 1: *Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*
- Preservation Brief 6: *Dangers of Abrasive Cleaning*
- Preservation Brief 10: *Exterior Paint Problems on Historic Woodwork*
- Preservation Brief 39: *Controlling Unwanted Moisture in Historic Buildings*

Exterior Doors

Observations

With the exception of the steel door at the upper level accessing the exhibit space, all remaining exterior doors are original.

Of the doors at the lower level, the northeast door has been heavily modified by cutting holes to accommodate building systems (*Fig. II-16*).

The eastern leaf of the paired doors and associated frame at the center of the north elevation has detached from the masonry and are stored within the building (*Fig. II-17*). The door and frame are in reusable condition and should be protected and retained.

The northwest door is identical to the northeast door but remains intact.

Two original wood frames that once held paneled wood doors are located at the upper level on the



Figure II-16. Original northeast doorway at lower level. Note holes cut in door for building systems.



Figure II-17. North doorway at lower level. Note that fallen left leaf and jamb are stored on the interior.

south elevation, on accessing the observation deck from each of the approaching paths (*Fig. II-18*). The doors themselves were removed at an unknown date but were similar in design to the paired north doors at the lower level.

A partial original frame remains at the north doorway at the upper level accessing the exhibit space (*Fig. II-19*). The frame has been supplemented at the sides and top to hold a modern replacement hollow steel frame and steel slab door. The existing steel door and frame detract from the historic character of the building.

With the exception of the modern upper-level doorway, all doorways retain original hardware and hinges. The lower-level doorways each have original mortised locksets. The paired doors have decorative exterior handles, with the primary leaf having a thumb latch and the secondary leaf having a matching dummy handle.

An opening-by-opening assessment of the doors with recommendations can be found in the *Door and Window Assessment and Treatment Schedule* located in *Appendix D*.

Recommendations

- Maintain protective coatings on all elements of exterior doors, frames, and casings in accordance with the guidelines in the preceding *Exterior Wood Elements* section.
- Repair the northeast door at the lower level using one of the following options:
  - **Option 1:** After rerouting drainage piping in accordance with the *Observation Deck Recommendations* section, remove the door and added grille and fans from the previous HVAC system.
  - Patch the missing center section of the door, as well as the two holes cut for piping using dutchman repairs. The center hole should be patched with tongue-and-groove boards at the interior and exterior that align with the original material seams at top and bottom. Re-hang the door in the opening following lintel replacement and retain all existing hardware.
  - **Option 2:** If a dutchman repair is not feasible, replace the door in-kind, taking care to match material dimensions. Retain and reuse original hardware and hinges from original door.
- Reattach the historic door jamb and casing to the masonry opening at the north doorway at the lower level using stainless steel fasteners following lintel repair or replacement. Fasteners should be hidden behind existing wood stops or concealed by wood plugs.
- Rehang historic doors in the north lower-level doorway, reusing original hinges and hardware.
- Replace missing mortised deadbolt to eliminate the need for a padlock hasp to secure the building. The deadbolt chosen should be visually compatible with the original bronze door handles.



Figure II-18. Inside face of typical south doorway, in this case at the west entryway. Note early or original frame.



Figure II-19. Remaining original casing at upper-level north doorway. Note modern steel frame at right.

- Replace door and frame at upper-level north doorway, removing added blocking to restore the original doorway width. Install a paneled door design that is modeled after the original design shown in the construction drawings found in *Appendix A* and in historic photographs shown in the *Recommendations for Ultimate Use* section. If allowable by code, it is the preference of this report to replicate the original door design based on the historic drawings. Depending on accessibility requirements, the original design may require modification to achieve accessibility standards for width. One option may be to use a wider active leaf paired with a narrower adjacent panic leaf at the side to restore the historic appearance while still offering an accessible entry width. The fact that the building site is not accessible may offer some flexibility in requirements for the building itself.
- Fabricate two pairs of new wood doors to replace those that once hung on pintles in the two south openings at the upper level. Reinstallation of doors at these openings will be beneficial to controlling access to the museum and observation deck. Use the original construction documents found in *Appendix A* to guide the design of these doors. Retain existing original frames at both locations. Fabricate the new doors using wood that is moisture resistant, such as Sapele mahogany. Hardware should approximate the original hardware shown in the construction drawings, most notably the pintle hinges.
- Regularly maintain hardware, applying lubricants, replenishing paint finishes as appropriate, and making repairs to extend the life of the hardware.
- Implement regular monitoring of doorways and lubrication of hardware at intervals indicated in the *Monitoring Checklist* found on p.113.

Related NPS Preservation Briefs

- Preservation Brief 10: *Exterior Paint Problems on Historic Woodwork*

Windows

Observations

The windows at the lower level are in poor condition overall. An opening-by-opening assessment of the windows with recommendations can be found in the *Door and Window Assessment and Treatment Schedule* located in *Appendix D*.

The cast iron window shutters on the east and west elevation are in good condition but exhibit some peeling paint.

A key consideration for treatment is whether or not lintel replacement is necessary. Removal of failed lintels will require removal of the steel window and frame below. The majority of the window frames are too deteriorated to be removed for reinstallation. For this reason, in-place repair of window frames is being considered only at openings where the existing steel lintels may be able to be treated in place and retained.

The windows beneath the covered entryways at the upper level are in good condition and should be retained in place as intact examples of the original window design (*Fig. II-20*).

Two options for window treatment are presented:

- **Approach 1:** Retain and repair existing window sash and frames by performing welded dutchman repairs as necessary where material integrity has been lost. Replace glazing putty and cracked or broken glass. Typically replace hinges which are a common point of failure due to their thin construction. Replace locking handles to allow operation. Remove loose rust, prime



Figure II-20. Paired sash at upper level in protected entryway. Note lack of steel lintel.

with rust inhibiting primer, and repaint all window elements, including lintels.

- **Approach 2:** At locations where lintel replacement is necessary, or where steel frames and sash are too heavily deteriorated to be feasible to repair, replace the frames and sash in-kind. Replacement units should match the design and dimensions of the existing windows.
- Approach 1 is the preference of this report and efforts should be made to retain as many of the original window units as possible.
- Retain both original windows at the upper level. Replace glazing putty and repaint.
- Repaint iron window shutters on east and west elevations.
- Select paints and finishes for window elements based on the finding of recommended paint and finish analysis. See the R*ecommendations for Further Research* section on p.112.
- Implement regular monitoring of window coatings, glazing, and lubrication of hardware at intervals indicated in the *Monitoring Checklist* found on p.113.

Exterior Steps

Observations

The west exterior steps are in overall good condition but have many open joints at the treads.

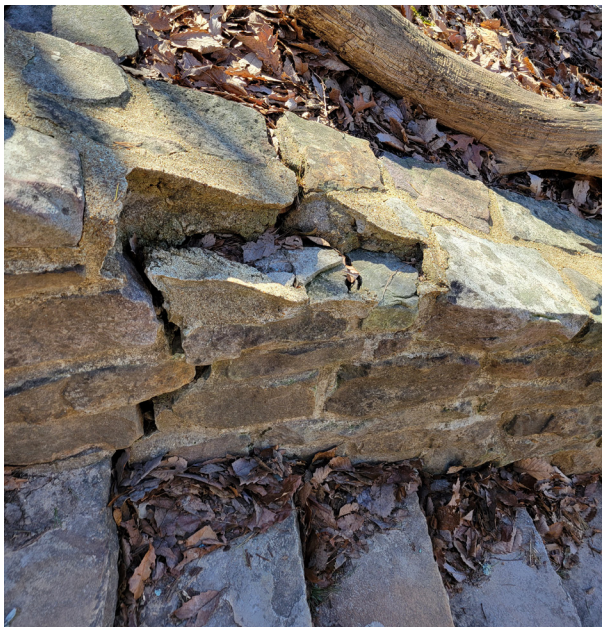


Figure II-21. Missing stone and crack at west cheek wall.

One stone is missing from the cheek wall near the top of the stairs and is associated with a crack (*Fig. II-21)*. The crack is likely the result of freezing and thawing cycles and the wide crack and missing stone are allowing water to infiltrate the wall.

The stairs accessing the north doorway at the lower level have been undermined by erosion and have separated from the building (*Fig. II-7*).

Recommendations

- Repoint west stair using mortar formula determined by mortar analysis. See *Recommendations for Further Research* section on. p112.
- Replace missing stone at cheek wall and perform mortar repair at crack to prevent water infiltration into the masonry. Monitor to see if crack returns. If it does, consider embedding a stainless-steel tie in the mortar joint across the crack.
- Dismantle and reconstruct the north stair after restoring grade in combination with site drainage recommendations. Reconstruct the stair using the original stones.

Observation Deck and Drainage System

Observations

The observation deck is suffering from several long-term issues resulting from an insufficient and non-functional drainage system.

The stone paving at the deck is experiencing localized failure and spalling as a result of standing water (*Fig. II-22*). Additionally, the tar waterproofing beneath the paving has failed and is allowing water to saturate the slab beneath.



Figure II-22. Stone paving showing typical example of deterioration.



Figure II-23. Typical clogged drain.

The original design for the deck depicted in the construction drawings included a cantilevered cover and perimeter wood window sash, making the observation area a largely enclosed space. The cantilever element was ultimately removed from the design and never constructed. The drainage system, however, remains consistent with what is shown in the drawings, but was designed to handle only incidental water. The result is that the drainage system is undersized and ill-equipped to handle the volume of water and amount of debris that collects on the deck.

Compounding the issues above is the replacement of the original 8" by 8" drains with much smaller drains with largely solid grilles (*Fig. II-23*).

The original drains emptied to vertical cast iron pipes that passed through the floor slab to a subsurface drain that exited from the east side of the rock face, below the lower floor level. It is likely that the two downspout pipes from the south side of the building connect to the same main discharge.



Figure II-24. PVC piping crossing lower level. Note that the pipes prevent doors from closing. The pipes are no longer pitched to drain due to being filled with sediment.

Unfortunately, the subsurface drain appears to have collapsed or broken and cannot be cleared.

Currently, a system of PVC piping descends from each drain location and crosses the ceiling to combine in the eastern room on the lower level (*Fig. II-24*). The pipe passes through the northwest door and drains off the side of the rock outcropping.

The PVC system has filled with debris and/or water and has sagged, preventing any water from draining. This means that water falling on the deck is currently pooling until it either evaporates or migrates through the paving and into the structural slab below, furthering damage.

The issue of drainage and waterproofing of the observation deck is the number one condition issue facing the building. Water migrating through the structural slab, combined with previous use of salt for deicing, has caused rusting of reinforcing bars and spalling of concrete.

The water has also entered the exterior walls at the lower level and greatly accelerated the deterioration of the steel windows, window and door lintels, and door frame fasteners. The main doors and frame at the lower level have fallen out of the masonry opening in the past year as a result of weakened fasteners leaving the doors vulnerable to vandals.

Recommendations

- Remove paving at deck in sections, labeling pieces for reinstallation. Replace deteriorated stone pavers in-kind.
- Install new waterproof membrane beneath the paving after performing any necessary repairs to the surface of the structural slab. Structural repairs should happen concurrently with paving work.
- Install new internal drainage system with larger drain openings at deck level. Provide new PVC drainage pipes to connect the drains to a subsurface drainage system trenched beneath the lower-level floor. This new subsurface system should also serve the two south downspouts (see R*oofing and Roof Drainage Recommendations* section). Increase the diameter of the subsurface pipe accordingly as more drains join the system as the drain line reaches the outlet. Discharge water out the east side of the rock outcropping as the original system did.

- Ensure that water discharging from the subsurface drainage system does not in any way flow toward the rock promontory of the museum. The water should be safely directed down the mountain. Recommended study of potential impact of runoff is discussed in the *Recommendations for Further Research* section on p.112.
- Provide cleanouts at all turns and intersections of new piping to provide means of maintaining the entire system. Cleanouts for subsurface sections of the pipe should be level with the lower-level floor.
- Consider adding two overflow scuppers at the observation deck that pass through the parapet wall near the floor drains. These scuppers would likely best be created at the east and west ends of the long north face of the parapet. Provide an extending chute on the exterior face of the scupper to ensure that water is projected beyond the flared exterior wall below. Note that these scuppers should not be viewed as an alternative form of drainage, but as an emergency relief measure until the internal drains can be repaired/unclogged. Shedding water onto the rock outcropping below for extended periods could contribute to erosion and may have negative impacts on the natural fissures in the rock below.
- Implement regular monitoring and cleaning of repaired drainage system at intervals indicated in the *Monitoring Checklist* found on page 113.

Roofing and Roof Drainage

Observations

The current membrane roof has multiple layers of applied coatings. The coating extends to the inside face of the parapet walls and chimney (*Fig. II-25*). In many locations, the membrane has separated from the underlayment material, creating large bubbles that make the membrane more susceptible to puncture and prevents adequate drainage.

Unauthorized access by visitors is an ongoing concern for the park. Foot traffic on the roof membrane has led to premature failure and is causing leaks. Security spikes have been added along the south parapet and are embedded in the masonry.

Two scuppers adjacent to the chimney drain the roof into two collection boxes with downspouts (*Fig. II-26*). The downspouts connect to cast iron pipes below grade that cross the crawlspace before combining at the center and turning down beneath the concrete slab. The pipe has no cleanouts and is most likely clogged. The collection boxes have filter screens but are covered with leaves. The downspouts are overflowing, saturating the ground at the base of the wall, and migrating into the crawlspace (*Fig. II-27*).

Recommendations

- Remove existing roofing material to a stable substrate. Retain existing copper flashing if feasible.



Figure II-25. View of roof with applied coatings on membrane, parapet, and chimney.



Figure II-26. Typical scupper, collection box, and downspout on south elevation. Note clogged filter.



Figure II-27. Moisture on south wall of crawlspace.

- Replace existing membrane with a new membrane, potentially one that is ballasted. The gravel on atop the membrane will offer greater protection from ultraviolet light, which improves longevity, and will also provide a buffer between the membrane and individuals walking on the roof. A membrane of appropriate thickness for this application should be selected and care should be taken to select a membrane that offers the greatest resistance to punctures.
- Maintain existing spikes along the south parapet to discourage access. Reinstall missing spikes using epoxy or mortar. Consider replacing the existing spikes, which appear to be painted steel, with painted stainless-steel versions to avoid potential damage to masonry from expansion due to rusting. Ensure that water is not able to collect in holes surrounding the spikes, as this could lead to freeze-thaw damage.
- Consider the use of rubber roof access panels along areas thought to be high traffic locations, such as the path from the table rock at the rear (the main access point by trespassers) to the north parapet. Although this will not prevent intentional damage, it may reduce damage caused by those who are accessing the roof for the view alone.
- Renew coatings on the inside face of the parapet wall. No obvious signs of water infiltration were noted at the perimeter of the building; however, removal of the many layers of coatings and fiberglass mesh underlayment would be costly and would likely result in damage to the stone and potentially create more water infiltration issues. For these reasons, maintaining the coating is preferred.
- Add cleanouts with screens to the base of both the downspouts where they transition to the subsurface drainage system.
- Pitch existing debris screens at scuppers such that they are more likely to shed leaves and needles.
- As part of larger subsurface drainpipe replacement at the observation deck, plan to replace the cast iron piping in the crawlspace, providing cleanouts for regular maintenance at all elbows and direction changes.
- Implement regular monitoring and cleaning of repaired drainage system at intervals indicated in the *Monitoring Checklist* found on p.113.

Relevant NPS Preservation Briefs

- Preservation Brief 4: *Roofing for Historic Buildings*
- Preservation Brief 39: *Controlling Unwanted Moisture in Historic Buildings*

Interior Features

Flooring

Observations

The original concrete slab floors are exposed at the lower level.

The exhibit space retains the original stone tile flooring (*Fig. II-28*). The original hearth and



Figure II-28. Room 201 - Original stone tile flooring. Note location of previous partition wall and doorway threshold. Similar conditions are found at both wall locations.

partition wall locations are evident in the tile, as illustrated in the *Physical Description* section.

Recommendations

- Retain concrete slabs at the lower level.
- Retain original tile flooring and hearth. If restoration of the interior takes place, any patching of previous HVAC grilles should be done in-kind. If partition walls are not rebuilt, ensure that the evidence of their locations is not lost as part of renovations.

Interior Trim

Observations

The lower level retains original trim at each exterior doorway as well as at both interior doorways (*Fig. II-29*). A section of this trim is provided in *Appendix C*.

The upper level has modern crown moldings, baseboards, and casings that are incompatible with the style of the building. The railings and trim associated with the display cases are similarly incompatible.

Ongoing leaks have caused isolated damage to the crown molding and baseboards (*Fig. II-30*).

Recommendations

- Retain all existing trim at the lower level.
- If restoration of the exhibit space is carried out, match the trim profiles shown in the construction documents. Examples of original trim may remain behind added furred-out walls.
- If restoration is not undertaken, or if the existing space is to remain for the foreseeable future, replace damaged trim pieces in kind and repaint.

Walls and Ceilings

Observations

Walls at the lower level consist of exposed stone masonry. Original partition walls consist of combed clay tile. The concrete structural slab and beams are exposed at the ceiling. These conditions reflect the original appearance of the lower-level spaces.

At the upper level, furred-out stud walls within the original footprint of the room are finished with gypsum wallboard. The ceiling has been dropped slightly from the original level and is also gypsum wallboard. It is unknown how much of the original plaster finishes might remain behind existing finishes.

Ongoing leaks have caused damage to the drywall ceilings. There is a possibility that moisture from these leaks could be trapped behind the drywall.

Recommendations

- Retain exposed masonry and concrete at the lower level.
- As part of any major interior renovation, even if not a full restoration, explore the possibility of removal of added framing and wallboard to restore the original exhibit



Figure II-29. Original interior door casing at lower level. A section detail of this trim can be found in *Appendix C*.



Figure II-30. Room 201 - Typical modern baseboard. Note patch in flooring at location of removed casework on center south wall.

space footprint. See the *Recommendations for Ultimate Use* section on p.110 for information regarding potential restoration of the exhibit space.

- If the existing finishes are to remain in place for the foreseeable future, patch water damaged areas after first addressing the roof. Open probes large enough in the areas with water damage to better assess the condition of the space behind the drywall ceilings and walls for trapped moisture. Allow the area to dry after ensuring that moisture infiltration issues are solved. Remove any damaged or deteriorated drywall before patching and repainting.
- Implement regular monitoring of walls and ceilings for water infiltration at intervals indicated in the *Monitoring Checklist* found on page 113.

Building and Site as Artifacts

Observations

It is important to think of the building and its surroundings as having archaeological value. Evidence of the creation and evolution of this place is embodied in the building and site features, and sometimes hidden below the ground's surface.

Recommendations

- Strive to protect evidence of the evolution of the building as part of future work campaigns, particularly evidence dating from the original construction. Preservation of the previously mentioned bands in the flooring at the original partition wall locations is a good example of this practice (*Fig. II-28*).
- As part of any project requiring ground disturbances, have an archaeologist on call to review any potential findings.

Building Systems

Observations

General Considerations

The introduction of any new building systems, including mechanical, electrical, plumbing, and life safety, can result in damage or loss of historic fabric if care is not taken in its design, installation, and operation.

Mechanical Systems

The exhibit space is currently served by two "mini split" indoor units that are connected through the crawlspace to outdoor units off the east elevation at the lower level. The units are in serviceable condition; however, the outdoor units are very close to the rock edge (*Fig. II-31*). The units in the exhibit space are positioned in front of two walled-off window openings visible from the exterior.

The former ducted system with air handler located on a rack in Room 102 remains in place but is non-functional (*Fig. II-32*). Multiple supply and return grilles enter the exhibit space from this abandoned system and insulated ductwork remains in the crawlspace. In Room 101, the abandoned outdoor unit is positioned on a platform to exhaust through the nearby window.

The lower level does not currently have any form of climate control.

Electrical System

The electrical system is of considerable age and the panel directories are out of date, making it difficult to determine what is still active.

Embedded metal fixture boxes remain at the lower level and outside of lower-level exterior doorways. Wiring at these locations appears to be inactive.

Electrical systems at the upper level are functional and are modern.

Plumbing System

No remaining plumbing is thought to be active; however, a toilet remains installed at the lower level



Figure II-31. Outdoor units at east side of the building.

and the supply water for the water fountain is capped.

Fire Protection System
The existing fire protection system, which consists of smoke detectors at both levels, is nonfunctional. The upper level has a fire extinguisher near the exterior doorway.

Security System
The exhibit space is currently monitored by several cameras connected to a computer in the upper-level closet. The closet is not secured, and the deadbolt can be disengaged without a key.

Currently there are no cameras on the exterior of the building and no signage warning against trespassing. Trespassing and vandalism remain major threats to the building and have been increasing in frequency since the building was closed to the public.

Recommendations

General Considerations
- Minimize drilling, cutting or otherwise damaging historic trim or finish materials as part of building systems installation.
- Use/reuse existing holes in masonry for building systems whenever feasible.
- Implement regular monitoring/inspection of building systems at intervals indicated in the *Monitoring Checklist* found on p.113.

Ventilation
- If the lower level remains unconditioned, regularly open windows (once repaired) during warmer months to promote ventilation. Security bars on the interior will remain to prevent access.



Figure II-32. Abandoned air handler in Room 102.

Mechanical Systems
- Plan for in-kind replacement of the existing mini-split system in the near future. Installation of new units should be coordinated with potential restoration plans for the interior. The current indoor unit locations prevent the original windows from being uncovered. See the *Recommendations for Ultimate Use* section on p.110 for more information.
- Remove abandoned mechanical system components in the lower level and crawlspace.
- Reposition outdoor units, which are very close to the rock edge and could present a safety hazard for those doing service. Alternatively, a guardrail could be provided at this location.
- Consider using portable dehumidifiers at the lower level to reduce moisture levels at damp times of year.

Electrical System
- Plan for rewiring of the exhibit space as part of any major renovation. Upgrades to the main electrical panels should take place at the same time. Lower-level lights and receptacles appear to be of recent vintage.
- Remove abandoned electrical system elements, specifically embedded metal boxes in the concrete ceiling and masonry openings at the lower level.

Plumbing System
- No recommendations. See *Recommendations for Ultimate Use* section of p.110 for potential plumbing needs.

Fire Protection System
- Install new fire/smoke detection and fire alarm system that adequately covers both levels.
- Equip fire protection system with cell dialer to call emergency services when the alarm is triggered.
- Ensure that adequate fire extinguishers are provided at both levels of the building.

Security System
- Secure door to closet to avoid tampering with security cameras and theft.

- Consider installation of outdoor cameras at key locations to monitor trespassers.
- Add signage at locations such as the table rock south of the building and at the gate securing the lower level indicating no trespassing and indicating that security cameras are in use (assuming outdoor cameras are installed).

Operations and Maintenance Program

The park currently does not have formal procedures established for conserving the historic building materials.

Recommendations

- Initiate an Operations and Maintenance (O&M) program focused on this building, specifically to:
  - Develop a protocol of best practices for maintenance, including lists of proven products, materials, and methods.
  - Also develop a list of products, materials, and methods that should NOT be used.
  - Avoid the use of new construction products and materials until the specific application has been sufficiently tested and approved by the appropriate NPS management unit.

Monitoring Checklist

The use of a Condition Monitoring Checklist outlining inspection topics and the date of inspection helps both to formalize the monitoring process and to create a record for future reference.

A checklist tailored specifically to the needs of the Adolph S. Ochs Observatory and Museum was prepared for this HSR and can be found on p.113.



Figure II-33. Stair 4D Overview. Note lack of handrail.

Recommendations

- Adopt the recommended inspection schedule included in the Checklist or substitute a more suitable one.
- Adjust the list of inspections as appropriate. Integrate the monitoring schedule into park activities.
- Retain the Checklists for tracking needs and scheduling remedial actions.

Accessibility and Universal Design

Observations

The building site is accessed by a network of steps and paths that descend from the carriage drive to the southwest. The difference in grade across the path is significant and creation of a universally accessible path to the museum is not feasible. The lower level, while not open to the public, is not accessible without using two sets of stairs, one along the side of the building and another to access the lower-level doorways.

Recommendations

- Because providing universal access to the building site is not feasible, consider duplicating information contained at the museum in a location that is universally accessible.

Site Walkways

Observations

The site walkways and stairs leading to the building site are in overall good condition.

Handrails were found to be slightly loose at stairs 1, 3. Stair 4D lacks any handrails (*Fig. II-33*).

Several stairs have added stone paving at the treads that was likely added to level out the tread. Some examples of this paving, most notably at stair 3, are failing and present a trip hazard (*Fig. II-34*).

The eastern approach path the museum has a section without guardrail. Given the steep drop at this location, one should be added to ensure safety (*Fig. II-35*).

Recommendations

- Refasten/tighten connections of all loose handrails.
- Retain early or original handrails.



Figure II-34. Stair 3 Overview. Note chipping of applied paving.



Figure II-35. Area along east walkway with no guardrail.

- Consider adding handrails to stair 4D.
- Replace chipped stone paving at steps as necessary, or alternatively remove paving to expose the original stone tread.
- Add guardrail at east approach path.

Resilience to Natural Hazards

Climate

Observations

Average temperatures and precipitation at CHCH are increasing and are projected to continue to increase. Storm frequency and intensity is also projected to increase. These changes will have major impacts on the frequency of maintenance required for buildings. Storm preparation and adequate drainage to handle increased rainfall will also be critical.

A number of studies have been prepared by NPS on a park-by-park basis that address changing climatic conditions and interpret historic climate data. Studies include "Recent Climate Change Exposure of Chickamauga and Chattanooga National Military Park" (Monahan & Fisichelli, 2014) and "Chickamauga and Chattanooga National Military Park: How Might Future Warming Alter Visitation?" (Fisichelli & Ziesler, 2015). Both documents are available on NPS.gov.

Recommendations

- Consider the potential effects of climate change issues on the building and its immediate site, such as increased storm threats, changes in average temperature and rainfall totals, and associated loss or degradation of resources.
- Monitor weather-related deterioration and evaluate needed responses to protect the building and its immediate site in coordination with overall assessment of climate change effects on the park overall.
- Complete site and building drainage recommendations advocated by this HSR.
- Use studies regarding adaptation to natural hazards to inform management decisions. Current studies that address the park include those cited above.
- Assume increased visitation will take place in the coming years and adjust maintenance schedules appropriately.
- Consult regularly with the NPS Interior Region 2 Climate Change, Socioeconomics, and Adaptation Coordinator to inform management policies. Coordinate with planning and documentation projects being implemented by the NPS Region.
- Evaluate building maintenance schedules as necessary to account for the possibility of more frequent exterior painting/finishing campaigns, roof repairs, and roof and site drainage repairs in response to increased and more intense projected precipitation. The Condition Monitoring Checklist found on page 113 of this report helps guide cyclical

maintenance and frequent monitoring of conditions and creates a record.

- Update emergency and disaster planning to address resiliency to natural hazards and mitigation of the effects of hazardous events.

Vermin and Pests

Observations

No obvious evidence of vermin or pest activity was noted during the assessments for this report; however, ongoing monitoring for activity is important to the wellbeing of the building and park visitors.

Recommendations

- Remove any insect nests that may appear on the building exterior. Monitor the building regularly for insect activity.
- Be vigilant to prevent habitation of vermin such as mice, rats, or snakes on the interior of the building.

Recommendations for Ultimate Use

The Adolph S. Ochs Observatory and Museum retains its original use as an exhibit space at the upper level with an adjacent observation deck. The lower level continues its historic use as unconditioned storage. This report advocates for keeping the existing use while improving the exhibit space by restoring select character-defining features. The restoration would improve the quality of the exhibit space and restore the historic feel and character of the interior, which has been heavily compromised by later changes.

Alternative uses for the lower level are limited by access restrictions, as the public is not able to access the lower level of the structure due to proximity to the edge of the rock outcropping. In its current state, the lower level is best used for storage of items that do not require any form of climate control. If the lower level were to be climatized, additional uses such as office space could be considered. Plumbing for a toilet and sink would also be required for this use. A dedicated use for the lower level would aid in monitoring building condition and by extension would be beneficial to its preservation.

Restoration of Exhibit Space

The exhibit space has been heavily modified since construction (*Figs. II-36 - II-40*). The footprint of the space has been reduced by the addition of furred-out walls and integrated display cases. Two small rooms at the south end of the space have been eliminated. Two window openings at the south end have been covered from the inside, and the firebox of the central fireplace has been covered and the surrounding casework removed. Please refer to the *Chronology of Development and Use* chapter for more information on the original design, as well as the original construction drawings in *Appendix A*.



Figure II-36. Room 201 - View looking northwest toward doorway.



Figure II-37. 1940 view of same location as the photograph above. (Frost, photographer, CHCH_301_P11_[143442])



Figure II-38. Present-day view of south wall of the exhibit space, the location of the original fireplace.



Figure II-39. View of south wall of exhibit space in 1940 showing centered fireplace and flanking casework. (Frost, photographer, CHCH_301_P11_[143442])

The room is currently finished with gypsum wallboard on the walls and ceiling and modern colonial-style trim has been installed throughout, which is inappropriate for the style of the building. Historic photos and the construction drawings indicate simple, streamlined details and fixtures on the interior.

Tasks to restore the interior to its original design include the following:

- Removal of added wall construction at perimeter and restore the original footprint of the room. It is likely that portions of the original plaster walls remain behind these additions.
- Reopening of the windows to the interior to provide natural light. The locking doors recommended for the south exterior openings will reduce the security risk of exposing the windows to the exterior. The covered entryways provide ample shading to the windows to prevent excessive sunlight, and UV films or acrylic thermal panels could be used to protect materials in the exhibit space.
- Exposure of the stone fireplace and firebox, indicated to remain behind the current display panels on the south wall.
- Restoration of the wood mantel and casework flanking the fireplace based on historic photographs and the original construction documents, which provide full detailing.
- Optional restoration of the two partition walls forming the original office and chair storage rooms at the southwest and southeast ends of the room, respectively. The decision to restore these partitions should be based upon the programmatic needs of the exhibit space. The existing banding in the floor indicating the wall locations should be preserved if the walls are not restored.
- As described in the *Exterior Doors* section, replace the current steel door and frame with a paneled door more faithful to the original design while also conforming to modern accessibility requirements.
- Duplicate or closely approximate the characterizing dome-shaped Modern wall sconces shown in the historic photographs and construction drawings. Three of these



Figure II-40. 1940 view looking southwest toward the now-removed office partition. Note window opening. (Frost, photographer, CHCH_301_P11_[143442])

fixtures were originally found on each side of the fireplace wall as well as flanking the main entrance doorway on the north wall (*Figs. II-37, II-40*).

- Assume full rewiring of the exhibit space as part of any major renovation.
- Assume replacement of the mechanical units in the exhibit space as part of any major renovation. Placement of the units should minimize visibility. Floor console units may prove a better option than wall mounted cassettes given the low ceilings and reduced wall space.
- Exhibit design should be cognizant of the style and character of the building and strive to avoid the introduction of inappropriate details such as the moldings used in the current space. Similarly, displays should avoid closing off space in an already small room. The current exhibit space greatly reduces the floor area in favor of deep display cases and false walls that impact the overall sense of the interior.

Recommendations for Further Research

Paint and Finish Analysis

Perform paint and finish analysis on early coated materials such as doors, door casings, and windows prior to any major work campaign. Finishes may also exist behind modern fabric at the interior. This analysis can provide insight into historic paint colors and clear finishes.

Mortar Analysis

Complete mortar analysis prior to any repointing campaign. Although no major repointing efforts are known to have taken place, it should be ensured that mortar sampled for analysis comes from an area thought to contain original mortar, such as the protected areas beneath the entryways at the upper level.

Although the basic formula for the original mortar is indicated in the specifications, this information should be verified by a true analysis to ensure that replacement mortar has the appropriate performance characteristics to avoid damaging the sandstone walls. Matching the original mortar coloration is critical to avoiding a "patchwork" appearance when spot repointing.

Hazardous materials testing should be performed on mortar prior to repointing. See the *Hazardous Materials Testing Recommendations* for more information.

Runoff Drainage Study

Drainage recommendations proposed by this report focus on directing water away from the building and promontory. Further study should take place to determine what, if any, measures may be required to ensure that water discharged from the site does not have an adverse effect on downstream conditions.

Hazardous Materials Testing

Observations

The building was constructed and renovated in an era when hazardous materials such as asbestos and lead paint were in widespread use. Examples of building materials commonly containing asbestos include, but are not limited to:

- Plaster and Stucco
- Flooring tiles and tile mastic or grout
- Insulation
- Gypsum wallboard
- Mortar
- Acoustic ceiling tiles
- Electrical wire insulation

If left undisturbed, lead-based paint and asbestos-containing materials pose no threat to building occupants. However, appropriate abatement measures should precede any future work on building elements suspected to contain hazardous materials.

Recommendations

- Perform appropriate abatement measures for hazardous materials prior to future work that could disturb suspected hazardous materials.

CONDITION MONITORING CHECKLIST
OCHS OBSERVATORY AND MUSEUM

Feature	Action	Frequency	Date
Rainwater Collection & Dispersal:			
• ***Upper Roof***	○ Inspect for punctures in membrane, clear debris from roof and scuppers.	Post-Storms	
• ***Observation Deck***	○ Clear drains at deck	Post-Storms	
• ***Drainage***	○ Clear subsurface drains using cleanouts to ensure that underground drainage system remains clear and functional	Seasonally	
	○ Clear site drainage components; increase frequency of checks during spring and fall when vegetation is falling, especially before a rain event.	Pre and Post-Storms	
Masonry	○ Monitor for new or worsening cracks.	Twice yearly	
Windows & Window Openings	○ Inspect for cracked or broken glass, failing glazing and paint. ○ Lubricate hardware	Twice yearly Twice yearly	
Doors & Doorways	○ Probe with awl for rot if soft wood ○ Lubricate hardware	Twice yearly	
Perimeter Vegetation	○ Trim surrounding vegetation to promote airflow around the building.	Seasonally	
Structural Systems	○ Visually inspect underside of concrete slab and beams at lower level for spalls and water infiltration	Twice yearly	
Interior Finishes & Material Substrate	○ Inspect for evidence of water infiltration at ceilings and perimeter exterior walls, doors and windows due to failure in exterior envelope ○ Monitor finish deterioration, soiling and damage to substrate materials due to visitation	Post-Storms Twice yearly	

Fire Detection System	○ Schedule system tests as per NPS policy	NPS Policy	
Security System	○ Schedule system tests as per NPS policy	NPS Policy	
Electrical Service	○ Inspect exposed system components for evidence of deterioration	Annually	
Mechanical System	○ Inspect and service system as per NPS policy	NPS Policy	

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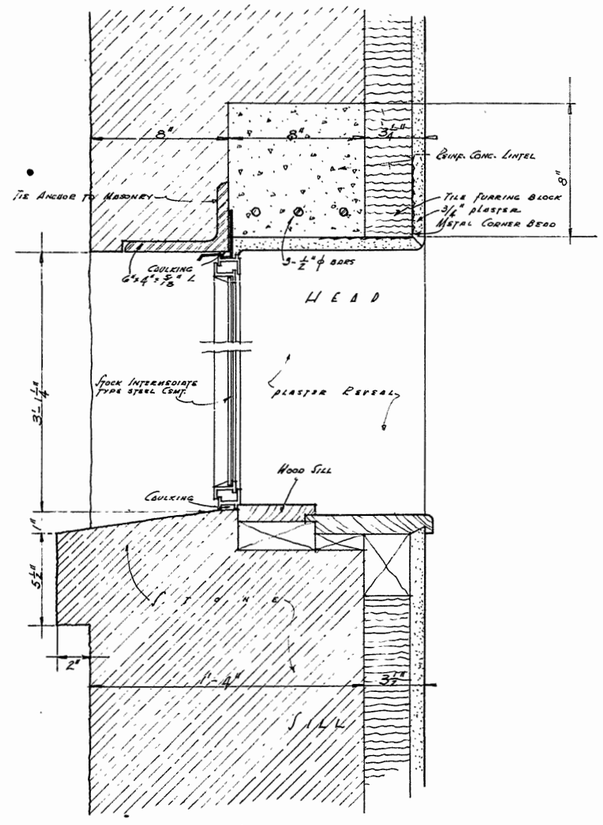
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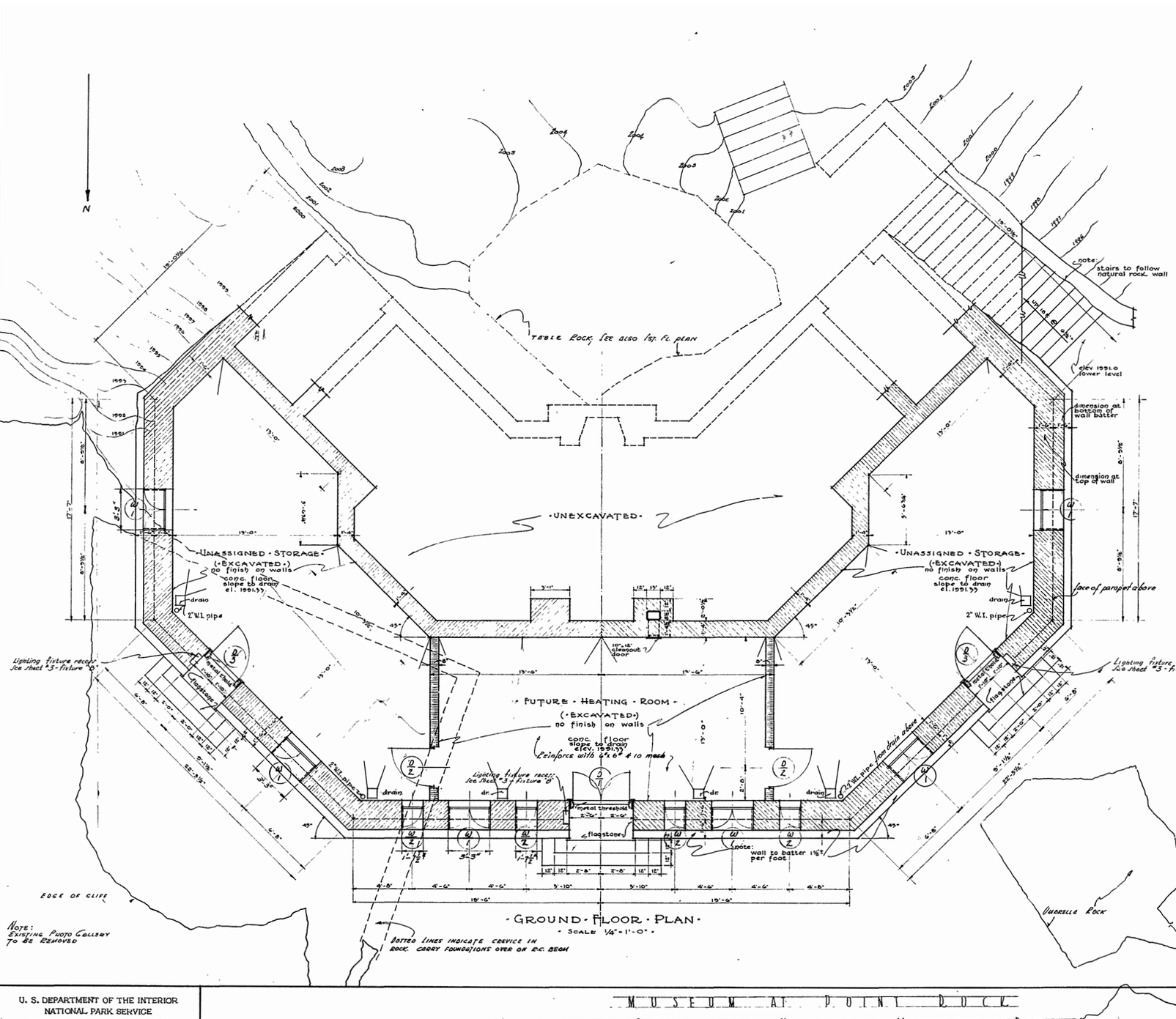
Appendix A:
1938 Construction Drawings

DOOR SCHEDULE				
TYPE	HEIGHT	WIDTH	THICKNESS	NOTES
D/1	7'-6"	4'-0"	1 3/4"	2 LEAVES; SEE DETAILS, SHEET
D/2	7'-6"	3'-0"	2"	" " "
D/3	7'-6"	3'-0"	2"	" " "
D/4	7'-6"	3'-0"	1 3/4"	" " "

WINDOW SCHEDULE				
W/1	3'-11 1/4"	3'-2 5/8"		INTERMEDIATE TYPE STEEL CSMT.
W/2	3'-1 1/4"	1'-7 5/8"		do.



WINDOW DETAILS
SCALE- 3" = 1'-0"
THIS DETAIL TAKEN THRU 1ST. FL. WINDOWS; OTHERS SIMILAR EXCEPT FURRING.



GROUND FLOOR PLAN
SCALE 1/4" - 1'-0"

Note: Existing Photo Gallery To Be Removed

Dotted lines indicate crevice in rock. Carry foundations over on R.C. beam

HALF-SIZE REPRODUCTION

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

Drawn by: J.L.
Traced by:
Checked by:
Approved:

MUSEUM AT POINT DUCK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

Recommended	Chief, Eng. Branch	9-21-37 Date
Concurred	Chief, Chief Archt.	9/24/38
Concurred	Chairman, Washington Planning Committee	11/2/38
Approved	Director	6-24-37 Date

Eng. No. CHIC-CHAT 1112-C
Sheet 1 of 8 Sheets

N

Contours are Existing

Existing Steps

Ident wall to rock conditions

catchbasin el. 2000.5

flagstone walk

note: stair treads to follow batter of wall

note: stairs to follow natural rock wall

Elev. 2015

Table Rock

10'-0" air intake louvre

fireplace

fire brick

stone

for Fireplace Details See Sheet 7

· CHAIR · STORAGE · wood floor ·

· OFFICE · wood floor ·

grille

ramp 5'-0"

gate

6 equal panels

Slope

drain

· EXHIBITS · Wood floor & base. Metal picture molds. · el. 2001.33 ·

finished interior walls 3½" from stone. (See detail)

f.c. flue lining

metal threshold

flagstone

el. 2001.33

TERRACE · flagstone Ashlar laid. —

el. 2001.0

8 equal panels

projecting roof slab

7 equal panels

wall batter at lower level

Inside face of parapet

Inside face of wall beneath

Edge of roof slab

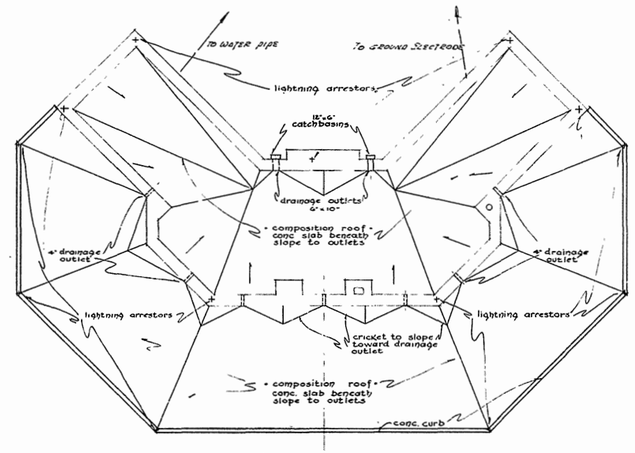
ELEVATION "B"

Repeat Closed panel arrangement on this half

EDGE OF CLIFF

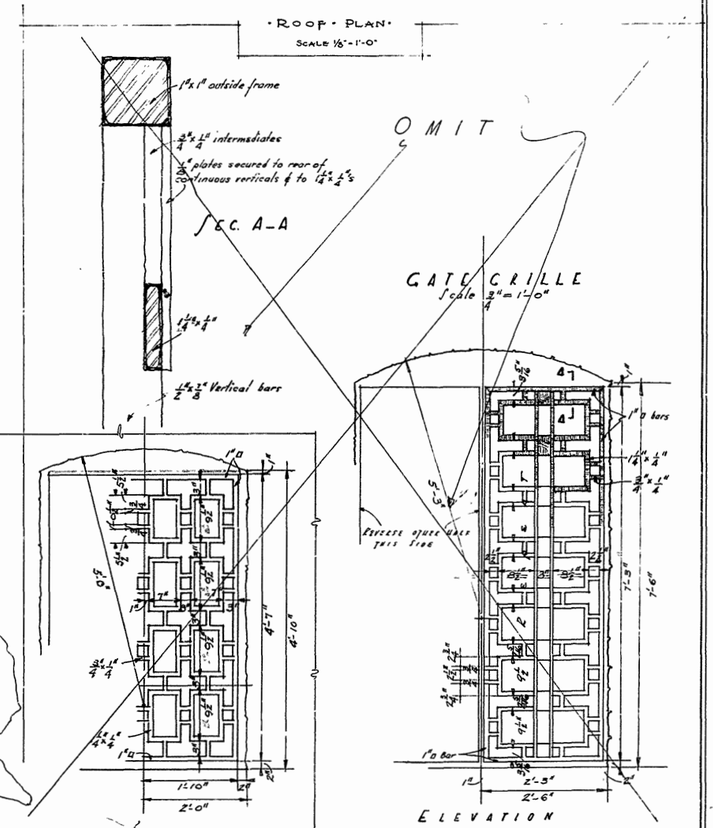
· 1ST · FLOOR · PLAN ·

· SCALE 1/4" - 1'-0" ·



· ROOF · PLAN ·

Scale 1/8" - 1'-0"



WINDOW GRILLE DETAILS

Scale 3"=1'-0"

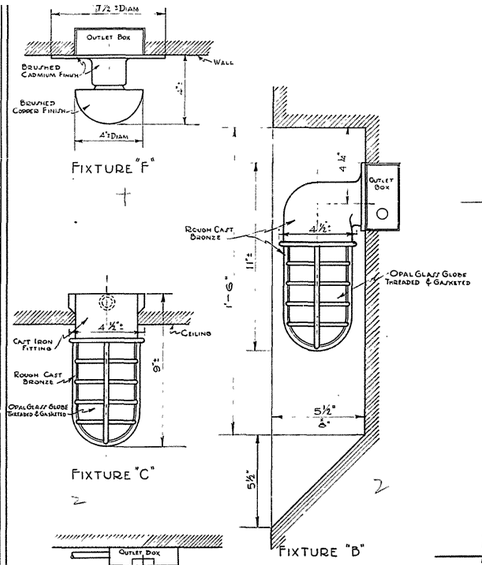
General construction similar to sec. A-A above

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

MUSEUM AT POINT DOCK

CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

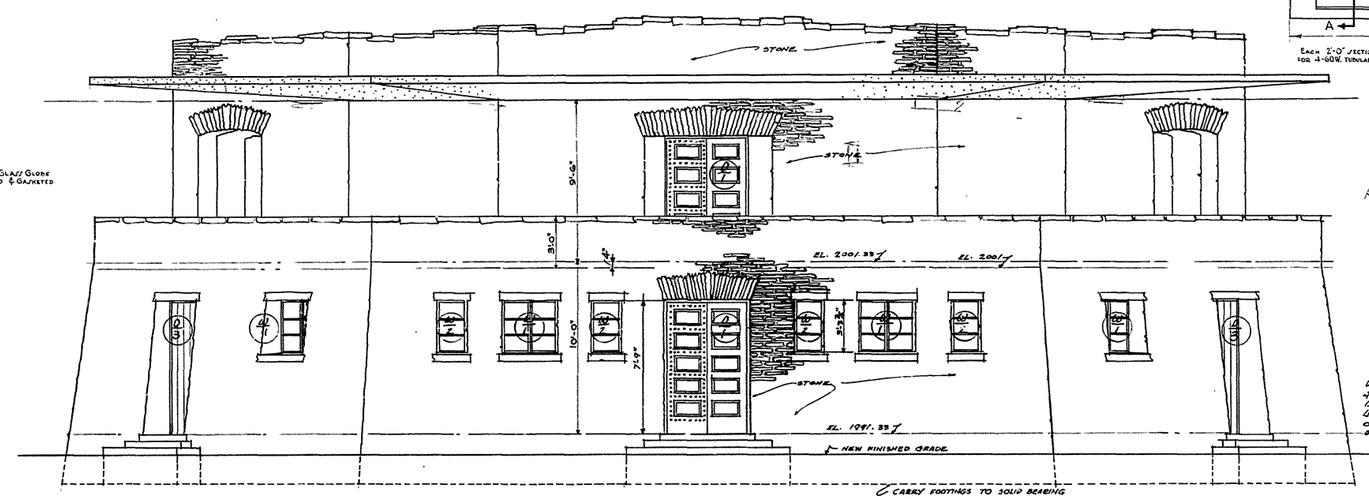
DRAWING NO. CHIC-CHAT. 1112-C.
SHEET 2 OF 8 SHEETS



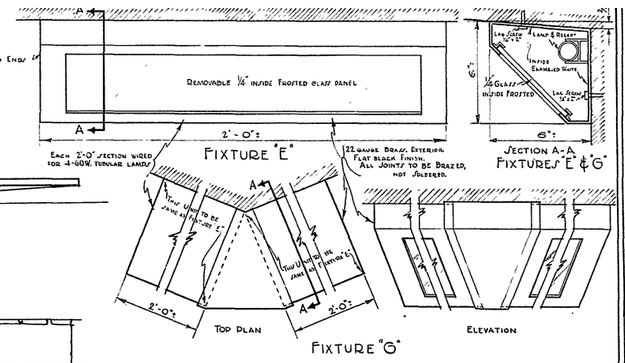
for Fixture "G" & Fixture "E" see upper right hand corner of this sheet.

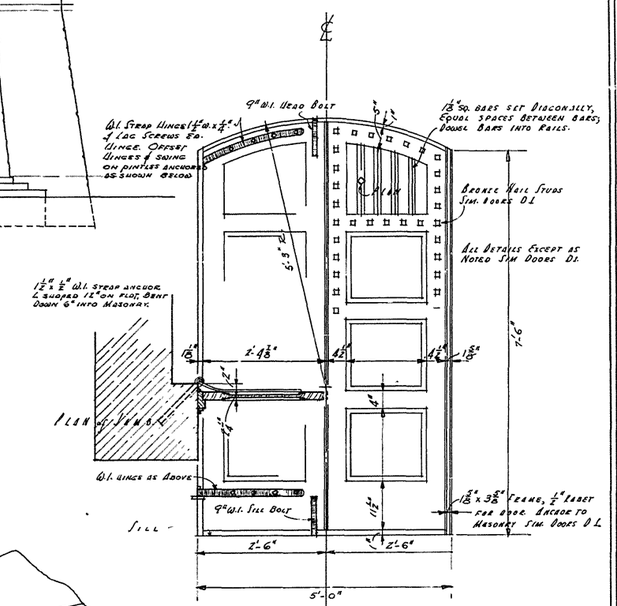
Lighting Fixtures

No Scale



· Front · Elevation ·
Scale ¼"=1'-0"

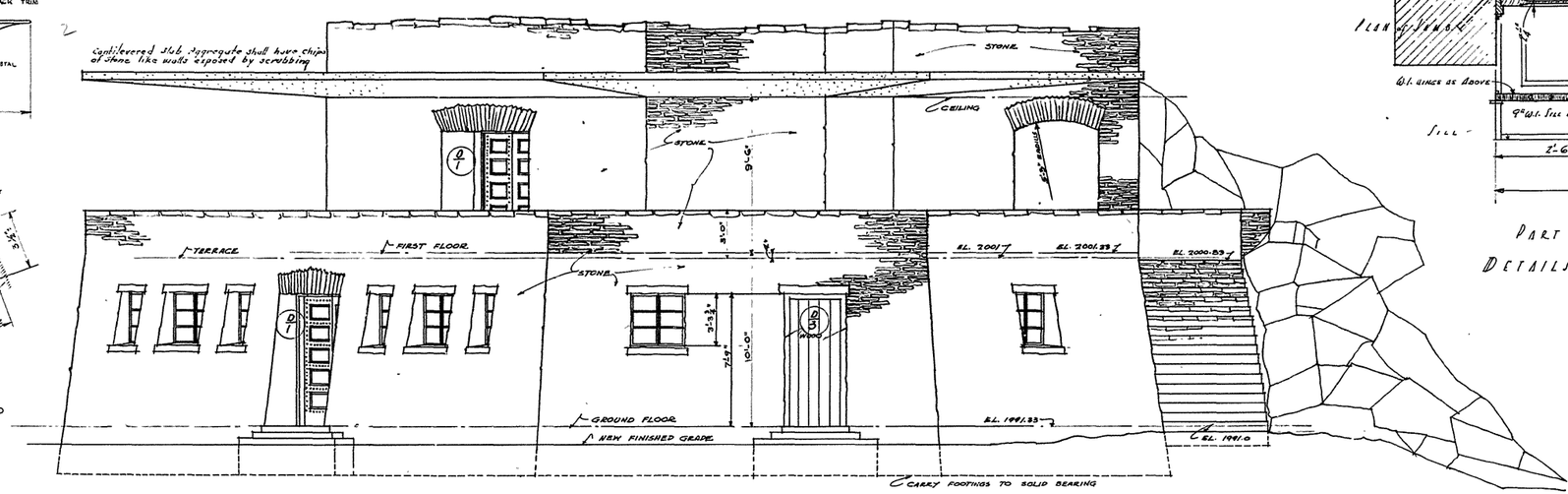




Part Int. Half Ext.

Details of Entrance Gates

Scale: 3/4" = 1'-0"

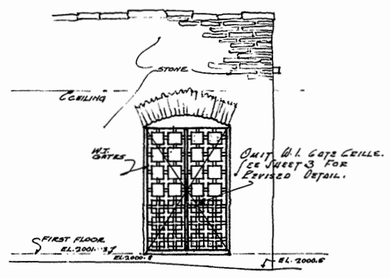


· Elevation · "B"
Scale ¼"=1'-0"

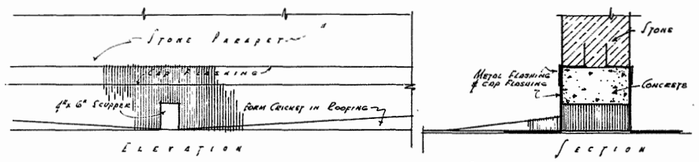
U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

Museum at Point Rock
Chickamauga Chattanooga National Military Park

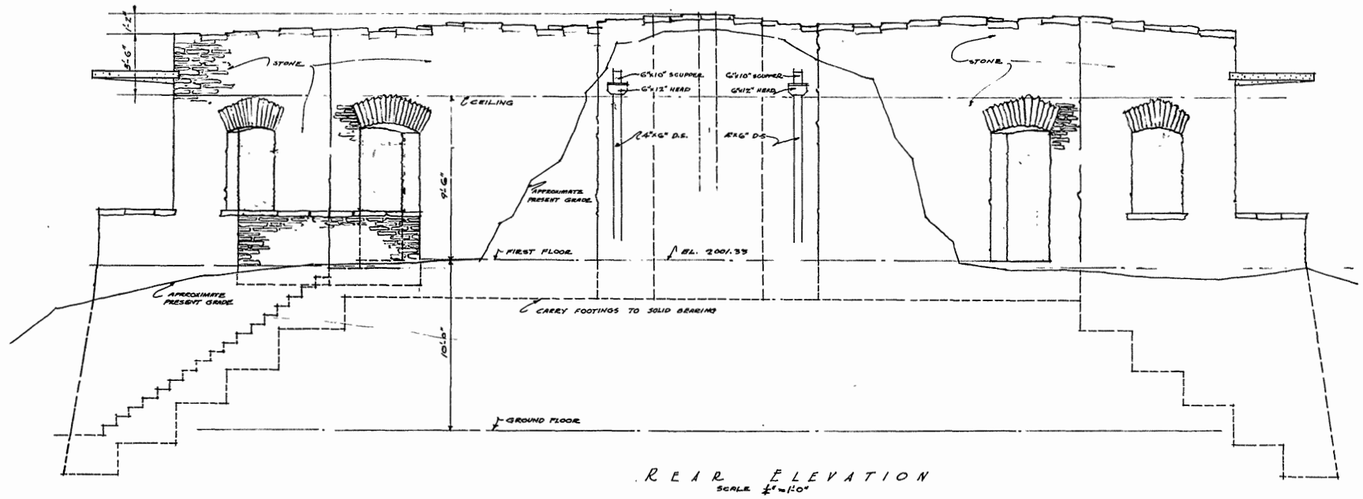
Dwg. No. CHIC-CHAT 1112-C
Sheet 3 of 8 sheets



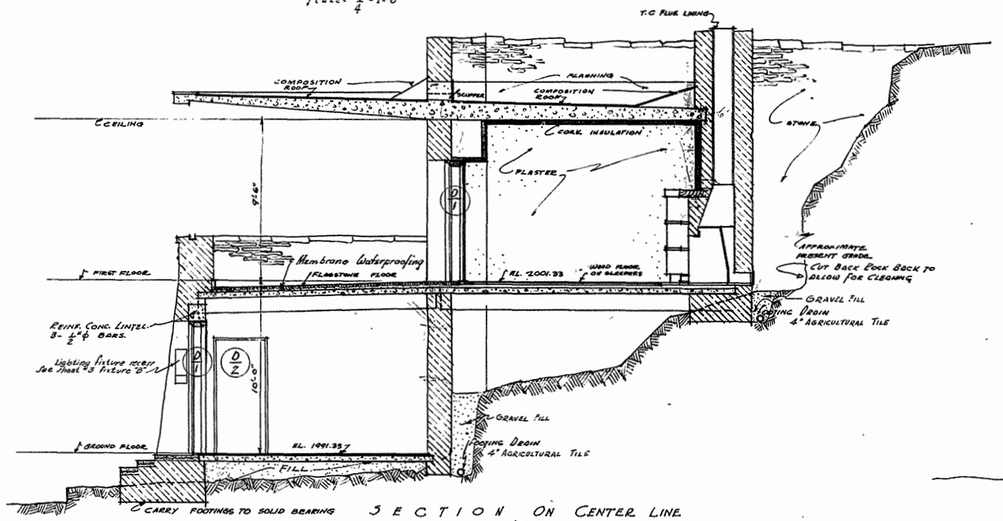
ELEVATION OF GATES
SCALE $\frac{1}{2}$"=1'-0"



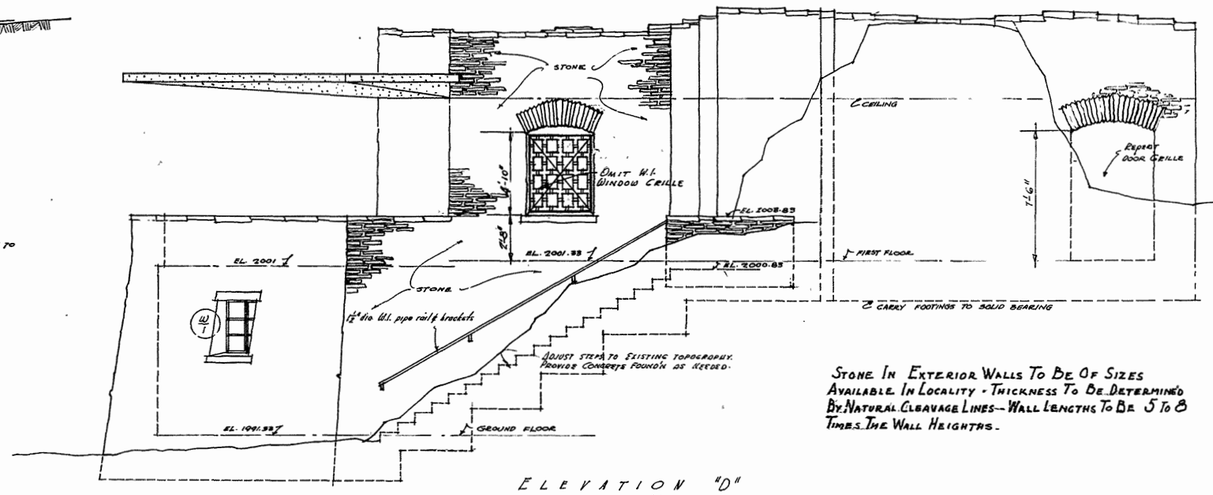
DETAILS OF SCUPPER FLASHING
Scale $\frac{1}{4}$"=1'-0"



REAR ELEVATION
SCALE $\frac{1}{4}$"=1'-0"



SECTION ON CENTER LINE
SCALE $\frac{1}{4}$"=1'-0"



ELEVATION "D"
SCALE $\frac{1}{4}$"=1'-0"

STONE IN EXTERIOR WALLS TO BE OF SIZES AVAILABLE IN LOCALITY - THICKNESS TO BE DETERMINED BY NATURAL CLEAVAGE LINES — WALL LENGTHS TO BE 5 TO 8 TIMES THE WALL HEIGHTS.

DESIGNED BY: U.S.E. | TRACED BY: | CHECKED: D.J.

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

MUSEUM AT POINT LOOK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

DWG. NO. CHIC-CHAT. 1112-C
SHEET 4 OF 8 SHEETS

MEETING RAIL
SCALE ½ FULL SIZE

HEAD D/1

~ JAMB D/1

SILL
DOOR FRAME
SCALE 1½"=1'-0"

½ EXTERIOR ELEVATION of PRINCIPAL DOORS

PLAN of EXTERIOR DOOR D/1
ON 1ST FLOOR PLAN
~ SCALE ¾"=1'-0" ~

TOP RAIL

INTERMEDIATE RAILS

BOTTOM RAIL
DOORS NO. D/1
SCALE ½ F.S.

TOP VIEW

SIDE ELEV.
BRONZE STUDS
DOORS No. D1-
SCALE F.S.

HEAD

PART ELEV. TOP RAIL

INTERMEDIATE RAILS

BOTTOM RAIL

PART ELEV. BOTTOM RL.

JAMB
DOOR NO. D/4
SCALE 3"=1'-0"

PART OF DOOR ELEV.

HEAD DOOR D/3

PART ELEV. of DOOR D/2 D/3

SILL

JAMB DOOR D/2
HEAD SIMILAR WITH PRECAST LINTEL
Reinforcing in Lintel 2 - ½" ϕ Bars
DOOR DETAIL SAME AS D/3

JAMB
DOOR NO. D/3

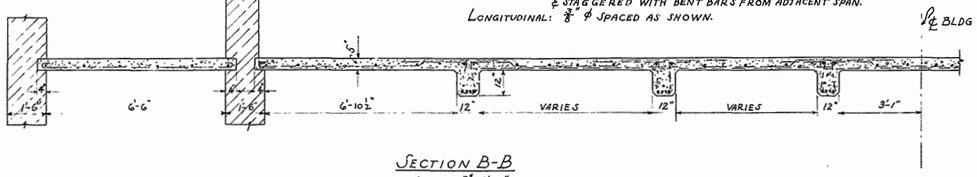
DETAILS DOORS D/2, D/3
Doors in Ground Floor of Bldg.
Scale 3"=1'-0"

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

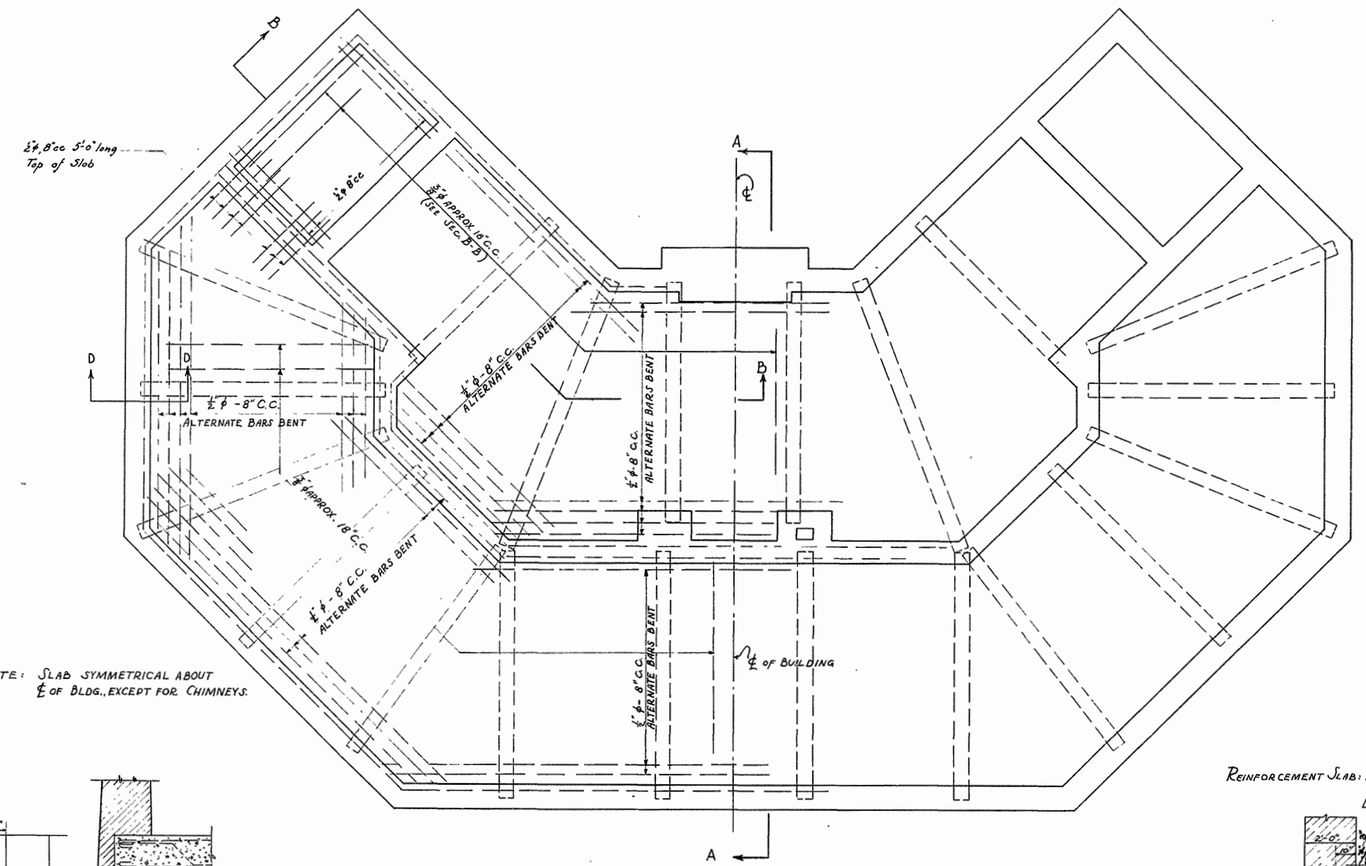
MUSEUM AT POINT ROCK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

DWG. NO.
CHIC-CHAT
1112-C
SHEET 5
OF
8 SHEETS

REINFORCEMENT SLAB: TRANSVERSE: ½" ϕ - 8" O.C. ALTERNATE BARS BENT UP OVER SUPPORT & STAGGERED WITH BENT BARS FROM ADJACENT SPAN.
LONGITUDINAL: ⅜" ϕ SPACED AS SHOWN.

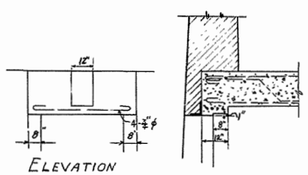


SECTION B-B
SCALE ¾"=1'-0"



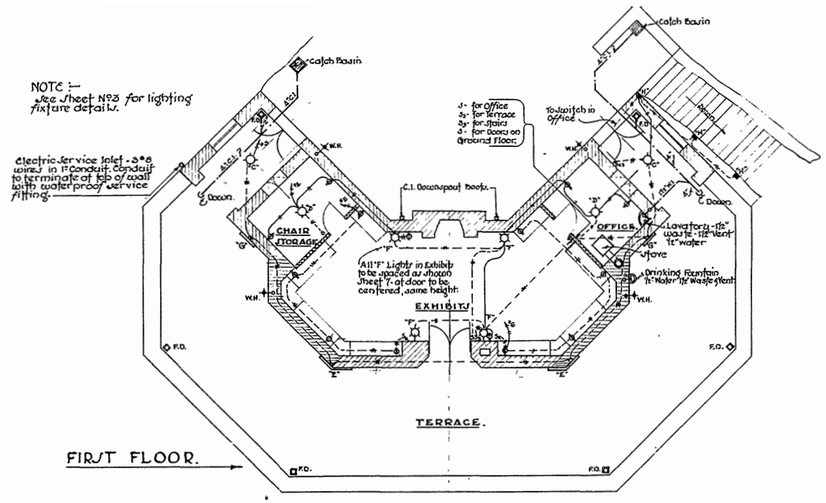
NOTE: SLAB SYMMETRICAL ABOUT ℄ OF BLDG., EXCEPT FOR CHIMNEYS.

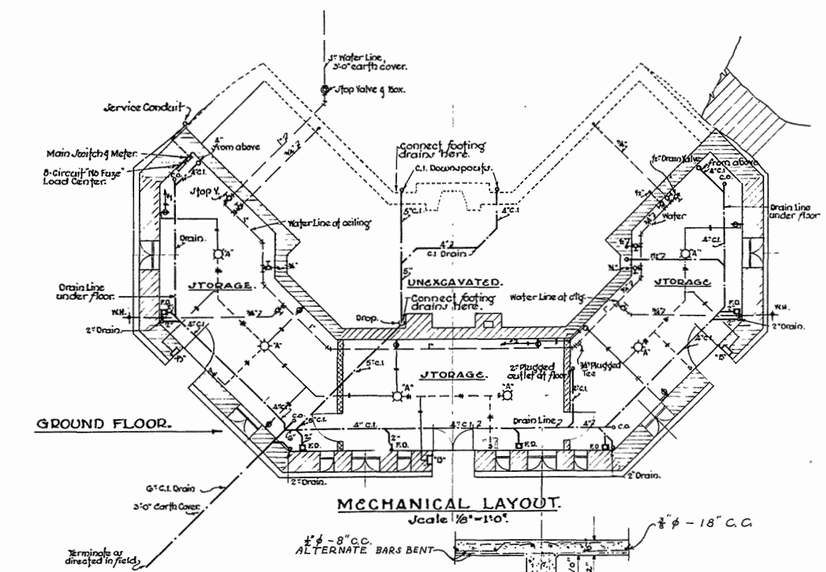
PLAN OF FIRST FLOOR SLAB
SCALE ½"=1'-0"



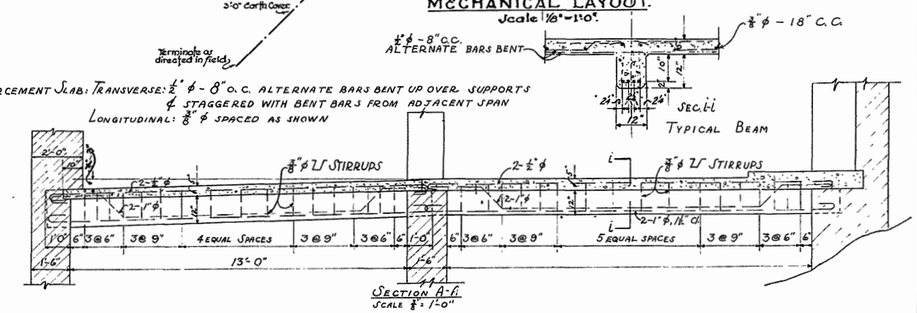
ELEVATION

SECTION D-D
SCALE ½"=1'-0"





REINFORCEMENT SLAB: TRANSVERSE: ½" ϕ - 8" O. C. ALTERNATE BARS BENT UP OVER SUPPORTS & STAGGERED WITH BENT BARS FROM ADJACENT SPAN
LONGITUDINAL: ⅜" ϕ SPACED AS SHOWN

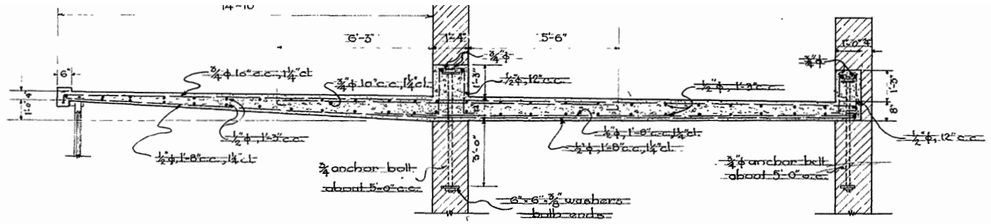


U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

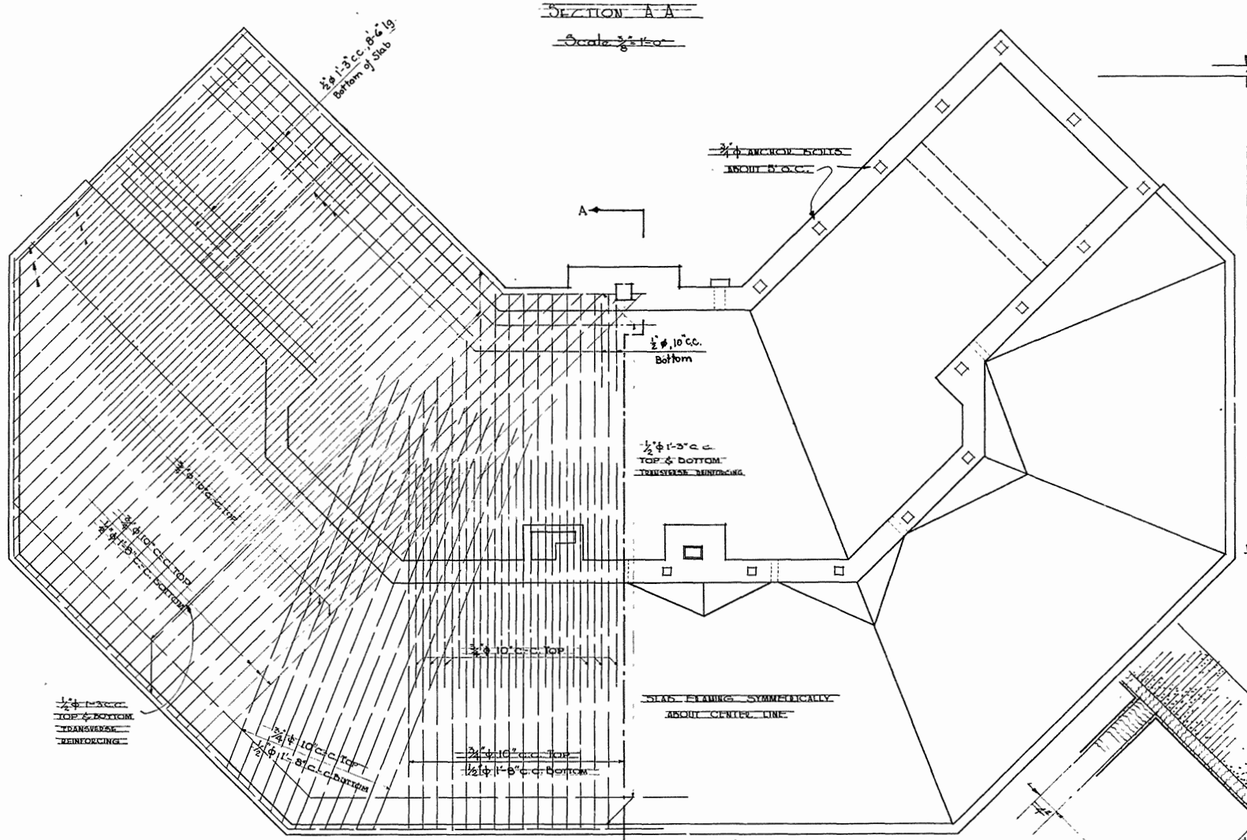
DRAWN BY J.S.
TRACED BY
CHECKED
APPROVED

MUSEUM AT POINT ROCK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

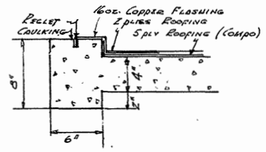
DRAWING NO. CHIC-CHAT. 1112-C
SHEET 6 OF 8 SHEETS



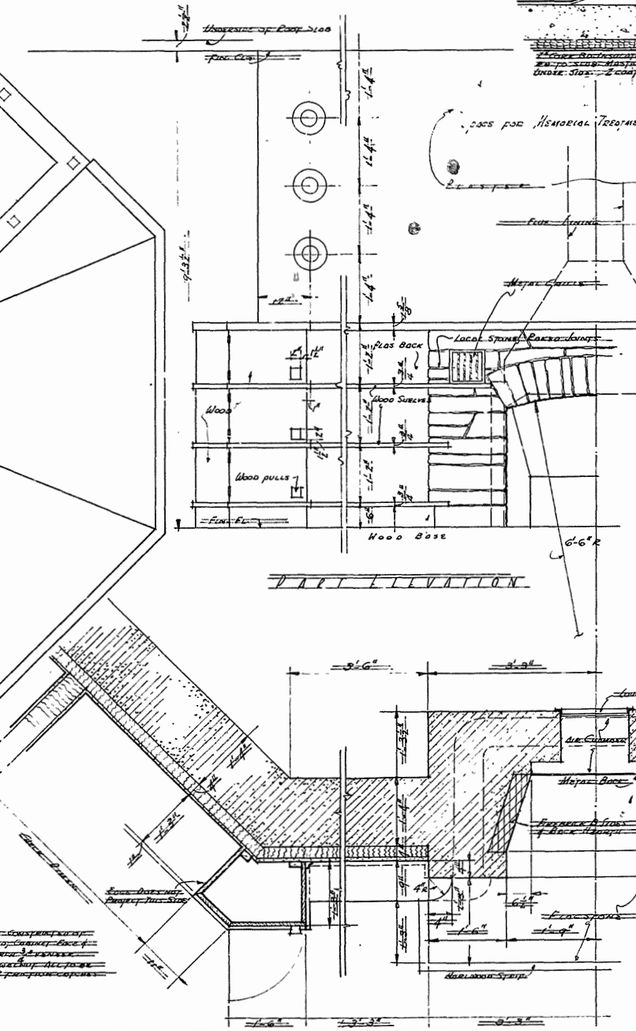
SECTION A-A
Scale ⅜"=1'-0"



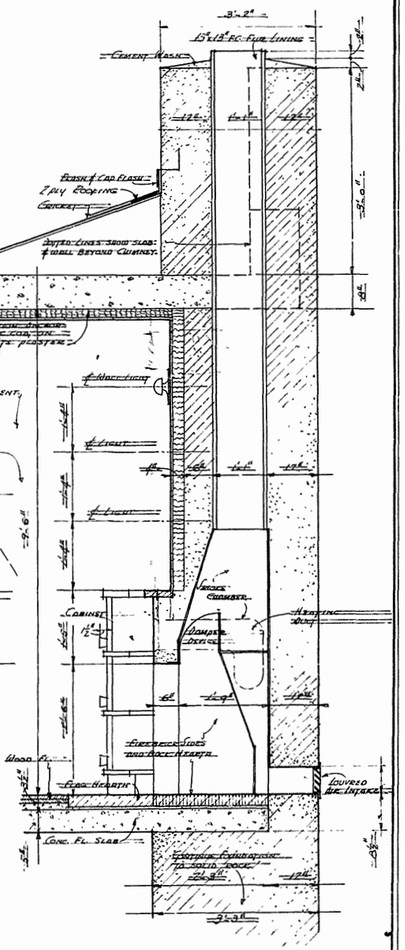
PLAN OF ROOF SLAB
SCALE ¼"=1'-0"



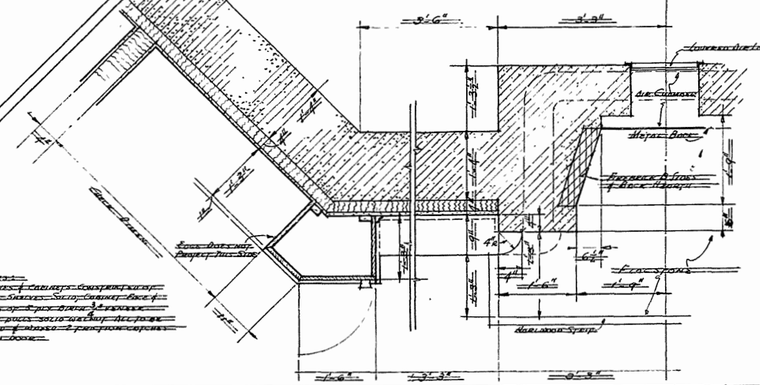
DETAIL OF ROOF EDGE
SCALE 1½"=1'-0"



WEST ELEVATION



SECTION



FIREPLACE DETAILS
SCALE ¾"=1'-0"
4

PLAN

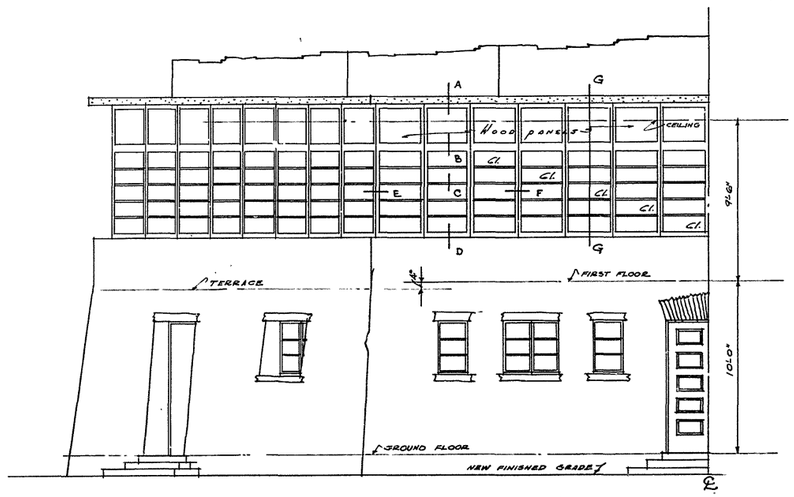
Notes:
Windows & Transoms - Casement Type
Wood Sleeper - Set in Cement Floor
Base - Top Base 3½" High
Wood pulls - Solid Walnut, Acorn Type
Colors & Finish - Selection Depends Entirely

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

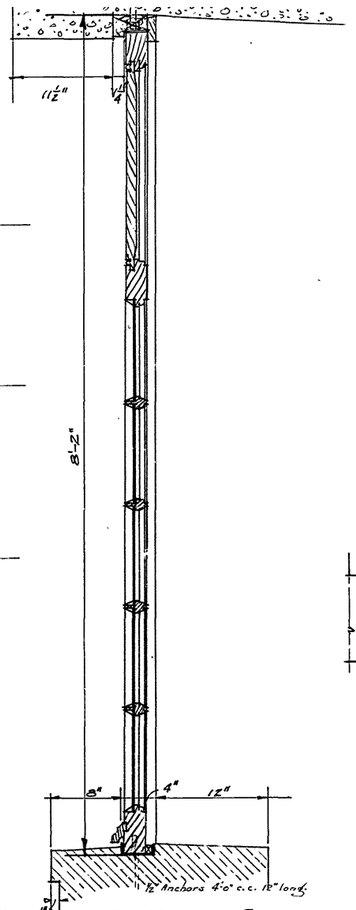
MUSEUM AT POINT PARK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

DRAWING NO. CHIC-CHAT. 1112-C.
SHEET 7 OF 8 SHEETS

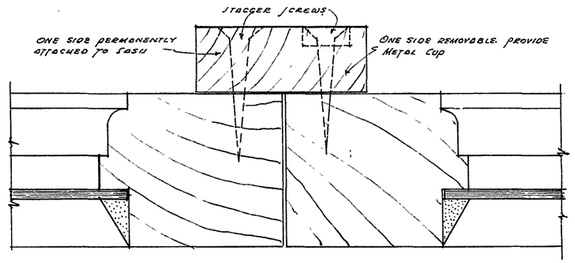
Drawn by | Traced by | Checked
Field Check | Submitted | Approved



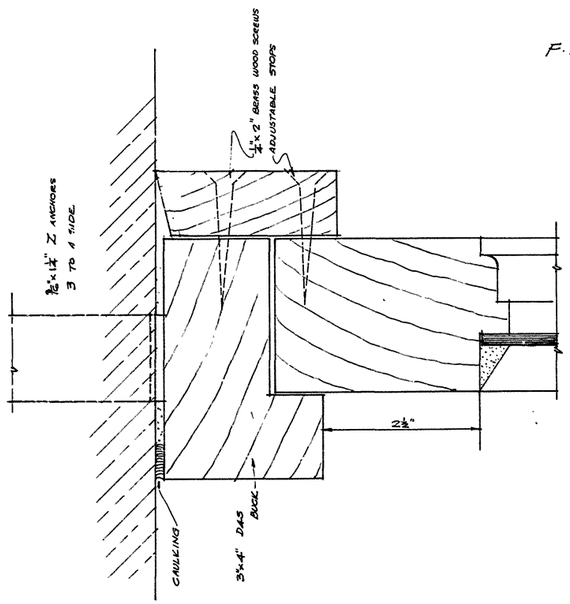
ONE HALF FRONT ELEVATION
SHOWING REMOVABLE WOOD SASH
SCALE 3/4"=1'-0"
FOR DETAILED ELEVATION SEE SHEET NO.



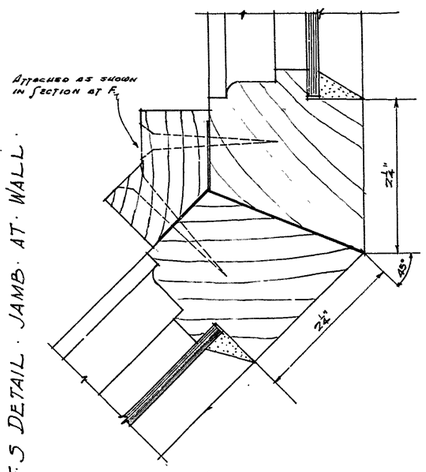
SECTION G-G
SCALE 1 1/2"=1'-0"



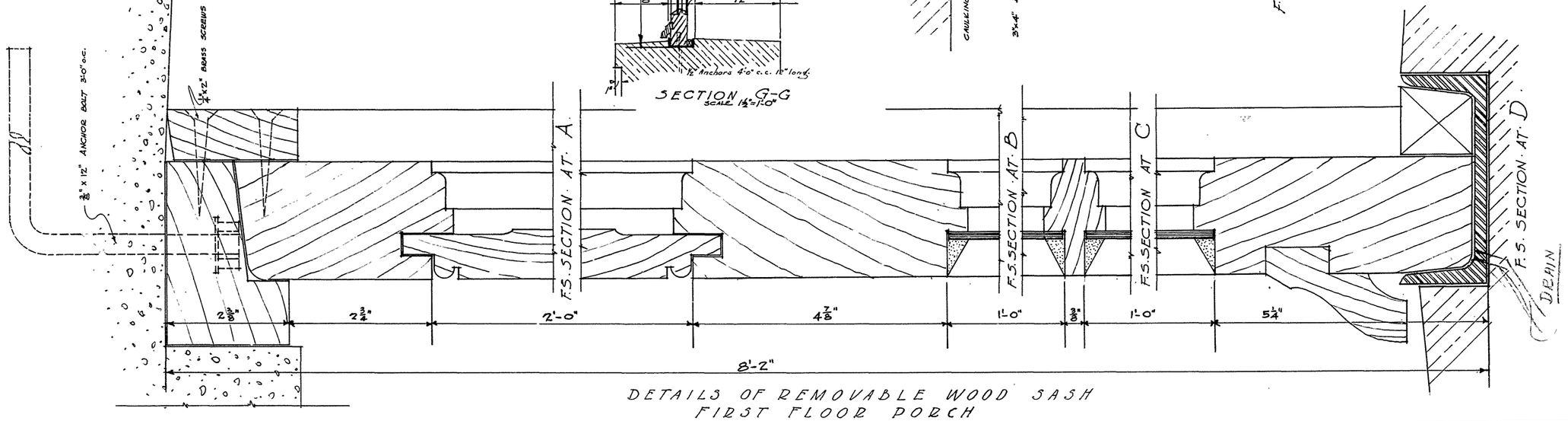
F.S. SECTION AT F



F.S. SECTION AT E.



F.S. DETAIL AT WALL.



DETAILS OF REMOVABLE WOOD SASH
FIRST FLOOR PORCH

U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS AND DESIGN

MUSEUM AT POINT ROCK
CHICKAMAUGA CHATTANOOGA NATIONAL MILITARY PARK

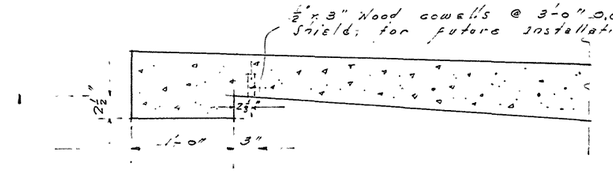
DRAWING NO. CHIC-CHAT 1112-C
SHEET 8 OF 8 SHEETS

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T.P. BY
J.A.C. V.H.C.
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TRIM LINE

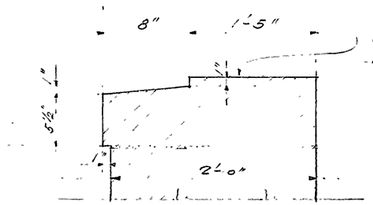
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DRAWN AND TRACED
DRAFTSMEN
DATE 10-13-39

TRIM LINE



8'-2"

DETAILS FOR PRESENT CONSTRUCTION OF TERRACE PARAPET WALL AND PROJECTING ROOF SLAB.



SECTION G-G REVISED
Scale, ½" = 1'-0"

Job Completed 5-31-40 Date
SCALE

BASIC DATA

RECOMMENDED V. R. Tudgate DATE 11/15/39
REGIONAL LANDSCAPE ARCHITECT
CONCURRED _____ DATE _____
Superintendent
APPROVED _____ DATE _____
For the Park Committee.
Regional Director.

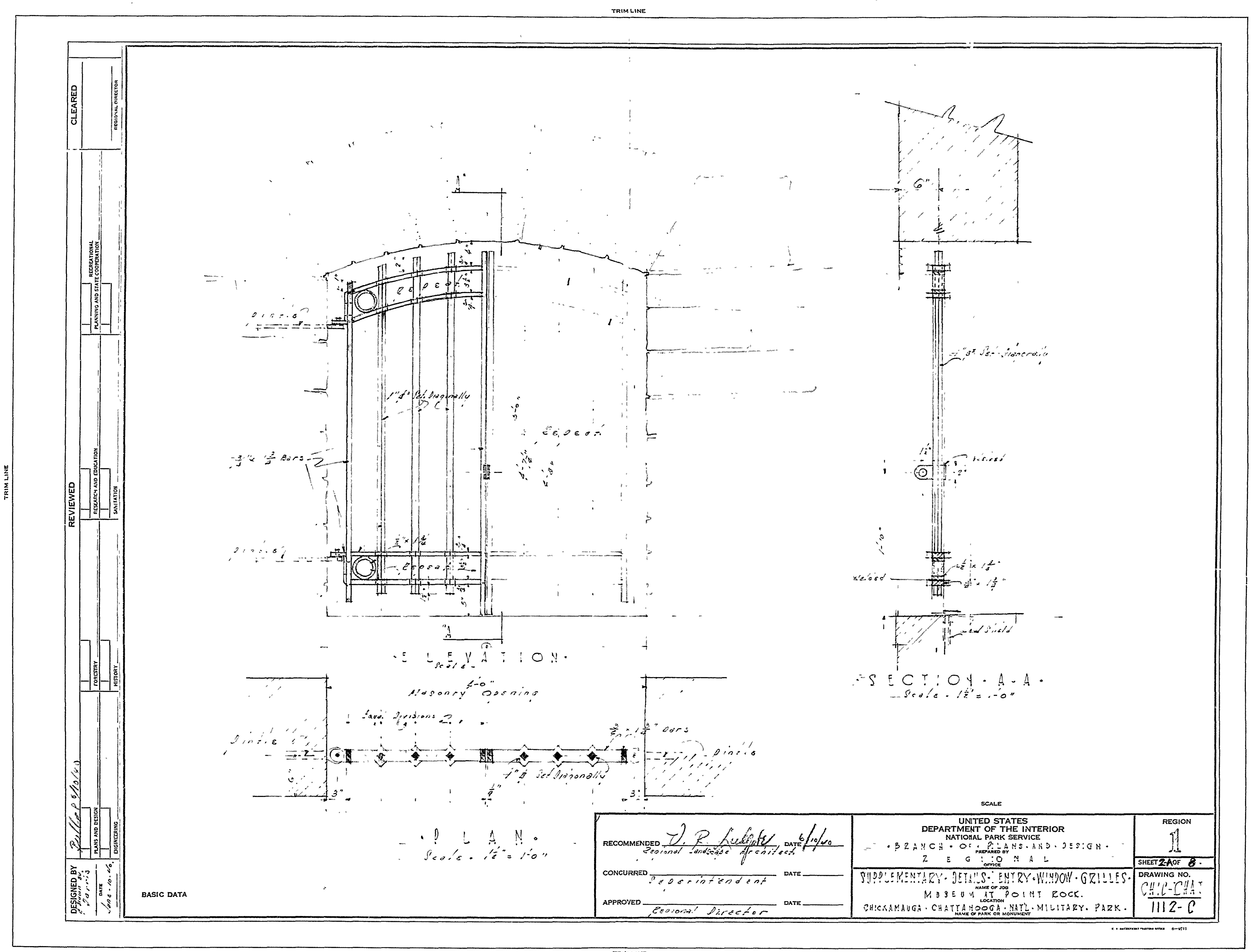
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BRANCH OF PLANS & DESIGN
PREPARED BY
REGIONAL
OFFICE

REGION 1
SHEET 8 A OF 8
DRAWING NO. CHI-CHAT-111.2-C

MUSEUM AT POINT ROCK
NAME OF JOB
POINT ROCK,
LOCATION
CHICKAMAUGA CHATTANOOGA NAT'L MILITARY PARK
NAME OF PARK OR MONUMENT

U. S. GOVERNMENT PRINTING OFFICE 0—9711

TRIM LINE


TRIM LINE
CLEARED
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REVIEWED
RECREATIONAL PLANNING AND STATE COOPERATION
RESEARCH AND EDUCATION
SANITATION
FORESTRY
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PLANS AND DESIGN
ENGINEERING
DESIGNED BY
DATE
BASIC DATA
ELEVATION
Masonry Opening
PLAN
Scale · 1½" = 1'-0"
SECTION · A-A ·
Scale · 1½" = 1'-0"
SCALE
RECOMMENDED
Regional Landscape Architect
DATE 6/10/40
CONCURRED
Superintendent
DATE
APPROVED
Regional Director
DATE
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
· BRANCH · OF · PLANS · AND · DESIGN ·
PREPARED BY
REGIONAL
OFFICE
SUPPLEMENTARY · DETAILS · ENTRY · WINDOW · GRILLES ·
NAME OF JOB
MUSEUM AT POINT ROCK.
LOCATION
CHICKAMAUGA · CHATTANOOGA · NAT'L · MILITARY · PARK ·
NAME OF PARK OR MONUMENT
REGION
1
SHEET 2-A OF 8 ·
DRAWING NO.
CHIC-CHAT
1112-C

Appendix B:
1938 Specifications

CHICKAMAUGA CHATTANOOGA
NATIONAL MILITARY PARK.

GEORGIA - TENNESSEE.

September 25, 1937.

OUTLINE SPECIFICATIONS FOR THE CONSTRUCTION OF A MUSEUM AT POINT ROCK.

To Accompany Drawing No. CHIC CHAT. 1112-C, 8 sheets.

Prepared by the Branch of Plans and Design,
National Park Service, Department of the Interior,
Washington.

1. WORK TO BE DONE.

The work to be done comprises the furnishing of all materials, plant, equipment and labor and constructing therewith the work above described, in accordance with the accompanying drawings and as hereinafter specified.

Plumbing, heating and electrical systems or other mechanical work, together with their outside services, are included in the above work to be done unless otherwise shown on the plans or described hereinafter.

2. LOCATION.

All data pertaining to the site and location, the various floor elevations, grade lines, orientation, etc., shall be predetermined and approved by the Officer in Charge before any work is installed. He shall also designate the locations of any temporary shacks or toilet facilities that may be necessary in the prosecution of the work.

3. MATERIALS AND WORKMANSHIP.

When not otherwise described all the materials shall be new and the best of their respective grades. They shall be suitable for the use and purpose intended and shall conform to the minimum requirements of all applicable Federal Specifications. Where the types and classifications of articles specified are not readily obtainable other articles of similar or better quality may be substituted at the option of the Officer in Charge.

Laws, rules, and regulations of the state or locality wherein the work is situated shall be complied with.

All work shall be cut, fitted, formed, connected and securely installed or applied plumb and true and in full accordance with the best modern practice of the trade involved. Minor modifications may be made by the Officer in Charge as the needs arise or as necessary or expedient to carry out the implied intent for a complete and finished job, consistent with the purposes for which designed.

No work shall be done during cold, damp or freezing weather with materials adversely affected by such conditions. During these times all installed work shall be adequately protected.

The work and surroundings shall at all times be kept neat and orderly. Strict precautions shall be taken to preserve both men and materials and the surrounding property from injury and damage. No litter or debris shall be allowed to accumulate in or about the premises. Passages shall be kept clear and openings protected. Oily rags and waste shall be removed from the building at the end of each day's work and no inflammable materials shall be stored therein.

Any damage made shall be promptly corrected.

Water, for use in the work, shall be clean and drinkable.

Upon completion of the work the building and premises shall be thoroughly cleaned and the surplus material, temporary structures, debris, etc., removed from the site.

4. EXCAVATION - FILLING - GRADING.

The site of the building is assumed to be rock. It shall be cleared of all vegetation, soil and loose or decayed rock.

Foundations shall rest on solid rock, cut reasonably smooth and level. Stepped foundations shall have similar bearings.

Filling under the floors, steps, etc., shall consist of clean gravel or sand, compacted. Exterior filling, about walls and for the trenches, shall be good soil, brought to the adjacent grade line and compacted smooth and level.

FORT OGLETHORPE, GEORGIA

5. CONCRETE.

The floor and ceiling slabs, beams, and the step foundations, together with the lintels over the openings indicated, shall be concrete.

Materials:

Cement shall be a standard Portland brand of a light grey color, obtained from a fresh stock and free of caking or damage caused by storage or exposure to the elements.

Sand shall be hard, durable particles uniformly graded from fine to coarse, all grains passing a No. 4 sieve. Sand shall be clean and free of all objectionable matter.

Stone shall be hard, durable particles of gravel, crushed rock or other inert material. It shall be clean and free of objectionable matter. Particles shall range in size from fine to coarse, varying from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in size.

Reinforcement shall be rust free steel rods or steel wire as indicated on the plans. Wire mesh shall have all crossings electrically welded, the transverse members being at right angles to the longitudinal members.

Proportions:

Concrete ingredients shall be accurately measured by volume, the proportions being one part cement, two parts sand and four parts stone.

Forms:

The necessary forms shall be securely constructed of dressed lumber and be properly braced and tied so as to remain true to line and position without bulging, sagging or leakage of mortar.

Forms shall not be removed until the concrete has set and developed sufficient strength to safely support any imposed loads. After removal of the forms all rough spots and voids in the concrete shall be patched and repaired, the exposed surfaces shall be finished as described hereinafter.

OCT 10 1939

Mixing:

All ingredients shall be mixed dry, then water added and the mixing continued until a plastic and homogeneous mass is obtained. Water shall be added only in amounts sufficient to cause the concrete to flow sluggishly when spaded or agitated.

Placing:

Reinforcement shall be secured in place so no movement will take place when the concrete is being deposited. Laps and joints shall be wired. Rod splices shall be made with laps 45 rod diameters long.

Concrete shall be placed immediately after mixing and with the minimum of handling. It shall be worked in and about the reinforcement and into all corners, then compacted with suitable tools so that a dense mass will be obtained, free of honey comb or voids.

Concrete that has been allowed to stand longer than 30 minutes after mixing before being placed in position shall not be used. No retempering of such concrete will be permitted.

Curing:

Concrete shall be protected from damage and premature drying by being covered on the exposed surfaces as soon as practicable after being placed or finished. The cover shall consist of a reinforced paper or other suitable material and shall remain in place until the concrete is thoroughly cured or until such time when there is no danger from mechanical injury and damage.

Surface Finishes:

The top of the roof slab that receives the composition roofing shall be given a smooth, even and uniform finish with a wood float or trowell, all the coarse aggregate being fully imbedded in the slab. Other surfaces of this slab, where exposed over the terrace, shall be treated with acid and brushed well to expose the large aggregate. After the proper effects are obtained, care shall be taken to see that all traces of the acid are completely removed with clear water.

The top of the first floor slab under the flagstone flooring shall be smoothed similar to the top of the roof slab. Other portions of this first floor slab, under the wood flooring, shall be screeded.

The wearing surface of the ground floor slabs shall consist of a topping not less than one inch thick, laid over the green slab so that perfect bond will be obtained between the two materials. The topping shall be composed of one part of Portland cement and two parts of sand, by volume. The ingredients shall be thoroughly mixed with water to a plastic mass and applied as soon as possible after the concrete slabs have been installed and are still plastic and green. The topping shall be screeded and trowelled to a hard, smooth finish, level and uniform.

Fills:

The concrete for the roof cants and the fills between the sleepers of the wood floor shall be a light-weight mixture using clean, well graded cinders. Proportions, by volume, shall be one part of Portland cement and five parts of cinders.

The amount of water used shall be such as will allow the mass to remain in place on the given slopes without sliding and quaking.

6. MASONRY.

The exterior and interior walls, partitions, parapets, chimneys, terrace flooring and other indicated places shall be composed of masonry.

Materials:

Stone for the foundations, walls, chimneys, etc., shall be a sound and durable local sandstone, in the sizes and shapes indicated. A full range of the natural colors is desired and the surfaces exposed to view shall be selected for their weathered and time worn appearance.

Flagging for the terrace and steps shall be of sound and durable laminated quartzite in a full range of natural colors. Thickness for the flooring shall not be less than ¾ inch. For the steps, stoops, and similar places where the edges are exposed, the thickness shall be not less than 2 inches.

Clay tile, for the wall furring and the interior partitions shall be sound and hard or medium burned, without warping or cracks to impair its strength or usefulness. Tile shall be scored to receive plaster and may be either the load-bearing or non-load-bearing type.

Fire brick and flue lining shall be sound and well made articles made with fire clay having a softening point of not less than 2000 degrees F. Walls of the flue lining shall be not less than 5/8 inch in thickness.

Mortar:

Mortar for laying all masonry shall be composed, by volume, of one part Portland cement, one part hydrated lime and six parts clean sand. Ingredients shall be thoroughly mixed with water to a plastic and homogeneous mass and then used immediately.

At the option of the Officer in Charge masonry cement may be substituted for the Portland cement and lime specified. Such cement shall be used in the proportions (by volume) of one part masonry cement to three parts sand.

Laying:

Units for stone walls and similar work shall be laid in full beds of mortar and then shoved into place. Bond or through stones shall be used for every 4 square feet of wall surface. Install metal ties for the tile furring, using one tie for every square feet of wall surface. Exposed joints shall be slightly raked out and then rubbed with burlap or sacking to expose the sand and pebbles of the mortar.

Tile shall be laid with broken joints, the mortar being cut smooth. Reinforced lintels shall be precast and have end bearings of not less than 8 inches. Wedge tile with slate.

Flagging for the steps, terrace and similar work shall be thoroughly bedded in mortar and finished with flush joints, slightly concave.

All masonry shall be laid plumb and true and thoroughly bonded to itself and to other connecting work. Accessory work, such as windows, beams, iron and steel, etc., shall be built in as required and as the work progresses.

7. CARPENTRY.

This work shall include all the doors and their frames, the gates, the wood flooring and sleepers, rough bucks and framing, window stools, trim, baseboard, the glazed terrace enclosure, the fire place mantel and the built-in shelving and other equipment shown.

Materials:

All lumber shall be thoroughly dried and seasoned to the approximate moisture content it will contain in the completed work.

Bucks, sleepers and other rough framing material may be dressed all sides or dressed one side and one edge.

Millwork shall be smoothly finished and sanded. Exposed faces shall be selected for their qualities to receive a natural finish.

Sub-flooring shall be tongue and grooved, 1 inch stock, in 6 inch or 8 inch widths.

Finish flooring shall be tongue and grooved and sanded, 13/16 inch thick by 2½ inch face.

MILITARY PARK

Grades:

Bucks, sleepers and similar rough framing, - Pine, No. 2, com.
Sub-flooring, - Pine, No. 2, com.
Finish flooring, - Red Oak, Clear Grade, plain.
Doors, frames and interior millwork, - Red Oak, "FAS" Grade.
Terrace Enclosure, - Red cypress, - C and Better finish.
Gates, - Red Oak, "FAS" Grade.

Glazing (for the Terrace enclosure), Glass shall be "B" quality, double strength, clear window glass; sprigged in with zinc points and puttied and back puttied with whiting and linseed oil putty.

Door Construction:

The joints of all doors shall be run in white lead paste. As these doors will receive a natural finish care shall be exercised to keep all lead within the joints and not smeared on the exposed faces.

Finishing:

Upon completion of the millwork installation and the laying of the wood floors all exposed surfaces shall be smoothly sanded and cleaned of all dust, stains and other matter that would impair the effects of the natural finish specified.

Caulking:

The exterior door frames and the terrace enclosure frame shall be caulked and made watertight with a standard caulking compound, applied before any finish painting or staining is done. The compound shall be non-staining and non-hardening and shall be in a neutral color to harmonize with the adjacent surfaces.

8. MISCELLANEOUS STEEL AND IRON.

Anchors, bolts, metal lintels, nails and similar iron and steel items shall be standard and of the proper size and type for the work required.

Fireplace Unit:

The fireplace in the Exhibits Room on the first floor shall have a unit of heavy steel construction comprising a back wall, down draft shelf, throat damper and combustion chamber; an outside air intake with a protective grille to keep out rain, snow and dust and a warm air outlet provided with a grille as indicated.

Door Saddles:

The exterior doors on both floors shall have cast iron saddles or thresholds, continuous in one piece over the entire opening. Ends shall be neatly fitted around the door frames and the saddles shall be set level, in a full bed of mastic cement and secured to floor with flat head, countersunk brass screws in lead expansion shields.

Thickness of thresholds shall not be less than ½ inch and the exposed surfaces shall be given a sanded or anti-slip finish.

Paintings:

A shop priming coat of red lead and oil, or other rust-resisting paint, shall be given all angles, lintels, grilles and the fire place unit.

9. CORK INSULATION.

This work includes the application of two inches of compressed cork-board insulation to the ceilings of the three spaces on the first floor, - the Chair Storage, the Exhibits Room and the Office.

Materials:

Compressed cork-board shall be a standard product, one inch thick.

Asphalt shall be free from organic matter but mixed with three per cent, by weight, of ground cork or cork dust. The mixture shall be heated when used.

Installation:

The cork-board shall be applied in two layers, the first being laid on top of the concrete forms required for the ceiling slabs. These forms shall be constructed to allow for this one inch thickness of cork-board.

The first layer shall be laid with tight joints, broken between each course. Galvanized nails shall be driven obliquely into the top side of the cork-board, the nail heads protruding for a firm anchorage into the concrete slab, thus holding the cork-board in place when the wood forms have been removed.

The second layer of cork-board shall be applied on the underside of the first layer, all side and end joints being broken between the two layers. In applying the second layer each board shall first be dipped into the hot asphalt and stuck in place. Hardwood skewers, saturated in the hot asphalt, shall then be driven in for bonding the two layers together.

Three galvanised nails and three skewers, respectively, shall be used for each square foot of cork-board.

10. METAL WINDOWS.

This work includes the metal casement windows, complete, for all window openings on both floors.

Construction:

Casements shall be a standard residence type, of hot rolled sections containing new billet steel. The combined weight of outside frame and vent sections shall be not less than 3.4 pounds per lineal foot.

Frame and vent corners shall be mitered and electrically welded and the exposed surfaces ground smooth. Muntins shall be riveted to frames and interlocked at their intersections.

Weathering contacts shall be continuous between parallel surfaces.

All windows shall be the side hung type, with exterior drop forged steel pivots continuouslywelded to both frames and vent frames. Operating hardware shall include a locking handle of bronze with a statuary bronze finish.

Spring glazing clips and continuous fins for anchoring into the wall openings shall be furnished with the windows.

A shop priming coat of rust resisting paint shall be given all windows.

After installation the windows shall be glazed with "B" quality, double strength, clear window glass, puttied in and back puttied with a special putty adapted for the use of steel sash.

Caulking shall be done when the windows are installed, using a standard caulking compound in a neutral color.

11. ROOFING AND WATERPROOFING.

This work includes the built-up roofing over the concrete roof slab; the membrane waterproofing over the terrace floor slab, together with all flashing and metal work in connection therewith. All work shall be installed water-tight.

Materials:

The felts and pitches specified hereinafter may be either coal tar or asphalt products. If asphalt pitch is used then the felt shall be asphalt saturated; if coal tar pitch is used the felt shall be coal tar saturated. In addition, if asphalt products are used an asphalt primer will be necessary for application between the concrete surfaces and the first layer of felt.

Felt - Saturated, 15 pound weight.
Pitch - Built-up roofing type.
Stone - Similar to that used in the masonry walls; crushed, cleaned and dried; uniformly graded from 1/4 inch to 5/8 inch in size.

Sheet Metal - Copper, 16 oz. weight; soft temper for flashings and similar purposes; hard temper for downspouts.

Roofing:

Five plies of felt shall be used, lapped and applied according to standard practice. An extra strip shall be installed in all angles or bends. Each layer shall be imbedded in a mopping of hot pitch so that no two layers are in contact or the first layer in contact with the concrete.

The final layer shall receive a pouring of hot pitch and the stone evenly imbedded while the pitch is hot. Three pounds of stone shall be placed for each square foot of roof surface.

Waterproofing:

Three plies of felt shall be used, lapped and applied according to standard practice. An extra strip of felt shall be installed in all angles or bends. Each layer shall be bedded in a mopping of hot pitch so that no two layers are in contact or the first layer in contact with the concrete.

The final layer of felt shall be covered with a mopping of pitch.

Care shall be exercised to fully protect the membrane before and during the installation of the finish flooring.

Steel Metal:

The flashings, scuppers and other parts of the above work shall be correctly and neatly constructed and shall prove water-tight upon completion. Downspouts shall be supported by copper or brass straps firmly attached to the walls. Downspout ends shall be connected to the underground drainage system as elsewhere specified.

12. LATH AND PLASTER.

This work includes the plastering and related work for the interior spaces indicated for the first floor. Gypsum plaster shall be used, applied in three coats, the total thickness being not less than 5/8 inch and the final or finishing coat being Keene's cement.

Materials:

Lath - No. 9 gage, galvanized wire, ½ inch mesh.
Corner beads, picture molding and expansion casing - Galvanized sheet steel, 24 gage, with expanded metal wings, galvanized and not less than 5 inches wide. Casings shall have one-piece concealed miter pieces.
Gypsum plaster, - Calcined gypsum, neat.
Keene's Cement - Anhydrous calcined gypsum.
Lime - Hydrated, finished grade.
Sand - Clean, well graded and suitable for plastering use.

Lathing:

The cork ceiling shall be completely covered with the lath mesh, securely stapled or nailed in place. Where the ceiling joins vertical surfaces the lath shall be bent down and lapped over these vertical surfaces not less than 6 inches, then firmly secured in place.

External angles of the door and window openings and other wall surfaces shall have corner beads continuous for the full length of such angles.

The picture molding shall be installed in all walls of the Exhibits Room, being placed 12 inches below the finished ceiling.

Door frames in the plastered partitions shall have expansion casings where indicated.

Plastering:

Surfaces to be plastered shall be clean and dry. Immediately before the application of the first coat the masonry surfaces shall be wet down to reduce the suction.

Ingredients shall be carefully measured by volume and thoroughly mixed with water to a homogeneous mass of the proper plastering consistency.

The first coat shall consist of one part of gypsum plaster and three parts sand. It shall be applied with sufficient pressure to obtain a good key and bond with the base and with sufficient material to cover well. The surface shall be scratched thoroughly to form a rough surface to provide a good bond with the second coat.

The second coat shall consist of one part of gypsum and three parts sand. This coat shall be applied after the first coat has set firm and hard. It shall be brought out to the grounds and straightened to a true surface with rod and darby. The surface shall be left rough, equivalent to a broomed surface, to receive the final coat. Screeds shall be used if necessary to obtain a true and even surface.

The third coat shall consist of one part of lime putty and three parts of Keene's cement. This coat shall not be applied until the previous coat has thoroughly set, but not quite dry. If the second coat is found to be too dry it shall be sprayed with water immediately before the application of the final coat. This final coat shall be scratched in thoroughly, laid on well and doubled back and filled out to a true and even surface. It shall be allowed to draw a few minutes then trowelled and brushed to a smooth and uniform finish. Use as little water as possible when troweling. The thickness of this finishing coat shall be not less than 1/16 inch nor more than 1/8 inch.

13. LIGHTNING PROTECTION.

This work includes a lightning protection system as shown on Sheet No. 2 and comprises - elevation rods on all parapets and the outside edge of the terrace roof; connecting conductors from each elevation rod; two down conductors and two ground connections.

The installation shall conform to the Code for "Protection Against Lightning," Bureau of Standards Handbook, No. 17.

Materials:

Copper, having a conductivity of 98 per cent, shall be used for all parts except that the fasteners and fittings may be bronze or a similar metal or alloy having high corrosion resistance.

Elevation Rods:

Points or elevation rods shall be 5/8 inch diameter, or solid section, 10 inches high, the top end pointed and the bottom end having threads for a screw attachment to the conductor fastenings.

Conductors:

Conductors shall be braided or stranded copper cable, 5/8 inch in diameter. Bends shall have a radius of not less than 8 inches.

Ground Connections:

One conductor cable shall be extended and firmly attached, by clamps or fasteners, to the water supply pipe at a point not less than 15 feet away from the building walls. The conductor shall be buried underground at least two feet for the entire distance.

The second conductor cable shall be extended to a ground connection comprising a copper plate of 36 ounce weight and having an area of not less than three square feet. This plate shall be buried where most practical, three feet below grade and not less than 15 feet away from the building walls or entrance steps, preferably in a natural rock depression containing moisture or in damp soil. The plate shall be placed in a 6 inch layer of mixed charcoal and sand, then covered with a similar layer, the remaining fill being earth to its proper grade. The plate shall be fastened to the conductor cable by means of three bronze U bolts and the strands of the cable brazed to the plate in a permanent manner.

Fasteners:

All work shall be securely fastened in place with substantial fittings of the proper size and type.

Conductors shall be adequately supported not over 4 feet apart.

Connections to the building parts shall be done neatly and made watertight.

14. FINISHING HARDWARE.

This work includes the finishing and operating hardware for the exterior and interior doors and the fireplace cabinet doors.

Exterior Door, D-1, double -

6 wrought bronze butt hinges, 5 inches by 5 inches, button tips.
144 bronze studs, as detailed.
1 mortise cylinder lock; bronze front, bolts and strikes to fit door jambs; two entrance door handles, bronze, with thumb piece and sectional trim; two dummy door pulls to match handles above; operation - latch bolt by thumb piece from either side, except when outside thumb piece is set by stops in face of lock. Dead bolt by turn knob on inside; both dead and latch bolts by key from outside.
2 Lever Flush Bolts, cast bronze.

Interior Door, D-2 and D-4, single -

2 wrought bronze butt hinges, 5 inches by 5 inches, button tips
1 mortise cylinder lock; bronze front, bolts and strike;
2 wrought bronze knobs and escutcheons; operation - latch bolt by knob from either side; dead bolt by key from outside and turn knob inside.

Exterior Door, D-3, single -

3 wrought bronze butt hinges, 5 inches by 5 inches, button tips.
1 mortise cylinder lock; bronze strike, bolts and front;
2 wrought bronze knobs and escutcheons; operation - latch bolts by knobs from either side, except when outside knob is set by stops in face of lock; dead bolt by turn knob on inside; both dead and latch bolts by key from outside.

Cabinet Door, single -

2 wrought brass cabinet butt hinges, size as required.
1 concealed Friction Catch, brass.

Gate, Double -

2 wrought iron strap hinges for each leaf, hand-made from oversized bars and with all the characteristics of local blacksmith craftsmanship.
Bronze studs for each leaf, similar to the studs detailed for Door D-1.
1 nine inch foot bolt and 1 nine inch head bolt for each leaf, wrought iron, finished as described for the strap hignes.
Cylinder mortise deadbolt; operation by key from the inside only.

CHICKAMAUGA AND CHATTANOOGA NATIONAL MILITARY PARK GEORGIA OCT 10 1939

Finishes:

Surfaces for exterior use shall be finished in a sanded, dull black (US 19). For interior use in a dull bronze (US 10).

Keying:

All cylinder locks shall be mastered.

15. PAINTING AND FINISHING.

This work includes the painting, staining and finishing for all wood floors, the millwork and metal work on both exterior and interior surfaces, the interior plaster surfaces in the first floor spaces and the concrete soffit of the terrace ceiling.

Wood Floors:

The wood floors shall receive a colorless paste filler followed by an oil treatment.

The filler shall be rubbed well into the wood pores and allowed to dry at least one hour. Then the wood shall be rubbed across the grain and all loose filler cleaned off.

Three parts of boiled linseed oil shall be mixed with one part of turpentine and the mixture rubbed thoroughly into the wood and allowed to absorb. Then clean off surplus oil with rags.

Millwork:

The doors, interior trim and all other millwork except the baseboards, and the terrace enclosure, shall be given a filler and oil treatment similar to that for the floors. In addition, two coats of semi-gloss varnish shall be applied, using standard spar varnish for the exterior surfaces and interior varnish elsewhere.

Baseboards (including the bases of the fireplace cabinets) shall be filled, followed by one priming coat and two finishing coats of lead and oil paint in a flat-black color.

The terrace enclosure shall receive an oil treatment and two coats of spar varnish. The oil shall be mixed with turpentine as specified for the other millwork. In order that this treatment, on cypress, will give a similar color tone as obtained on the oak millwork a small amount of color shall be added to the oil. Standard colors in oil or a combination of such colors shall be used as necessary.

Terrace Ceiling:

The terrace ceiling and other exposed parts of the roof slab over the terrace shall be treated to kill the free lime and then stained.

In order to avoid lime burns to the stain the concrete surfaces shall be treated with a zinc sulphate solution, using three or four pounds of zinc sulphate to one gallon of water.

The stain shall consist of a mixture of boiled linseed oil, or china wood oil, thinned with turpentine, to which shall be added the necessary color pigments that will give the concrete surfaces a tone similar to the stone walls. The treatment shall be given in two coats, the first coat being allowed to dry thoroughly before the second coat is applied.

Plaster:

One coat of casein, cold-water paint shall be applied. White paint shall be used and a small amount of black and burnt sienna color added in order to obtain a warm-grey effect.

Metal Work:

The casement sash and frames, the metal lintels and accessory work shall receive two coats of lead and oil paint in a drak-red-brown color.

The fireplace unit and all other metal work shall receive two coats of lead and oil paint in a flat-black color.

Sanding:

All wood surfaces shall be rubbed down and smoothed with fine sandpaper both before and after the first coat of varnish, or the first finishing coat of paint, is applied.

QUARTERMASTER'S DEPARTMENT
MILITARY PARK
OCT 10 1933
FORT OGLETHORPE, GEORGIA

Appendix C:
Documentation Drawings

Adolph S. Ochs Observatory and Museum
U.S. Department of the Interior, Interior Region 2, National Park Service (NPS)
Chickamauga and Chattanooga National Military Park
Fort Oglethorpe, Georgia

Sheet 1: Lower-level Plan

Sheet 2: Upper-level Plan

Sheet 3: Roof Plan

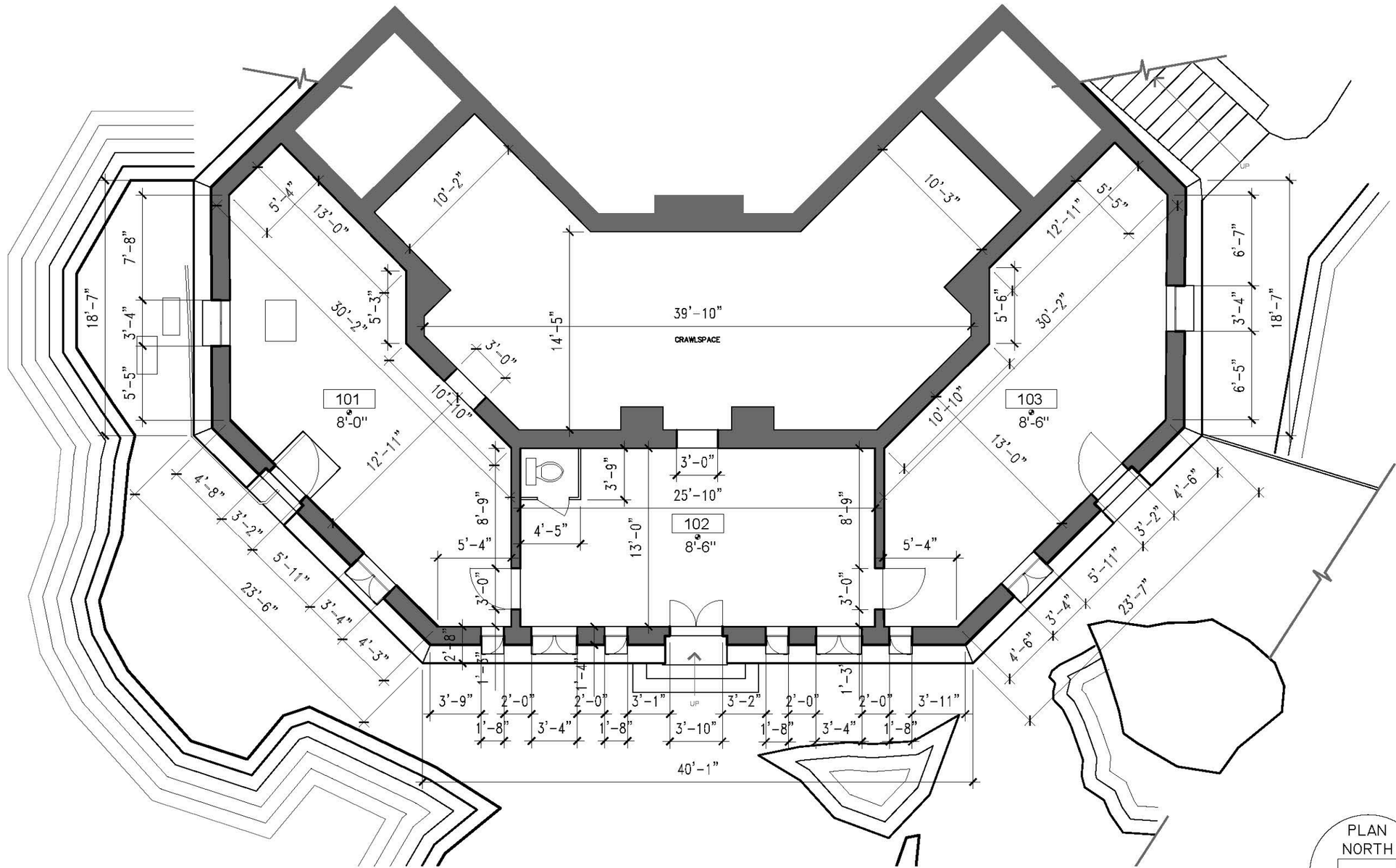
Sheet 4: North, Northeast, and Northwest Elevations

Sheet 5: West and Southwest Elevations

Sheet 6: East and Southeast Elevations

Sheet 7: South Elevation

Sheet 8: Details



1 LOWER LEVEL PLAN
SCALE: 1/8" = 1'-0"

0 4' 8' 16' 24'

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WINSTON-SALEM, NORTH CAROLINA

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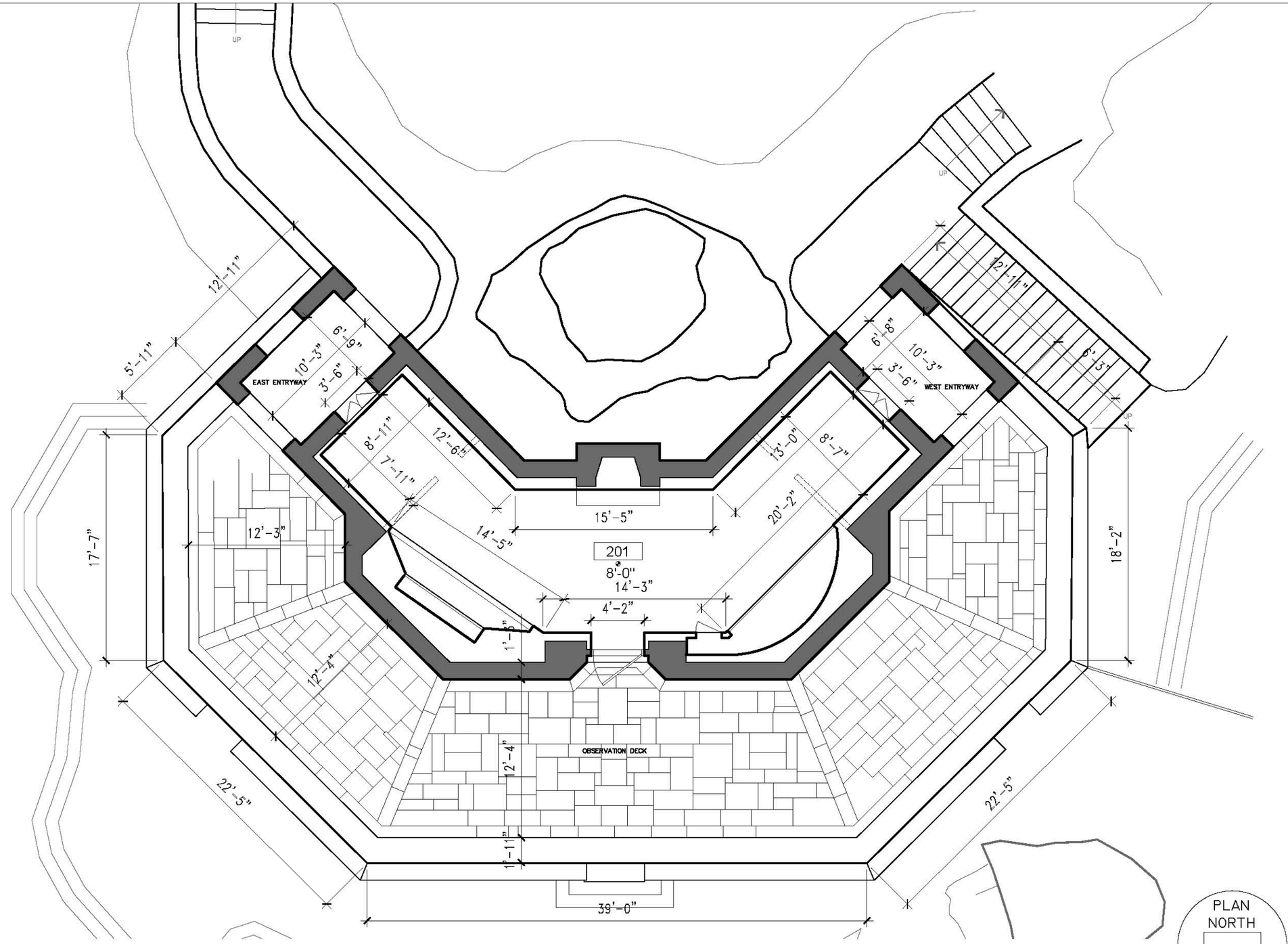
RECORDATION DATE:
03.01.2022

RECORDED BY:
PA, RJH, JPA

SCALE:
1/8" = 1'-0"

HSR APPENDIX C: SHEET

1



1 UPPER LEVEL PLAN

SCALE: 1/8" = 1'-0"

0 4' 8' 16' 24'

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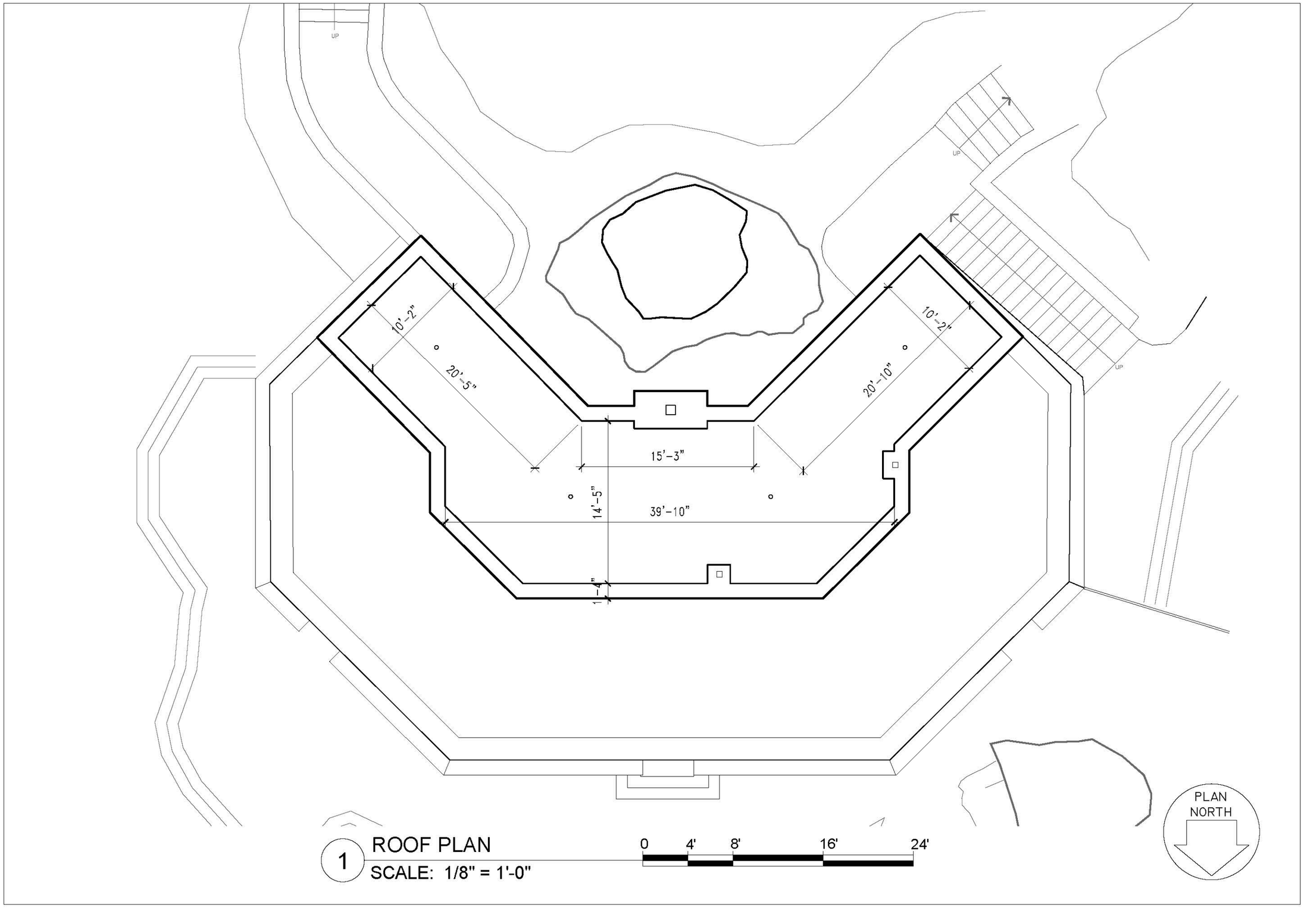
RECORDATION DATE:
03.01.2022

RECORDED BY:
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SCALE:
1/8" = 1'-0"

HSR APPENDIX C: SHEET

2



1 ROOF PLAN

SCALE: 1/8" = 1'-0"

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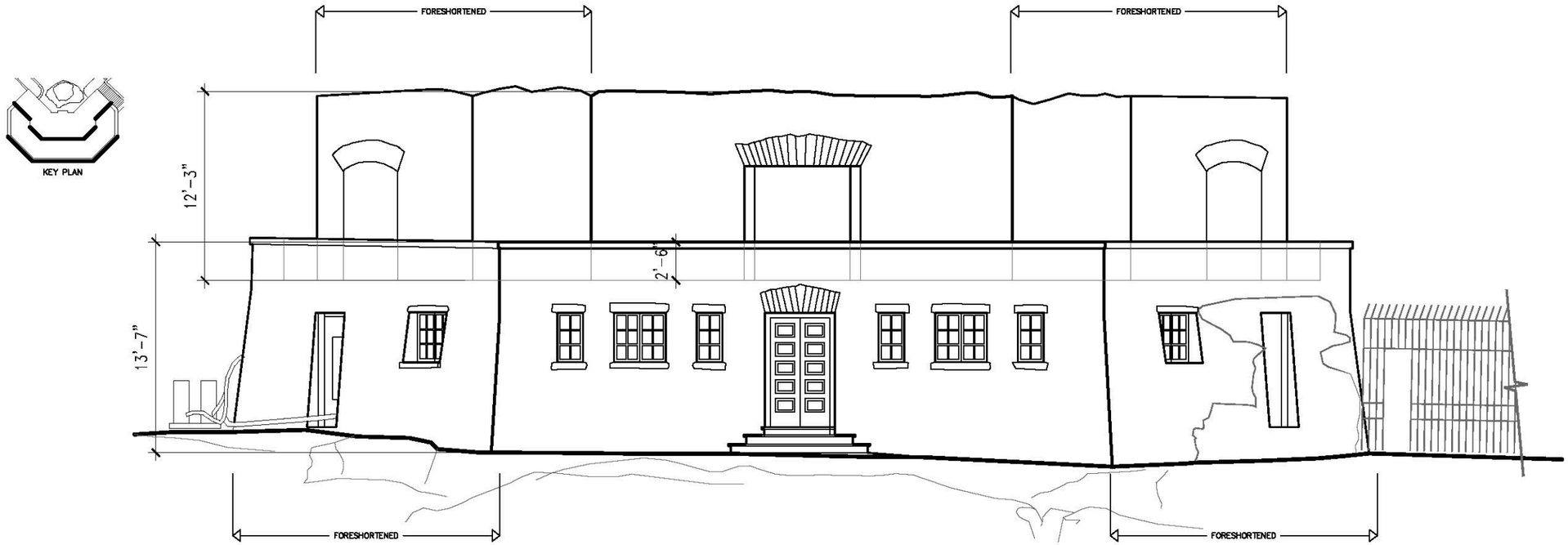
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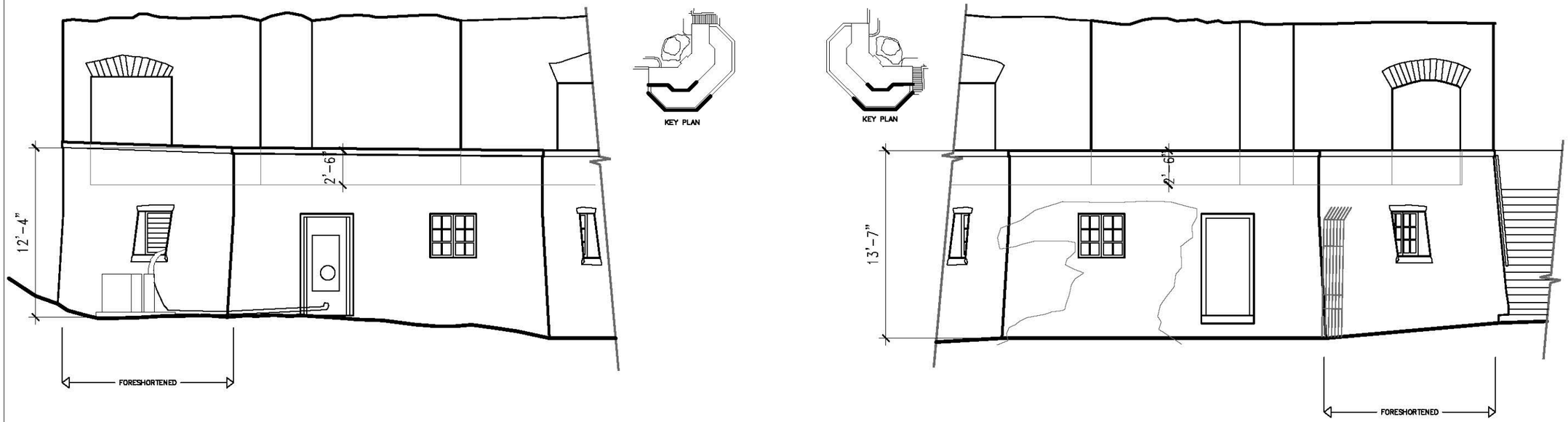
SCALE:
1/8" = 1'-0"

HSR
APPENDIX C:
SHEET

3



1 NORTH ELEVATION



2 NORTHEAST ELEVATION

0 4' 8' 16' 24'

SCALE: 1/8" = 1'-0"

3 NORTHWEST ELEVATION

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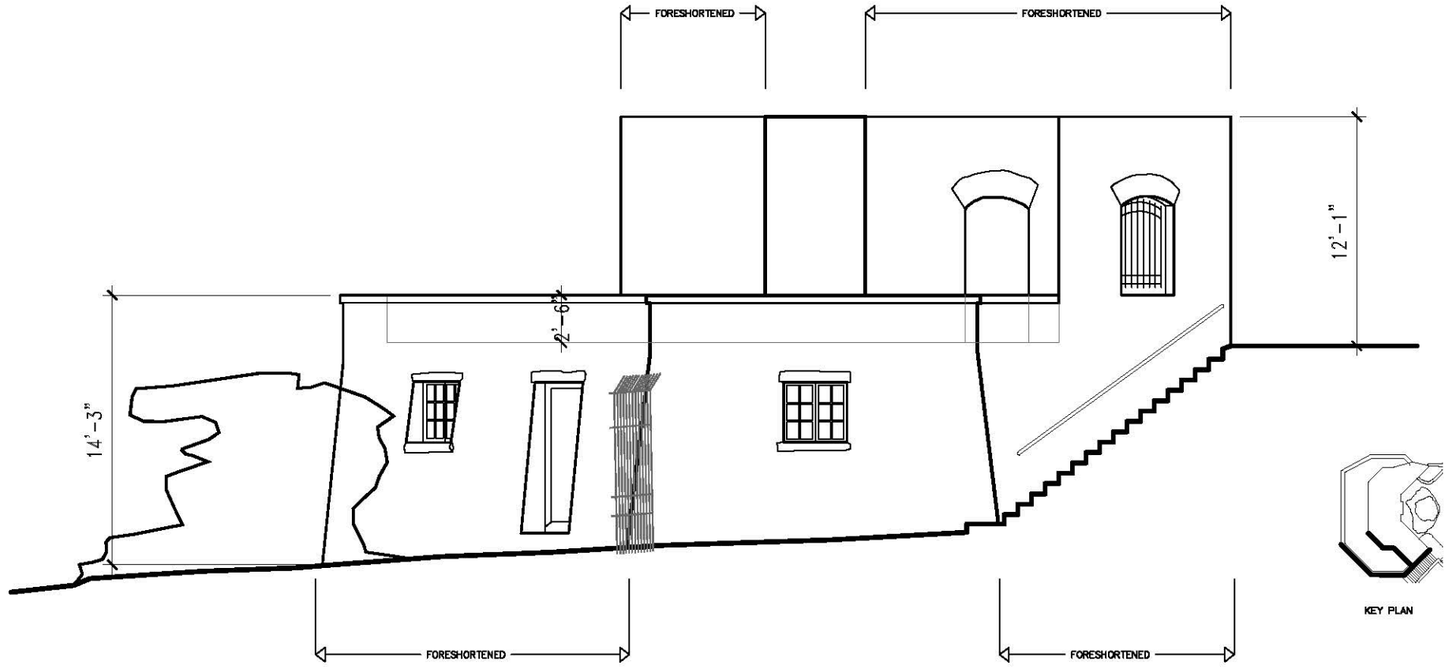
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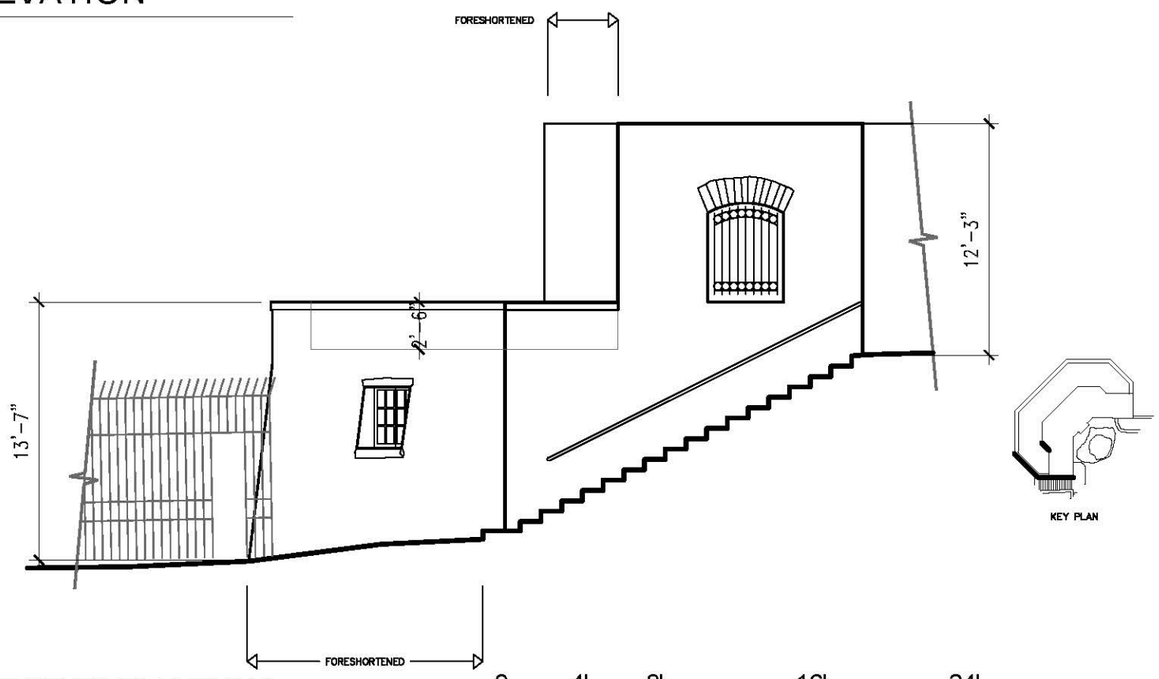
SCALE:
1/8" = 1'-0"

HSR APPENDIX C: SHEET

4



1 WEST ELEVATION



2 SOUTHWEST ELEVATION

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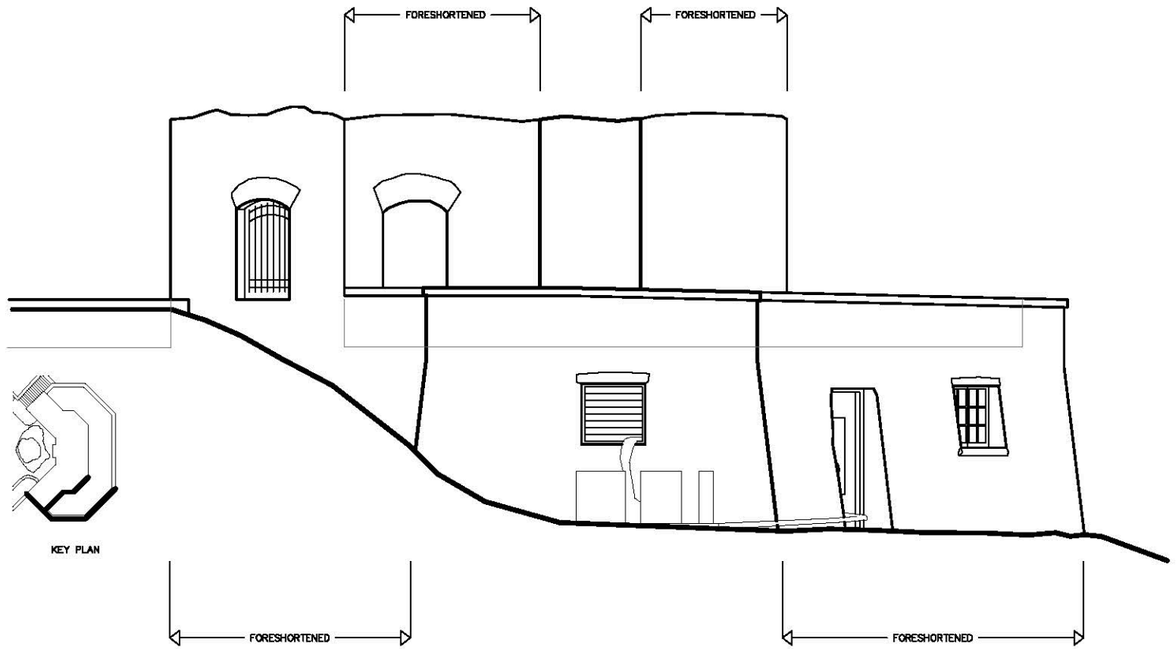
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RECORDED BY:
PA, RJH, JPA

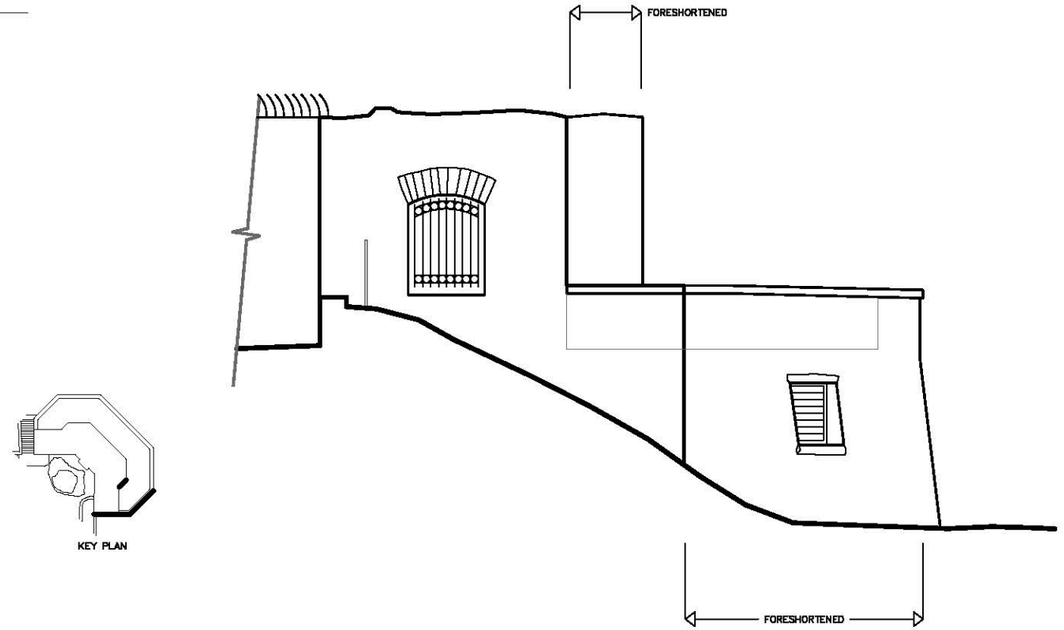
SCALE:
1/8" = 1'-0"

HSR APPENDIX C: SHEET

5



1 EAST ELEVATION



2 SOUTHEAST ELEVATION

0 4' 8' 16' 24'

SCALE: 1/8" = 1'-0"

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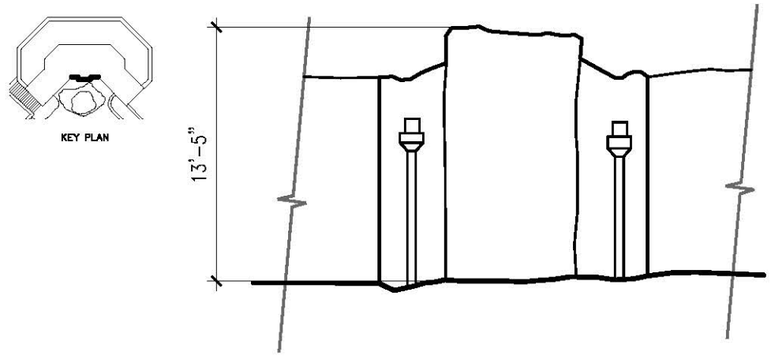
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RECORDATION DATE:
03.01.2022

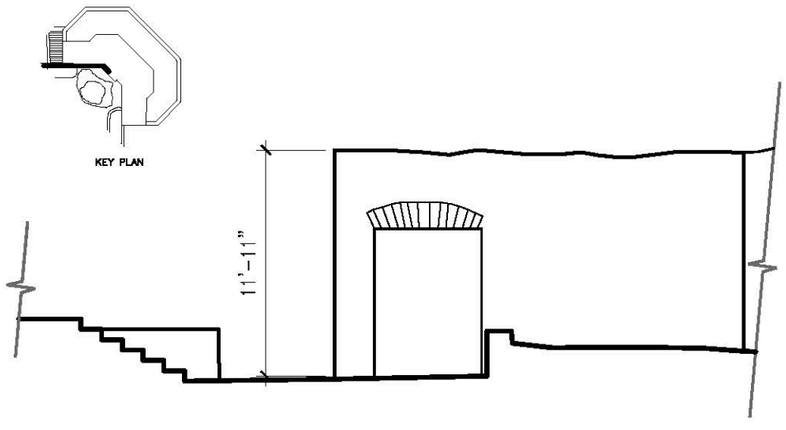
RECORDED BY:
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SCALE:
1/8" = 1'-0"

HSR APPENDIX C: SHEET
6



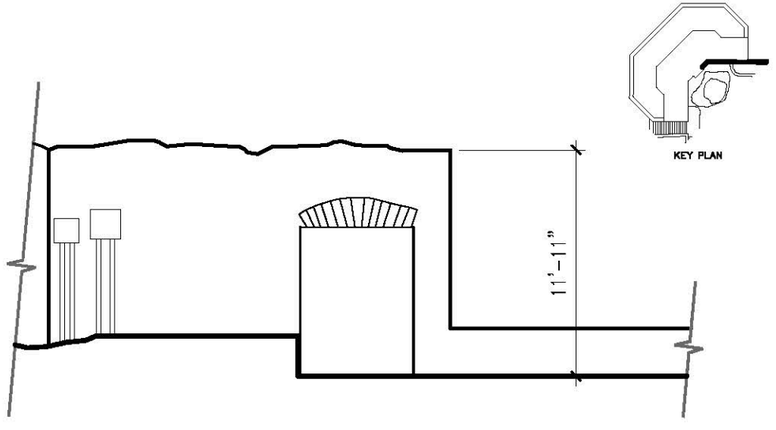
1 SOUTH ELEVATION (CENTER)



2 SOUTH ELEVATION (WEST END)

0 4' 8' 16' 24'

SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION (EAST END)

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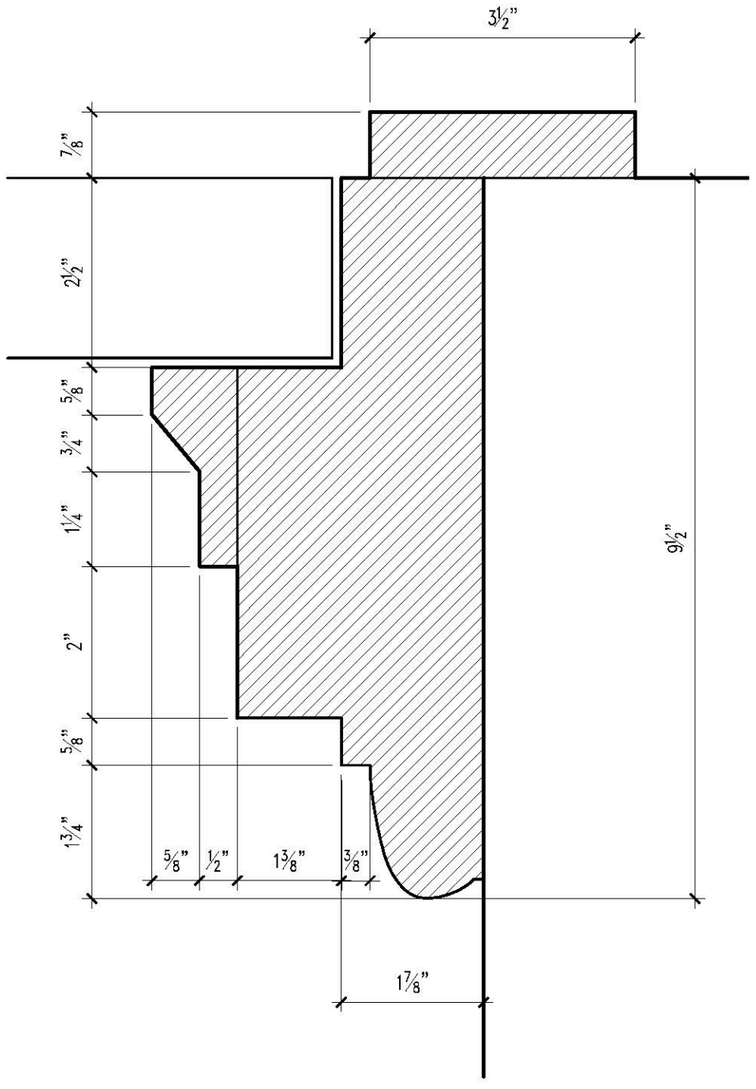
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RECORDATION DATE:
03.01.2022

RECORDED BY:
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SCALE:
1/8" = 1'-0"

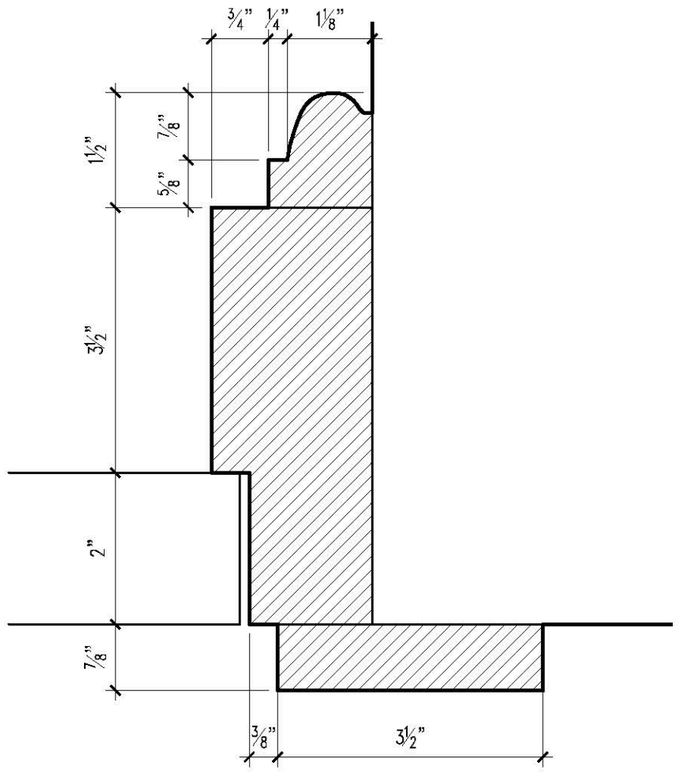
HSR APPENDIX C: SHEET
7



1 TYP. ORIGINAL EXTERIOR DOOR CASING

SCALE: 6" = 1'-0"

0 .5" 1" 1.5" 3"



2 TYP. ORIGINAL INTERIOR DOOR CASING

SCALE: 6" = 1'-0"

0 .5" 1" 1.5" 3"

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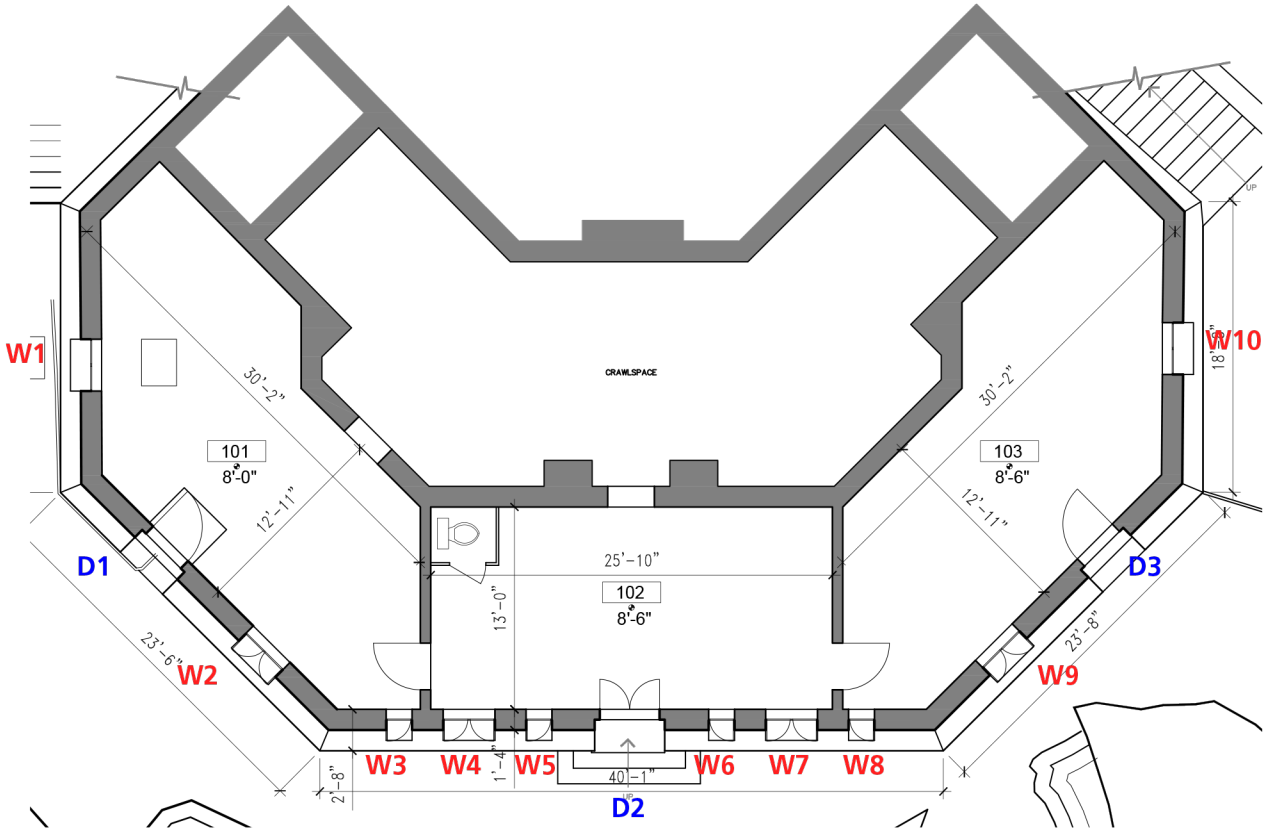
SCALE:
3" = 1'-0"

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APPENDIX C:
SHEET

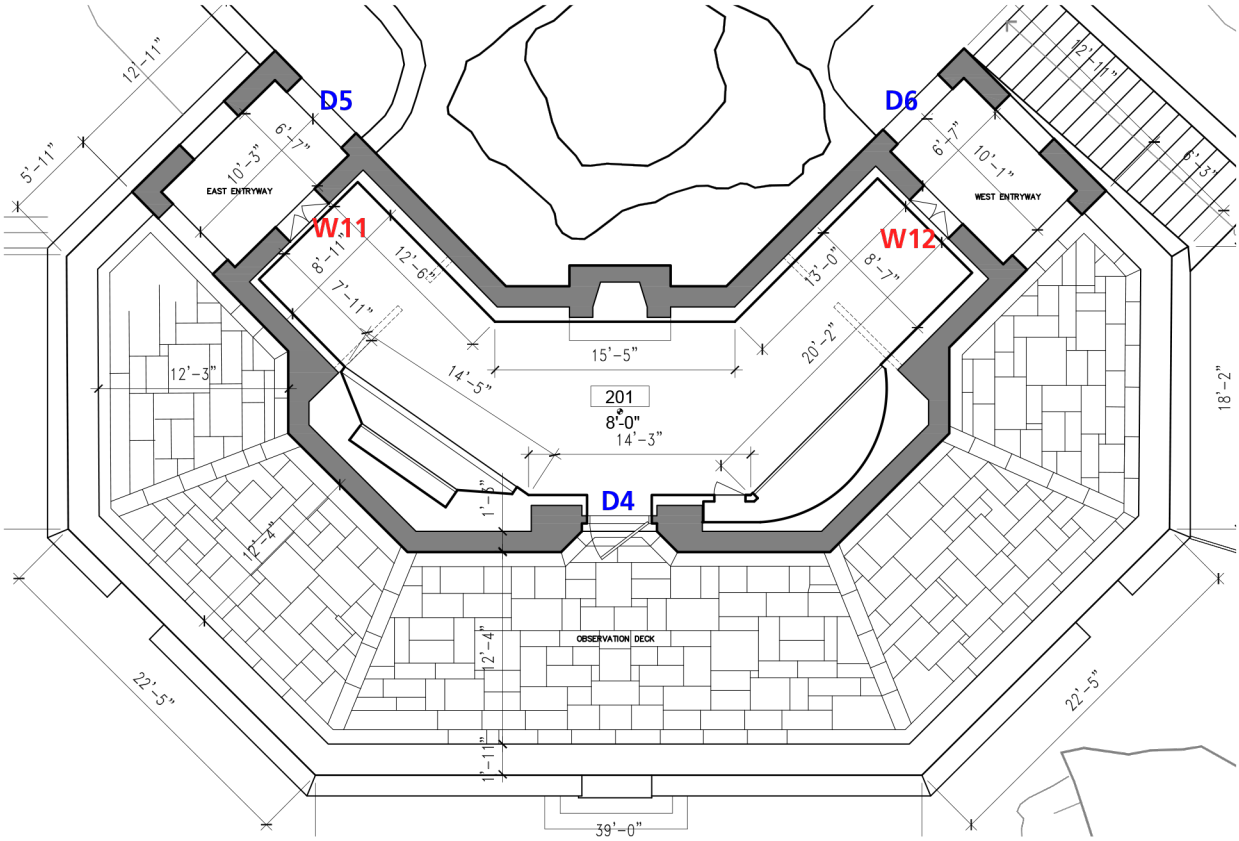
8

Appendix D:
Door and Window Survey and Treatment Schedule

Lower-Level Opening Key Plan



Upper-Level Opening Key Plan



Window W1 - Lower-Level East



Window W1 - Exterior



Window W1 - Interior

Window W1	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- One sash removed for louver. Sash is stored in good condition in lower level.
- One handle missing.
- Frame moderately rusted
- Remaining sash moderately rusted
- Glazing failed
- Mullion and muntins intact
- Steel lintel rusted, has caused loss of stone face above. No rust jacking observed.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting.
- Reinstall removed sash, replace broken glass, and apply new glazing putty.
- Cut acrylic pane to closely surround HVAC hoses.

Window W2 - Lower-Level Northeast



Window W2 - Exterior



Window W2 - Interior

Window W2	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- One sash missing.
- Handle missing from remaining sash
- Frame heavily rusted at top and bottom rail
- Remaining sash heavily rusted at hinges
- Glazing failed
- Mullion and muntins intact
- Steel lintel heavily rusted.

Recommendation:

Replacement of heavily rusted lintel will require removal of window frame. The frame is too heavily rusted to removed intact.

- Support opening and replace steel lintel with stainless steel lintel.
- Install new window unit with same design and dimensions as original.

Window W3 - Lower-Level North - East End Left



Window W3 - Exterior



Window W3 - Interior

Window W3	
Original?	• Yes
Type	• Single 6-light steel casement
Dimensions	• 1'-6½" wide by 3'-0" tall by 1¼" thick
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• N/A
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Two ¾"-diameter vertical bars at interior

Condition Notes:

- Missing handle
- Frame heavily rusted at top and bottom
- Sash moderately rusted, missing corners
- Glazing failed
- Muntins intact
- Steel lintel rusted. No rust jacking observed.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges
- Replace broken glass and all glazing putty.

Window W4 - Lower-Level North - East End Center



Window W4 - Exterior



Window W4 - Interior

Window W4	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- Hardware intact.
- Frame heavily rusted at top and bottom rail
- Both sash heavily rusted at hinges
- Glazing failed
- Mullion and muntins intact
- Steel lintel moderately rusted.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges
- Replace broken glass and all glazing putty

Window W5 - Lower-Level North - East End Right



Window W5 - Exterior



Window W5 - Interior

Window W5	
Original?	• Yes
Type	• Single 6-light steel casement
Dimensions	• 1'-6½" wide by 3'-0" tall by 1¼" thick
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• N/A
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Two ¾"-diameter vertical bars at interior

Condition Notes:

- Sash fallen from opening due to rusted hinges. Sash stored inside during site visit
- Handle intact
- Frame heavily rusted at top and bottom
- Sash moderately rusted.
- Glazing failed
- Muntins intact
- Steel lintel rusted. No rust jacking observed.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges and handle
- Replace broken glass and all glazing putty.

Window W6 - Lower-Level North - West End Right



Window W6 - Exterior



Window W6 - Interior

Window W6	
Original?	• Yes
Type	• Single 6-light steel casement
Dimensions	• 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• N/A
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Two ¾"-diameter vertical bars at interior

Condition Notes:

- Sash fallen from opening due to rusted hinges
- Handle missing
- Frame heavily rusted at top and bottom
- Sash moderately rusted.
- Glazing failed
- Muntins intact
- Steel lintel rusted. No rust jacking observed.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges and handle
- Replace broken glass and all glazing putty.

Window W7 - Lower-Level North - West End Center



Window W7 - Exterior



Window W7 - Interior

Window W7	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- Hardware intact.
- Frame heavily rusted at top and bottom rail
- Both sash heavily rusted at hinges
- Glazing failed
- Mullion and muntins intact
- Steel lintel moderately rusted.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges
- Replace broken glass and all glazing putty

Window W8 - Lower-Level North - East End Right



Window W8 - Exterior



Window W8 - Interior

Window W8	
Original?	• Yes
Type	• Single 6-light steel casement
Dimensions	• 1'-6½" wide by 3'-0" tall by 1¼" thick
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• N/A
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Two ¾"-diameter vertical bars at interior

Condition Notes:

- Handle missing
- Frame heavily rusted at top and bottom
- Sash heavily rusted
- Glazing failed
- Bottom vertical muntin rusted through
- Steel lintel rusted. No rust jacking observed.

Recommendation:

Attempt to retain existing window. Replace in-kind if repair is found to be infeasible.

- Treat steel lintel, sash, and frame, by removing exfoliation, priming with rust inhibiting primer, and repainting. If window is replaced, replace lintel with stainless steel.
- Perform welded dutchman repairs to sash and frame, if feasible.
- Replace hinges and handle
- Replace broken glass and all glazing putty.

Window W9 - Lower-Level Northwest



Window W9 - Exterior



Window W9 - Interior

Window W9	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- One handle missing
- Frame heavily rusted at top and bottom rail
- Remaining sash heavily rusted at hinges, hinge-side stiles, and top and bottom rails
- Glazing failed
- Mullion and muntins intact
- Steel lintel heavily rusted and appears to be deflecting.

Recommendation:

Replacement of heavily rusted lintel will require removal of window frame. The frame is too heavily rusted to be removed intact.

- Support opening and replace steel lintel with stainless steel lintel.
- Install new window unit with same design and dimensions as original.

Window W10 - Lower-Level West



Window W10 - Exterior



Window W10 - Interior

Window W10	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- One sash missing.
- Handle missing from remaining sash
- Frame heavily rusted at top and bottom rail. North jamb bowed
- Remaining sash heavily rusted at hinges and bottom rail
- Glazing failed
- Mullion and muntins intact
- Steel lintel heavily rusted.

Recommendation:

Replacement of heavily rusted lintel will require removal of window frame. The frame is too heavily rusted to removed intact.

- Support opening and replace steel lintel with stainless steel lintel.
- Install new window unit with same design and dimensions as original.

Window W11 - Upper-Level East



Window W11 - Exterior

Window W11	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Interior lintel not observable • Single stone (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- Interior face of window obscured by interior finishes.
- Hardware intact
- Glazing putty and paint failing.
- Overall window is in good condition.

Recommendation:

Retain window.

- Replace glazing putty and repaint.

Window W12 - Upper-Level West



Window W12 - Exterior

Window W12	
Original?	• Yes
Type	• Paired 6-light steel casements
Dimensions	• 3'-5" wide by 3'-1" tall (overall) • 1'-6½" wide by 3'-0" tall by 1¼" thick (each sash)
Frame (at masonry)	• 1½" wide by 1¼" deep
Center mullion	• 3⅞" wide
Muntin	• ⅞" wide, T-shaped, glazing putty at exterior
Hardware	• Pivot handle 4¾" long • Corner pivoting hinges (2 ea. sash)
Lintel	• Interior lintel not observable • Single stone (exterior)
Sill	• Stone 4" to 6" thick
Bars	• Four ¾"-diameter vertical bars at interior

Condition Notes:

- Interior face of window obscured by interior finishes.
- Hardware intact
- Glazing putty and paint failing.
- Overall window is in good condition.

Recommendation:

Retain window.

- Replace glazing putty and repaint.

Doorway D1 - Lower-Level East



Doorway D1- Exterior



Doorway D1 - Interior

Doorway D1	
Original?	• Yes
Type	• Tongue-and-groove wood flush panel
Dimensions	• 3'-0" wide by 7'-0" tall by 2" thick
Casing	• Casings are original. • Exterior: Mitered ovolo molding measuring 1⅞" wide by 2⅜" thick • Interior: Plank board casing measuring 3½" wide by ¾" thick
Hardware	• All hardware is original • (3) 6" ball-pin hinges • Beveled rectangular escutcheons measuring 2" wide by 7" tall on the interior face and 3" wide by 10" tall on the exterior face
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)

Condition Notes:

- Large opening cut in door for previous HVAC system
- Holes cut for PVC drain pipe and condensate drain
- Paint failed
- Caulking at masonry failed
- Steel lintel heavily rusted and deflecting

Recommendation:

Retain and repair existing original door and frame.

- Remove door and frame, support opening, and replace steel lintel with stainless steel lintel
- Perform dutchman repairs at cut portions of door to restore original appearance.
- Reinstall door and frame, reuse all original hardware.
- Repaint.

Doorway D2 - Lower-Level North



Doorway D2- Exterior



Doorway D2 - Interior

Doorway D2	
Original?	• Yes
Type	• Paired, wood 5 horizontal panel.
Dimensions	• 2'-0" wide by 6'-11 ½" tall by 2 ¼" thick (ea. leaf)
Casing	• Casings are original. • Exterior: Mitered ovolo molding measuring 1⅞" wide by 2⅜" thick • Interior: Plank board casing measuring 3½" wide by ¾" thick
Hardware	• All hardware is original • (3) 6" ball-pin hinges ea. leaf • Corner pivoting hinges (2) • Bronze mortised lockset and handle with thumb latch on primary leaf. Dummy version of secondary leaf. • Mortised bronze head and foot bolts at ea. leaf.
Lintel	• Reinforced concrete beam (interior) • (3) Steel angles (exterior)

Condition Notes:

- At time of site visit, secondary leaf and east jamb had fallen due to rusted fasteners and forced entry. Since the site visit, the second door and remaining frame have similarly fallen. The doors are stored at the lower level.
- Mechanical connection to masonry failed.
- Deadbolt missing.
- Paint failed
- Caulking at masonry failed
- Steel lintel heavily rusted and deflecting.

Recommendation:

Retain and repair existing original doors and frame.

- Support opening, and replace steel lintels with stainless steel lintels
- Re-attach door frame using stainless steel fasteners.
- Rehang existing doors, reuse all hardware. Replace missing deadbolt to avoid need for padlock hasp.
- Repaint.

Doorway D3 - Lower-Level West



Doorway D3- Exterior



Doorway D3 - Interior

Doorway D3	
Original?	• Yes
Type	• Tongue-and-groove wood flush panel
Dimensions	• 3'-0" wide by 7'-0" tall by 2" thick
Casing	• Casings are original. • Exterior: Mitered ovolo molding measuring 1⅞" wide by 2⅜" thick • Interior: Plank board casing measuring 3½" wide by ¾" thick
Hardware	• All hardware is original • (3) 6" ball-pin hinges • Beveled rectangular escutcheons measuring 2" wide by 7" tall on the interior face and 3" wide by 10" tall on the exterior face
Lintel	• Reinforced concrete beam (interior) • Steel angle (exterior)
Condition Notes: • Paint failed • Caulking at masonry failed • Steel lintel heavily rusted and deflecting • Doorknobs missing	
Recommendation: Retain and repair existing original door and frame. • Remove door and frame, support opening, and replace steel lintel with stainless steel lintel • Reinstall door and frame, reuse all original hardware. Replace missing doorknob • Repaint	

Doorway D4 - Upper-Level North



Doorway D4- Exterior



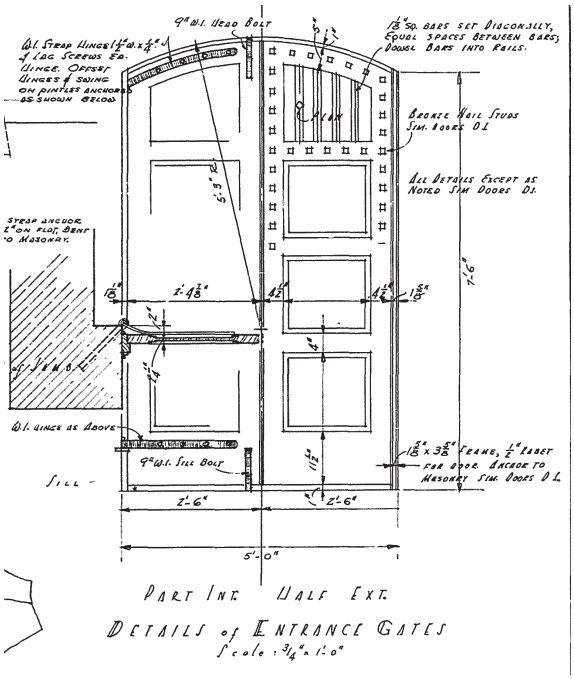
Doorway D4 - Interior

Doorway D4	
Original?	• No
Type	• Steel flush panel with single light
Dimensions	• 3'-9 ½" wide by 6'-11 ½" tall by 1 ¾" thick
Casing	• Exterior casing is original • Exterior: Mitered ovolo molding measuring 1⅞" wide by 2⅜" thick • Interior: Steel frame
Hardware	• Modern butt hinges • Magnetic lock • Modern push plate
Lintel	• (3) Steel angles (exterior) • Interior face of lintel not visible
Condition Notes: • Steel door detracts from historic character of the building and is rusted • Steel lintel have minor rust	
Recommendation: Replace door with new version that is more in keeping with the historic design, which was similar to paneled door D2 at the lower level. • Treat steel lintel by removing exfoliation, priming with rust inhibiting primer, and repainting. • Remove existing steel door and frame to restore original opening size. • Fabricate and hang new wood door that approximates the original design while conforming to accessibility requirements. • Provide new hardware similar to that found on original doors while conforming to accessibility requirements.	

Doorway D5 - Upper-Level East



Doorway D5- Exterior



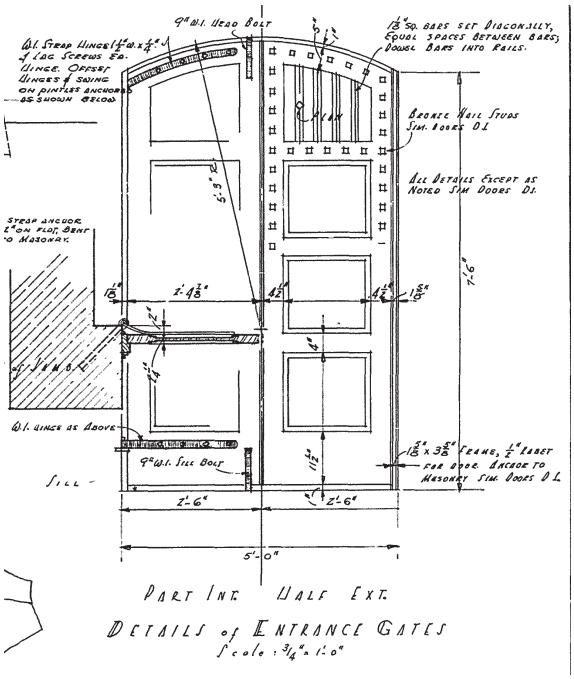
Doorway D5 - Original Door Design

Doorway D5	
Original?	• Original frame, doors missing
Type	• Wood frame, previously held paneled door.
Dimensions	• 5'-0" wide by 7'-6" tall by 1 ¾" thick
Casing	• Exterior wood frame is original and has rabbit cut for 1¾" doors • Frame has 1½" wide cove molding at the exterior and a 1" quarter round at the interior
Hardware	• Partial remnants of 3 pintle hinges at each leaf (consistent with original drawings) • Original head bolt keeper remains at head of opening
Lintel	• N/A (masonry arch)
Condition Notes: • Doors have been removed from opening and have been lost • Trim elements at frame are detached	
Recommendation: Fabricate a pair of doors based on the original construction drawings and hang in original frame. • Reattach loose trim • Repaint frame	

Doorway D6 - Upper-Level West



Doorway D6- Exterior



Doorway D6 - Original Door Design

Doorway D6	
Original?	• Original frame, doors missing
Type	• Wood frame, previously held paneled door.
Dimensions	• 5'-0" wide by 7'-6" tall by 1 ¾" thick
Casing	• Exterior wood frame is original and has rabbit cut for 1¾" doors • Frame has 1½" wide cove molding at the exterior and a 1" quarter round at the interior
Hardware	• Partial remnants of 3 pintle hinges at each leaf (consistent with original drawings) • Original head bolt keeper remains at head of opening
Lintel	• N/A (masonry arch)
Condition Notes: • Doors have been removed from opening and have been lost • Trim elements at frame are detached	
Recommendation: Fabricate a pair of doors based on the original construction drawings and hang in original frame. • Reattach loose trim • Repaint frame	

Appendix E:
List of Implementation Projects

List of Implementation Projects

The following is a list of potential projects relating to the Adolph S. Ochs Observatory and Museum. Justification for each project is provided for the purposes of submitting the Project Management Information System (PMIS). Note that many projects are interdependent and should not be completed as standalone projects (for instance, window repairs should not be completed before the drainage system is repaired or before steel lintels are replaced/repaired).

1. Observation Deck and Drainage System Repairs

- Repair failed waterproofing layer at observation deck and replace failed drainage system. These repairs should be completed in combination with structural repairs.
- Justification: Water is causing active damage to paving and the structural slab below as the deck is no longer waterproof and is unable to drain.

2. Concrete Slab and Beams Repair

- Repair spalling concrete and rusting rebar at observation deck floor slab.
- Justification: The concrete slab and beams have been exposed to water and road salt due to failed waterproofing and drainage above. Structural repairs should be completed in concert with repairs to the deck.

3. Site Drainage Improvements

- Correct drainage issues at east and west sides of the building where water is directed toward the structure and is causing water infiltration and erosion.
- Justification: Water is entering the crawlspace and pooling at the east entrance. Water from the lower west path is causing erosion along the northwest face of the building.

4. Masonry Repairs and Cleaning

- Spot repointing is necessary at failed mortar joints. Mortar analysis is to be completed before beginning work. Power tools should not be used to remove mortar. Clean biologic growth in accordance with recommendations of this HSR. Complete repairs to exterior stairs as part of project. This work should be completed in combination with the window and door repairs and lintel replacements/repairs.
- Justification: Given prevalence of mortar separation from stone, repointing should occur as part of any major exterior work campaign. Biologic growth is heavy at the lower level. Exterior stairs have mortar loss and the north stair is undermined and separating from the building.

5. Window and Door Repairs

- Selective repair or replacement of steel windows and lintels is necessary. See assessments included in this HSR. Repair existing historic wood doors.
- Justification: The steel windows and steel lintels are heavily rusted. The historic wood doors require repair in order to secure the lower level.

6. Upper Roof Replacement

- Replace failed membrane roof above exhibit space.
- Justification: The roof has reached its end of life and is leaking.

National Park Service
U.S. Department of the Interior

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