Historic Housing Area
Historic Structures Report

Wind Cave National Park

Volume I of VIII



January 27, 2016
NPS PMIS # 158029

Susan Richards Johnson & Associates, Inc.
1701 Oak Street, Suite 100
Kansas City, Missouri 64108

Cover Photo:
Historic Housing Area and Visitor's Center ca. 1930s. (WICA Museum Collection #WICA 8741)

Historic Housing Area
HISTORIC STRUCTURES REPORT
Wind Cave National Park

Hot Springs, South Dakota

Recommended: Vidal Davila Date: 2/9/16
Superintendent,
Wind Cave National Park

Concurred: Date: 2/22/16
Associate Regional Director
Cultural Resources, Midwest Region

Approved: Date: 2/24/16
Regional Director, Midwest Region

January 27, 2016

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Table of Contents

List of Figures iii
Summary 1
Episode Summary 3
History and Context 13
Timeline 79
Historic Building Materials 101
Roofing 101
Native Stone 108
Stucco 112
Exterior Paint and Stain 115
Exterior Wood Trim and Siding 116
Windows and Shutters 120
Storm Doors 126
Interior Hardware 130
Exterior Hardware 138
Historic Light Fixtures 141
Technical Appendixes
A. List of Known Historic Plans
B. Historic Photograph Information Pages
C. Historic Material Analysis

List of Figures

Notes:
All references to the WICA Museum Collections are cited by the title WICA, followed by the catalogue number. For example--WICA 3754 refers to record number 3754 in the Wind Cave National Park archives.

See Appendix B for more information about the photo files.

1. Photo of the housing area taken ca. 1935. (WICA 8754)
2. Charts of building names and construction dates.
3. 1939 Site Plan, with Construction Dates and Current Numbers. (Base Map from the 1940 master plan, on file at Wind Cave National Park)
4. Early cave visitors. (WICA 566)
5. Stabler Hotel, ca. 1895. (WICA 682)
6. Map of the original boundaries of Wind Cave National Park. (Spence, 233)
7. Photo of the park headquarters ca. 1906. (Photo from the Hot Springs Public Library)
8. Park headquarters, with new frame cave house and administration building. (WICA 663)
9. Sketch Plan of HS 5, and floorplan of a house from an Aladdin Readi-Cut Houses catalog. (National Archives RG79, Central Classified Files. 1907-1949, Box 448. National Archives II, College Park, MD, and Aladdin Readi-Cut Houses Catalog, (Bay City, Michigan: Aladdin Company,1920)
10. Detail of a 1927 topo map of headquarters. (National Archives RG 79, Box 446. Central Classified Files)
11. Photo of Wind Cave National Park Headquarters, ca. 1925. (WICA 4162)
12. 1931 Headquarters Area Site Plan from the 1931 master plan. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD)
13. Edward Dixon Freeland. (WICA 7308)
14. Power house (HS-13) under construction. (WICA 4440)
15. Power house (HS-13) shortly after completion. The pipe at the corner provided exhaust for the fumes form the diesel power plant. (WICA 4423)
16. Detail of the 1932 master site plan of the administrative area with author notations. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD)
17. HS-08 under construction, ca. 1931. (WICA 4267)
18. HS-08 shortly after completion, Nov. 12, 1931. (WICA 4727)
19. HS-07 Under construction, Jan 4, 1932. (WICA 4271)
20. HS-07 Shortly after completion, March 1, 1932. (WICA 4724)
21. HS-04 Original Superintendent's Residence, ca. 1933. (WICA 4421)
22. Detail of the 1933 site plan of the administrative area. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD)
23. HS-06, soon after completion, Nov. 1934. (WICA 4269)
24. HS-06, with CCC installed landscaping, ca. 1937. (WICA 4275)
25. HS-03, just before Freeland moved in, August 17, 1934. (WICA 4319)

26. HS-11 soon after it was completed, ca. 1935. HS-13 is shown to the right, and HS-03 is in the far background. (WICA 4559)
27. CCC Camp at Wind Cave. (WICA 8747)
28. Planting Plan for HS-07, issued Oct 15, 1934 ((WICA_108_3019 [id3239])
29. Detail of the 1931 site plan of the administrative area, showing original and new locations for HS-05. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD)
30. Housing area before HS-05 was moved, Nov. 1934. (Detail of WICA Museum Collection #WICA 4335)
31. HS-05, shortly before it was moved, ca. 1935. (WICA 4732)
32. HS-05, ready to be moved, early 1935. (WICA 4274)
33. HS-05, after move and remodeling. (WICA 4259)
34. General Development Plan of Wind Cave National Park, from the 1936 park master plan. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD)
35. Plan for the dormitory addition of HS-04, issued in 1936. (WICA_108_3023_[id278474]) See Appendix A for more information about historic plan sheets.
36. HS-04, before remodeling, ca. 1935. (WICA 4153)
37. HS-04, after remodeling, probably taken in the late 1930s. (WICA 4277)
38. HS-07, ca. 1937, during basement construction. Note the hole in the foundation. (WICA 4730.)
39. Fire trailer house, built ca. 1935, probably removed by 1963. (WICA 4258)
40. HS-12, soon after construction, ca. 1938. (WICA 4289)
41. HS-02, elevator building, with stone being applied, ca. 1938. (WICA 4253)
42. Site plan of the headquarters area, drawn in 1939 for the 1940 master plan. (WICA library files, No Drawing Number)
43. Freeland's sketch for a proposed new sun porch/sleeping room for HS-03, drawn 1938. (National Archives RG 79, Collection 2579433, National Archives at Kansas City, Kansas City, Missouri)
44. July 15, 1939. Plans drawn for a sunroom addition to HS-03. (WICA_108_3010B_[id278471])
45. Cover sheet for the 1938 master plan. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD)
46. HS-05. Holes on exterior showing insulation. (WICA 4273)
47. Routine maintenance ca.1959. (WICA 4559)
48. 1960s site plan of the administrative area. The plan was begun in 1963 but not fully approved until 1965. (WICA 15854)
49. Housing area in November 2014, looking south, HS-05 is the first building on the right. (DS 2014)
50. Game Loge of nearby Custer Sate Park (http://custerresorts.com/lodges-and-cabins/state-game-lodge/accommodations/cabins/)
51. 1920s English Revival Style house. (James C. and Shirley Maxwell, House Styles in America: The Old-House Journal Guide to the Architecture of American Homes, New York: Penguin Studio, 1999, 220)

52. Grand Canyon Administration Building, built in 1921, is considered to be one of the best early examples of rustic architecture in a national park. ("Historic Structure Report, First Administration Building Grand Canyon National Park." June 2008)
53. House located in the Galacia region of northern Spain. (Accessed April 1, 2015 http://www.exploregalicia.com/accommodation-galicia.html)
54. First design for the power house. (HS-13) (National Archives RG 79, Central Classified Files Box 446. National Archives II, College Park, MD)
55. Site of the housing area before development and tree planting, ca. 1931. (WICA 4117)
56. Map of the cave trail system from the 1933 park master plan. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD)

Historic Building Materials

H-1. Detail of the HS-13 metal ridge cap and finial. (WICA 4127)
H-2. Detail of HS-05 before it was moved and renovated with the metal ridge cap and finials. (WICA 4265)
H-3. Detail of half-round gutter. (WICA 4256)
H-4. Detail of box gutter. (WICA 6853)
H-5. Detail of box gutter. (WICA 4272)
H-6. Detail of box style gutter on HS-08. (WICA 6320)
H-7. West roof detail. Note the curling shingles and wood nailers along the roof. (WICA 6855)
H-8. Contemporary asphalt shingle roofing, HS-03. (SRJA 2014)
H-9. Detail of south foundation wall, HS-04. (SRJA 2015)
H-10. Detail of east terrace walls, HS-04. (SRJA 2014)
H-11. Detail of basement, porch and retaining walls, HS-03. (SRJA 2014)
H-12. Detail of foundation wall, HS-13. (SRJA 2014)
H-13. Detail of stone steps, HS-03. (SRJA 2014)
H-14. Stone chimney, foundation and terrace walls, HS-03. (SRJA 2014)
H-15. East stone facade, HS-12. (O'Bright 2014)
H-16. Spanish stucco at HS-04. (SRJA 2014)
H-17. Exterior stucco sample with integral-colored finish coat and top coats of paint. (SRJA 2015)
H-18. Exterior stucco sample with integral-colored finish coat and top coats of paint. (SRJA 2015)
H-19. Exterior wood trim and siding at HS-06. (SRJA 2014)
H-20. Exterior wood siding and louver at HS-03. (SRJA 2014)
H-21. Exterior wood siding and louvers at HS-11. (SRJA 2015)
H-22. Historic drawing details of exterior trim and louvers, Rangers Dormitory and Mess Hall, Sheet 5, WC313A, May 7, 1931. Plans from Maintenance Department Files.
H-23. Historic drawing details of exterior trim and louvers, Rangers Dormitory and Mess Hall, Sheet 5, WC313A, May 7, 1931. Plans from Maintenance Department Files.
H-24. Fuel Box detail behind HS-07, 1932. (WICA 4430)
H-25. Fuel Box detail behind HS-07, 1934. (WICA 4493)
H-26. HS-04 Dining Room replacement window. (SRJA 2014)

H-27. HS-08 Steel casement windows soon after construction, ca. 1933. (WICA 4727)
H-28. HS-08 Wood 2/2 1952 replacement windows, ca. 1969. (WICA 6710)
H-29. HS-08 Current 2009 replacement out-swing window installation (SRJA 2015)
H-30. HS-08 Window 100, Historic drawings, 1931. (WICA_108_313A_[id278462])
H-31. HS-08 Window 100, 2009 replacement aluminum out-swing windows with wide picture-framed metal panning. (SRJA 2015)
H-32. HS-03 Window 200, Historic drawing with 8/12 double-hung window (WICA_108_3010 [id278449])
H-33. HS-03 Window 201. (SRJA 2014)
H-34. HS-05 Typical aluminum panning. (SRJA 2014)
H-35. HS-03 Typical aluminum panning at window sill. (SRJA 2015)
H-36. HS-13 Typical steel window. (SRJA 2014)
H-37. Screened door at north entrance to HS-03. (Detail of photograph, WICA 4319)
H-38. Figure 38. Full-lite screened door at main entrance to HS-06. This may have also had an interchangeable glass panel insert. (Detail of WICA 4728)
H-39. Storm door at south entrance to HS-08. (Detail WICA 4268)
H-40. Existing early screened door at east entrance to HS-03. (SRJ 2014)
H-41. Standard combination storm/screened door style with a mid-rail. Rendering of the Gardenia Style door by Vintage Doors, www.vintagedoors.com.
H-42. Exterior Door Hardware on HS-04 Door 109/3. (SRJA 2015)
H-43. Door Hardware on HS-04 Door 104/2. (SRJA 2014)
H-44. Door Hardware on HS-04 Door 102/2. (SRJA 2014)
H-45. Door Hardware on HS-05 Door 103/2. (SRJA 2014)
H-46. Door Hardware on HS-05 Door 103/2. (SRJA 2014)
H-47. Door Hinge on HS-05 Door 103/1. (SRJA 2014)
H-48. Door Hardware on HS-08 Door 109/1. (SRJA 2015)
H-49. Door Hardware on HS-08 Door 102/2. (SRJA 2014)
H-50. Historic Door Stop for HS-08 Door 104/1. (SRJA 2015)
H-51. Door Hardware on HS-07 Door 107/2. (SRJA 2015)
H-52. Door Hardware on HS-07 Door 100/1. (SRJA 2015)
H-53. Door Hardware on HS-06 Door 102/2. (SRJA 2015)
H-54. Door Knob on HS-03 Door 106/1. (SRJA 2014)
H-55. Door Hinge on HS-06 Door104/1. (SRJA 2015)
H-56. Door Hardware on HS-03 Door 111/1. (SRJA 2015)
H-57. Door Hardware on HS-04 Door 112/1. (SRJA 2014)
H-58. Door Hardware on HS-04 Door 111/1. (SRJA 2014)
H-59. Door Hardware on HS-05 Door 100/1. (SRJA 2014)
H-60. Door Hardware on HS-07 Door 100/1. (SRJA 2015)
H-61. Door Hardware on HS-06 Door 100/1. (SRJA 2015)
H-62. HS-06 Exterior Light Fixture. (SRJA 2014)
H-63. Detail of HS-06. 1934, Nov. 6. (WCNP Archive Number: WICA 4269)
H-64. Wall Sconce in HS-05 Living Room 100. (SRJA 2014)
H-65. Wall Sconce in HS-07 Living Room 100. (SRJA 2014)
H-66. Wall Sconce in HS-06 Living Room 100. (SRJA 2014)
H-67. Chandelier in HS-03 Dining Room 102. (SRJA 2014)
H-68. HS-03 Living Room 100 Wall Scone that has since been removed. 1990. (Maintenance Department Files)
H-69. Art Deco Pendent Light in HS-04 Dormitory 112. (SRJA 2014)

H-70. Art Deco Wall Sconce HS-04 Bathroom 111. (SRJA 2014)
H-71. Light Fixture in HS-05 Room 103 (SRJA 2014)

Executive Summary

The Historic Housing Area of Wind Cave National Park contains six residences and three ancillary structures which were built between 1905 and 1938. Referred to as the study group in this report, the collection of buildings includes all of the housing facilities that were part of the Wind Cave National Park headquarters area during the first half of the 20th century. Together, they form a significant grouping of historic buildings which reflects a unified architectural design theme. This theme was established for the park as part of a master planning process which began in the late 1920s. The design theme was developed by the Landscape Architectural office of the National Park Service, which was located in San Francisco. The office was headed by landscape architect Thomas C. Vint, who has been widely recognized for his role in the creation of a comprehensive planning process for the National Park Service. Vint was personally involved in the development of the first master plan for Wind Cave National Park, which was published in 1931. He also appears to have developed the architectural theme for the individual buildings there, which features a combination of stucco and roughly dressed ashlar masonry that is unusual for national park architecture of the 1930s.

The purpose of the report is to provide a record of existing conditions and past alterations through field study, conditions assessments and archival research. The goal of this Historic Structures Report (HSR), as defined by the National Park Service (NPS) is to provide a document to guide the interpretation, rehabilitation and maintenance of the buildings. It is intended to serve as a guide for the long-term care of the buildings in the Historic Housing Area of Wind Cave National Park. Preservation objectives and treatment recommendations for the individual buildings are presented in their specific volumes. Archival research conducted for the report is intended to provide historical context and to support future maintenance and rehabilitation efforts. This is the first HSR to be conducted for these resources.

The Historic Housing Area is part of the “Administrative and Utility Area Historic District, Wind Cave National Park,” which was first listed in the National Register of Historic Places in 1984. Additional information and historic contexts were added to that nomination in 1995. The district was first listed for significance in the areas of architecture and conservation and the additional context recognized the area’s important association with the Civilian Conservation Corps (CCC) and other federal works programs. The period of significance for this Historic Structures Report begins in 1928, with the initiation of the master planning process for the park, and ends in 1942, when the CCC camp at Wind Cave National Park was officially abandoned.

The buildings within the area were all built or brought to their current form between 1931 and 1938. The oldest building in the group is HS-04, which was built ca. 1905 to serve as the first park superintendent’s residence. In 1935 and 1936, that building saw substantial interior and exterior renovations aimed to follow the design theme established by the National Park Service. The first building constructed that aligned with the new design theme was HS-13, a modest utilitarian building which housed the park’s first electrical generation equipment.

Although eight of the nine buildings in the study group were built before the Civilian Conservation Corps established a camp at the park in 1934, the CCC had a significant impact upon the housing area. CCC crews supplied labor for numerous improvements to the site and buildings. Examples of work completed by the CCC include moving and remodeling HS-05, a 1924 rangers' cabin, remodeling HS-04, and adding basements to many of the residences. The crews also transplanted hundreds of native trees and shrubs around the headquarters area and altered stone retaining walls. The buildings of the study group constituted all of the residential facilities in the headquarters area until the 1960s, when a second housing area was developed in the former site of the CCC camp. The historic housing group continues to serve a much as it did during the period of significance with the exception of HS-04, which serves as an office.

The buildings in the study group are collectively in good overall condition, due to the active maintenance by the park staff. The existing conditions for each structure were reviewed on the interior and exterior. Based on this review, Immediate and Long Term Treatment Recommendations were compiled. Both the Immediate and Long Term Treatment Recommendations focus on *Rehabilitation* as the preferred treatment alternative. Rehabilitation was selected in order to allow for the sensitive renovation of the buildings, while allowing for the ability to install modern conveniences and amenities, including the selection of potential substitute materials for exterior and interior finishes.

The exterior of the buildings in the Historic Housing Area were well documented during and after construction. Historic drawings are available for each of these buildings, in some capacity, except for HS-12. These drawings clearly indicate the original design intent for the buildings and help guide future treatment recommendations for the reconstruction or restoration of missing character defining features. The interiors of the buildings were not well documented and photographs of the interiors from the period of significance have not been located.

The buildings continue to serve their original functions, as residences, garages and storage, with the exception of HS-04, which is now park offices. Even with the office function, the building retains its residential scale, form and overall character. The continued use of the historic buildings requires that they are well maintained and regularly renovated to provide modern conveniences. For HS-04, this includes upgrades required for office occupancy, including emergency egress, heating, ventilation and cooling and accommodations to meet the Americans with Disability Act (ADA) requirements.

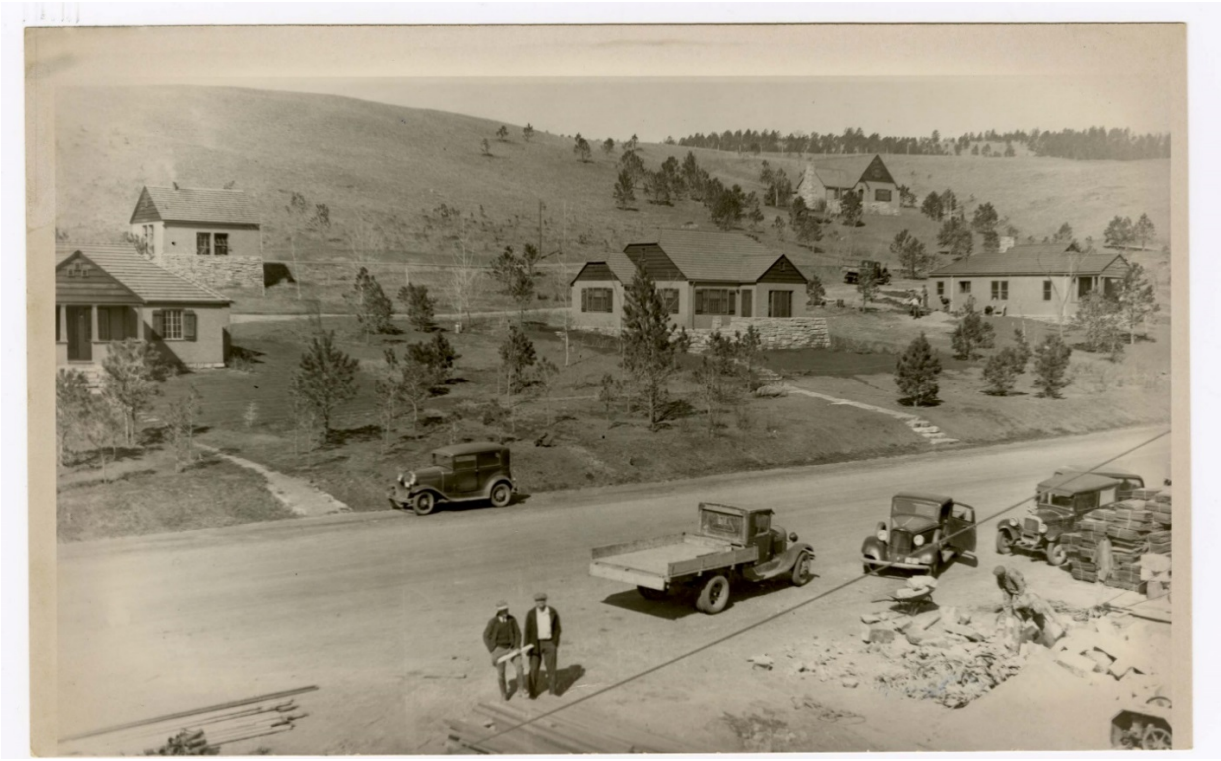


Figure 1. Photo of the housing area taken ca. 1935, looking west. (WICA 8754)

Episode Summary

Site History

Long revered by Native Americans, Wind Cave became known to Euro-American settlers in the region around 1881, and it soon became a local tourist attraction. Promotion and development of the cave led to squabbles among various early promoters, and in 1899 the Government Land Office decided that all affiliated homestead and mining claims should be denied and that Wind Cave should be “held in reserve as a public resort."[1] That action initiated a successful campaign to have the property designated as a National Park. No buildings that were constructed during this time period have survived.

Episodes have been established to help define important periods of development and to establish a Period of Significance for the Historic Housing Area.

Episode 1. Early Operations: 1903-1927

The legislation which created Wind Cave National Park was signed into law January 9, 1903 by President Theodore Roosevelt, a full thirteen years before the National Park Service was

[1] Karsmizki, Kenneth W. 1995, “Wind Cave National Park Administrative and Utility Area Historic District.” National Register of Historic Places, E.5.

established.[2] Early administrators utilized buildings that were on the site when the government took control of the property in 1900, and only a few new buildings were constructed during the time period. Two of the existing buildings, HS-04 and HS-05, were constructed during this time period, and both of those have since been greatly altered.

Episode 2. Cooperative Design and Development: 1928-1942
This is also the Period of Significance. The episode was characterized by a close working relationship between park staff and the Landscape Division of the National Park Service. All of the buildings in this study group were built or brought to their current form and location during this time period. Several of the construction projects utilized Civilian Conservation Corps (CCC) labor, and much of the original landscaping was done by CCC crews.

Episode 3. Working Housing: 1943-1983
Few major additions or alterations occurred to the study group during this episode. In 1951, incoming superintendent Earl M. Semingsen set a goal to upgrade all buildings and utilities over the next five years. As a result of that program, most of the houses were insulated, some windows were changed, and most of the roofs were changed from wood to asphalt.

Episode 4. Historic Housing: 1984-2015
The buildings of the study group were listed in the National Register of Historic Places in 1984, and officially designated as “historical buildings” in park files in 1986. External changes during this period were minimal, but all buildings saw routine interior updates. All were also tested for hazardous materials, and most were treated for lead based paint mitigation in the 1990s.

[2] Long, Barbara Beving, “Wind Cave National Park: Historic Contexts and National Register Guidelines“. National Park Service, 1992, 4/25.

Current Designation	Original Name	Completion Date	Major Alterations	Builder
HS-03 Superintendent's Residence	Superintendent's Residence	1934		Hot Springs Lumber Co.
HS-04 Fire Office	Superintendent's Residence	ca. 1905	1918, Two room addition; 1936-1937, Converted to a Rangers Dormitory.	CCC did much of the remodeling work.
HS-05 Quarters	Ranger's Cabin	1924	1935, Moved to current site and expanded.	1924, Laurence Henry Kaudy. CCC did some of the work in 1935.
HS-06 Quarters	Employee's Residence	1934		Hot Springs Lumber Co.
HS-07 Quarters	Employee's Residence	1932		Not found
HS-08 Quarters	Employee's Residence	1931	1936, Converted from dormitory to a residence.	W. A. Kepp Construction Co.
HS-11 Upper Garage	Machine Shop Shed	1934		Hot Springs Lumber Co.
HS-12 Old Fire Cache	Fire House	1938		CCC
HS-13 Window House	Power House	1931		Not found

All Administration Center Buildings, In Order of Construction
Per plan dates, and Annual Superintendent Reports.

HS#	Date Completed	Drawn by/Designed By
1. HS-04	ca. 1905; Remodeled 1935-36	1905 unknown/1935-36 G. W. H.
2. HS-05	1924; Moved 1935	1924 "Ready-cut" kit 1935 Kerr? (illegible signature)
3. HS-13	June,1931	J. H. G.
4. HS-08	September,1931	J. H. G.
5. HS-07	February,1932	H. W. B. (probably Howard W. Baker)
6. HS-03	August,1934	R. W. A.
7. HS-06	August,1934	R. W. A.
8. HS-11	August,1934	R. W. A.
9. HS-01*	1935	Not researched
10. HS-02*	1936-38	Not researched
10. HS-12	1938	Not found

* Not part of this study

Figure 2. Charts of building names and construction dates.

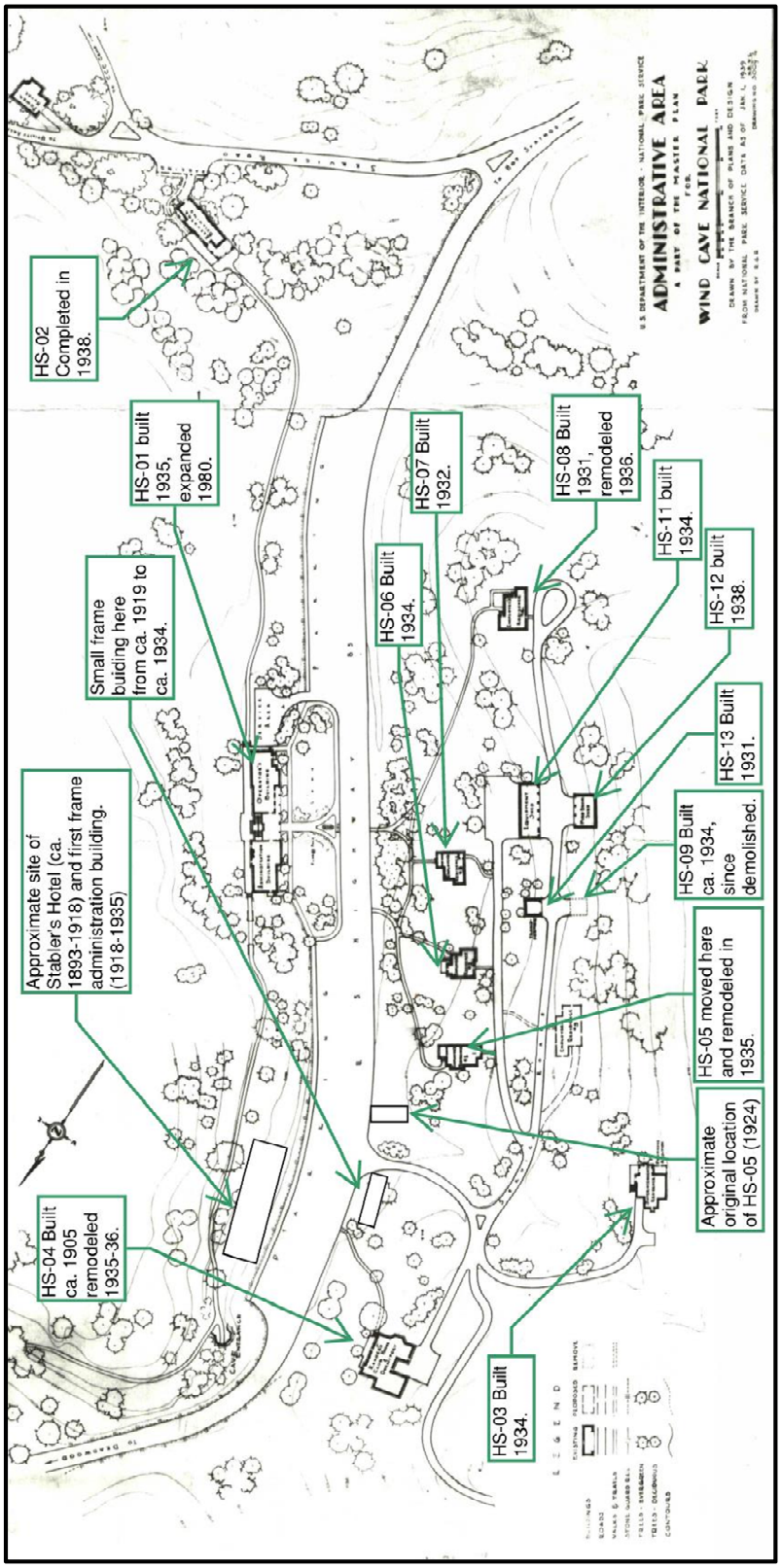


Figure 3. 1939 Site Plan, with Construction Dates and Current Numbers. (Base Map from the 1940 master plan, on file at Wind Cave National Park)

Project Team Members and Methodology

The Historic Structures Report team for the Historic Housing Area consisted of the following:

Project Manager and Preservation Architect

Susan Richards Johnson Associates, Inc. (SRJA), Kansas City, Missouri

SRJA served as the Project Manager and Preservation Architect for the Historic Structures Report, prepared as-built architectural recordation drawings, performed existing conditions analysis and provided treatment recommendations related to the individual buildings.

Architectural Historian

Deb Sheals (DS), Columbia, Missouri

Deb Sheals was the Lead Historian, assisted by Andrea Herries. Research for this project focused upon identifying construction dates, builders and architects, and identifying how the development of the Historic Housing Area of Wind Cave National Park reflected larger historic trends.

Structural Engineer

Structural Engineering Associates, Inc. (SEA), Kansas City, Missouri

SEA provided structural engineering services related to the existing conditions analysis and provided treatment repairs and recommendations for the individual buildings.

Mechanical, Electrical & Plumbing Engineering (MEP)

Henderson Engineers, Inc. (HEI), Lenexa, Kansas

HEI provided HVAC, plumbing and electrical engineering services related to the existing conditions analysis and provided treatment recommendations for Historic Structures 3, 4, 5, 6, 7 and 8.

Cost Estimating

Construction Management Resources (CMR), Mission, Kansas

CMR provided independent Class C cost estimating services for the proposed immediate and long term treatment recommendations.

Historic Materials Analysis and Testing

Ron Koenig with Building Arts Conservation, LLC from Saline, Michigan was contracted to provide paint analysis for the historic buildings. Mortar and stucco samples were analyzed by Peter Ellison with Ellison Conservation from Canandaigua, New York. Wood species identification was done by Regis Miller, Ph.D. from Madison, Wisconsin.

Research and Investigation Methodology & Review Standards

Research for this project was facilitated by a wealth of available primary and secondary materials. The most helpful primary materials were found in the park library and archives, building files in the park maintenance department, and at National Archives repositories in Kansas City and College Park, Maryland (Washington, D.C. area) Files at the local library and the county historical society were also consulted. Secondary sources included a number of reports on park-specific research projects that were sponsored by the park and/or the National Park Service, as well as published works on a variety of topics.

The museum collections of Wind Cave National Park (WICA) offer an abundance of primary material about the creation and ongoing operation of the park. Sources on file at the park include bound collections of early annual and monthly superintendent's reports, other early reports, and several archival boxes of historical files.[3] Research for this project included reviewing all annual superintendent's reports written between 1907 and 1961, all monthly reports filed between 1929 and 1940, as well as a more general review of information in the historical files and in the park archives. Additional information was provided by a large collection of photocopied information prepared by Mark David Spence for "Passages Through Many Worlds: Historic Resource Study of Wind Cave National Park." (Omaha, NE: Midwest Regional Office, National Park Service, 2011.) Much of the information compiled by Spence appears to have been obtained in the WICA library; some may also have come from the National Archives and other repositories. WICA maintenance department records, some of which are filed in folders created in the 1940s, were found to contain a wealth of information about the buildings of the study group, including summary lists of all changes made from the 1940s to the present.

The WICA museum collection also contains more than 5,300 digital photograph files. The well-organized photograph files are keyed to the WICA museum database, which contains basic information about each of the images. Relevant information from the museum database was also provided as an excel file, which was imported into FileMaker Pro software to facilitate additional research and analysis. All 5,305 photograph files were reviewed for this study, and just over 350 photograph files were found to contain information directly related to the Historic Housing Area. A group of 58 photograph files were added to the FileMaker file, which created an easily searchable database of image files. Those files include both front and back views of individual photographs. The photograph appendixes for each volume of this report were created from the FileMaker database; more than 110 historic photo pages have been included in the appendixes.

Additional primary information was obtained from National Park Service files and from two branches of the National Archives. National Park Service files included digital files of early or original architectural drawings for all except one of the study properties. (No historic plans were found for HS-12.) Copies of the plans have been included as appendixes for this report.

[3] See the bibliography for full citations of all sources consulted for this project.

Records on file at the National Archives included field reports from National Park Service staff members who visited the park during the period of significance, as well as copies of reports that were sent from WICA to the Director of the National Park Service during the period of significance. Although most of the records reviewed at the Kansas City branch of the National Archives were duplications of information already on file at the WICA library, the National Archives II in College Park, Maryland were much more diverse. The most notable finds at the College Park facility included an extensive collection of original hand-colored architectural renderings for WICA master plans that were issued between 1931 and 1938.[4]

Historical context and more information about park operations over the years was supplied by a number of previous studies and published works. The most informative of those include "75 Years at Wind Cave: A History of the National Park," written by John W. Bohi in 1961, and Kenneth W. Karsmizki's 1990s National Register nominations, "Wind Cave National Park Multiple Property Submission," and "Wind Cave National Park Administrative and Utility Area Historic District." The National Register nominations were accepted by the National Register of Historic Places in 1995. The headquarters area was originally listed in the National Register in 1984; that brief early nomination laid the groundwork for the much more extensive 1990s addition, as did Barbara Beving Long's, "Wind Cave National Park: Historic Contexts and National Register Guidelines," which was written in 1992. Other National Park Service-sponsored reports of use included a Cultural Landscape Report completed in 2005, a Historic Structure Report for the former CCC Officer's Quarters dated 2008, and the above-mentioned Historic Resources Study by Mark Spence, which was completed in 2011.

Published works of a more general nature assisted with overall context. Linda McClelland's 1998 book titled *Building the National Parks: Historic Landscape Design and Construction*, provided invaluable insight into the early workings of the National Park Service and the important role the San Francisco field office played in the development of the Wind Cave and many other national parks. Ethan Carr's 1998 *Wilderness by Design: Landscape Architecture and the National Park Service*, was also helpful in that regard.

In all, thousands of pages of text, and images have been reviewed for this study. A detailed timeline was developed as the work progressed to help place each event into its proper place in history, to identify conflicting information and to tie sometimes vague statements to the specific buildings of the study group. On-site study and photography of the buildings took place in November of 2014.

This report is based upon a combination of field study, data analysis and archival research, conducted by a multi-disciplinary project team. The work was guided by Preservation Brief #43: The Preparation and Use of Historic Structure Reports and Historic Structure Reports & Preservation Plans: A Preparation Guide. All recommendations included in the report have been developed in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

[4] Scans of selected master plan pages are included in an appendix for Volume One of this report.

Building Code / Life Safety / Accessibility / Preservation Standards

The building was reviewed utilizing the following standards:

- Architectural Barriers Act Accessibility Standards (ABAAS)
- International Building Code 20012 – (IBC)
- International Existing Building Code 2012– (IEBC)
- International Mechanical Code 2012 (IMC)
- International Plumbing Code 2012 (IPC)
- National Electrical Code 2012 (NEC)
- National Fire Protection (NFPA)
    - Standard for the Installation of Sprinkler Systems 2007 (NFPA 13)
    - National Fire Alarm and Signaling Code 2007 (NFPA 72)
    - Life Safety Code 2006 (NFPA 101)
    - Standard for the Installation of Lightning Protection Systems 2008 (NFPA 780)
- Preservation Brief #43; The Preparation and Use of Historic Structure Reports
- Preservation Brief #47; Maintaining the Exteriors of Small and Medium Size Historic Buildings
- The Secretary of the Interior's Standards for the Treatment of Historic Properties
- The Secretary of the Interior's Standards for Rehabilitation

Report Organization

The Historic Housing Area Historic Structures Report (HSR) addresses a total of nine buildings. While these buildings have a collective history and context, each of them is unique, with its own history and building evolution. Therefore, the HSR has been divided into individual volumes to address the overall history and context and an individual volume for each building. Volume I includes the overall history and development of the Historic Housing Area at Wind Cave National Park and an analysis of the historic building materials that were used on each of the buildings. The purpose of the individual volumes is to provide a compilation of the relevant history, historic photographs, drawings, assessment, recommendations and cost estimates for each building in one location.

Throughout the report, the terms 'original' and 'modern' are utilized in reference to materials, architectural fabric, or room layout. 'Original' refers to materials or features which are thought to have been added during Episode 1 or Episode 2. Items referencing the period of significance date to renovations which occurred during Episode 2 from 1928-1942. 'Modern' refers to materials and/or alterations made within the last fifty years. The term 'study group' is also used in many places, to refer collectively to the group of buildings covered by this study.

Acknowledgements

The Historic Housing Area Historic Structures Report team is grateful for the support and knowledge of Wind Cave National Park Staff. They assisted in understanding the history and maintenance of the housing area and provided assistance with the archives collections. The staff offered guidance for the maintenance immediate and long term treatment recommendations for the individual properties. Many thanks to the following staff members: Vidal Davila, Superintendent; Tom Farrell, Chief of Interpretation; Randall Weiss, Museum Technician; Doug Crossen, Facility Manager; Mark Greene, General Supervisory Forman; and Karri Fischer, Administrative Officer/Housing Manager.



Wind Cave National Park 1936, Jan 21. (WICA Museum Collection #WICA 4341)

History and Context

History and Context

Site History

Located in the Black Hills of South Dakota, Wind Cave developed within a limestone plateau of an antiquated geological system.[5] It is a large cave system, identified as the sixth longest system in the world in 2015, and is still under exploration and mapping.[6] The cave is valued for not only its size but also its unique calcite crystal formations. Wind Cave lies below a surface topography formed by ancient upheavals of the ground and then reshaped by rivers and winds over hundreds of thousands of years. The area is diverse and supports grass plains, forests, thermal springs and a wide diversity of plants and animals, including elk, pronghorn, prairie dog, deer and bison.

Wind Cave and the Black Hills are sacred to the Lakota People.[7] Indigenous lore tells of the reverence given to Wind Cave by Native Americans, and archeological data reveals that these same Peoples also occupied the area for use of the hot springs, found in current day Hot Springs, South Dakota.[8] Although many different indigenous peoples were attracted to the Black Hills over time, by the mid-1600s the Lakota had become the predominant Native American Peoples who occupied the area.[9] They used the land around Wind Cave for seasonal hunting, and visited the hot springs into the 1870s, when the discovery of gold nearby brought a flood of Euro-American settlers to what is now Custer County.[10]

Over a few years in the early 1870s, the nearby town of Custer City became home to some 11,000 white prospectors, and by 1877 the Lakota were forced to cede their land in the Black Hills to the U. S. Government.[11] The gold rush in Custer County proved to be short-lived—news of richer strikes to the north shifted mining activities to the town of Deadwood in 1876, and the gold rush in Custer County faded almost as quickly as it had begun. Cattle ranching, however, proved to be more enduring, and the region around Wind Cave saw a steady stream of settlement throughout the 1870s and 1880s.[12] The advent of railroad service to nearby towns such as Buffalo Gap and Minnekahta supported the cattle industry and attracted new residents to the southeast Black Hills.

Homesteaders began to lay claim to land around Wind Cave and the thermal hot springs, and in 1882 the town of Hot Springs was established approximately ten miles south of Wind Cave.

[5] Mark D. Spence, “Passages Through Many Worlds: Historic Resource Study of Wind Cave National Park,” (Omaha, NE: Midwest Regional Office, National Park Service, 2011), 19-20, 22. Detailed geological formation and identification of the Wind Cave area is outlined in this report.
[6] “World’s Longest Caves,” accessed 7-9-2015 http://www.caverbob.com/wlong.htm.
[7] Spence, 12, 16, 81-99.
[8] Long, 2/4; Spence, 12, 16.
[9] Long, 2/4; Spence, 81-99.
[10] Long, 2/4.
[11] Long, 2/4; Spence, 81-99, 133.
[12] Long 2/6, 2/7. Long recorded several ranches that were located within the current boundaries of Wind Cave National Park; Spence 129-131.

Promotion and development of the thermal baths in the new town helped tourism become a vital part of the Hot Springs economy in the 1880s and 1890s.[13]

It was during this period that Wind Cave was rediscovered. Although the exact date the cave was found varies somewhat depending on the historical account, ranch-hands, and brothers, Jesse and Tom Bingham are commonly credited with rediscovering the cave opening north of Hot Springs in 1881.[14] Jesse Bingham is said to have followed a wounded deer up a ravine when he heard a loud whistling noise and observed “grass waving violently on an otherwise calm and windless day.”[15] Jesse found that a strong wind was blowing from a hole approximately eight by ten inches in diameter. The wind is said to have been so strong that it blew the hat off of his head when he tried to see inside the hole. When he tried to replicate the “hat trick” during a later visit, he was surprised to find that the wind was blowing into the hole instead of out, and according to one description, the hat was sucked into the hole “never to be seen again.”[16] The reversal and velocity of air flow into and out of the cave was caused by changes in the barometric pressure and the grand size of the cave, hence the name Wind Cave.

Throughout the 1880s independent parties, comprised of residents from Custer and Hot Springs, began to explore the cave. As knowledge of the cave increased among local residents, it was mentioned in several Hot Springs newspapers, and at least one tourist booklet.[17] In July of 1886 a Custer newspaper reported that a large party of thirty to forty people traveled to the cave for a couple days of exploration.[18] By the late 1880s it was well known in the area and began to emerge as a tourist attraction for the nearby towns of Hot Springs and Custer. Paid tours of the cave began in 1890, along with a ten year fight for ownership which eventually led to reclamation of the land for settlement by the U. S. Government and the creation of Wind Cave National Park.

McDonalds and Stablers, Managers of Wind Cave

One of the first men to view Wind Cave as a potentially valuable tourist attraction was Jesse D. McDonald, who was hired to manage the property in 1890. The first substantial legal claim to control the cave came in the form of mining rights, which were granted to O. F. Day in 1890. Day almost immediately sold the rights to John C. Moss, president of the South Dakota Mining Company, and Moss hired Jesse D. McDonald in 1890.[19] Although McDonald was hired to supervise construction and mine assessment in the cave he soon realized that Wind Cave’s

[13] Spence, 161. See Figure 84 for location of homesteads once located within the current boundaries of Wind Cave National Park.
[14] John Bohi, "Seventy-Five Years at Wind Cave: A History of the National Park," in *South Dakota Historical Collections* (Pierre: South Dakota Historical Society, 1962), 1-2. Bohi notes that multiple interviews differ on the date and the name of the first white person to find the cave. Those dates are listed between 1880 and 1884; Spence, 138.
[15] Bohi, 1-2; Spence, 138.
[16] Bohi, 2.
[17] Bohi, 5; Spence, 187.
[18] Bohi, 3-4, 7-8.
[19] Bohi, 6; Long, 3/14; Spence, 188.

value was not in mining but in the formations and wonders in the cave and he began promoting it as a tourist attraction.[20]

Relatively soon after assuming management of the cave McDonald blasted a larger opening, not far from the original small hole that the Bingham brothers had discovered, and built a log house directly over the entrance. He lived in the one and one-half story log building with his two teenage sons, Alvin and Elmer, while they managed the cave.[21] Their work entailed exploring the cave but also adding ropes, stairs, setting trails and enlarging passages within the cave, often through blasting.[22]

Jesse McDonald hoped to attract tourists to the cave by regularly promoting the cave in the local Hot Springs newspaper. [23] On an annual basis he invited newspaper editors to visit the cave to see its wonders and also advertised that he was going to place specimens on display at the Corn Palace of the 1891 Ottumwa, Iowa exposition.[24] During his visits to the offices of the *Hot Springs Star* he would report on discoveries of new rooms and passages, describe or often bring in formations chipped out of the cave, and list what improvements had been made for ease of access into the cave for tourists.

Improvements to the cave took time and usually occurred over the winter months. In the beginning, as early as 1891 and 1892, ropes and ladders were used throughout the cave, rather than stairs, and visitors where guided along one of three routes in the cave; the Garden of Eden, the Fairgrounds and the Pearly Gates. Each route traveled through different rooms that had been named by the guides and tourists alike.[25] All visitors who toured the cave wore overalls and carried lanterns while traversing over the rough terrain. The guides burned magnesium ribbon as an extra light source while leading tours which lasted for hours.[26]

By 1893 significant improvements had been made to the tour routes. Visitors no longer needed to change clothes, and passages had been enlarged to a point where the need to crawl through tight spots was limited. The Garden of Eden route had been extended to an estimated and inflated 8 miles and passed through 75 chambers.[27]

Articles written by the newspaper reporters who toured the cave offer the most detailed explanations of the wonders of the cave and what the tours entailed. One article, dated August 22, 1890, tried to describe some of the boxwork formations distinctive to Wind Cave.

[20] Spence, 190.
[21] Bohi, 9-10; Spence, 181, 190.
[22] Bohi, 10
[23] Wind Cave National Park vertical files," Wind Cave Development and Newspapers." Sue Burden compiled articles concerning the cave from the Hot Spring Star in 1981 for the 100th anniversary of the discovery of the cave. The articles where retyped by seasonal employees and are presented in one large collection. The articles date to the 1890s.
[24] Long, 3/12; Spence, 190. The first article appeared in the Hot Springs Star on June 16, 1890.
[25] Accounts of cave exploration and tours given by Catherine Stabler are reprinted in Bohi's work. Catherine Stabler was the daughter of John Stabler, who entered into management of the cave with Jesse McDonald in 1881; Bohi, 26-28. Room discovery and routes where also recorded by Alvin McDonald.
[26] Bohi, 18, 28.
[27] Bohi, 15.

> But here we must move on to the next place of particular interest, known as the 'Post Office.' Here are sights that no mind can imagine, or tongue describe, but to know you must see….The room is called the Post Office owing to the formations covering the ceiling and parts of the walls, very much resembling honey comb, in structure, which are called 'boxes.' These boxes are cells of a beautiful, thin brown rocky substance…[28]

Another article, dated September 30, 1892, described a passage that had been opened and not yet written about in detail - the Coliseum Route. The visitor described "delicate" yellow and pink quartz formations, frost trees, crystalized popcorn along the ceilings and walls, "various colors of pink, venetian red predominating, with pure white interspersed", "stalactites, stalagmites, and pillars…of a beautiful yellowish brown water formation which gives it the appearance of a frozen waterfall."[29] The shorter articles may have tried to adequately describe formations brought into the newspaper office by Jesse McDonald, giving some detail to the rock, but usually the excerpts where filed with notes such as "This morning as fine a box of specimens as ever came from that wonderland was brought to the Star office."[30] Whether a lengthy article or short excerpt, the descriptors redundantly used, such as beautiful, wonderful, wonderful curiosity, unbelievable surprise, glimmer, novel, principal beauties, mineralogical wonder, etc. seemed to fall short of the fantastic geological formations which entranced readers and visitors.



Figure 4. Early Cave Visitors. (WICA 566)

[28] Wind Cave National Park vertical files," Wind Cave Development and Newspapers." 1-2
[29] Wind Cave National Park vertical files," Wind Cave Development and Newspapers." See article dated September 30, 1892, "The Wonders of Wind Cave."
[30] Wind Cave National Park vertical files," Wind Cave Development and Newspapers." See article dated December 26, 1890.

McDonald's efforts met with notable success. An estimated 900 tourists visited the cave in 1890 and as many as 1,500 went through in 1891.[31] Tourists traveled the ten miles north from Hot Springs via horse drawn wagons and paid $.50 to tour the cave. They also had an opportunity to purchase formation specimens extracted from the cave. A handbill created by McDonald listed boxwork, popcorn formations and different types of geodes, and McDonald and his son Alvin sold specimens at the 1893 World's Columbian Exposition in Chicago.[32]

Beginning in the summer of 1892, revenue from cave tour operations and specimen sales was bolstered by the service of meals and lodging. John C. Stabler, a man who had moved to Hot Springs in 1881 to manage the Parrott Hotel, found Wind Cave to be a fascinating place and purchased a share of the cave from McDonald in early 1892. Together the two men formed the Wonderful Wind Cave Improvement Company, and in May of that year Stabler began the construction of a two story 22 'x 32' frame hotel not far from the McDonald's cabin. (Figure 5) By June of 1892 the hotel was open for business.[33] Stabler and his family managed the hotel, children from both families led tours, and together they promoted the cave with a variety of techniques including continued newspaper coverage, establishing a post office at the site and arranging gimmicks such as placing a "petrified man" in the cave.[34]



Figure 5. Stabler Hotel, ca. 1895. (WICA 682)

[31] Long, 3/12-3/13.
[32] Long, 3/13.
[33] Long, 3/12. George H. Bront, son Charles Stabler, and M.V.B Osmer are also listed as partners in the business.
[34] Long, 3/12; Spence 195.

During the beginning years that the McDonald and the Stabler families managed the cave, Jesse McDonald's 17 year old son, Alvin McDonald, spent hundreds of hours exploring and working in the cave. He quickly developed a passion for the cave and began to journal his trips and discoveries on January 1, 1891, tallying over 250 hours by the end of March of that year.[35] His detailed records and sketches are considered to be the foremost authority for early mapping, room and formation identification. In the spirit of early conservation he valued the cave, recording in the diaries and reporting to visitors that he would cover delicate formations before blasting, extract specimens from passages and rooms off the main tour trail and expressed anger and dismay when specific formations had been broken off by visitors.[36] Alvin's last journal entry dates from October 20, 1893. He spent just shy of three years exploring the cave, which ended due to contraction of typhoid fever and his eventual death on December 15, 1893, at the age of twenty years old.[37]

By the time of Alvin's death, Wind Cave was an established tourist attraction and tourism for cave exploration was a growing industry in the nation, including the town of Hot Springs. Historian Mark Spence eloquently expresses the sentiment of the time.

> For Americans in the late nineteenth-century, a tour of Wind Cave also evoked associations of discovery… the ancient passage underground was new and little known, and taking a trip into the cave offered a chance to feel like a kind of subterranean Columbus. Discovery was something of a national conceit, especially in the early 1890s when the United States celebrated the 400th anniversary of Columbus' first voyage to the Americas. Yet Wind Cave promised something more than a sensation of discovery… appealed to another national conceit; namely, the propensity to boast about the biggest, tallest, longest, deepest, and greatest places or achievements. In this way, Wind Cave was a kind of underground natural monument for a nation of great destiny.[38]

Undermining Private Ownership

In the late 1890s, while the McDonalds and Stablers where enthusiastically developing and promoting tourism of the cave through the Wonderful Wind Cave Improvement Company, issues of legal ownership of the land, cave and mining rights began to arise from several different sources.

[35] "Alvin McDonald Diary," NPS, accessed 7-7-2015 http://www.nps.gov/wica/learn/historyculture/alvin-mcdonald-diary.htm; Spence,193; Bohi, 9. Alvin McDonald is also referred to as Alvah in some early records.
[36] "Alvin McDonald Diary," NPS, accessed 7-7-2015 http://www.nps.gov/wica/learn/historyculture/alvin-mcdonald-diary.htm; Bohi, 9-19. Accounts of Alvin's diaries appear in multiple sources. Accounts of the days and time spent on trips into the cave, including passage mapping, room identification and formations, along with names of brothers and friends that may have helped push passages are recorded. Long, 3/13. Contrary to current NPS regulation and general attitudes, sales of specimens was a common occurrence and little, if any disapproval, existed during the late 1800s.
[37] Bohi, 19; Spence, 212.
[38] Spence 2011, 196.

John C. Moss, of the South Dakota Mining Company was aware of Jesse D. McDonald's public promotion and tourist business of the cave, although to what degree is questionable.[39] McDonald corresponded with Moss, sending reports of building construction and activity at the cave, but as early as the spring of 1891 tensions between the two parties began to grow.[40] Ownership of the mining rights were disputed and the Moss family began to legally try to secure a tighter rein on their holdings at Wind Cave. In August of 1891 Moss demanded McDonald send him monthly reports concerning the value of all mineral specimens McDonald was extracting from the cave. Jesse McDonald appeared to attempt to comply with demands from his employer, but remained committed to his intentions of developing the cave for tourism and profiting from selling cave artifacts. Relations between the two men continued to decline and each maintained their own ideas of the future value of the cave. As one description of the dispute noted

> Moss essentially viewed McDonald as an embezzler, and that view would only harden over the next few years. McDonald apparently saw himself as the free-lance proprietor of a budding tourist attraction, and came to view Moss as an interloper rather than an employer. From McDonald's perspective, he was responsible to the South Dakota Mining Company for the supervision of a relatively small mining operation. Anything beyond that was a personal sideline, and he had no intention of halting his plans to develop the cave. He recognized that Wind Cave's potential lay within the context of Hot Springs' rapid development and tourism. Hitching his wagon to that future, McDonald clearly viewed his interests as more legitimate than any claims Moss might have on him or the cave.[41]

Legal disputes between the two men also involved Stabler and his family due to the joint ownership of the Wonderful Wind Cave Improvement Company. Matters were further complicated by the soon-to-be discovered fact that McDonald, at the time of property sale to Stabler, did not actually have proprietorship of the cave. Moss held ownership through the South Dakota Mining Company.[42] Official ownership became even more confused when the Moss family lost the mining rights to Peter J. Folsom, a surveying engineer that the Moss family had failed to pay for his services.[43]

In January of 1894, various members of the McDonald and Stabler families filed for land ownership under agricultural homesteading rights, in hopes of securing legal claims to the land around Wind Cave.[44] In time the McDonalds and Stablers entered into vicious fights, including physical fights, breaking and entering and public humiliation. They also became divided on legal sides, and John Stabler joined forces with Peter J. Folsom in 1897. In 1898 the continuing legal disputes resulted in the McDonalds being evicted from Wind Cave, and the creation of the Black Hills Wind Cave Company by Stabler and Folsom.[45] In an effort to permanently secure control of

[39] Spence, 198, 200.
[40] Bohi, 20-22.
[41] Spence, 201-201.
[42] Long, 3/15.
[43] Bohi, 34; Long, 3/14; Spence 209.
[44] Spence, 210.
[45] Long, 3/15.

the cave, Stabler and Folsom then made a business decision that counteracted their intensions and consequently resulted in the final legal decision to withdraw all holdings from any parties previously involved.

U.S. Government Involvement

In 1898, two geologists from U.S. Geological Survey (USGS) conducted a short survey of the cave and reported that they believed the cave was extensive and noted the unique boxwork found inside.[46] Their report did not mention the mineral value of the cave, but did comment on its unique beauty and interest enjoyed by "a large number of visitors", thus acknowledging its tourism potential.[47]

That same year, Stabler and Folsom hired their own surveyor, Lucius J. Boyd, who prepared a report solidifying the sentiments of the USGS, highlighting the beauty of the formations and the interest it would provide to the state and public, rather than the value of the minerals.[48] On April 18, 1898, the Stabler and Folsom proceedings continued, and they choose to submit Boyd's findings at a final hearing before the General Land Office (GLO). To their dismay, in July of 1899, a decision was handed down to remove mineral and land rights from all previous parties with a recommendation "that the land should revert back to the public domain and the cave be reserved by the government as a public resort."[49]

In December of 1899, special agent C. W. Greene from the GLO issued a report explaining the July decision to withdraw all previous private property claims.[50] The agricultural claims were disregarded because the land was deemed inadequate for cultivation and raising of livestock, and the mining rights because the claimants had failed to improve the cave for its mining potential (vs. tourist potential).[51] Although the agricultural and mining issues were cited as reasons to remove private ownership rights, it can be argued that what really laid at the heart of the matter was that the fact that the lengthy legal proceedings brought forth by the families over the majority of the 1890s had revealed to the state of South Dakota and the U.S. Government the natural beauties and resources of the cave.[52]

Creation of a National Park

Based on Greene's report, the Department of the Interior deemed the cave to be of "sufficient size and interest to be reserved as a national park."[53] Secretary of the Interior Ethan A. Hitchcock wrote to the General Land Office in January of 1900 requesting that the land around

[46] Long, 3/16.
[47] Long, 3/16.
[48] Long, 3/16. Lucius Boyd is listed a professor at the South Dakota School of Mines. His report did contain statements regarding potential valuable mineral deposits, but the physical beauty and unique formations highlighted served as the dominate information.
[49] Spence, 219.
[50] Bohi, 40-41.
[51] Long, 3/16 -3/17.
[52] Spence, 221-222.
[53] Bohi, 40-41

Wind Cave be temporary closed to settlement, entry and sale. Assistant Commissioner of the General Land Office, W.A. Richards agreed, and closed the lands that same month.[54]

One of the first suggestions to create a National Park at the cave appeared in the 1898 USGS survey conducted through the legal proceedings. There were also several local and national politicians who supported making the cave part of a public park.[55] Representative Eben W. Martin, who represented the Black Hills and served in Congress from 1901 to 1915, was a particularly strong advocate for the protection of Wind Cave, and he helped to keep it accessible to tourists during its temporary closing.[56] In 1901, at Martin's urging, Secretary of the Interior, Ethan A. Hitchcock, granted permission to keep the cave open and assigned C. W. Greene to oversee tour and management arrangements.[57] He in turn appointed sons of the McDonald and Stabler families to continue guiding tours, free of charge, due to their familiarity with the cave.[58]

In February of 1902, Martin suggested to the Secretary of the Interior that Wind Cave could be attached to the adjacent Black Hills Forest Reserve to provide protection until further investigation could be carried out to determine its eligibility as a National Park.[59] The General Land Office supported this recommendation and ordered another survey of the cave by their department. A report from the new survey was submitted to Secretary of the Interior, Ethan A. Hitchcock on May 24, 1902. Hitchcock concluded that it would take years to complete a full survey of the cave and that its remarkable formations needed immediate protection.[60] He choose to not submit a request to attach the land to the Black Hills Forest Reserve, but instead instructed Commissioner Binger Herman of the General Land Office to prepare a bill to establish a 10,522 acre National Park.[61]

In June of 1902, House Representatives Eban W. Martin of South Dakota and John F. Lacy of Iowa, along with Senator Robert J. Gamble of South Dakota sponsored the Bill to establish Wind Cave National Park.[62] A final vote passed on December 12 of that year and President Theodore Roosevelt signed the Bill on January 9, 1903, making Wind Cave National Park the eighth national park in the nation, and the first to protect a cave.[63]

[54] Bohi 51-52.
[55] Long, 3/17.
[56] Long, 4/24.
[57] Long, 4/24
[58] Long, 4/24. Tour guides where George Stabler (son of John), Elmer McDonald (son of Jesse D) and Peter T. Paulson (John Stabler's son-in-law).
[59] Spence, 230.
[60] "Past Secretaries of the Department of the Interior," accessed 24 March 2015 http://www.doi.gov/whoweare/past_secretaries.cfm; Spence, 231-232
[61] Bohi, 54; Spence, 232.
[62] Spence, 232.
[63] "National Park Service Anniversaries," NPS, accessed 7-9-2015 http://www.nps.gov/news/upload/NPS_Park-Anniversaries-2015-edition-02-2015.pdf.

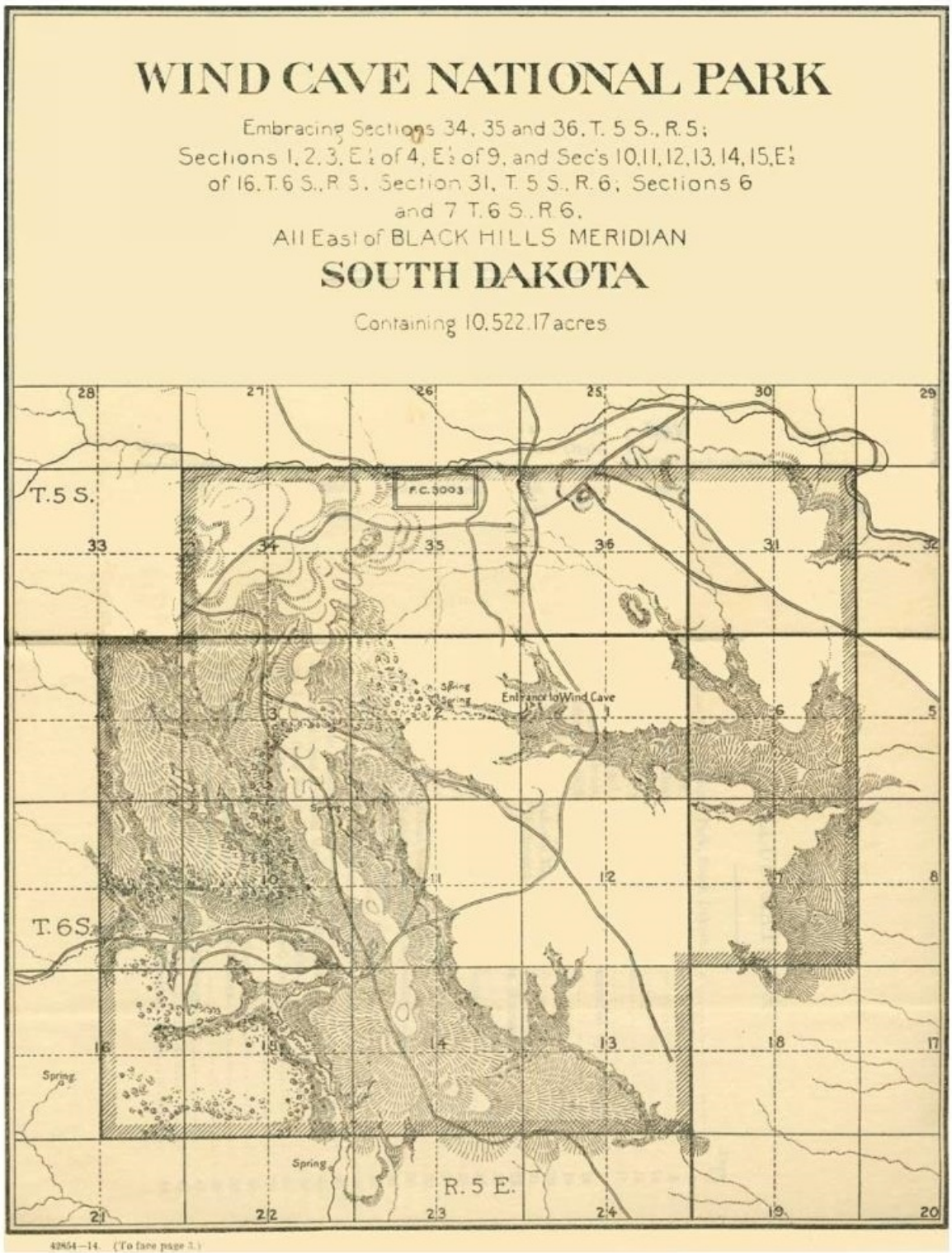


Figure 6. Map of the original boundaries of Wind Cave National Park. (Mark D. Spence, "Passages Through Many Worlds: Historic Resource Study of Wind Cave National Park," (Omaha, NE: Midwest Regional Office, National Park Service, 2011), 233, accessed Feb. 2015. http://www.nps.gov/wica/learn/historyculture/index.htm))

Episode 1. Early Operations: 1903-1929

The early years of operation at Wind Cave National Park were marked by slow growth and limited federal support. In December 1902, the property was put under the supervision of Captain Seth Bullock, who was supervisor of the Black Hills National Forest and he continued to oversee operations there until 1907 or 1908. Bullock served a largely supervisory role, with day to day operations being handled by the park superintendent.[64] During the initial ten years of the park's existence, the superintendent was the only full time permanent employee. The first superintendent of Wind Cave National Park was William A. Rankin, who was appointed to the post in August, 1903. Rankin's wife, Irene B. Rankin, became the food concessionaire the next year.[65]

The Rankins had few options for lodging when they arrived at the park in 1903. The property looked much as it had when it was under private control; the frame hotel built by Stabler and the log house the McDonalds had built over the cave entrance were still in service and there were few other buildings or improvements on the property. William Rankin's first annual report described the cave house as a "good, log house" but he found the hotel to be in poor shape, with only rough plank walls and interior partitions made of cheesecloth and building paper.[66] He also noted "water is the most difficult thing here…all water has to be hauled two and one-half miles."[67]

Construction of HS-04

The Rankins may have lived in the log cave house for the first several months they were at the park. Those living conditions likely encouraged Rankin to find a way to construct a suitable residence, even though funds were very limited, and no federal money had been specifically allocated for construction at the park. He was successful in that venture, and around 1905 a sturdy stone house was completed on the hillside across the road from the hotel. That stone house, which also served as the superintendent's office, survives at the core of what is now HS-04 (Figure 7).

The construction project was accomplished using local materials and a bit of creative bookkeeping, as described by another former superintendent many years later.

> An inspector came out from Washington in 1909 and was amazed to see the stone residence, since no appropriation had been made available. I think he left still wondering how it was built. The answer was; an appropriation of stone for bridge abutments furnished the stone, quarried on the park, and labor for road work and cave

[64] "Wind Cave National Park," Published Annual Report on National Parks in the Wind Cave Region, 1907. Copies on file at the WICA Library. (Hereafter referred to by year as NPS Report.)
[65] Spence, 234.
[66] 1903 Superintendents Annual Report as reprinted in Bohi, 61.
[67] Ibid.

improvements took care of the rest. It took figuring in those days even if the dollar was worth more.[68]



Figure 7. Photo of the park headquarters ca. 1906, looking west. Left to right: Stabler Hotel, Superintendent's Residence, Log Cave House. (Photo from the Hot Springs Public Library.)

Other modest improvements to the facilities followed, including a rudimentary water system to the new house, which supplied water at the modest rate of one gallon every seven minutes.[69] The Stabler hotel was razed in 1913, and the original McDonald log cave house was demolished soon after. Both were replaced with frame structures of approximately the same size.[70] A description of the buildings of the park which was published in 1914 noted that there was also a barn that had room for four horses, a small tool house/blacksmith shop, and an open pavilion for picnics and travelers.[71]

[68] Letter written to then-Superintendent Semingsen ca. 1953, by former superintendent Rufus J. Pilcher WICA Historical Files, Years of Growth 1931-1946, B2. F22.
[69] "Wind Cave National Park," Published Annual Report on National Parks in the Wind Cave Region, 1907. Copies on file at the WICA Library. (Referred to hereafter by years as "Federal Report".)
[70] 1914 WICA Annual Superintendent's Report, and "1914 Federal Report".
[71] "1914 Federal Report".

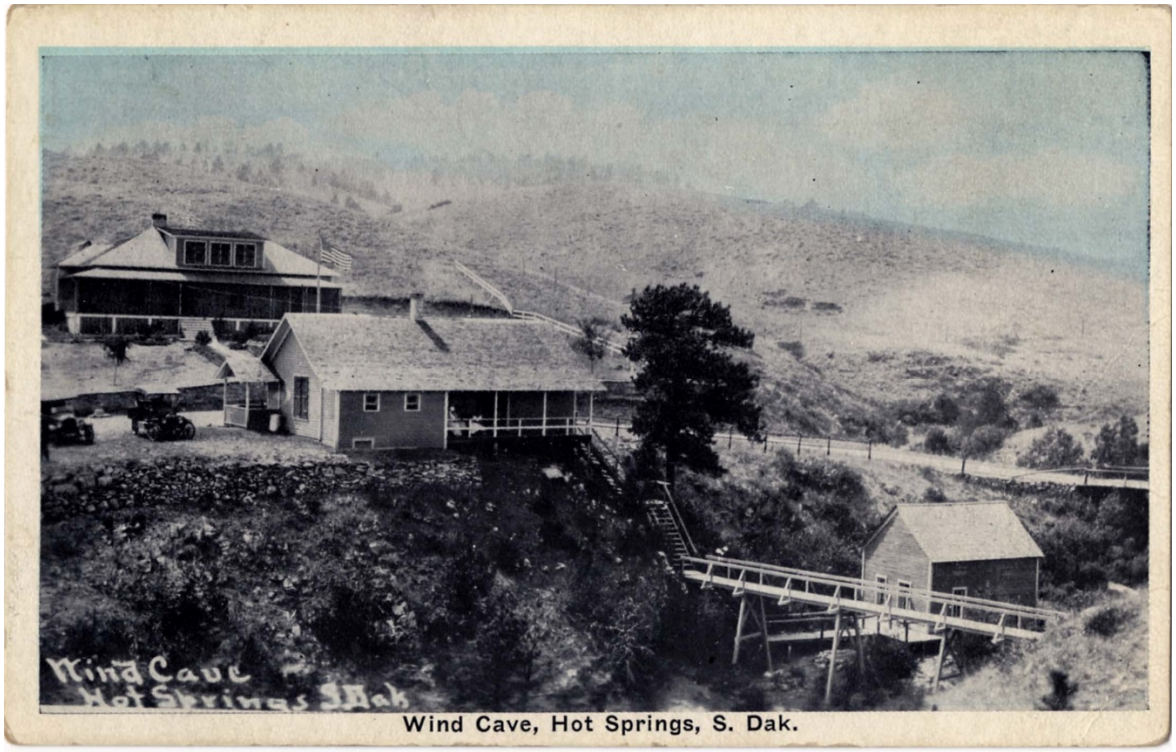


Figure 8. Park headquarters, with new frame cave house and administration building, looking west. (WICA 663)

Management of Wind Cave National Park and other national parks saw several changes in the 1910s. Wind Cave Superintendent Rankin left his post at Wind Cave in 1909, and over the next ten years the park saw what one history described as a "parade of inexperienced superintendents."[72]

In 1912, congress passed legislation to create a game preserve at Wind Cave National Park, an event that one historian described as being "probably the most important event in the first 25 years of the national park."[73] The creation of the game preserve, which included the introduction of small herd of buffalo, elk and antelope, created another reason for tourists to visit the park, and resulted in more visitors as well as increased federal funding.[74]

The most notable change at the national level was the creation of the National Park Service in 1916. Although the first national park in the country, Yellowstone, was created in 1872, the National Park Service did not come into existence for another forty-four years.[75] The Department of the Interior was in charge of all national parks before 1916, but there was no separate entity to manage them, and oversight and assistance were haphazard at best. Smaller parks like Wind Cave often received little funding or technical assistance. The Department of the

[72] Ibid.
[73] Bohi, 76.
[74] Karsmizki, Wind Cave MPS Cover Document, E.7.
[75] "National Park Service Anniversaries," NPS, accessed 7-9-2015 http://www.nps.gov/news/upload/NPS_Park-Anniversaries-2015-edition-02-2015.pdf.

Interior gradually developed a management program and began to add services to the smaller parks, including the creation of the position of "landscape engineer for the national parks" in 1914.[76] Finally, in 1916 legislation was passed to create the National Park Service (NPS) as a branch of the Department of the Interior.[77] By that time, there were twenty-two national monuments and seventeen National Parks.[78]

In 1915, Wind Cave was visited by Mark Daniels, landscape engineer for the NPS, who also served as the general superintendent of Yosemite National Park.[79] On June 11, 1915, Daniels visited the park and met with Thomas W. Brazell, who had become superintendent of the park in August of 1914. His report offers a firsthand description of the headquarters area and the work of the early park superintendents.

> I found the grounds around the Superintendent's headquarters in a most unsightly condition, and was very unfavorably impressed by the general appearance….As I walked about the place with Brazill [sic], my first impression of anger toward him for not keeping the place in order, gave way to quite the reverse feeling when I realized that the disorder was due to the fact that he was energetically repairing, remodeling and cleaning out the place. After I had spent a half-hour in this sort of investigation, I began to wonder what condition the place must have been in when he took charge. Of a new water line and reservoir, the inspector noted that Brazill [sic] was not able to complete the work within the allotted money; he is therefore doing most of it himself…the trench is not yet backfilled, which work will fall upon him personally.[80]

Annual reports filed by park superintendents in this time period show that the first early superintendents at Wind Cave not only had to do everything from creating budgets to digging ditches, they also had to share their homes with their employees. In 1918, two rooms and a bathroom were added to the stone superintendent's residence (HS-04), presumably to provide additional space for employees, who had no other options for lodging while working at the park. The annual report for 1920, prepared by then Superintendent Roy Brazell includes a request for more living quarters: "At present there are no quarters provided for employees and all of the help, laborers and temporary and permanent rangers must of necessity live at the superintendent's residence. For obvious reasons this is unsatisfactory and not conducive to efficient operation."[81] Brazell repeated his request for staff housing on an annual basis for the next several years, but it was not until 1924 before he and the NPS were able to agree upon a solution for the park's housing shortage.

[76] Linda Flint McClelland, Building the National Parks: Historic Landscape Design and Construction. (Baltimore: John Hopkins University Press, 1998) 123.
[77] Karsmizki, Wind Cave MPS Cover Document, E.7.
[78] McClelland, 123.
[79] McClelland, 123.
[80] Wind Cave National Park Historical Files: The Difficult Years 1914-1931, South Dakota: Wind Cave National Park Library, F REF 1914B1 #1-9, Box 1.F7 Inspection Report from Mark Daniels, General Superintendent and Landscape Engineer of National Parks.
[81] 1920 WICA Annual Superintendent's Report.

1924 Construction of HS-05

On March 17, 1924, Superintendent Roy W. Brazell wrote to Daniel Hull, then NPS Chief Landscape Engineer, that "At last I believe I have found a building suitable for our ranger cabin that can be built within our $1500 limitation." The letter included sketch plans and perspectives for two different floorplan options and noted

> Both of these buildings are of the 'ready cut and fitted' variety. As you know I have been planning on the construction of this house for more than a year and certainly have given it a lot of consideration…the ready cut variety is the solution to my present problem…all necessary material will be furnished" except for plaster lime and brick, which was to be procured locally.[82]

Brazell was probably planning to use prefabricated housing, which was extremely popular at the time. North American builders had access to mass-produced architectural plans as early as the 1870s, and by the first decade of the 20th century, those offerings had expanded to include full house "kits", which included everything from a full set of architectural drawings to the actual kitchen sink to put into the new house.[83] Brazell's use of the term "ready cut" indicates that he was familiar with the catalogues of the Aladdin Company of Bay City Michigan, which promoted the company's "Readi-Cut" houses. Aladdin was one of the first companies in the nation to offer what one historian called "full build-it-yourself-entirely services" with "complete houses that could be ordered by mail and shipped for on-the-spot assembly by amateurs."[84] Aladdin and other companies marketed their products though annual catalogues, and a review of Aladdin catalogues of the late 1910s and early 1920s shows that Aladdin offered several houses that had floorplans very similar to what Brazell had sketched (Figure 9).

Hull apparently granted permission to proceed with the project, as Brazell wrote in his annual report that even though no funds had been appropriated specifically for construction that year, he was able to build a small ranger cabin (Now HS-05.). He also noted that the number of visitors to the park had doubled in the past 5 years, and that the cabin would provide housing for the additional employees needed to handle the extra visitors.[85] A comparison of the plans submitted with the layout of the current building show that Brazell was able to build the plan he preferred, a six room house with three bedrooms and a bath. Brazell's letter to Hull also shows that he considered the location of the new house to be temporary, pending the creation of a development plan for the park

> In view of the fact that you have been unable to visit the park and plan a building program for us it is intended, with your approval, to erect this house near headquarters

[82] National Archives RG 79, Central Classified Files 1907-1949, Box 448. (National Archives II, College Park, MD.)
[83] Alan Gowans, The Comfortable House: North American Suburban Architecture 1890-1930, (Cambridge, MA 1897) 48.
[84] Gowans, 48.
[85] 1924 WICA Annual Superintendent's Report.

temporarily with a view to moving it to a permanent site after you have visited us and outlined a plan for us to follow for the balance of our building operations.[86]

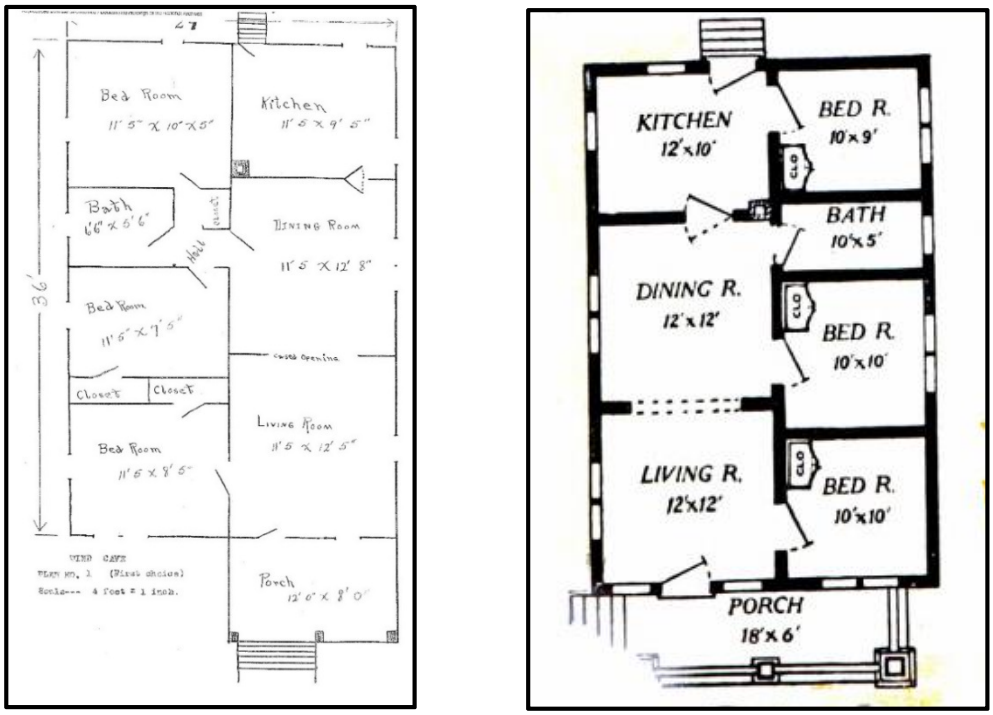


Figure 9. Left: 1924 sketch plan of the proposed house, by Roy Brazell. (National Archives RG79, Central Classified Files. 1907-1949, Box 448. National Archives II, College Park, MD.)
Right: Floorplan for the "Roseland" Model, Aladdin Readi-Cut Houses Catalog, (Bay City, Michigan: Aladdin Company,1920.) 30.

While Brazell was able to get the house he desired soon after that letter was written, it was not until the late 1920s before the NPS began work on a comprehensive development plan for Wind Cave National Park. In the meantime, the park was experiencing sharply increased numbers of visitors, and a growing staff. In 1927, more than 20,000 people went through the cave, and some 81,000 visited the park. Staff had increased to include four permanent employees—the superintendent, a game warden and two rangers.[87]

The note about the need for planning reflected a growing emphasis on long range planning at the federal level. At the annual park superintendent's conference of 1925, all National Park superintendents were directed to draw up five-year development plans for their parks.[88] At Wind Cave and other parks, the superintendents were assisted in those efforts by the landscape and engineering divisions of the NPS, who worked closely with them to help identify solutions to problems they had been dealing with and to develop plans for their parks.

[86] National Archives RG 79, Central Classified Files 1907-1949, Box 448. (National Archives II, College Park, MD.)
[87] Bohi, 92; Long Appendix B.1.
[88] McClelland, 291.

Correspondence files show that Wind Cave was visited by several NPS staff members in the late 1920s, including two visits by the engineering department in 1927. In September 1927, acting Chief Civil Engineer Burt H. Burrell sent a report to the Director of the National Park Service "pursuant to an understanding…to submit data for ultimate or 5-year programs for certain small parks and National Monuments." Burrell's report, which was based upon visits made to the park by staff engineers in 1926 and 1927, included a detailed justification for a power system at Wind Cave, and noted that "there are certain other improvements in the construction line which will be required at Wind Cave within the next five years…"[89] He included a list of needed construction projects which proved to be accurate, calling for administration buildings, additional quarters for the rangers, and adequate storage facilities, all of which were added over the next decade. The report was accompanied by a topographic map of the administration area which showed existing buildings and the game fence, as well as some of the cave passages. That map served as the base for many of the site plans that were prepared in the 1930s (Figure 10).[90]

Superintendent Roy Brazell left his post not long after Burrell made his report.[91] He was succeeded by Anton J. Snyder, a young former ranger who spent the next two years working with staff of the newly revamped Landscape Division of the National Park Service to develop a master plan for Wind Cave National Park.



Figure 10. Detail of a 1927 topographic map of headquarters. The red mark-ups may have been made by NPS staff members during the master planning process. National Archives RG 79, Central Classified Files, Box 447. (National Archives II, College Park, MD.)

[89] National Archives RG 79, Records of the San Francisco Field Office Box 44. (National Archives II, College Park, MD.)
[90] National Archives RG 79, Central Classified Files, Box 447. (National Archives II, College Park, MD.)
[91] Long, Appendix A.1.

Episode 2. Cooperative Design and Development: 1928-1942

Anton Snyder received his first post as a superintendent at a busy time for the National Park Service. He was appointed in June of 1928, in the midst of a major planning initiative by the National Park Service. In 1929 the National Park Service made the development of master plans mandatory for all national parks.[92] That master planning program was overseen by Thomas Chalmers Vint, who became head of the National Park Service Landscape Architectural Division in 1927, after his former boss Daniel Hull retired. Under Vint's leadership, the landscape architectural office was moved to San Francisco and was greatly expanded. In June of 1928 it became the Field Headquarters for the National Park Service, with departments for Civil Engineering, Landscape Architecture and Education. The Engineering division was headed by Frank A. Kittredge, who was the chief engineer for the National Park Service, and Vint headed the Landscape division, as chief landscape architect.[93] Vint and Kittredge both played important roles in the development of a master plan for Wind Cave National Park.
Vint has been widely recognized for his contribution to the creation of a planning process for the National Park Service. One history of the National Park Service noted that under his leadership, "the landscape program expanded into a single fully orchestrated process of park planning and development, based upon the principles of landscape preservation and harmonious design."[94] The same source noted that Vint "created a central design office of landscape architects and architects whose clients were the superintendents of the national parks."[95] Vint emphasized planning, with a stated goal of developing a "logical well-suited development plan for each park."[96] According to an NPS publication of the time, the National Park Service believed that the master plans should be the result of close cooperation between the individual park superintendents and the field office, noting that the success of the newly mandated master plans would depend "upon the proper collaboration of study and effect upon the part of the Superintendent, the Landscape Architects, the Chief Engineer, and the Sanitary Engineer.

Correspondence from the late 1920s shows that planning activities at Wind Cave National Park followed those precepts. Park superintendent Anton Snyder worked closely with Vint and his staff to create a development plan for the headquarters area at Wind Cave National Park (Figure 11). On September 5, 1928, Snyder wrote to National Park Service director Demary that "Mr. Vint arrived at Wind Cave Sunday afternoon and together we have gone over the proposed developments at the park…Mr. Vint is certainly the capable man you recommended him to be. He is full of real practical ideas, and I hope that his plans for the development of park headquarters can be substantially carried out."[97]

[92] McClelland, 293.
[93] "Brief Organizational History of the Office of Design and Construction, National Park Service 1917-1962," (United States Department of the Interior, Washington, 25 D.C.) Accessed 8 Dec. 2014 http://www.nps.gov/parkhistory/hisnps/npshistory/design.pdf.
[94] McClelland, 196.
[95] McClelland, 6.
[96] Vint, quoted in McClelland, 200.
[97] National Archives RG 79, Central Classified Files, Box 447. (National Archives II, College Park, MD.)

On September 8, 1928, Vint submitted a multipage report on that same visit which discussed the roads and buildings of Wind Cave Park; he clearly saw the need for a master plan at Wind Cave National Park: “The buildings at Park Headquarters compose about the most perfect haywire outfit we have in the park system. They are a disgrace to the United States Government and the National Park Service….These are rather strong and unqualified statements but they do not require an expert’s opinion for verification.”[98] Vint went on to report that “I have data for a new general plan which will be worked up to scale from the topographic maps prepared in 1927….the facilities to be included in this plan have been discussed with Supt Snyder and I believe I have his concurrence.”[99] Vint included a list of needed buildings, accompanied by cost estimates. That list echoed the one included in Burell’s 1927 report and included an administration building, storage facilities, and additional quarters for the rangers, all of which were built at the park over the next decade. Vint also described the expected layout of the site, noting that all new construction would be west of the road, with residential structures in the front and utility buildings located farther from the road and public view.



Figure 11. Photo of Wind Cave National Park Headquarters, ca. 1925, looking north. This photo was taken about the time Vint described the buildings of the park as a “haywire outfit.” (WICA 4162)

Vint and Kittredge worked on the development plan over the winter of 1928 and returned for visits in the summer of 1929. In July, Snyder reported that “Chief Landscape Architect Thos. C. Vint of the San Francisco office spent the 18th at the park inspecting road construction and the administrative area. Mr. Vint secured additional data for our proposed building program, and will prepare tentative sketches of the administration building upon his return to San Francisco.[100] A month later, Kittredge reported on a visit he had made to Wind Cave, and noted that Vint was

[98] National Archives RG 79, Central Classified Files, Box 446. (National Archives II, College Park, MD.)
[99] National Archives RG 79, Central Classified Files, Box 446. (National Archives II, College Park, MD.)
[100] July, 1929 WICA Superintendent’s Monthly Report.

working on sketches for a proposed administration building, as well as a site plan which used the 1927 topographic map as a base."[101]

Correspondence from Snyder in late 1929 and early 1930 shows that he was becoming weary of operating a park with limited funding and substandard facilities. In a report that repeated frequent comments by his predecessor, Roy Brazell, he wrote: "There is going to come a time and not far distant, either, when our puny capacity to operate is going to fail, just as an engine will stall under a load far too great for its power…unless our estimates are given more substantial recognition by the Budget and by Congress I am afraid we are sunk." Later in the report he defended the park's place in the National Park System: "the growing popularity of the cave and the enthusiastic endorsement given the cavern by the majority of visitors, places the park in purpose and spirit fully within the intent of its status as a national park." [102] A few months later he expressed frustration with the pace of the planning process proclaiming that "it is extremely unfortunate that none of the improvements in the estimate can be supported by preliminary sketches from the Landscape Architect, and approved preliminary estimates of cost of construction form the Chief Engineer."[103] He noted they had visited in the past and were very helpful but that he did not feel they stayed long enough to achieve all that he would have liked to have seen. That all seems to have changed soon after.

February of 1930 brought a flurry of discussions with Vint's office about what future development at Wind Cave should look like, as well as actual drawings for two new buildings. Synder reported that month that "Plans for the new Rangers' bunkhouse (HS-08)…and preliminary sketches of the proposed public utility improvements in the park, have been received from the landscape division." Those public utility improvements included a new power house (HS-13).[104] Other notes show that they were discussing where buildings should be placed, as well as construction details about the proposed new administration building.

The outlook for future development at Wind Cave National Park took a decided turn for the better in May of 1930, when Wind Cave became one of many national parks to benefit from a major increase in federal funding. On May 16, 1930, a press release from Wind Cave announced a major increase in funding for the Park as part of a federal appropriation bill that was signed by President Hoover on May 14, 1930. The annual appropriation for the Park jumped from $13,500 to $54,900, and $39,900 of that was earmarked for "physical improvements."[105] That press release may have included sketches of the proposed new buildings. The *Rapid City Journal* reported that "we have seen the preliminary sketches for buildings. They are not released for publication yet—but they will be a new type in Black Hills construction and will absolutely transform the old ranch type of buildings into something in a class by itself."[106]

[101] National Archives RG 79, Central Classified Files, Box 446. (National Archives II, College Park, MD.)
[102] 1929 WICA Superintendent's Annual Report.
[103] National Archives RG 79, Central Classified Files, Box 447. (National Archives II, College Park, MD.)
[104] February 1930 WICA Superintendent's Monthly Report.
[105] WICA Historical Files, Difficult Years 1914-1931, B2, F2.
[106] National Archives RG 79, Central Classified Files, Box 447. (National Archives II, College Park, MD.)

The note about the sketches shows that Vint and his staff were making good progress on the design work for the park, as does Snyder's monthly report of July 1930. He wrote that Vint, along with "Mrs. Vint and Jr. Landscape Architect McCarter", visited the park July 3 and 4, 1930, "reviewing and studying our general landscape and construction problems. Mr. Vint's visit was very valuable to us, for I believe as a result of it we have for the first time really arrived at a development program in which the several features of administration construction and landscaping are well coordinated."[107] Snyder was even more enthusiastic in his September report.

> This year for the first time I have been at the park that I have had the pleasure of seeing some of our proposed and badly needed improvements take material shape and form…I am quite elated at the thought that our long period of decline retrogression has apparently been broken….The Landscape Division has made quite a comprehensive study of our problem and is working on a general layout plan which should be carried out as expeditiously as possible.[108]

1931: HS-08 and HS-13

In 1931 the Field Headquarters published the first official master plan for Wind Cave National Park. Copies of that document and several subsequent editions are on file at the National Archives (Figure 12).[109] Each master plan included a narrative description of existing conditions as well as proposed future work, along with several large sheets of skillfully executed color renderings. That information supplied superintendents and the field office with a solid set of data which guided development throughout the 1930s. As was the case for all national parks, the master plan for Wind Cave National Park was updated annually from 1932 to 1942.[110] Each edition had an ornamental cover sheet and table of contents, plus several sheets of drawings. The sheets generally included the following:

- Topographic Map
- General Development Plan
- General Park Utilities
- Cave Trails
- Cave Electric Layout
- Headquarters Area
- Headquarters Area Utilities
- Game Ranch Headquarters Area
- Game Ranch Headquarters Area Utilities

[107] July 1930 WICA Superintendent's Monthly Report.
[108] Sept. 1930 WICA Superintendent's Monthly Report.
[109] National Archives RG 79, Stack Area 330, Master Plans. (Cartographic Department, National Archives II, College Park, MD.)
[110] McClelland, 304.

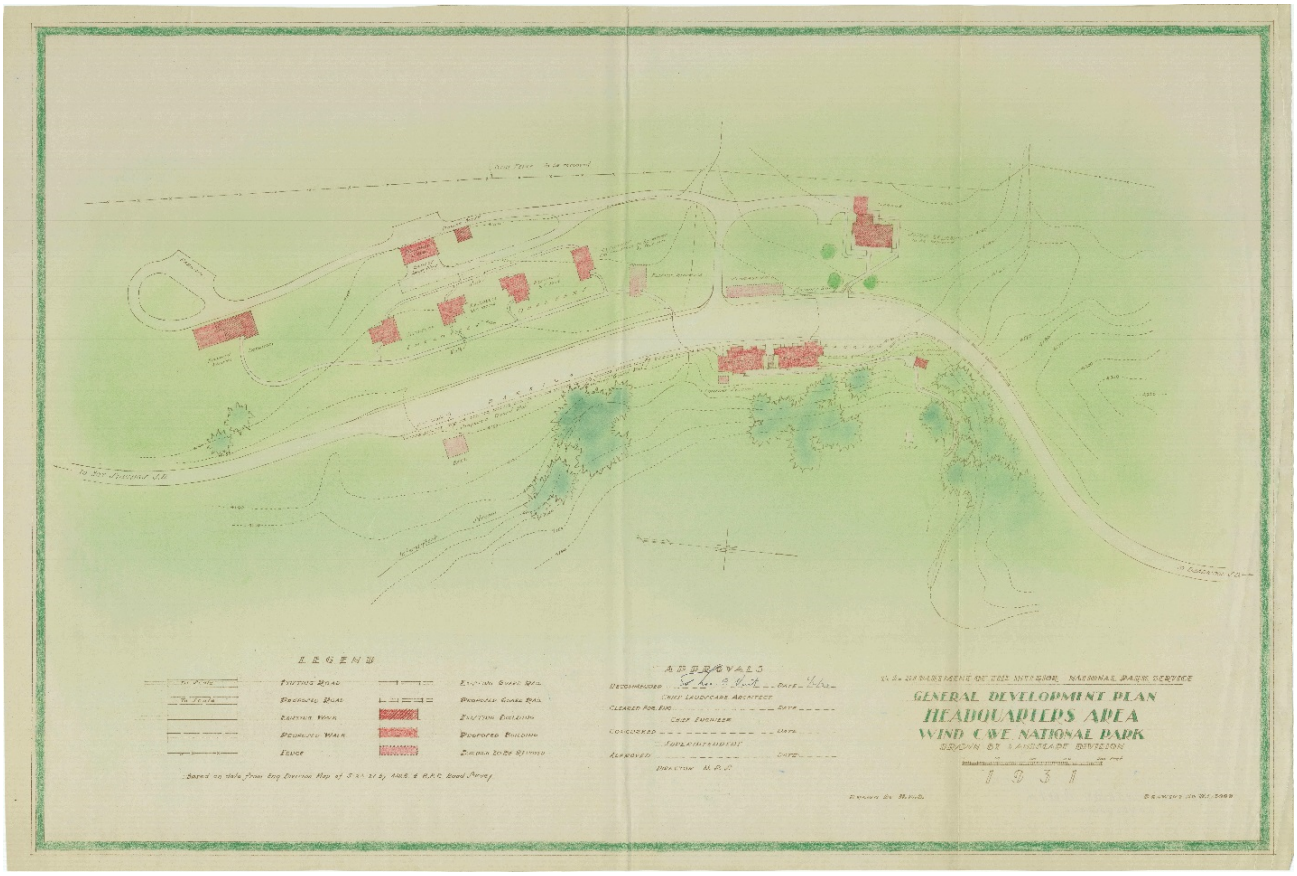


Figure 12. Headquarters area site plan from the 1931 master plan. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD.)

Wind Cave was one of many national parks in the country to benefit from the National Park Service's master planning program. By 1932, a master plan had been created for every national park in the country. That work was well-timed. As NPS historian Linda McClelland has noted, having the plans in place put the National Park Service in an excellent position to capitalize on the public funding increases that came about during the Great Depression and the New Deal. As was the case at Wind Park, when the funds were released, "the National Park Service was equipped with comprehensive plans and, in many cases, actual drawings. The service was ready to begin construction."[111]

Superintendent Snyder was not destined to see the long-awaited plan put into practice. On March 15, 1931, he was transferred to Carlsbad Caverns National Park, and Edward Dixon Freeland took over at Wind Cave.[112] Like Snyder, Edward Dixon Freeland was a young former ranger, and the position at Wind Cave was his first assignment as a superintendent. He and Snyder switched parks; Freeland left a job as head ranger at Carlsbad Caverns to take the Wind Cave position.

[111] McClelland, 304-305.
[112] 1931 WICA Superintendent's Annual Report. Census records show that Snyder had left the National Park Service by 1940, when he was working as an insurance salesman in Carlsbad, New Mexico.

Freeland apparently made a name for himself while at Carlsbad Caverns. His transfer merited a long article and photograph in the local paper, with the headline “Freeland Takes Helm at Wind Cave Reserve.”[113] The article praised the work he had done at Carlsbad Caverns and noted that he was promoted at the recommendation of the Director of the National Park Service, then Horace Albright. Although that type of recommendation could have been routine, a letter from Albright to Freeland written soon after seems to indicate that Albright knew Freeland personally. The long letter offered much advice about the new position, and in the final paragraph says “Above all things Mrs. Freeland and you should be yourselves...Your success at Wind Cave will determine your future in the National Park Service….”[114]

Freeland may also have been chosen for the post for his experience with caves in general, and particularly with the process of adding electrical lighting to a cave. The article about his move noted that although Wind Cave had not seen much development to date, that was set to change with the new federal funding. Planned improvements included the addition of an electric lighting system to Wind Cave, and the article claimed that “Mr. Freeland’s knowledge of the lighting of Carlsbad Cavern makes him particularly valuable in the coming development of Wind Cave.”[115] Those words proved to be prophetic—over the next eight years, Edward Dixon Freeland oversaw the most extensive period of development Wind Cave had seen to date (Figure 13).



Figure 13. Edward Dixon Freeland. (WICA 7308)

[113] “Freeland Takes Helm at Wind Cave Reserve,” Stockton Record, March 21, 1931, Clipping at National Archives RG 79, Central Classified Files B 446. (National Archives II, College Park, MD.)
[114] Letter dated March 24, 1931. WICA Historical Files, Years of Growth 1931-1946, B2, F19.
[115] “Freeland Takes Helm at Wind Cave Reserve.”

Construction of HS-13

The first major project Freeland supervised at Wind Cave was the long awaited addition of an electrical lighting system to the cave. Prior to 1931, cave tours were all lighted by lanterns and hand-held candles, sometime supplemented by magnesium strips that the guides burned in major rooms for added illumination. Superintendents had been calling for an electrical system since the 1910s, and it is therefore not surprising that the installation of an electrical system was one of the first items to be designed once the master planning process began. The 1927 report by Burt H. Burrell had noted the obvious need for such a system, and a new lighting system and power house were designed even before the master plan was completed. Burrell's 1927 report had included rough sketches for a power house, and the Landscape Division issued more refined drawings on May 1, 1931.[116] Work on the system must have begun as soon as the plans were issued, and progressed rapidly; the small new power house was completed on June 30th, and the entire system was finished by July 26, 1931 (Figures 14 and 15).[117] Power for the system was provided by a 25 horsepower semi-Diesel engine that was acquired second-hand from Carlsbad Caverns National Park.[118] The new power house was the first building in the park which was built to conform to a new uniform design theme established by the landscape division. The new theme, which featured stucco walls and rough stone foundations, was used for all subsequent construction in the housing area, and older buildings were later remodeled to match. (See the following section on architectural context for more information about design development.)



Figure 14. Power house (HS-13) under construction. (WICA 4440)

[116] See Appendix A.
[117] August and July 1931 WICA Superintendent's Monthly Reports.
[118] 1931 WICA Superintendent's Annual Report.

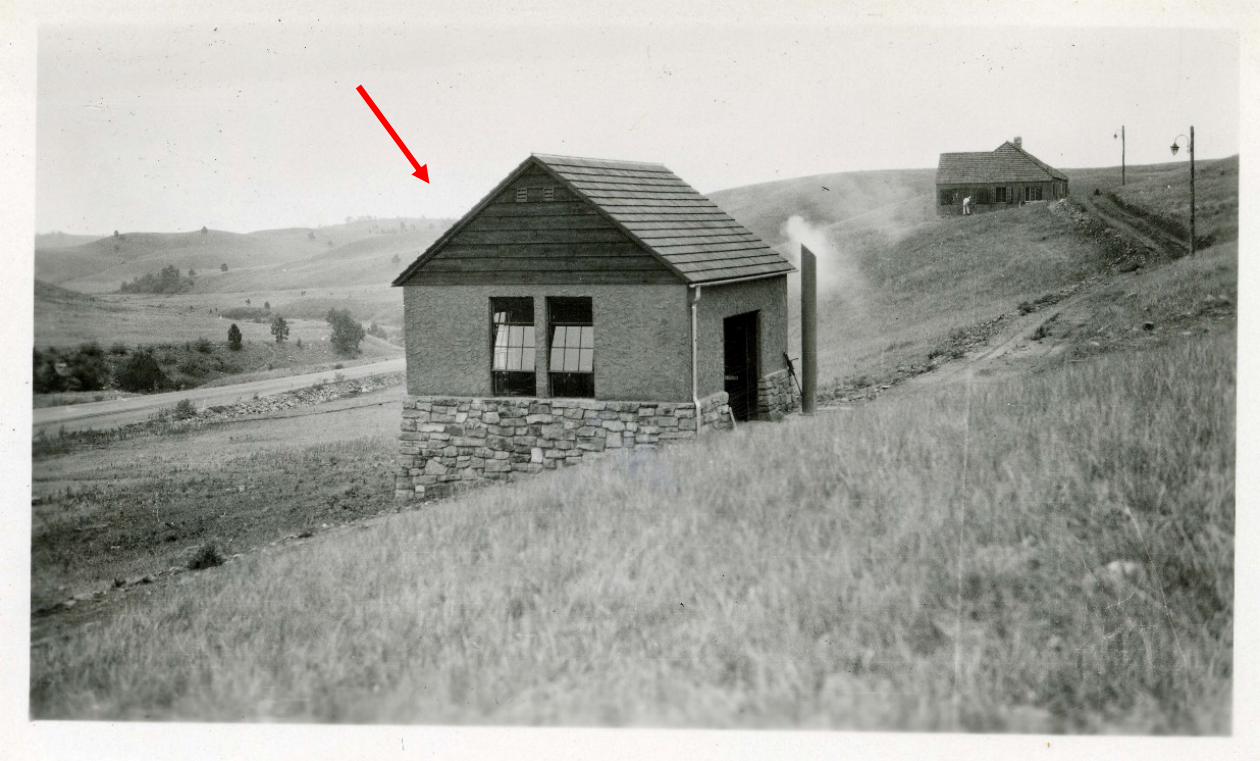


Figure 15. Power house (HS-13) shortly after completion, looking south.
The pipe at the corner provided exhaust for the fumes form the diesel power plant. (WICA 4423)

Construction of HS-08

The other major construction project to take place in 1931 addressed another long-standing need—housing for seasonal rangers. Although the staff of the park had grown as the number of visitors increased over the years, the small ranger cabin built in 1924 (HS-05) was still the only staff housing at the park, and Snyder had noted in a 1930 report that they were housing seasonal staff in tents. In May 1931, the Landscape Division issued plans for a "Ranger's Dormitory and Bunkhouse" (HS-08).[119] The work on that project went almost as quickly as did the electrical system. The new building, which served as a bunkhouse and mess hall for the rangers, was completed on September 15, 1931 (Figures 17 and 18).[120] The new rangers' building was constructed by a local contractor, the W. A. Kepp Construction Company, in less than two months.[121] The 1931 Master Plan site map for the area shows HS-08 and HS-13 as completed structures, and also indicates that the designers were considering expanding the ranger's quarters in the near future; an addition that would have nearly doubled the size of the house (HS-08) was included on the site plan (Figure 16).

[119] See Appendix A.
[120] 1931 WICA Superintendent's Annual Report.
[121] August 1931 WICA Superintendent's Monthly Report.

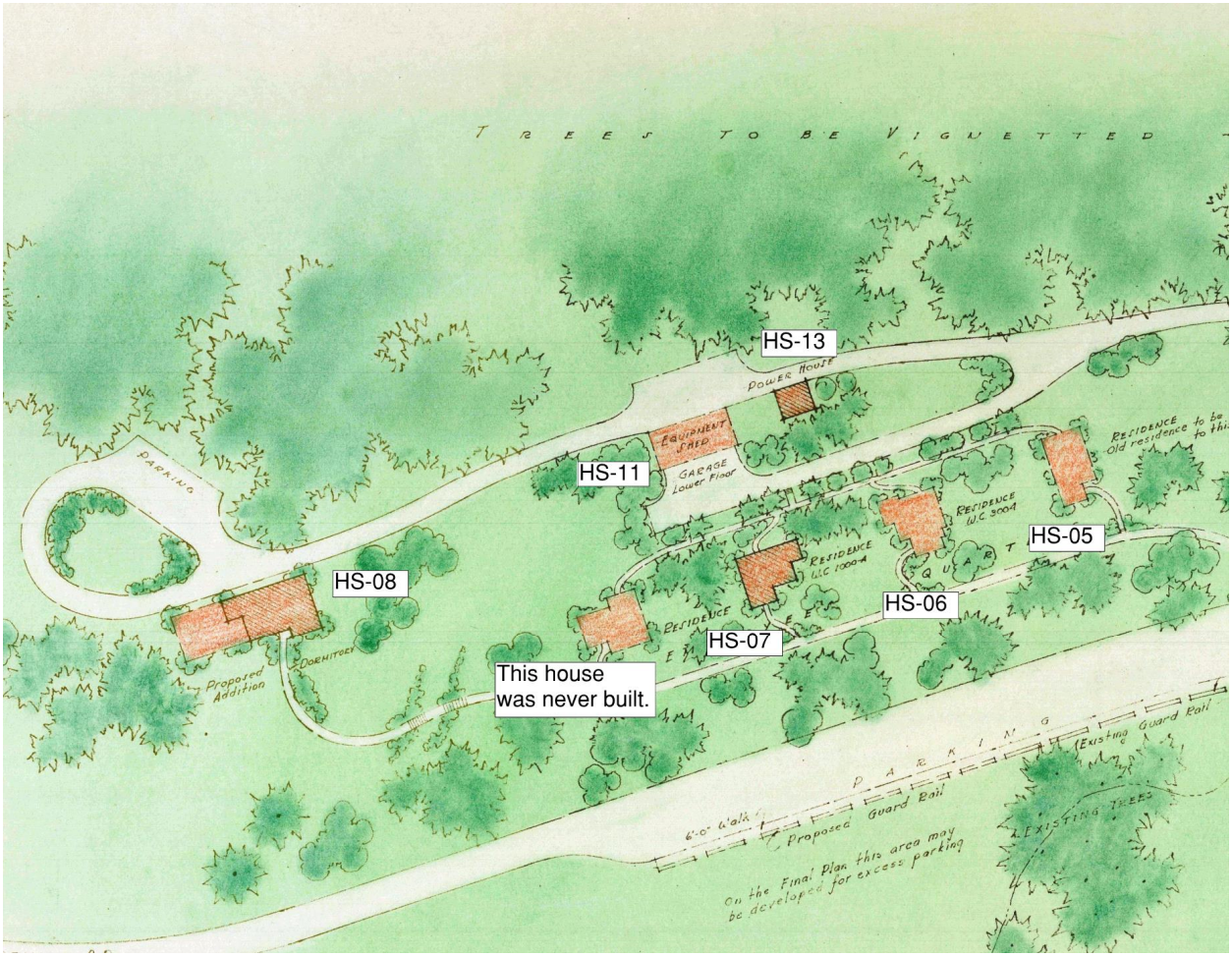


Figure 16. Detail of the 1932 master plan site map with author notations. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD.)



Figure 17. HS-08 under construction, looking north. (WICA 4267)



Figure 18. HS-08 Shortly after it was completed, looking north. (WICA 4727)

The Landscape Division was also busy creating plans for other staff housing (HS-07), and in August of 1931, the office issued plans for a smaller single family residence, to be located closer to the highway. Plans for that new house were drawn by the same staff member who did the drafting for the first master plan, Howard W. Baker (See Appendix A). Although some sources credit Baker with the design of several other buildings in the residential area, the plan sheets for HS-07 are the only ones to bear his initials. Construction of that residence began in December and the building was fully enclosed and ready for interior finishes within a few weeks.[122]

Edward D. Freeland had a busy first year as Superintendent. His first annual report, written in September 1931, noted that "construction of a complete water and sewer system, an electric system providing adequate surface circuits and electric lighting for the cave trails, and a rangers' dormitory and mess house supplied in all cases a need of long standing."[123] He also worked with the landscape division to complete the drawings for HS-07, and adopt the new master plan. He apparently handled the work load quite capably. A report from Chief Engineer Kittredge, an ordinarily brusque writer, who visited the park in June, 1931, included a side note about operation of the park. "I wish to take this opportunity to say, taken as a whole, it seems to me that things at Wind Cave National Park are being handled in a very efficient manner."[124]

[122] December 1931 WICA Superintendent's Monthly Report.
[123] 1931 WICA Annual Superintendent's Report.
[124] National Archives RG 79, Central Classified Files, Box 446. (National Archives II, College Park, MD.)

1932: HS-07 and HS-04 Garage

In 1932, the residence that was begun in December of 1931 (HS-07) was completed and placed in service (Figures 19 and 20). Like the earlier projects, the house was built in just a few weeks. Work started on December 9th and on Feb. 26th, the building was completed and accepted with one day to spare on the contract. The contractor for this house has not been clearly identified, but it is possible that the work was done by the same company that did HS-08 and HS-13, the Hot Springs Lumber Company. The only other construction project of the year was the addition of a two car garage to the rear of the superintendent's residence (HS-04). It was a frame structure which Freeland described as "sealed inside with metal lath and stucco outside (Figure 21)."[125]



Figure 19. HS-07 Under construction, Jan 4, 1932, looking west. (WICA 4271)

[125] 1932 WICA Superintendent's Monthly Report.



Figure 20. HS-07 Shortly after completion, March 1, 1932, looking southwest. (WICA 4724)



Figure 21. HS-04, original superintendent's residence, ca. 1933, looking northwest. The new garage is visible on the far left; note the addition of stucco to the bay window of the older stone house. (WICA 4421)

1933

In 1933 the National Park Service Field Headquarters, now known as the Branch of Plans and Design, completed plans for three more buildings, a new Superintendent's Residence (HS-03), another employee residence (HS-06), and a Machine Shop Shed (HS-11). The house and machine shop had been included on the original master plan site maps, but the superintendent's residence was a new addition. It first appears in the 1933 edition of the master plan site map, with a note that it was "under contract. (Figure 22)"

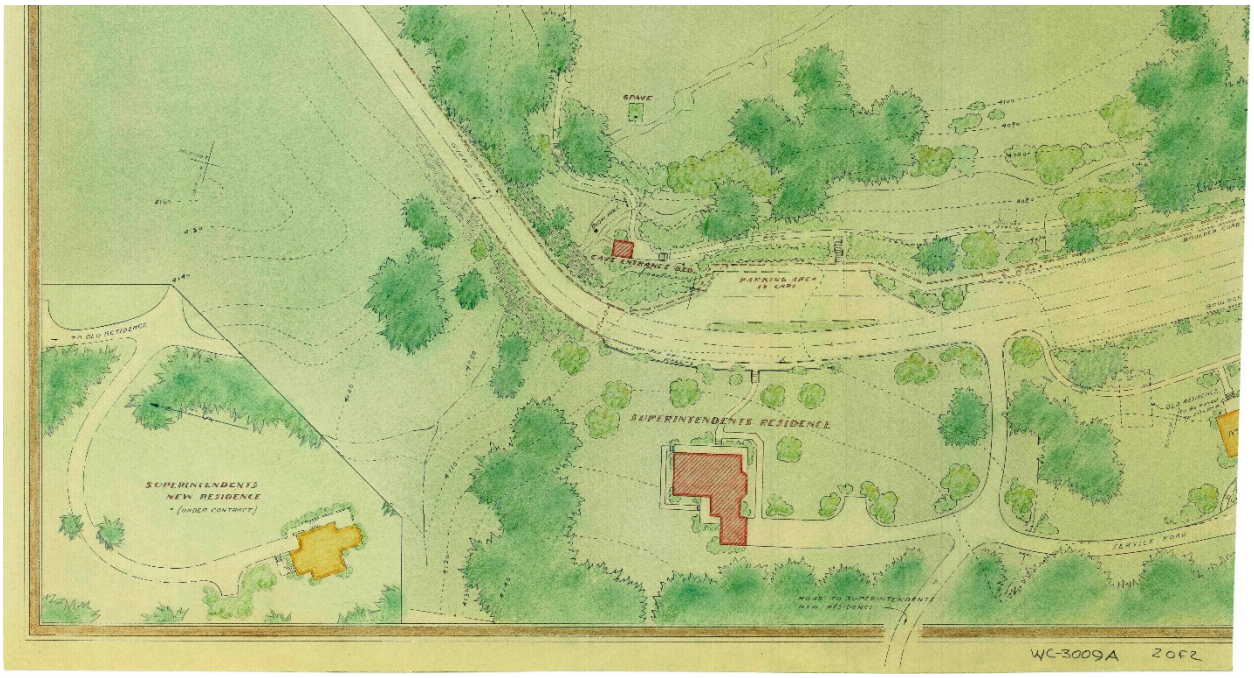


Figure 22. Detail of the 1933 site plan of the administrative area.
(National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD.)

As was the case in the preparation of the master plans, design of the new building was a cooperative project. Freeland reported in September 1933 that "Sketch plans and information were submitted to the Branch of Plans and Designs for working drawings. They consist of Machine Shop and Shed, Employee's Residence and Superintendent's Residence."[126] Design work must have been relatively advanced by that time, as the Branch of Plans and Design issued working drawings for all of those projects within weeks. The plans for HS-11 were ready on September 18, and plans for the new residence, HS-06 were completed on October 10. Plan for the most complicated of the three, design of the new superintendent's residence, (HS-03) was completed on November 3rd, 1933. Those projects went out for bid in 1934.

Other work in the area in 1933 included moving older existing buildings, including a garage/shed that had been constructed across from the administration building in the late 1910s. (The shed is visible in Figures 10 and 11.) That low frame building, labeled a storage shed on the 1927 site map, had been targeted for removal for years. Freeland's report that a "ramshackle combination

[126] October 1933 WICA Superintendent's Monthly Report.

of car shelter, oil and icehouse" was moved to a less conspicuous location that year was probably referring to that shed.

1934: HS-03, HS-06, HS-11, CCC Camp Established

1934 brought a flurry of activity. The three buildings designed in 1933 were all constructed and placed in service, and the establishment of a CCC Camp at the park created a bountiful supply of free labor. The three buildings (HS-03, HS-6 and HS-11) were constructed by a single contractor, the Hot Springs Lumber Company, which submitted the low bid for the project in February.[127] The construction contract was awarded in early April, and the contractor began work later that same month.[128]

All three buildings were completed on August 11, 1934. The Branch of Plans and Design sent a supervising architect, Mr. Kerr, to approve the project, and all three buildings were placed in service later that month. The new employee residence, HS-06, was occupied first (Figures 23 and 24). According to the annual superintendent's report for 1934, the park's chief clerk, Mr. Parsons, moved into the house on August 9. Edward Freeland moved into the large superintendent's residence (HS-03) a week later (Figure 25), and the machine shop was also put into service as soon as it was finished. HS-11, called a "Machine Shop and Shed" on the plans, is actually a two story, multi-stall garage which provided parking for cars owned by the staff and the park, as well as much-needed space for repair work and storage (Figure 26).



Figure 23. HS-06, soon after completion, Nov. 1934, looking west.
HS-03 is in the background. (WICA 4269)

[127] March 1934 WICA Superintendent's Monthly Report.
[128] May 1934 WICA Superintendent's Monthly Report.



Figure 24. HS-06, with CCC installed landscaping, ca. 1937, looking west. This photo was printed with an article by Edward D. Freeland, “Development of National Park Areas in the Black Hills by the CCC,” Black Hills Engineer (December 1937.) 26. (WICA 4275)



Figure 25. HS-03, just before Freeland moved in, August 17, 1934, looking south. (WICA 4319)

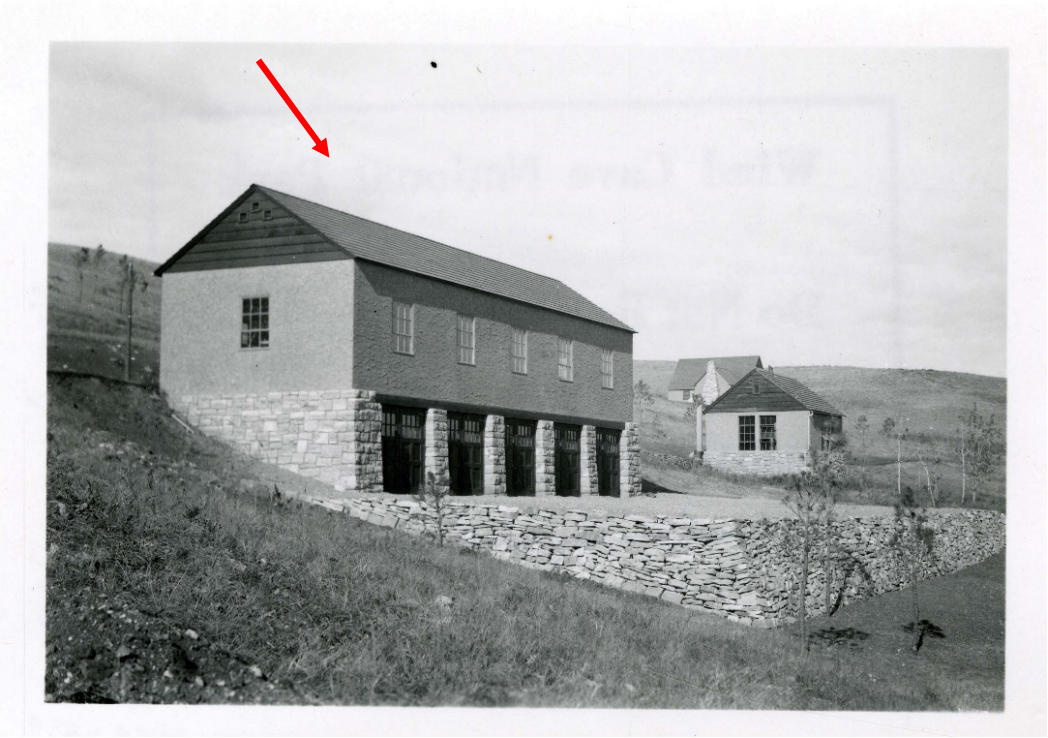


Figure 26. HS-11 soon after it was completed, ca. 1935, looking northwest. HS-13 is shown to the right, and HS-03 is in the far background. (WICA 4559)

This time period also marked the beginning of assistance from federal work programs. Wind Cave National Park received limited assistance from federal crews late in 1933. Monthly reports for November and December 1933 noted that a 78-man "Civil Works" project had been approved for tree planting, roadside cleanup shoulder sloping and conditioning cave trails in October, and noted that some of that work began before the end of the year.[129] A few months later, Freeland received the no-doubt welcome news that a 200 man CCC Camp had been approved for Wind Cave National Park.

The CCC, or Civilian Conservation Corps, was a depression-era program created by President Franklin Delano Roosevelt in 1933 to alleviate unemployment among young men by putting them to work on conservation related projects on public lands.[130] Enrollees were generally single men in their later teens and early twenties who lived in camps that were operated by the U. S. Army. They were required to send most of their modest salaries home, but were provided with free room and board in the camps.[131] Officially known as the ECW program, for Emergency Conservation Work, the program was commonly referred to as the CCC, to the point that it was officially renamed the CCC in 1937.[132]

[129] December 1933 and January 1934 WICA Superintendent's Monthly Reports.
[130] Robert Fechner. "The Civilian Conservation Corps," *Black Hills Engineer* (December 1937): 3.
[131] "Civilian Conservation Corps at Wind Cave," http://www.nps.gov/wica/learn/historyculture/civilian-conservation-corps-at-wind-cave.htm.
[132] Bahr Vermeer Haecker Architects, et. al. "CCC Officer's Quarters: Historic Structures Report," (Draft Copy on file at Wind Cave National Park, 2008) 2-2.

In July, 1934, the CCC Camp at Wind Cave, Camp DNP-1, became the first CCC camp in South Dakota to be located in a National Park. The camp was established in July, and the construction of camp buildings began August 2, 1934. Following standard practice, the enrollees did most of the construction work needed to get the camp up and running. Most of the buildings at Camp DNP-1 were completed in October that same year, and they remained in service throughout the 1930s.



Figure 27. CCC Camp at Wind Cave. (WICA 8747)

The work of the CCC had an immense impact upon the headquarters area of Wind Cave National Park. CCC crews provided labor for road work and cave improvements, helped dig the shaft for a new cave elevator and helped move existing buildings to new locations. While the CCC crews were not significantly involved in new construction in the housing area, they did help with moving and remodeling projects and provided much-needed assistance with landscaping.[133]

An article written by Freeland in 1937 noted that CCC crews had by that time planted some 3,000 trees and shrubs at the park, mostly within the administration area. He explained that

[133] The Annual Superintendent's Report for 1934 listed several activities expected to be completed by the ECW crews, but the only construction work listed there was "moving of old buildings."

"although there are many heavily wooded areas in Wind Cave National Park, it so happens that the headquarters are situated in a dry rather bare portion."[134] That same point had been made in a report filed by staff of the Landscape Division in 1931, who noted that development plans for the new housing area included a planting plan to soften the effect of the new construction. The inspectors noted at that time that "this will, however, take about five years to do as the site has not a single tree on it."[135] A few weeks after the CCC camp was established, the Branch of Plans and Design issued "Planting Plans" for the new Superintendent's Residence (HS-03), and the two employee's residences located closest to the road, (HS-06 and HS-07).[136] Those plans were all issued in October 1934, presumably to guide the efforts of the new CCC workers.

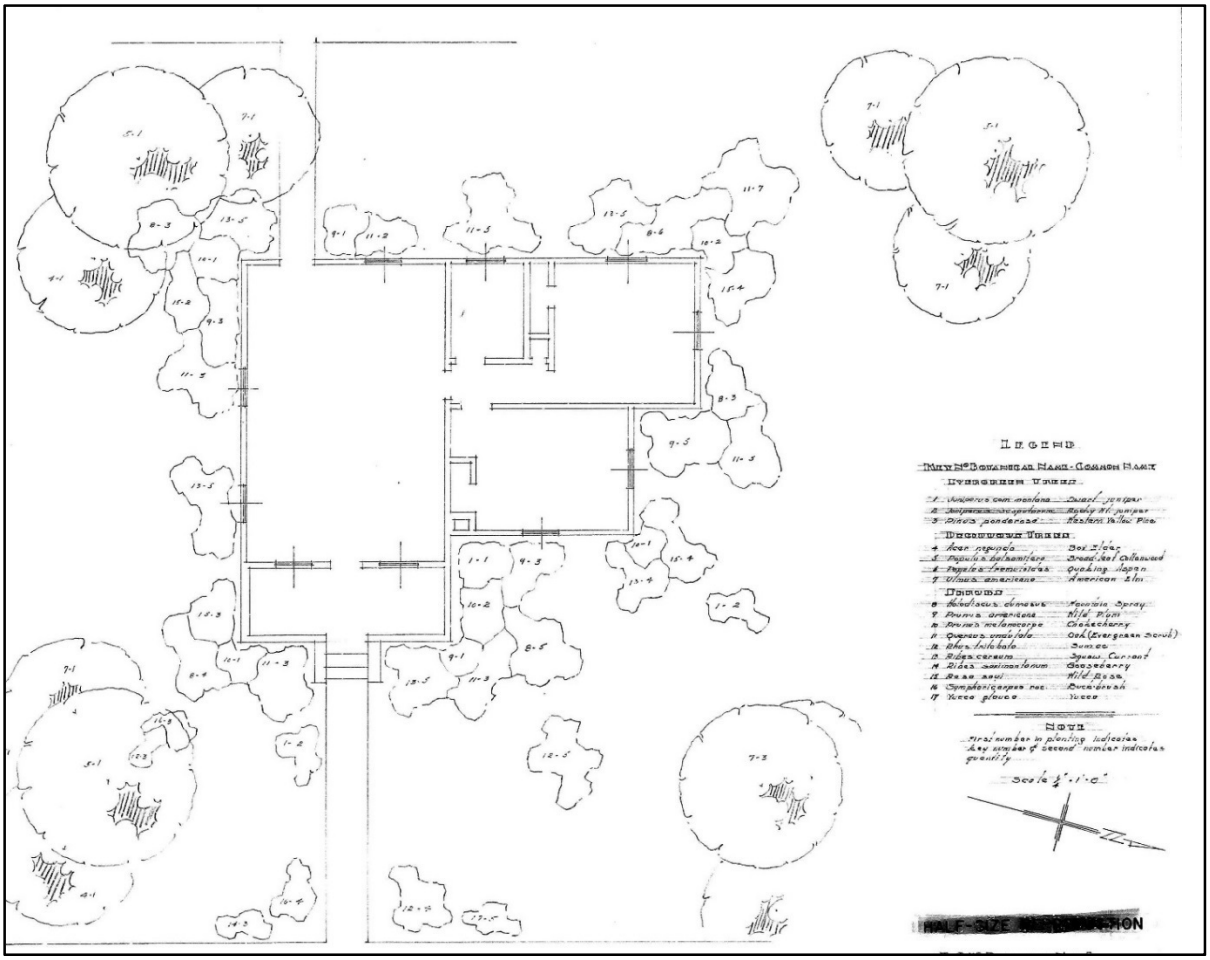


Figure 28. Planting Plan for HS-07, issued Oct 15, 1934 (WICA_108_3019 [id3239])

The superintendent's annual report for 1934 recorded an impressive amount of physical development, most of which was done with Public Works funding. In September of that year,

[134] Edward D. Freeland, "Development of National Park Areas in the Black Hills by the CCC," *Black Hills Engineer* (December 1937.) 26.
[135] "Report to the Chief Landscape Architect through the Superintendent of Wind Cave National Park," June 1931. National Archives RG 79, Central Classified Files, Box 446. (National Archives II, College Park, MD.)
[136] Appendix A.

Freeland wrote that Public Works funding that year accounted for $222,100 worth of work at the park. Projects supported by the funding were listed in the report: (current notes)

- Federal Project 201a (FP 201a) encompassed the two employees' quarters and machine shed. (HS-03, HS-06 and HS-11)
- Elevator and equipment installation. (This was the precursor for HS-02, which was completed in 1938.)
- Improvements to cave trials.
- Administrative and park operator's building. (HS-01; this was one of the first projects to be discussed in the master planning proves, but it was probably put off a few years due to the costs associated with such a large building; it was not completed until 1935.)
- Road improvements.

The report also noted that Jewell Cave park was put under jurisdiction of WICA that same year.[137]

1935: HS-05 Moved

The pace of new construction in the housing area slowed in 1935. This was partly because staff and crews were busy with the construction of the large new administration building and the elevator to the cave, and partly because many of the immediate needs for housing and utilities had been addressed in the preceding years. By 1935, eight of the nine buildings now located in the housing area had been built, and most of the dilapidated older structures had been moved or razed. With space needs largely met by new construction, staff and planners turned their attention to improving the site and making changes to the buildings that were already there.

Moving HS-05

The largest project of 1935 in the housing area consisted of moving and remodeling the small frame ranger cabin that had been built in 1924 (HS-05).The frame house was in fair condition, but placed too close to the road, and in need of interior and exterior updates. All of the new buildings in the housing area adhered to a uniform design theme established by the landscape division which featured stucco walls and rough stone foundations, and the shingled walls and bungalow styling of the old ranger cabin did not harmonize with the newer buildings of the area.

The landscape division had issued plans for changes to the ranger cabin in August 17, 1934, and later that year, CCC crews helped build a foundation in a new location, as had been shown on site plans for the past few years (Figure 29). The new site was located farther from the road, with a setback that aligned with the two recently completed residences (HS-06 and HS-07). By January 1935, the new foundation was complete, and workers had begun the task of moving the building.[138] Within a month, the house had been moved and most of the new interior walls were completed, and by June all work was finished and the house was back in service (Figures 30-33).[139]

[137] 1934 WICA Annual Superintendent's Report.
[138] February, 1935 WICA Superintendent's Monthly Report.
[139] March and June, 1935 WICA Superintendent's Monthly Reports.

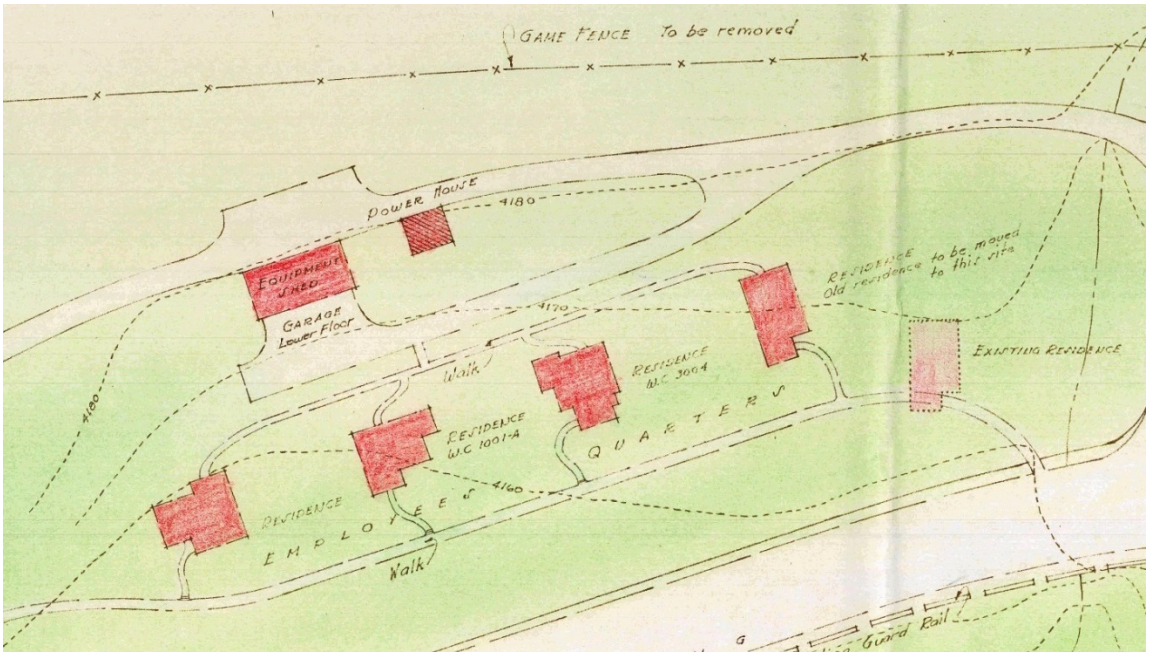


Figure 29. Detail of the 1931 site plan of the administrative area, showing original and new locations for HS-05. Note that the plan shows four residences facing the road; only three were built. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD.)



Figure 30. Housing area before HS-05 was moved, November 1934, looking southeast. HS-05 is on the far left. The CCC Camp is in the background. (WICA 4335)



Figure 31. HS-05, shortly before it was moved, ca. 1935, looking south. (WICA 4732)



Figure 32. HS-05, ready to be moved, early 1935, looking west. (WICA 4274)



Figure 33. HS-05, after move and remodeling, looking south. (WICA 4259)

By the end of the 1935, the new administration building, a second new power house and a new elevator to take visitors to the cave had been completed, and the last of the old frame utility buildings on the site had been demolished. With the improvements to the housing area from earlier years, these projects brought the headquarters area close to the appearance that had been shown in park master planning documents since 1931. A celebration of the completion of the large new buildings included an open house and spurred the publication of a special edition of the *Hot Springs Evening Star*, which described many of the recent projects and noted that more than 20,000 people went through the cave in the previous year, and approximately 265,000 had passed through the park.[140]

[140] *Hot Springs Evening Star*, October 9, 1935. (Clipping in WICA Historical Files, Years of Growth 1931-1946, B2, F5.)

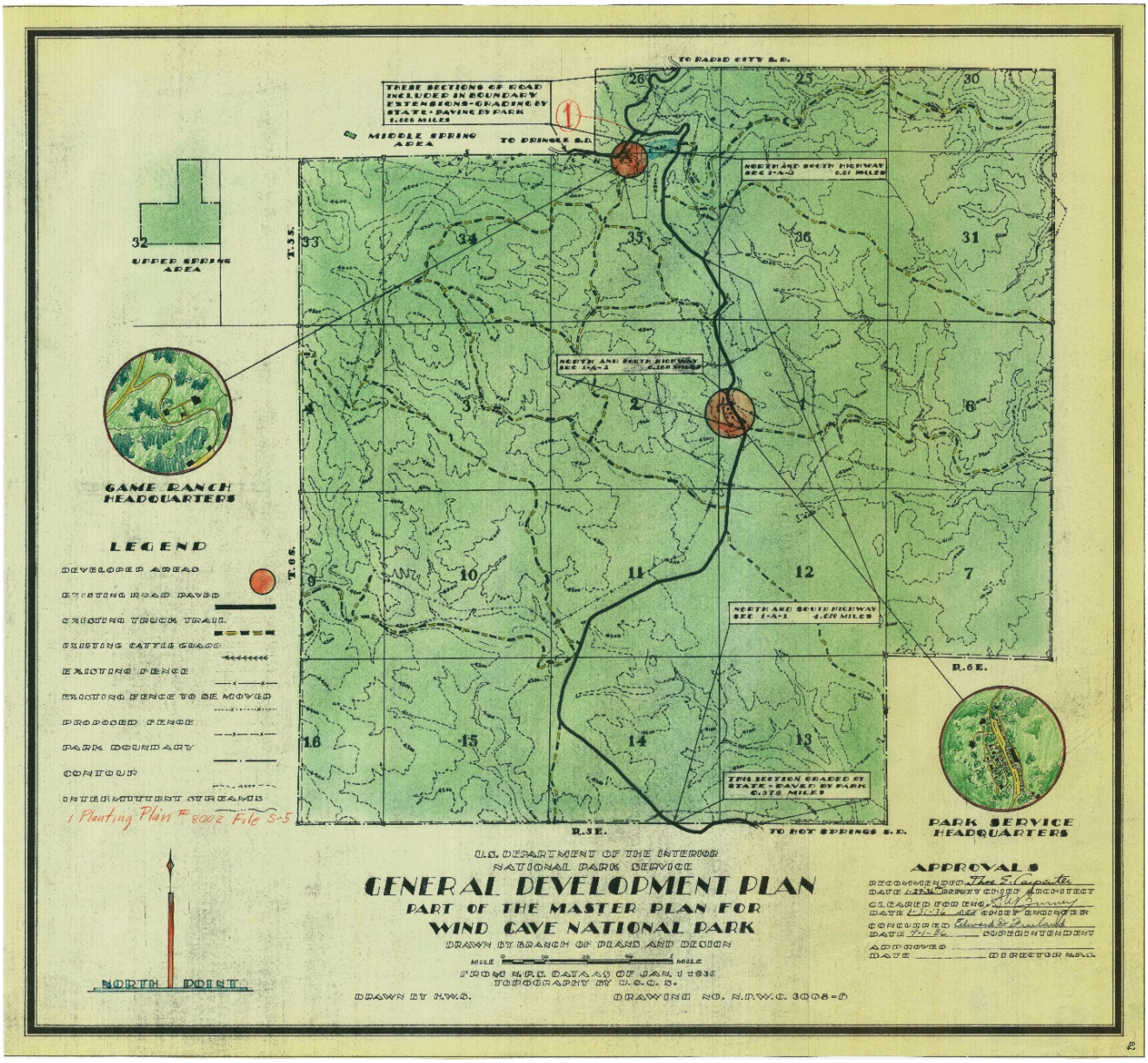


Figure 34. General Development Plan of Wind Cave National Park, from the 1936 park master plan. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD.)

1936-1937

Although no new buildings were constructed in the housing area in 1936 and 1937, CCC crews were kept busy with landscaping duties and remodeling projects (Figure 35). The biggest project of the year involved a complete overhaul of the original superintendent's residence (HS-04) for use as a ranger's clubhouse and dormitory. The older house had been vacated when the new superintendent's residence (HS-03) was completed in August of 1934, and the growing workforce had outgrown the original ranger's dormitory (HS-08). A rear addition to the northwest corner of the former superintendent's house (HS-04) was completed in 1937 to provide new

space for a ranger's dormitory (Figure 35). The existing floorplan of HS-04 also saw minor changes to accommodate the new use, including the addition of a "cook's bedroom" next to the new dormitory and demolition of a bedroom built in 1918. A 1938 ranger's manual on file at the park describes the newly completed "Ranger's Clubhouse" (HS-04) as "the oldest building in the park. It was built in 1906 of native stone, and for many years was used as the superintendent's residence. It has recently been extensively remodeled and is now used exclusively as a summer home for rangers."

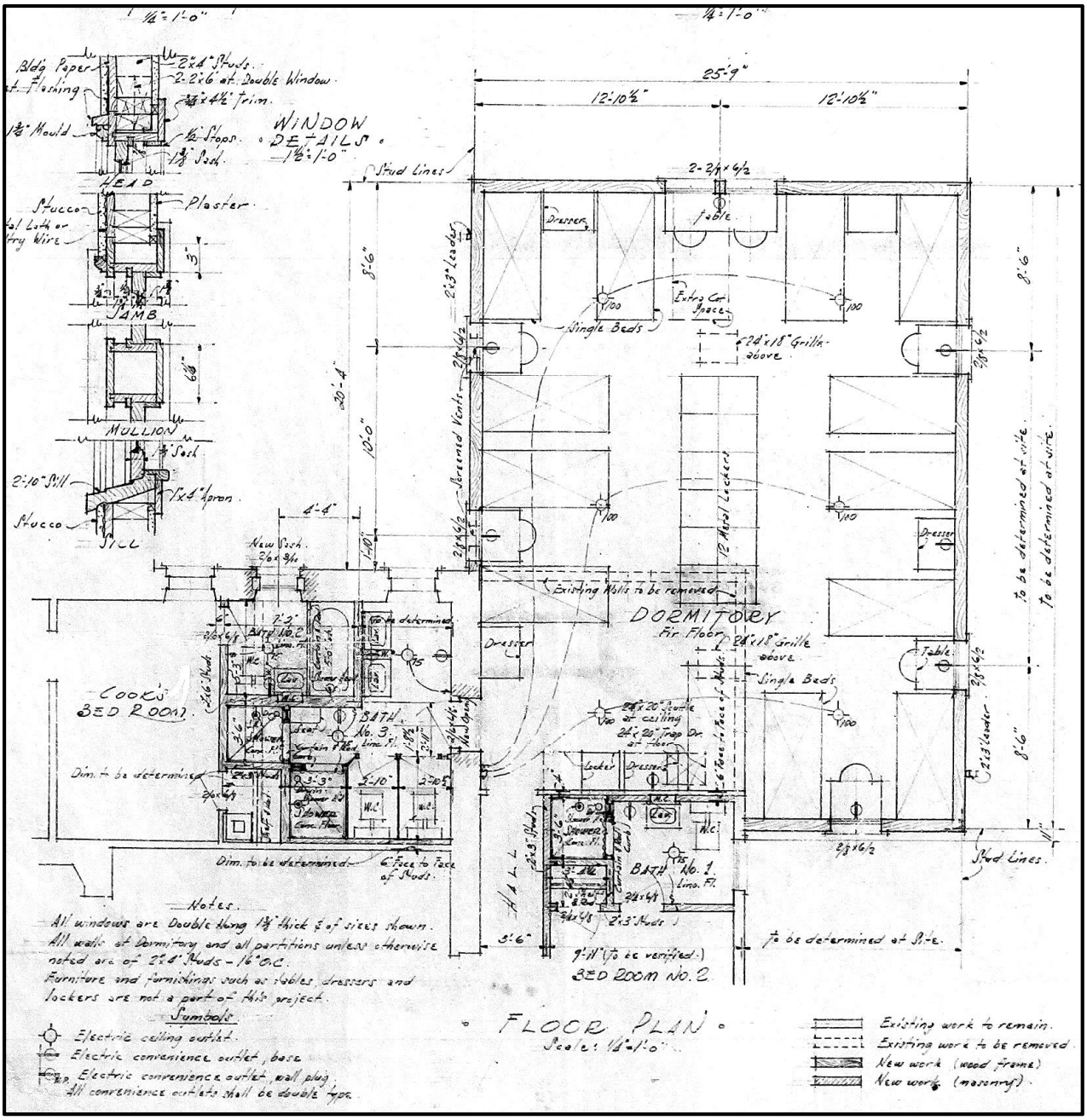


Figure 35. Detail of the plan page for the dormitory addition of HS-04, issued in 1936. (WICA_108_3023_[id278474]) See Appendix A for more information about historic plan sheets.

That project also included extensive exterior alterations to the building to bring it into line with the exterior design standards used on the other buildings of the area (Figure 36-37). Part of the remodeling of the stone house included coving along the upper portion of the exterior stone walls with stucco, and applying a new ashlar stone veneer to other parts of the existing stone walls. The roofline was also altered; overhangs were shortened, and a shed roofed dormer was replaced with a low sloped cross gable. According to the monthly superintendent's report filed in November 1936, "a small crew worked most of the month on the addition to the ranger's clubhouse, placing a stone foundation and starting the framework. Most of the old stonework around the entire building was veneered with new stone to make this structure conform in general appearance with other buildings in this area."[141]



Figure 36. HS-04, before remodeling, ca. 1935, looking west. (WICA 4153)

[141] November, 1936 WICA Superintendent's Monthly Report.



Figure 37. HS-04, after remodeling, probably taken in the late 1930s, looking west. (WICA 4277)

Once the former superintendent's residence (HS-04) was ready for use as a ranger's clubhouse, the field office began working on plans to remodel the old dormitory (HS-08) so that it could be used as a single family residence. Freeland wrote in March that the "old ranger's dormitory being remodeled for use as a residence will make one of the most convenient houses on the park."[142] Other work which took place that year included digging new full basements under several of the recently built houses. The new basements provided room for furnaces and laundry facilities.

Monthly superintendent's reports from this time period indicate that all or most of the labor for the remodeling work was supplied by CCC crews, (referred to as ECW in the reports) who did everything from landscaping to laying stone foundation walls. One report noted in January 1937 that the CCC crews worked an entire month on the ranger's dormitory, and another said in April that an "ECW crew, under supervision of stone mason, completed stone retaining walls in basement of employees' residences."[143] Those basements were probably added to HS-05, HS-06 and HS-07. HS-07 definitely saw foundation work in this time period, as documented in a photo taken ca. 1937, which shows a large hole in the stone foundation (Figure 38). The hole was presumably made to provide access to the new basement; a bulkhead door and stairs to the basement are located there now.

[142] May, 1937 WICA Superintendent's Monthly Report.
[143] January and April, 1937 WICA Superintendent's Monthly Reports.



Figure 38. HS-07, ca. 1937, during basement construction, looking north.
Note the hole in the foundation. (WICA 4730)

1938: Construction of HS-12

Development of the housing area concluded in 1938 (Figure45), with the completion of a new fire cache (HS-12), which was built into the slope of the hillside across the service road from the machine shed (HS-11). That wide three bay garage was the second building to be constructed in the side of that hill. The first was a small trailer house which was constructed across from the original power house (HS-13) around 1934 (Figure 39). Like the new building, the trailer house had been constructed to house fire equipment. A special report filed by Freeland in 1934 included photos and a description of a new “fire trailer” and the small hillside garage which was built for it.[144] It appears that the trailer house was removed soon after the fire cache was completed.

[144] E. D. Freeland “Pictorial Report” Nov. 1931. National Archives RG 79, Central Classified Files, Box 1691. (National Archives II, College Park, MD.)



Figure 39. Fire trailer house, built ca. 1935, probably removed by 1963. Looking west. (WICA 4258)

The fire cache is completely recessed into the hillside, with concrete walls and roof structure and a stone veneered façade (Figure 40). Freeland reported in March 1938 that crews were pouring the roof slab and drain tiles that month and noted that water, sewer and lights were already in place.[145] Three months later, the project concluded with the installation of cut stone veneer work to the front wall.[146] That stone veneer features a more refined style of ashlar masonry than what is found on most other buildings in the housing area. The change in style may reflect input from the same mason who had been supervising CCC crews on basement work the year before. It is likely that the same mason would have also been responsible for the stonework of the new elevator building (HS-02), which was completed around the same time as the fire cache (Figure 41). The evenly cut stone blocks and narrow joints on the façade of the fire cache are very similar to those used on the elevator building.

[145] April, 1938 Monthly Superintendent's Report.
[146] August, 1938 WICA Superintendent's Monthly Report.



Figure 40. HS-12, soon after construction, ca. 1938, looking west. (WICA 4289)



Figure 41. HS-02, Elevator Building, with stone being applied, ca. 1938, looking southeast. (WICA 4253)

1939-1942

A site map of the headquarters area which was drawn (Figure 42) in 1939 shows a layout for the historic housing area that is very similar to the current layout. All nine of the buildings in the present study group are shown on the map, along with connecting roads and trails. The roads remain; most of the trails, which led from the front doors to the administration building, are no longer in place.

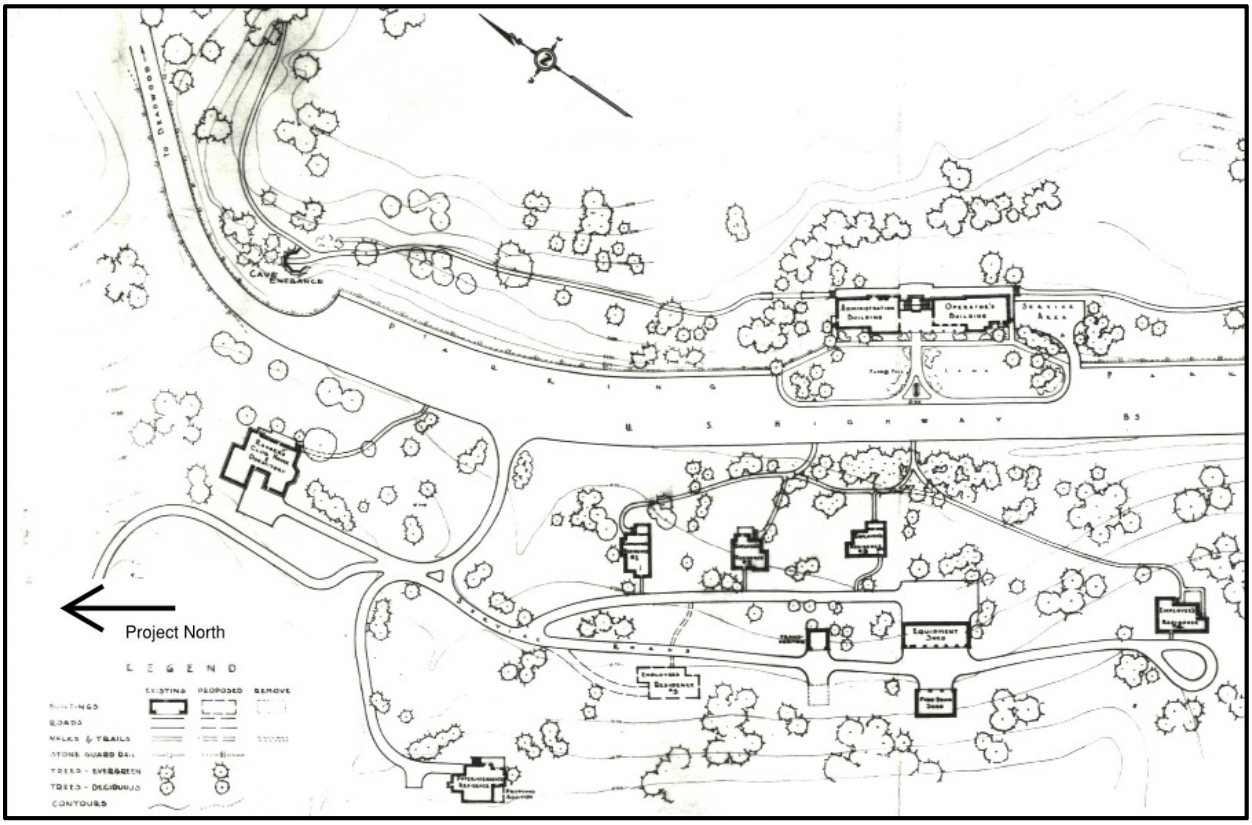


Figure 42. Detail of the site plan of the headquarters area, drawn in 1939 for the 1940 master plan. (WICA library files, No Drawing Number)

The 1939 site map and superintendent reports from 1939 also show that planners had intended to add more residential capacity, including a large new residence in the second tier of buildings, just west of HS-05. By that time, the National Park Service had established more regional offices, and Wind Cave was being served by an office in Omaha, referred to as Regional Office II. Freeland wrote in March of 1939 that plans "for a new employee's residence were submitted to Omaha for revision and comment."[147] That is as far as that building project appears to have gone, however. There is no sign that it was ever constructed. Historic plan files show that there was also a proposal to enlarge one of the residences, HS-07, in 1939, but that project also failed to materialize.

The late 1930s brought a change of management to the park, with the transfer of Edward Dixon Freeland to another National Park in St. Augustine, Florida. Freeland went on to enjoy a long

[147] March, 1939 WICA Superintendent's Monthly Report.

career with the National Park Service, from which he retired in 1961. His role in the development of Wind Cave National Park has long been recognized, and the *Hot Springs Star* ran a lengthy obituary when he died in 1987. That article listed his many subsequent appointments as park superintendent, and noted that "during [Edward] Dixon Freeland's eight year tenure at Wind Cave National Park, he presided over the most extensive developments within and above the cave that the park is likely to experience." [148]

Harry J. Liek took over as Superintendent in May 1939, and remained in that position until 1947. One of the first construction projects done under Like's leadership was the completion of a task initiated by Freeland--the addition of a sun porch/sleeping room to the superintendent's residence (HS-03). Freeland had discussed the project with the field office representative and even sent a sketch of what he thought would work best, but had not been able to get approval for the work before he left for his new post (Figure 43).[149] Freeland first requested the addition in 1938, but it was not built until 1941, the same year that crews completed a basement in HS-03 (Figure 44).[150]

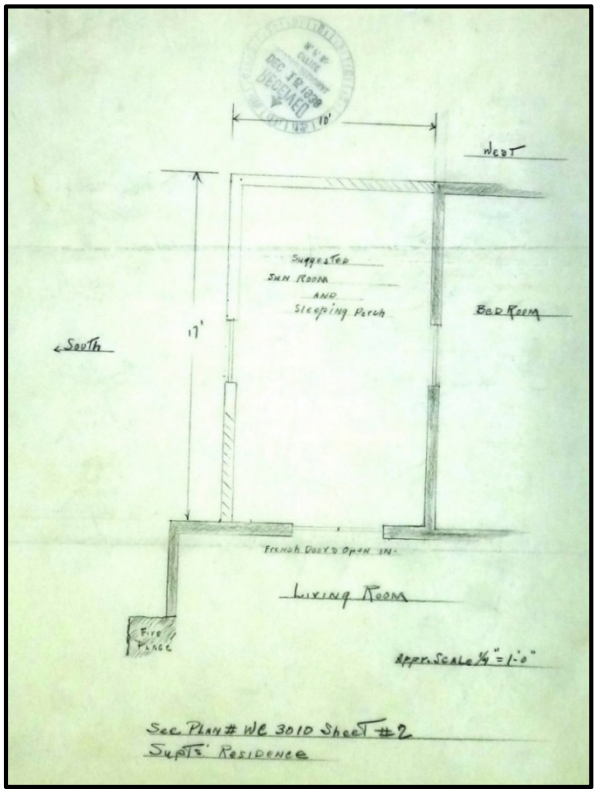


Figure 43. Freeland's sketch for a proposed new sun porch/sleeping room for HS-03, drawn 1938. (National Archives RG 79, Collection 2579433, National Archives at Kansas City. Kansas City Missouri.)

[148] "Edward Dixon Freeland," *Hot Springs Star*. January 13, 1987, (Clipping on file, Wind Cave National Park Historical Files: Years of Growth 1931-1945, Box 1. South Dakota: Wind Cave National Park Library, F REF 1931, B1 #1-10.)
[149] National Archives at Kansas City, Kansas City Missouri. RG 79, Collections 2579433 National Parks and Monuments; Wind Cave Box List 4709017; RG 77-2 Omaha Office-Special File Folder List
[150] February and December 1941 WICA Superintendent's Monthly Reports.

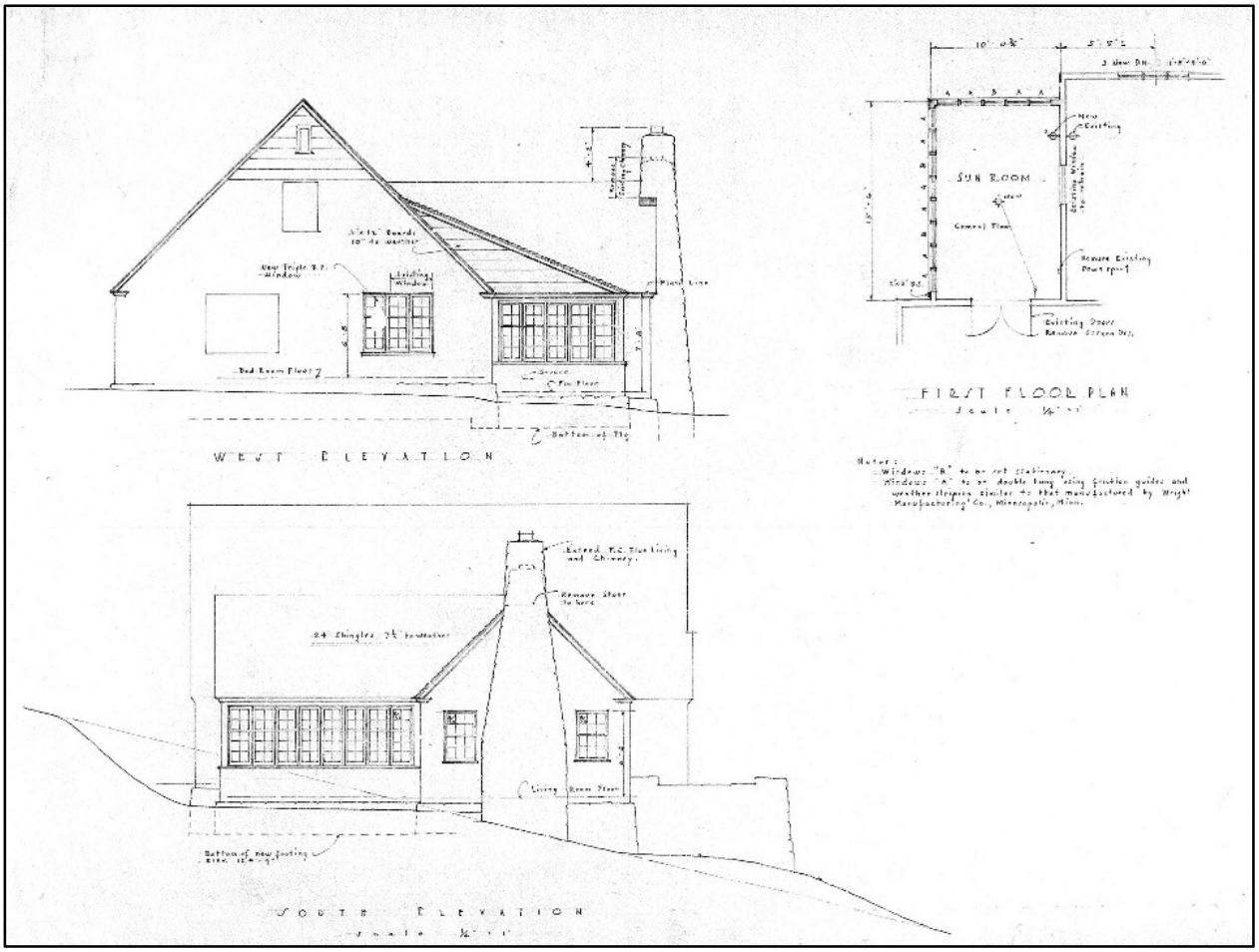


Figure 44. July 15, 1939. Plans drawn for a sunroom addition to HS-03. (WICA_108_3010B_[id278471])

Liek also had the unhappy experience of presiding over the end of the CCC camp at the park. He noted in his first annual superintendent's report that the CCC camp was scheduled to be closed in the fall of 1939 but that he hoped it could be kept open. He enclosed a list of work yet to be done, which included: "Additional landscaping called for in Master Plan" and an employee's residence for an additional permanent ranger. The report also noted that the elevator building had been done almost completely with CCC labor, and that CCC crews had transplanted 102 native trees and shrubs around the headquarters that year.[151] Liek was unsuccessful in his efforts to keep the camp open, and it closed in December 1939.[152]

The park was not completely cut off from CCC assistance when it officially closed. A "side camp" of 50 men was assigned to Wind Cave in 1940 to help wrap-up unfinished tasks. The 1940 superintendent's report noted that the crew of the side camp had focused upon on wildlife management and roadwork during that year, so it is unlikely that crews did much more work in the housing area. The park had access to limited help from the CCC again in 1941, but after the attack on Pearl Harbor on December 7, 1941, all CCC work not related to the war effort was

[151] 1939 WICA Annual Superintendent's Report.
[152] Bahr Vermeer Haeker Architects, 2-5.

halted. Congress ordered that the program be terminated in July 1942. Liek's 1942 annual report claimed that the most notable occurrence at the park that year was "the abolishment of the Civilian Conservation Corps and the liquidation of the camps."[153]

The federal relief programs of the 1930s had helped Wind Cave National Park develop into a modern, fully equipped national park. But, the coming of World War II not only curtailed federal spending at all national parks, it also caused a notable drop in tourism. Wind Cave was not immune to that trend, and the park saw sharply lower levels of use throughout the war years. Liek reported in 1942 visitation that year had dropped more than 35%, and those numbers remained low throughout the war.

End of the Period of Significance

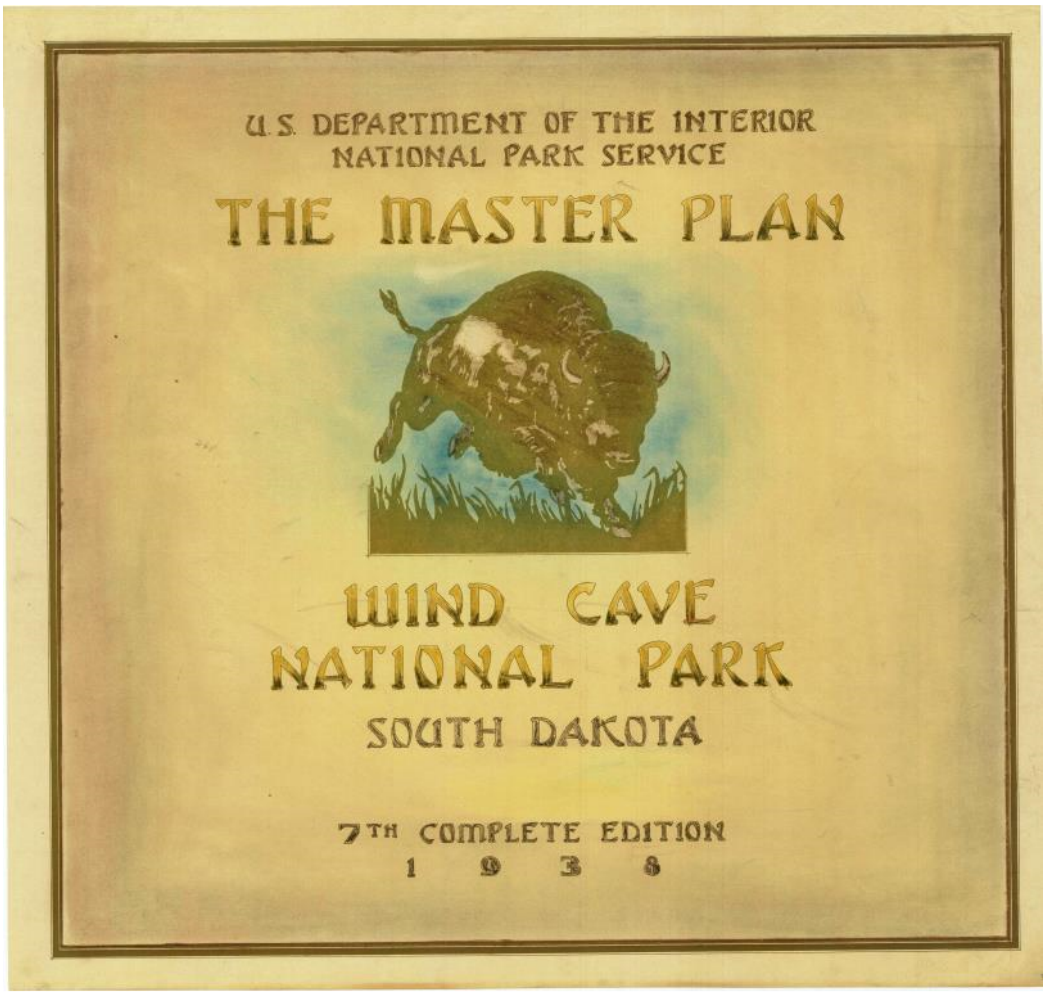


Figure 45. 1938 Master Plan Cover Sheet (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD.)

[153] 1942 WICA Annual Superintendent's Report, and Bahr Vermeer Haeker Architects, 2-5.

Episode 3. Working Housing: 1943-1983

Visitation remained low throughout the early 1940s, dropping nearly 50% in 1943, from 19,174 in 1942 to just 9,417.[154] Little physical development took place at the park during WWII. The only notable work on the residences involved redecorating four buildings; two received what was described as complete redecoration, and the other two saw more limited work on items such as linoleum and plaster work.[155]

In 1946 visitation jumped back to pre-war standards, with 19,159 cave visitors and 30,589 total park visitors.[156] The escalation of visitors coupled with a Park expansion of approximately one and a half times due to the passage of Public Law 708 on August 9, 1946 proved to be taxing on the limited number of rangers working at the park during the 1946 tourist season, so the staff was increased in 1947.[157] The increased staffing was well-timed, as visitation continued to rise throughout the 1940s, and the administrative load increased for a variety of reasons.[158] The park was also in charge of the business management of all NPS Service Areas in the Black Hills, including Badlands, Devil's Tower, Fossil Cycad, Mount Rushmore, and Jewell Cave.[159]

The 1950s varied significantly from the 1940s for Wind Cave National Park concerning visitation, fiscal management and building improvements. Just prior to the 1951 tourist season, Harry J. Liek moved to the central Black Hills Area Offices in Rapid City, South Dakota, and Acting Superintendent William J. Watson managed the Park until August of 1951, when Earl M. Semingsen arrived.[160] Superintendent Semingsen was in charge of activity within the park, but the Area Office in Rapid City handled accounting, personnel and assistance from the central repair shop.[161]

Semingsen had an effective nine-year tenure at Wind Cave National Park. One of the first actions of his administration was to set a goal to upgrade all park buildings and utilities within a five year period.[162] Following budgetary approval, building improvements began in 1951 with plumbing upgrades in most of the residences.[163] Most buildings also received improved hot water and heating systems, and many saw full window replacements and/or the addition of storm doors and windows. Holes were drilled into the exterior walls of many of the buildings to allow for the installation of blown-in insulation, after which the stucco was repaired (Figure 46). Other changes included electrical upgrades, interior and exterior painting, cabinetry upgrades, some new appliances and general repair and replacement for minor items such as faucets and

[154] 1941-42 WICA Annual Superintendent's Reports.
[155] 1945 WICA Annual Superintendent's Report.
[156] Public Law No. 708 increased the park boundaries from 11,718.17 acres to 28,059 acres. 1946 WICA Annual Superintendent's Report.
[157] 1947 WICA Annual Superintendent's Report.
[158] 1947 WICA Annual Superintendent's Report.
[159] 1946,1947 and 1948 WICA Annual Superintendent's Report.
[160] 1953 WICA Annual Superintendent's Report.
[161] 1953 WICA Annual Superintendent's Report.
[162] 1953 WICA Annual Superintendent's Report.
[163] See individual Maintenance Department Files. Available at WICA Library.

broken tiles.[164] The work proceeded quickly, and Semingson reported in 1953 that the initial push of "bringing all buildings and utilities up to a high maintenance level appears to be in sight at the close of the second year."[165]



Figure 46. HS-05. Holes on exterior showing insulation. (WICA 4273)

1953 marked Wind Cave National Park's 50th anniversary, with a Golden Jubilee celebration and record numbers of visitors at the park; some 65,000 people came through the park that year.[166] Increases in visitation and park management taxed the 11 permanent and 12 seasonal employees at the Park during the first half of the decade, a number far short of the 23 seasonal workers that Semingson considered to be needed for the level of visitation that park was experiencing.[167]

By 1954 all the residences had been remodeled, but general maintenance and a few minor additions continued into the second half of the decade (Figure 47). In 1956 the back porch and basement entrance to HS-06 were enclosed.[168] Installed along the south wall of the residence, the 7' x 20' porch and new concrete stairway were originally covered with a flat roof. At an unknown date, the flat roof was replaced with a shed roof.[169] In 1957 the stone porch on the north side of HS-03 was rebuilt.[170]

[164] See chronologies for individual structures.
[165] 1953 WICA Annual Superintendent's Report.
[166] 1953 WICA Annual Superintendent's Report.
[167] 1953 WICA Annual Superintendent's Report.
[168] 1956 Maintenance Department Files.
[169] Karsmizki, "Administrative and Utility Area NR Nomination," 7.45-46.
[170] 1957 WICA Annual Superintendent's Report.



Figure 47. Routine maintenance ca.1959. (WICA 4559)

In 1960 Semingson was replaced by Superintendent Jess H. Lombard.[171] At the beginning of Lombard's service, 11 year-round employees worked at the Park, with an additional 29 seasonal staff.[172] Lombard was guided by the "Master Plan for the Preservation and Use of Wind Cave National Park: Mission 66 Edition," which was published in 1961. Mission 66 was a National Park Service program which was put into effect in the 1950s, to prepare for the fiftieth anniversary of the National Park Service in 1966.[173] The program focused on planning for increased levels of visitation, and looked at ways to improve and expand programs, facilities and staff.

Part of the Mission 66 process included evaluation of existing facilities, a move which led to a recommendation to remove some of the older residences at the park. The 1961 master plan called for the demolition of "residences across the road from the Administration building" (probably HS-05, HS-06, HS-07) once they had "served reasonably their useful lives."[174] The buildings were apparently found to be in better condition than first believed, as they were obviously never found to have reached the end of their useful lives, and they continue to serve their original residential function.

There was no major construction in the existing housing area during the Mission 66 era, but the park administration did make plans to add to its housing stock at a different location. A site plan

[171] 1960 WICA Annual Superintendent's Report.
[172] 1960 WICA Annual Superintendent's Report.
[173] "Master Plan for the Preservation and Use of Wind Cave National Park:" Mission 66 Edition. November 1961, 3. On file at the WICA Library.
[174] "Master Plan for the Preservation and Use of Wind Cave National Park: Mission 66 Edition." WICA November 1961, 9.

begun in 1963 called for an all-new housing area as well as a new interpretive facility and a second elevator shaft for the cave (Figure 48). The interpretive facility and elevator were not built, but housing was added in the mid-1960s.[175] The Ash Lumber Company began construction on two apartment–type buildings in the early fall of 1964, with one building containing four units and the other eight units.[176]

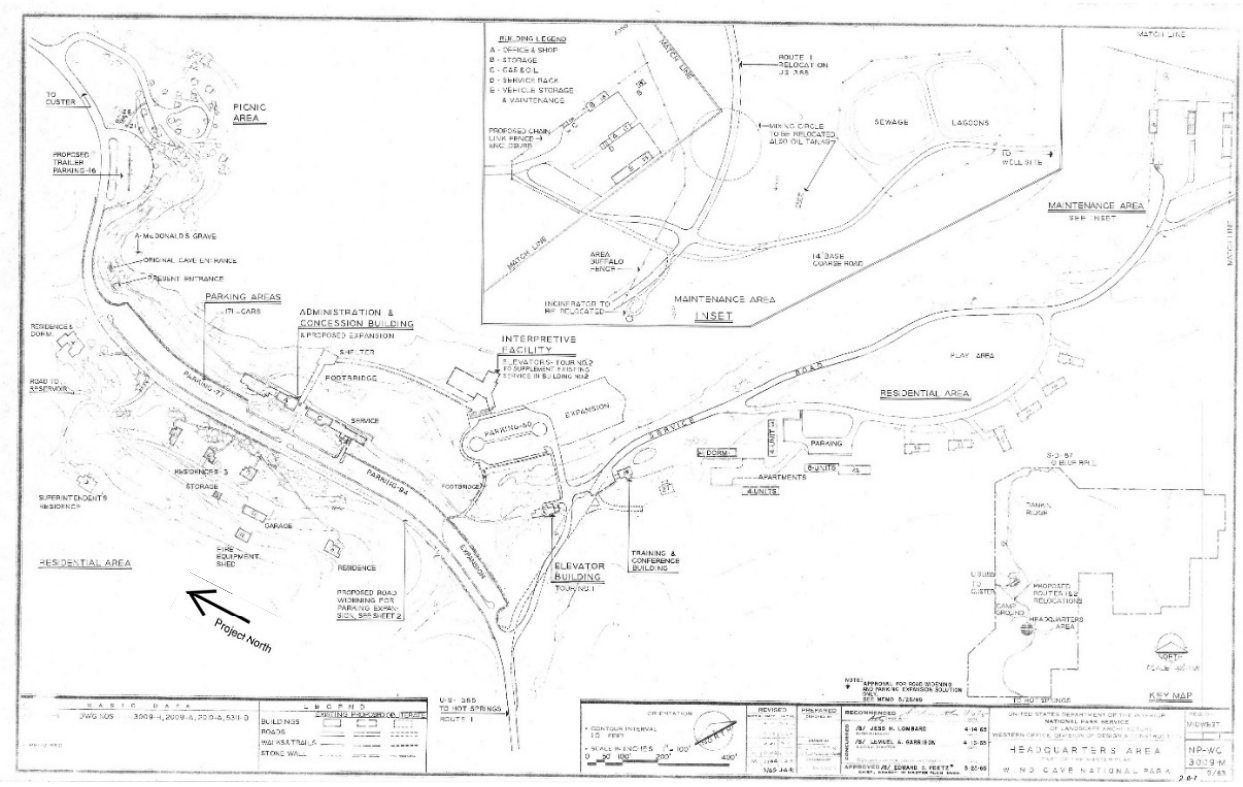


Figure 48. 1960s site plan of the administrative area. The plan was begun in 1963 but not fully approved until 1965. (WICA 15854)

The next major construction project in the headquarters area came in 1980, with a major expansion and remodeling of the visitor's center (HS-01). That project was followed by routine updates to the older housing and utility buildings across the street from the administration buildings, including replacing all of the wood shingle roofing with asphalt shingles in 1982.[177]

In 1976, all of the buildings in the headquarters area were recorded as part of a Classified Structure Field Inventory Report. That project laid the groundwork for future research and spurred recognition of the historic value of the buildings in the original housing area.[178]

[175] Plans in the WICA Museum Collection #15854; Appendix A, 1966 Site Plan WICA_108_3009N [id194754].
[176] 1965 WICA Annual Superintendent's Report; "Highlighted Briefing Statements, 1965 Calendar Year," A copy is available in the Mission 66 file folder at the WICA Park Library.
[177] 1982 Maintenance Department Files.
[178] Lance R. Williams, Classified Field Structure Inventory Report." Feb. 1976. (On file in the Wind Cave National Park Maintenance Department.)

Episode 4. Historic Housing: 1984-2015

The 1980s also brought a growing interest in the history of the buildings, and in 1982 a nomination to the National Register of Historic Places was begun. In July, 1984, the "Administrative and Utility Area Historic District, Wind Cave National Park" was listed in the National Register of Historic Places. With that designation came a greater awareness of the historic value of the buildings in the administrative area, and in 1986, as they all reached fifty years of age, they were administratively classified as "Historical Buildings."[179]

Although successful in achieving National Register status, the original Register nomination was a relatively brief document, and additional research began within a few years of the first listing. In 1992, Barbara Beving Long prepared a detailed document titled, "Wind Cave National Park, Historic Contexts and National Register Guidelines" which was originally intended to serve as a Historic Resource Study of the park, but evolved into a guide and basis for a multiple property National Register submission. In 1993 the buildings of the Administrative area were all included in the List of Classified Structures, which included recommendations to restore all of the buildings in the study area.

Long's work was followed by the preparation of the *Wind Cave National Park Multiple Property Submission Cover Document* and the *Wind Cave National Park Administrative and Utility Area Historic District* nomination, both of which were accepted by the National Register in January 1995. Those documents were prepared by Kenneth W. Karsmizki, who presented the history of the park with emphasis on the landscape and architectural development. He examined how this development was reflective of the National Park Services' goal to create buildings complimentary to the setting of the park.

Following the National Register listing, future funding provided for continued analysis of the important role of Wind Cave National Park plays in the preservation of the ecology, natural wonders, architecture, anthropology and archeology of the southeastern Black Hills. The "Wind Cave National Park Cultural Landscape Report" was completed in 2005, and in 2008 a Historic Structure Report for the CCC Officer's Quarters helped to document CCC contributions to park development.[180] In 2011, a new Historic Resource Study titled "Passages Through Many Worlds: Historic Resource Study of Wind Cave National Park" was completed by Mark Spence. That document covered the entire park, with particular emphasis on the importance of the people of the Northern Plains and Black Hills, including Native Americans, and Euro-American settlers who lived in the area prior to the establishment of Wind Cave National Park.

From the 1980 into the new millennium, the building and maintenance department at Wind Cave National Park worked to sustain the integrity of the buildings while maintaining safe and healthy living standards for the staff. One of the most notable projects of the period was the evaluation

[179] "Fixed Property Records", Property Files, Wind Cave National Park Maintenance Department.
[180] Wind Cave National Park Cultural Landscape Report. Prepared by John Miller Associates, Inc. and Rivanna Archeological Consulting (Charlottesville, VA) in association with Bahr, Vermeer & Haecker Architects, Ltd. (Lincoln, NE), May 2005.

for and remediation of hazardous materials, including lead paint. In the early 1990s all six houses tested positive for lead based paint, and all abatement was completed by 1995. That process included stripping paint from interior and exterior doors and woodwork and hardware. Many of the property files for the abatement project include sketch floorplans of the buildings as they appeared when the work was being done, providing a snapshot of conditions in the mid-1990s.

In 2014 the topics of history and maintenance were blended, with the initiation of this Historic Structures Report, which will serve as a guide for the continued preservation of these important historic resources.



Figure 49. Housing area in November 2014, looking south, HS-05 is the first building on the right. (DS 2014)

Architectural Context: Setting a Style for the Park

The National Park Service planning program of the 1920s resulted in a distinctive architectural design theme as well as a comprehensive development plan for Wind Cave National Park. All of the buildings in the historic housing area have similar architectural detailing, which features stucco walls and rough native stone foundations. Most have steeply pitched gable or hipped roofs that have little to no roof overhang and rough sawn board siding in the gable ends. Applied ornamentation is minimal. Four of the houses originally had decorative rough-hewn shutters, although none of those shutters have survived. (HS-03, HS-06, HS-07, and HS-08 all had shutters during the period of significance.)

All of the buildings in the study group feature highly textured stone work, and in almost all cases, the stone is the most ornamental element of the exterior design. All of the houses have thick basement walls of stone, and several also have stone terraces or patios. It appears that all of the stone came from nearby. Records show that a quarry was established in the park in1905, and superintendent reports of the 1930s repeatedly refer to "native stone" when describing construction of the buildings.[181] Although the individual ashlar pattern and level of detailing of the stonework varies somewhat from building to building, all of the structures feature large relatively rough-hewn blocks of sandstone. The textured stonework forms a marked contrast to the flat stucco walls and simple roof detailing.

About the only generalization that can safely be made about the architectural styling of the 1930s building at Wind Cave National Park is that no one agrees on what it should be called. In the 1930s, park staff and National Park Service landscape architects often referred to it as Spanish or northern Spanish, an early National Register nomination called it English Vernacular Revival, and other sources refer to it as Californian, Parkitecture and Rustic.[182] Although all of those terms apply to some extent, the most accurate discussion of the design theme at Wind Cave National Park as it relates to recognized patterns of architectural history is found in the 1995 Multiple Property Submission Cover Document, by Kenneth Karsmizki:

> The buildings of the Administration and Utility Area Historic District represent an adaptation of English Vernacular Revival style to the rustic or naturalistic architecture of resort hotels, lodges, cabins and governmental structures of the 1900-1940 period in South Dakota…Wind Cave National Park buildings are unusual in that the rusticated materials—hewn timbers, masonry trim, and stucco—are used in the English Vernacular style. The precise, incised lines created by the steel multi-light windows creates a contrast to the less refined, more organic stucco and hewn timbers. The ashlar coursing of the sandstone masonry contracts with the more commonly employed rubble masonry in the structures of the Custer State Park Game Lodge.[183]

[181] Notes from a review of WASO microfilm notes compiled by Lyle K. Linch in 1953 show that a quarry was established at the park in 1905. (Note on file at the Wind Cave National Park Library.)
[182] Baker, 1; Carolyn Torma, "Administrative and Utility Area Historic District, Wind Cave National Park," (August 24, 1982.); Karsmizki, "Administrative and Utility Area NR Nomination," 7.59; Long, 11/84.
[183] Karsmizki, Wind Cave MPDF, E.14-E.15.



Figure 50. Game Lodge of nearby Custer Sate Park (http://custerresorts.com/lodges-and-cabins/state-game-lodge/accommodations/cabins/)

English Vernacular Revival is also known as Tudor Revival or Romantic Revival.[184] As one history of residential design of the early 20th century put it, "of all the picturesque informal styles that piqued American homebuilders' imaginations in the first third of the 20th century, the most popular ones were those rooted in English tradition."[185] Common characteristics of English Revival houses, which were also used in the historic housing area of the Park, include steeply pitched roofs with large cross gables, irregular massing, prominent chimneys, heavy board and batten exterior doors, and multi-paned windows.[186] Several of the houses at Wind Cave National Park have similar design features; HS-03 and HS-08 are among the most distinctive.

Stucco was a popular exterior wall treatment in English Revival architecture, often in conjunction with false half timbering, and or masonry accents. One style guide noted that stucco offered an inexpensive way to make a frame building look like it was a masonry structure. "In the early decades of the century, wood framed houses could be most easily disguised as masonry by applying stucco cladding over the wooden studs; many early Tudor houses used this technique, both with and without false half timbering."[187] As Karsmizki noted, the design theme developed for Wind Cave National Park offers a distinctive combination of elements common to both English Revival houses of the period and the more naturalistic rustic detailing typical of many National Parks in the western part of the country (Figures 51 and 52).

[184] James C. and Shirley Maxwell Massey, House Styles in America: The Old-House Journal Guide to the Architecture of American Homes, (New York: Penguin Studio, 1999) 219.
[185] Massey and Maxwell, 219.
[186] Virginia and Lee McAlester, Field Guide to American Houses, (New York: Alfred A. Knopf, 1986.) 356.
[187] McAlester and McAlester, 355.

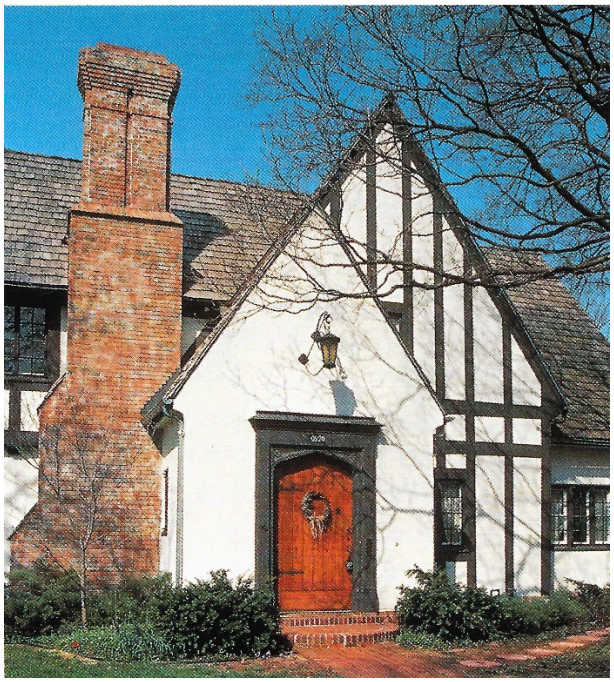


Figure 51. 1920s English Revival Style house. James C. and Shirley Maxwell, House Styles in America: The Old-House Journal Guide to the Architecture of American Homes, (New York: Penguin Studio, 1999) 220.



Figure 52. Grand Canyon Administration Building, built in 1921, is considered to be one of the best early examples of rustic architecture in a national park. ("Historic Structure Report, First Administration Building Grand Canyon National Park." June 2008.)

Although the buildings appear to relate to English precedents when viewed through the lens of history, they were originally referred to as "Spanish." The National Park Service landscape division used the term "northern Spanish" at least once, and there are several references to "Spanish stucco" in the superintendent's reports of the 1930s. An early article in the *Hot Springs*

Star, written by National Park Service landscape architect Howard Baker in 1935 described recent developments at the park:

> Among the first appropriations was that for a building, and the type of architecture that was to predominate in this park had to be chosen. We chose to use the northern Spanish architecture, which harmonized with the landscape, having a not too rustic but pleasing character. All buildings have and will carry this same design throughout the entire development.[188]

It is possible that the term northern Spanish referred to buildings in the north of Spain, but more likely that it came into use because the use of stucco spurred associations with Spanish Mission and Spanish Eclectic architecture of the United States. A brief review of architecture located in northern Spain revealed a small number of buildings that combine stucco walls with rough stone foundation, and straight topped openings, but it does not appear to have been a significant building tradition in the area (Figure 53). Baker's use of the term "northern Spanish" may refer to the lack of wide arched openings and red tile roofs that typified Spanish and Spanish inspired architecture in the United States, or simply to Spanish inspired architecture of northern California.



Figure 53. House located in the Galacia region of northern Spain. (Accessed April 1, 2015 http://www.exploregalicia.com/accommodation-galicia.html)

The source of inspiration for the design team may be uncertain, but the source of the design is not. Thomas Vint and the staff of the National Park Service Landscape Division in San Francisco developed the design theme used for the buildings at Wind Cave National Park. The architectural theme for the park developed during the planning process in the late 1920s. A review of correspondence associated with that process shows indicates that the distinctive

[188] Baker, 1.

combination of stucco and stone which defines the buildings at Wind Cave today may have been based more upon the setting and budgets than on stylistic precedents. The landscape division initially considered log construction for many of the new buildings at the Park, until it was pointed out that since the site had few trees at the time, that plan was counter to the National Park Service policy that new buildings should reflect the landscape in which they were located.[189]

Log construction was featured in one of the of the first National Park Service produced drawings for a building at the Park. In 1927, acting National Park Service Chief Civil Engineer Burt H. Burrell sent a report to the Director of the National Park Service which included blueprints for a proposed power house and comfort station.[190] Both of those small early buildings were drawn with field stone walls and exposed round log rafters and trusses (Figure 54).

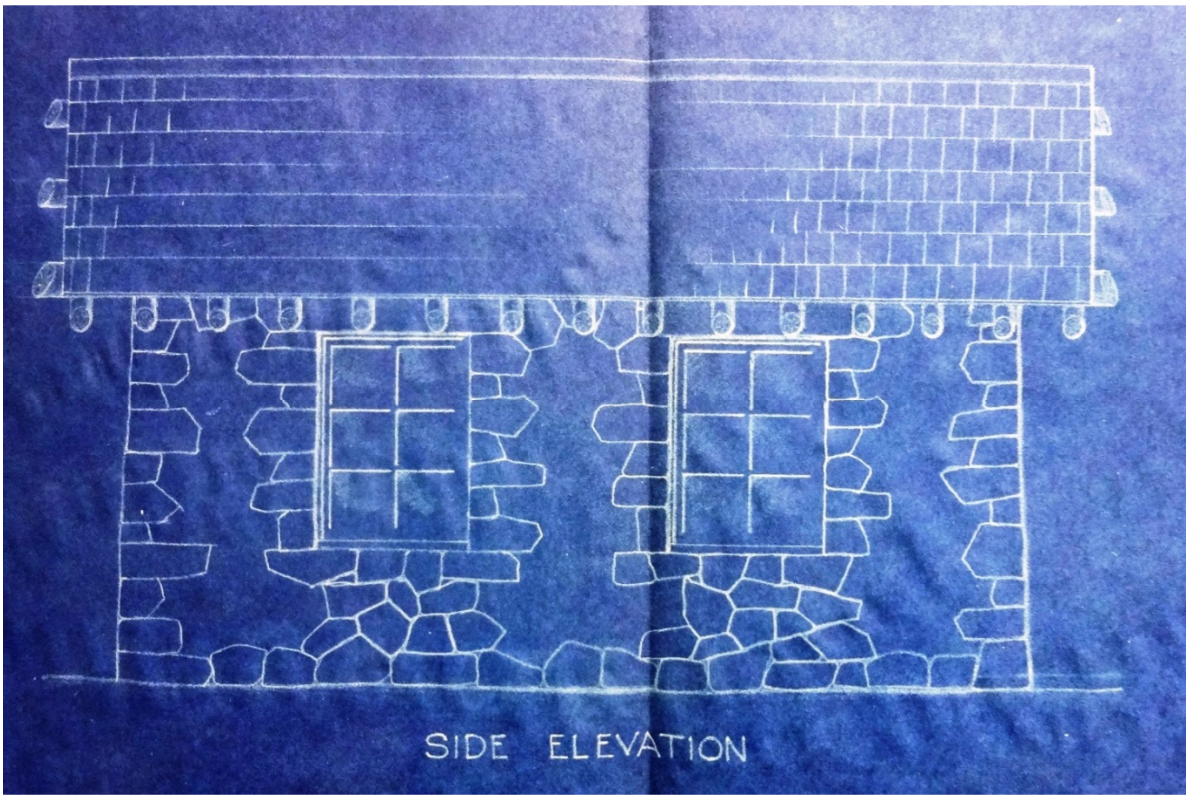


Figure 54. First design for the power house (HS-13). (National Archives RG 79, Central Classified Files Box 446. National Archives II, College Park, MD.)

Those plans may have been intended for cost estimates, but it is clear that log construction was considered for Park buildings in the early phases of the planning process. Chief Landscape Architect Thomas C. Vint took an active role in the preparation of the Park's first master plan, and visited the Park several times in the late 1920s. After a visit in 1929, he reported that "I have data for a new general plan which will be worked up to scale from the topographic maps prepared in 1927...The facilities to be included in this plan have been discussed with

[189] Harrison 5-6.
[190] National Archives RG 79, Central Classified Files Box 446. (National Archives II, College Park, MD.)

Superintendent Snyder and I believe I have his concurrence."[191] He went on to describe the planned layout of the site, and noted that he had discussed the construction of a possible new concession building, which he said was to be "of log construction."[192]

A few weeks later superintendent Anton Snyder wrote to the Director of the National Park Service to discuss the need for a new administrative building. In that letter, Snyder offered "a brief history" of "the various phases through which the evolution in design of this building has progressed." Snyder noted when he mentioned log construction to Chief Engineer Frank Kittredge, "Mr. Kittredge was not in favor of a log or a frame building and pointed out that an entrance to a cavern and in an environment such as ours, where there is practically no timber, stone alone would be appropriate."[193] Kittredge later clarified his statements in a letter to Snyder:

> You will recall that when you first mentioned your administration building to me you mentioned the use of logs as being your proposal, and inasmuch as the Landscape Department try to harmonize their buildings with the surroundings—that is logs in timber country, and masonry building in rock country—I immediately volunteered the information that since this is rock country and there is no timber within many miles, I thought you and the Landscape Division would prefer a masonry building.[194]

Snyder said he liked the idea of an all-stone building but did not think he could get funding for one, and noted that "frame or log were being considered only because of the lower cost." [195] The letter mentioned that a log or frame building was expected to cost $3,000 to $4,000, while one all of stone would be closer to $10,000. At that time, all parties were considering a new two-story building that could house administration, visitors' services and ranger's quarters. Vint and Snyder next devised a modified plan which would utilize more stone. Snyder reported that in the revised design, the building would be "two stories high of stone construction to the sills of the second floor. The balance of the sidewalls to be of logs or slabs."[196]

Even with the partial use of log or slab walls, the two-story multi-purpose building was considered to be too expensive, and in the end Snyder and Vint agreed upon the need for a one-story administration building and a separate ranger's quarters, both of which were later included in the master plan and constructed. It is likely that the preliminary design work and cost estimating for that proposed building influenced the development of the current architectural theme, which uses stuccoed frame walls instead of logs. Such a combination was more fitting to

[191] National Archives RG 79, Central Classified Files Box 446. (National Archives II, College Park, MD.)
[192] Sept 7, 1929. National Archives RG 79, Central Classified Files Box 446. (National Archives II, College Park, MD.)
[193] October 28, 1929 National Archives RG 79, Central Classified Files Box 447. (National Archives II, College Park, MD.)
[194] November 5, 1929. National Archives RG 79, Central Classified Files Box 447. (National Archives II, College Park, MD.)
[195] October 28, 1929 National Archives RG 79, Central Classified Files Box 447. (National Archives II, College Park, MD.)
[196] October 28, 1929 National Archives RG 79, Central Classified Files Box 447. (National Archives II, College Park, MD.)

the then-treeless site of the headquarters area, and less expensive to construct than 100% masonry.

In spite of its lower cost and suitability for treeless sites, stucco did not become a common building material in National Parks of the period. A comprehensive collection of designs for park structures which was published in 1938, for example, documents hundreds of buildings and structures located in North American parks, but includes only four stucco buildings.[197] Three of those, all located in state parks, also had clay tile roofs or arched fenestration patterns typical of Spanish Revival architecture. The fourth was the Administration Building at Wind Cave National Park, which was on the tile page for the chapter on "Superintendent's and Staff Quarters." The book included a photo and floor plan of the Administration Building, with a note that "The architecture expression found here departs in materials and manner from what one almost comes to expect in park construction. The widening of vocabulary is welcome, and in this particular treatment is well undertaken in surroundings that are completely unwooded.[198]



Figure 55. Site of the "unwooded" housing area before development and tree planting, ca. 1931. Looking to the north with newly completed HS-13 on the left. (WICA 4117)

The newly developed design scheme was first used at Wind Cave National Park in 1931, just before the park's first master plan was issued (Figure 56). Ironically, the new design theme premiered with a modest utilitarian building, the new power house (HS-13) (Figure 55). Superintendent E. D. Freeland reported upon the completion of the new power system in 1931 and noted that the "power house on the surface is constructed of native stone and Spanish stucco, setting the style for all future buildings in the park."[199] He also noted that the new

[197] Albert H. Good, Park & Recreation Structures, (Washington, D. C.: National Park Service 1938). The book also showed a few buildings in the Southwest that were constructed of stuccoed adobe bricks.
[198] Good, 72.
[199] 1931 WICA Annual Superintendent's Report.

ranger's dormitory (HS-08) which was begun about the same time "conforms in every respect to the style of architecture prescribed by the Landscape Division." [200] He repeated that phrasing a year later, when he described two recently completed construction projects: "Both buildings are of native stone and Spanish stucco, conforming to the approved design."[201]

Although an early National Register nomination credited Howard Baker with the design of many of the buildings in the housing area, subsequent research has indicated that the design theme was developed before Baker joined the staff of the landscape division and that he actually drew plans for only one building in the park, HS-07.[202] It is much more likely that Vint personally developed what Freeland came to call "the style of architecture prescribed by the Landscape Division." Although the staff of the landscape division included several junior and assistant architects and assistants by the late 1920s, numerous staff reports show that Vint handled much of the work at Wind Cave National Park himself.

Howard Baker did play an important role at the park as construction got underway. He appears to have joined the Landscape Division staff around 1931, when his name started appearing on field reports and architectural drawings. By that time, Vint had established a training process in in which each new member of the staff spent a year in the office working on drawings before being assigned to a field position of resident landscape architect."[203] Howard W. Baker's initials appear on many of the earliest master plan pages of the 1930s, and he also initialed the construction documents for one of the buildings at the park, HS-07. Some or all of those plans were probably drawn during his initial training period. He later served as a field representative for Wind Cave National Park. He had the title of Junior Landscape Architect when he visited the park with Assistant Landscape Architect K. C. McCarter in 1931, and correspondence files indicate he remained involved with park design issues into the late 1930s.[204]

The buildings in the historic housing area were built during one of the most significant periods of development experienced at Wind Cave and at the National Park Service in general. They offer an unusual and highly intact collection of National Park Service architecture and an irreplaceable link to the early development of Wind Cave National Park.

[200] 1931 WICA Annual Superintendent's Report.
[201] 1932 WICA Annual Superintendent's Report.
[202] Population census records show that in 1930, Baker, then 24 years old and unemployed, was living in Lyndon, Kansas with his parents. Accessed March 2015 at Ancestry.com
[203] McClelland, 200.
[204] National Archives RG 79, Collection 2579433. (National Archives at Kansas City. Kansas City Missouri.)

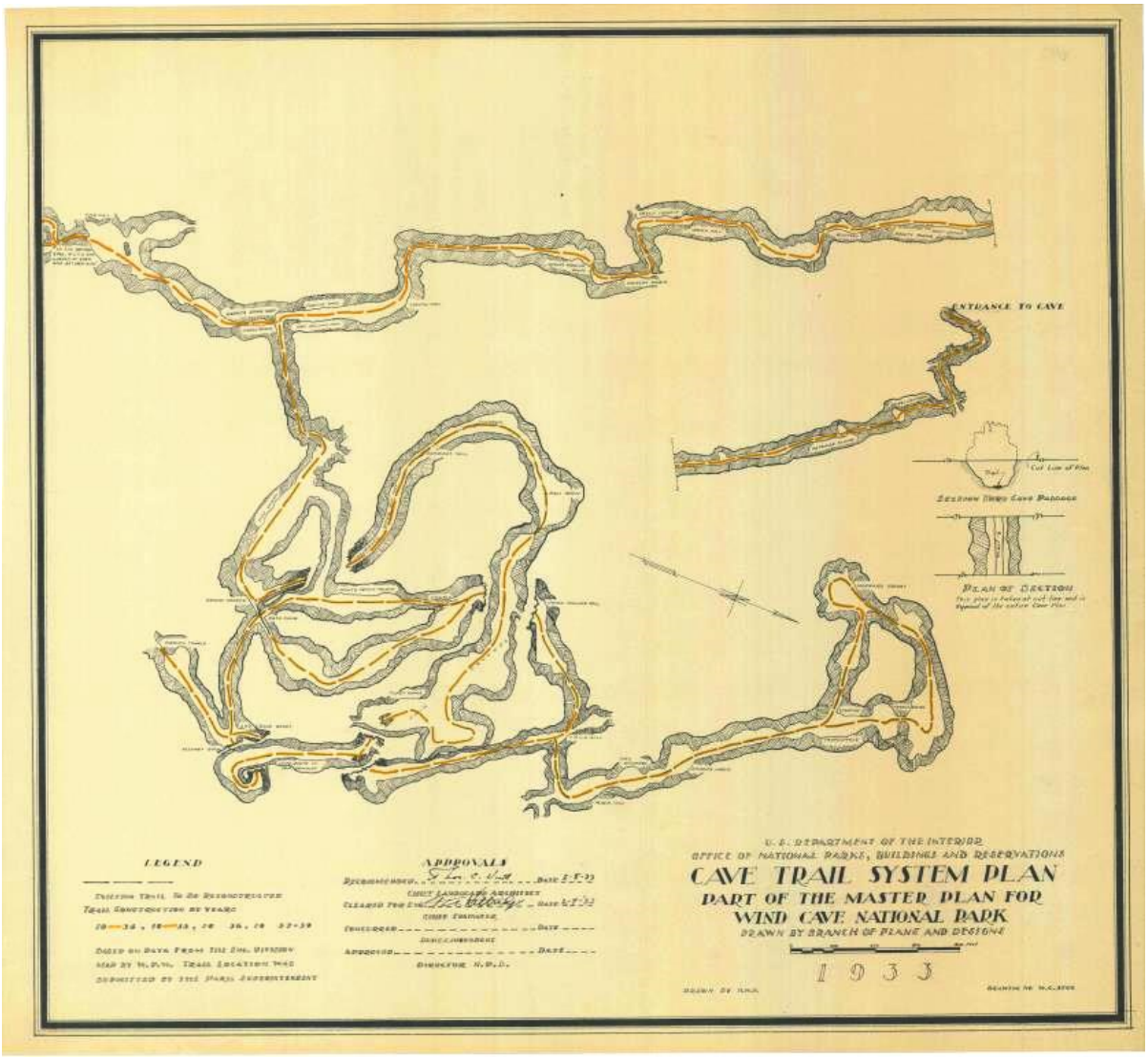


Figure 56. Map of the cave trail system from the 1933 park master plan. (National Archives RG 79, Master Plans, Stack Area 330. Cartographic Department, National Archives II, College Park, MD)



Ranger with buffalo in front of HS-13 ca. 1966.
(WICA Museum Collection #WICA 4331)

Timeline

Timeline

Pre Park Development
No buildings constructed during this time period have survived.

1640. First written reference to Lakota in the Black Hills. [Barbara Beving Long, *Wind Cave National Park: Historic Contexts and National Register Guidelines* (National Park Service: 1992), 2/4.] NPS

1860-1870s Lakota still holding their sacred sun dance and buffalo calling ceremonies in the Black Hills. [Mark Spence, "Passages through Many Worlds: Historic Resource Study of Wind Cave National Park." (Omaha, NE: Midwest Regional Office, National Park Service, 2011), 91-93, accessed Feb. 2015, http://www.nps.gov/wica/learn/historyculture/index.htm]

1881
Wind Cave rediscovered by Jesse and Tom Bingham.

1884-1888. Local newspaper articles describe parties from Custer and Hot Springs visiting the cave. One Hot Springs tourist brochure printed in 1888 lists the Cave as attraction. [John W. Bohi, "75 Years at Wind Cave: A History of the National Park," (South Dakota Historical Collections XXXI, 1962), 20.]

1886 Lode mining certificates for Wind Cave filed by Frank Horton and Nels Hyde. - Abandoned. Two other claimants held the rights until sold to the South Dakota Mining Co., headed by John C. Moss. [Spence, 188.]

1890
Jesse D. McDonald, an employee of the South Dakota Mining Company, began charging for guided tours and initiated an active campaign to develop the cave as a tourist attraction. [Long, 3/11.]

1892
John Stabler purchases an interest in the cave from McDonald and erects a hotel near the mouth of the cave. [Long, 3/12.]

1893
Peter J. Folsom, surveying engineer, wins a suit against Moss family for non-payment of surveying and is awarded rights to Wind Cave as retribution. [Spence, 209-210.]

1893. U.S General Land Office first becomes involved in Wind Cave and surrounding land due to Folsom lawsuits. [Long, 3/16]

1894
January. Multiple members of the McDonald and Stabler families file for 160 acre agricultural homesteading rights to area covering Wind Cave. [Spence, 210.]

1898 USGS visits Wind Cave and prepares report concerning mineral rights claimed by Folsom and Stabler. [Long, 3/16]

1899
GLO declares that Wind Cave should be "held in reserve as a public resort." [Karsmizki, WCMPS NR Nomination E.5] The 1898 U.S. Geological Survey report and the General Land Office both supported the use of the cave as a national park. [Long, 4/23]

1902
Discussion of possible public management included option to attaching the cave property to the Black Hills Forest Reserve. [Long 4/24.] Secretary of the Interior Ethan A. Hitchcock instead ordered the GLO to prepare legislation to establish Wind Cave as a national park. [Spence, 232]

June 1902. House Representatives Eban W. Martin of South Dakota and John F. Lacy of Iowa, along with Senator Robert J. Gamble of South Dakota sponsored the Bill to establish Wind Cave National Park, with a final vote in December. [Spence, 232]

Episode 1. Early Operations: 1903-1929

1903
January 9 1903. President Roosevelt signs law to establish the park, and an initial appropriation of $2,500 was established by Congress in March. [Spence, 234].

August, 1903. William A. Rankin was appointed as the first superintendent of Wind Cave National Park. He served until May 1909. His wife Irene B. Rankin became the food concessionaire in 1904. [Spence, 234.]

1905
First stone quarry opened at park, per WASO microfilm notes compiled by Lyle K. Linch in 1953. [WICA Library Historical Files.]

1905, ca. A stone superintendent's cottage (HS-04) was built overlooking the area of the historic cave entrance.

1907
Federal Report notes installation of a water and pipe system for conveying water from Beaver Creek to the "superintendent's office and residence building." Rankin's wife had revocable privilege to furnish meals for 50 cents each…"which service has proved to be very desirable and satisfactory in former seasons." Seth Bullock, Marshall for the district of South Dakota, in

charge in advisory capacity, with superintendent in charge of day to day. ["Wind Cave National Park," Published Annual Report on National Parks in the Wind Cave Region, 1907. Copies on file at the WICA Library. Hereafter referred to by year and Federal Report.]

1908
Superintendent. William A. Rankin recommends that the hotel, "built in 1893 by John Stabler", be torn down and someone be allowed to build a new one. Need to fence the entire park. [1908 Superintendent's Annual Report, Wind Cave National Park. Copies on file at the WICA Library. Hereafter referred to by year as WICA Annual Superintendent's Report.]

1909
May, 1909. Joseph E. Pilcher replaced William A. Rankin as the Wind Cave National Park superintendent. He stayed until March 1910. [Long, Appendix A.1] ["Wind Cave National Park Timeline," National Park Service, Wind Cave, South Dakota, accessed February 2015]
The old hotel was repaired and Mrs. Pilcher served meals. [1909 Federal Report.]

1909. Federal report lists the following buildings:

- Superintendent residence (now HS-04)
- Cave House
- Restaurant building
- Blacksmith shop—appears to have been built that year or maybe just whitewashed. [1909 Federal Report.]

1910
March 14, 1910. Superintendent J. E. Pilcher died. His son Rufus J. Pilcher was assigned as the new superintendent on March 26, 1910, and he managed the park until May of 1911. [Long, Appendix A.1.]
Harold Peterson given permission to take pictures in the cave for the year for $15 fee. Mrs. Jennie A. Pilcher, widow of J. E. Pilcher was given food concession. [1910 Federal Report]

1911
May 1, 1911. Abram C. Boland was instated as the new superintendent, following the resignation of Rufus Pilcher. He and served until June of 1912. [Long, Appendix A.1] Barn built for superintendent. [1911 WICA Superintendent's Annual Report.]

1912
June, 1912. William M. Boland: June 1912 to November 1913. (Replaced Abram C. Boland). [Long, Appendix A.1]

1913
National Game Preserve established at WICA.

Stabler's hotel is demolished, and a new frame registration office is built on the same site. [1914 WICA Annual Superintendent's Report.]

November, 1913. William Boland resigns as park superintendent. Frederick M. Dille becomes the acting superintendent in December of 1913 and serves until July of 1914. [Long, Appendix A.1; 1913 Federal Report]

1914
Annual Report shows that the superintendent is the "only official upon a regular salary," but there is also a "ranger for a month at a time to assist with grazing and timber matters," plus one or two guides [1914 Federal Report]

WICA Buildings in 1914:

- HS-04—six rooms, substantially constructed of stone obtained from within the park.
- Registration office and dressing rooms—recently enlarged
- Open pavilion for picnics and travelers
- Frame cave house
- Good barn with room for 4 horses
- Tool house/Blacksmith shop—this was moved behind the barn this year. 1915 report notes this is log.
- Water supply via pipe that flows at one gallon in seven minutes.
- Superintendent recommended a "neat stone structure about the entrance" to the cave, plus a concrete water tank at the spring. [1914 Federal Report.]

August, 1914. Thomas W. Brazell becomes the park superintendent, replacing acting superintendent F.M. Dille; he served until March of 1919. [Long, Appendix A.1] Ester Cleveland Brazell was a ranger guide. She may have been the first woman to be a ranger for the National Park Service. ["Wind Cave National Park Timeline", NPS]

1915
First report authored by T. W. Brazell, and first to include a map of the cave.
Ice house added (12x12x10 feet), water tank and system completed, screen doors and windows added to visitor building. Old ½" water pipe froze and was removed.
Some recommendations for future work:

- Lighting the cave with electricity
- Abolishing fees to transport visitors to the park
- Finishing upstairs of HS-04
- Increasing superintendent salary
- Adding two part time rangers [1915 WICA Annual Superintendent's Report.]

June 11, 1915. Inspector from Department of the Interior visits the park. [Wind Cave National Park Historical Files: The Difficult Years 1914-1931, South Dakota: Wind Cave National Park Library, F REF 1914B1 #1-9, Box 1.F7 Inspection Report from Mark Daniels, General Superintendent and Landscape engineer of for national parks, Department of the Interior.]

1916
President Woodrow Wilson establishes the National Park Service, and appoints Stephen Mather to be the first director. [Karsmizki, Wind Cave MPS Cover Document, E.7]

1918
HS-04 got a two-room and bathroom addition. [1918 WICA Annual Superintendent's Report.]

1919
March 1919. Superintendent, Roy W. Brazell: Mar. 1919 to June 1928. Replaced Thomas Brazell. Roy Brazell was Thomas Brazell's son. [Bohi 85; Long, Appendix A.1]

1920
Annual superintendent report also includes a request for rangers' quarters. [1920 WICA, Superintendent's Annual Report.]

1924
March 17. Supt Roy W. Brazell writes to Daniel Hull, National Park Service Landscape Engineer (Los Angeles) seeking permission to use a "ready cut variety" of house for the new ranger cabin. [National Archives RG 79, Records of the San Francisco Field Office Box 448. (National Archives II, College Park, MD.) Here after recorded as NARA RG 79, Box #.]

1924 Superintendent report notes that the number of visitors had doubled in the past 5 years. No funds were appropriated specifically for construction this year but it was necessary to build a small ranger cabin (HS-05) to house the additional employees required to handle the increased number of visitors. [1924 WICA Annual Superintendent's Report.]

1925
All National Park Service superintendents are directed to draw up five-year plans to meet future needs of their parks. [Linda McClelland, Building the National Parks: Historic Landscape Design and Construction (Baltimore: John Hopkins University Press, 1998), 291.]

1927
Under the control of Thomas C Vint, National Park Service Landscape Architectural Office moves to San Francisco. ["Brief Organizational History of the Office of Design and Construction, National Park Service 1917-1962."]

1927, ca.
Memo from Superintendent Brazell to the Chairman of the House Appropriations Committee notes rising numbers of visitors and no increases in funding. The only recent improvements were roadwork and construction of a "small ranger cabin in 1924…More funds badly needed…In closing it must be said that to hope to continue under the conditions that have obtained here in the past few years is nothing less than suicidal. Unless funds are provided for the adequate maintenance of what few utilities we have, this park is going to present much the

same appearance as the shiftless landlord's property." [WICA Historical Files, Difficult Years 1914-1931, B1, F7.]

1927. More than 20,000 visitors, four permanent employees—superintendent, game warden and two rangers. [Bohi, 365-468.]

August 1927. Burt H. Burrell, acting chief engineer, issues a topographic "Map of Administration Area…to accompany report on ultimate development plan." The map may have been drawn by A. EW. Burney, office engineer. The map shows existing buildings and game fence as well as some of the cave passages. [NARA RG 79 Central Classified Files, B447.]

Sept. 7, 1927. Acting Chief Civil Engineer Burt H. Burrell sends a report to the Director of the National Park Service which includes blueprint sketches for a new power house and comfort station, as well as a detailed justification for a power system at Wind Cave. The blue prints show a classic rustic stone and log structure.

Episode 2. 1928-1942: Cooperative Design and Development

This is also the Period of Significance. *Because this was one of the busiest times of development in the history of the park, annual summaries of construction projects have been included for this episode, starting in 1930.*

1928
National Park Service Landscape Architectural Office becomes the National Park Service Field Headquarters. ["Brief Organizational History of the Office of Design and Construction, National Park Service 1917-1962."]

June, 1928. Superintendent, Anton J. Snyder replaced Roy W. Brazell. Brazell apparently left under pressure. [Long, Appendix A.1]

September 5, 1928. Snyder writes to NPS director Demary that "Mr. Vint arrived at Wind Cave Sunday afternoon and together we have gone over the proposed developments at the park…. Mr. Vint is certainly the capable man you recommended him to be. He is full of real practical ideas, and I hope that his plans for the development of park headquarters can be substantially carried out." [NARA RG 79 Central Classified Files, B447.]

Sept 8, 1928. Vint sends a report on his trip to the park which includes a development plan which foresees most of the development that took place in the 1930s. He notes that "I have data for a new general plan which will be worked up to scale from the topographic maps prepared in 1927 by Mr. Burney. The facilities to be included in this plan have been discussed with Supt Snyder and I believe I have his concurrence. All to lie west of the road with residential structures in front and utility group to rear. Also talked about a concession building, which was to be "of log construction." [NARA Central Classified Files RG79 B 446.]

Sept 11, 1928. Acting Director A. E. Demaray writes Snyder to say how much Demaray had enjoyed his visit to Wind Cave. [NARA RG 79 Central Classified Files, B447.]

1929
Horace Albright becomes NPS director. [Ethan Carr, Wilderness by Design: Landscape Architecture and the National Park Service, (Lincoln, NE: University of Nebraska Press, 1998), 239.]

1929. National Park Service makes park development plans mandatory, and declared that their "success depends upon the proper collaboration of the Park Superintendent, the Landscape Architect, and the Chief Engineer and the Sanitary Engineer." [McClelland, 293-4]

July 1929. Monthly Superintendent report notes that "Chief Landscape Architect Thos. C. Vint of the San Francisco office spent the 18th at the park inspecting road construction and the administrative area. Mr. Vint secured additional data for our proposed building program, and will prepare tentative sketches of the administration building upon his return to San Francisco. [July 1929 Superintendent's Monthly Report, Wind Cave National Park. Copies on file at the WICA Library. Hereafter referred to by month and year as Superintendent's Monthly Report.]

1929, mid-year. By mid-1929, Vint's staff consisted of six assistant landscape architects and two junior landscape architects. He established a training process in which each new member of the staff spent a year in the office working on drawings before being assigned to a field position of resident landscape architect." [McClelland, 200.]

August 4, 1929. Frank A. Kittredge, Chief Engineer of NPS, sends his report on a visit to Wind Cave, and notes that "Mr. Vint is preparing sketches of a proposed new Administration building…Mentions using Burrel's topographic map as a base." [NARA central classified Files RG79 B 446.]

September 1929.
Annual Report lists following buildings: (current notes) [1929 WICA Superintendent's Annual Report.]

- Superintendent' residence (HS-04)
- Ranger cabin (HS-05)
- "Public or Registration building" (razed, replaced Stabler Hotel in 1913, which was right across street from HS-04)
- Barn (razed, was by HS-01 site)
- Cave Entrance building (razed)

Oct. 1929. Snyder writes to director of National Park Service about general need for a new admin building and offers "a brief history" of "the various phases through which the evolution in design of this building has progressed." "Mr. Kittredge (Chief Engineer) was not in favor of a log or a frame building and pointed out the entrance to a cavern and in an environment such as ours, where there is practically no timber, stone alone would be appropriate." Snyder noted that

the “frame or log were being considered only because of the lower cost [NARA RG 79 Central Classified Files, B 447.]

1930 Summary
Superintendent: Anton J. Snyder
Relevant Projects Completed in 1930: Design of HS-13, as a Power House, and HS-08, to serve as a Ranger’s Bunkhouse.

1930
National Park Service opens an Eastern Field Office in Virginia. The San Francisco Office, which becomes the Western Field Office, is still in charge of Wind Cave National Park. [“Brief Organizational History of the Office of Design and Construction, National Park Service 1917-1962.”]

Jan. 30, 1930. Snyder writes a long preliminary estimate for the year, and notes that “it is extremely unfortunate that none of the improvements in the estimate can be supported by preliminary sketches from the Landscape Architect, and approved preliminary estimates of cost of construction form the Chief Engineer.” He noted they had visited in the past and were very helpful but did not stay long enough… [NARA RG 79 Central Classified Files, B447.]

Feb 15, 1930. Letter from Snyder to Cammerer indicates he had been working with Vint on the master plan. “I fully agree with Mr. Vint that the bunkhouse and all other possible buildings be placed in the area back of the current ranger cabin.” (HS-05) Also noted that “our interview at the conference...may serve to supply some detail…Mr. Gideon (concessions manager), will have a sketch of his temporary building and a general proposal ready by the end of the week…good progress is being made on the administrative area changes.” [NARA RG 79 Central Classified Files, B447.]

February, 1930. Park Superintendent reports that “Plans for the new Rangers’ bunkhouse (now HS-08)…and preliminary sketches of the proposed public utility improvements in the park, have been received from the landscape division.” [February 1930 WICA Superintendent’s Monthly Report.]

May 16, 1930. Press release from WICA announces major increase in funding for the park in a federal appropriation bill that was signed by the president on May 14, 1930. Says it increased appropriation for the park from $13,500 to $54,900, with $39,900 earmarked for “physical improvements.” [WICA Historical Files, Difficult Years 1914-1931, B1, F7.]

May 29, 1930. Article in the Rapid City Journal notes that “we have seen the preliminary sketches for buildings. They are not released for publication yet—but they will be a new type in Black Hills construction and will absolutely transform the old ranch type of buildings into something in a class by itself.” [Clipping in NARA RG 79 Central Classified Files, B447.]

July, 1930. Proposed Water System Plans Drawn. 1 Page. Completed by 6/10/1932 [Appendix A.]

July, 1930. Monthly superintendent's report says Thos. C. Vint, along with Mrs. Vint and Jr. Landscape Architect McCarter, visited the park July 3 and 4, "reviewing and studying our general landscape and construction problems. Mr. Vint's visit was very valuable to us, for I believe as a result of it we have for the first time really arrived at a development program in which the several features of administration construction and landscaping are well coordinated." Anton J. Snyder to Sect of Interior. [July 1930 WICA Superintendent's Monthly Report.]

September, 1930. Superintendent's report says
"This year for the first time I have been at the park that I have had the pleasure of seeing some of our proposed and badly needed improvements take material shape and form…I am quite elated at the thought that our long period of decline retrogression has apparently been broken….The Landscape Division has made quite a comprehensive study of our problem and is working on a general layout plan which should be carried out as expeditiously as possible." [Sept. 1930 WICA Superintendent's Monthly Report.]
The report included a list of buildings that were needed:

- New public building "to supersede the old unsightly frame building in which visitors to the cave are being registered."
- Two new resident buildings to provide quarters for increase [sic] personnel.
- Ranger's dormitory and mess hall. "At present temporary rangers are in tents."
- A general utility building combining machine storage, workshop, and warehouse facilities.

"In concluding this report I want to express my appreciation of the mighty fine cooperation we have had from the Washington office and the Landscape and Engineers Division." [1930 WICA Superintendent's Annual Reports. Superintendent's cover letter dated September 2, 1930.]

1931 Summary
Superintendent: Anton J. Snyder until March, then Edward D. Freeland.
Relevant Projects Completed in 1931: First Master Plan, HS-13, Power House, HS-08, Ranger's Bunkhouse, Master Plan.

1931
First Master Plan developed for Headquarters area, [NARA RG 79, cartographic collections.]

1931. San Francisco Office has 14 landscape architects. [Carr, 239.]

March 15, 1931. Superintendent Anton J. Snyder transferred to Carlsbad Caverns and Edward Dixon Freeland took over at Wind Cave. Census records show that Snyder had left the Park Service by 1940, when he was working as an insurance salesmen in Carlsbad, New Mexico. [1931 WICA Superintendent's Annual Report.]

March 24, 1931.
A letter from National Park Service Director, Horace M. Albright, to Edward Dixon Freeland offers much advice about the post and in the final paragraph says “Above all things Mrs. Freeland and you should be yourselves...Your success at Wind Cave will determine your future in the National Park Service….” [WICA Historical Files, Years of Growth 1931-1946, B2, F19.]

May 1, 1931. Plans completed for Power House, (HS-13). [Appendix A.]

May 7, 1931. Plans completed for Ranger’s Dormitory and Bunkhouse (HS-08). [Appendix A.]

June 30, 1931. HS-13 completed. [1931 WICA Annual Superintendent’s Report.]

July 18, 1931. Work begins on HS-08. [1931 WICA Annual Superintendent’s Report.]

July 26, 1931. Landscape architects McCarter and Baker arrived on the 27th to inspect completed electric system and the work now in progress on the new ranger’s dormitory. Also noted that “work was started July 13 by the W. A. Kepp Construction Company on the rangers’ dormitory.” (HS-08) [August 1931 WICA Superintendent’s Monthly Report.]

August 31, 1931 Plans completed for “Employee’s Residence” (now HS-07). [Appendix A.]

September 15, 1931 Construction of HS-08 completed, per plans. [Appendix A.]

Sept, ca. 1931. Superintendent annual report notes that “construction of a complete water and sewer system, an electric system providing adequate surface circuits and electric lighting for the cave trails, and a rangers’ dormitory and mess house supplied in case a need of long standing.” [1931 WICA Annual Superintendent’s Report.]

The 1931 report also described new power system—started April 25 and completed on June 30, 1931: “visitors are relieved of the burden of carrying lanterns, a complaint in the past…The power house on the surface is constructed of native stone and Spanish stucco, setting the style for all future buildings in the park.” The power plant, a 25 horsepower semi-Diesel engine, was transferred from Carlsbad Caverns National Park and short belt drive installed.”
Also described the Ranger’s dormitory: “This building conforms in every respect to the style of architecture prescribed by the Landscape Division. It is located on a hill overlooking Wind Cave Canyon and contains four sleeping rooms, a bath, dining room and kitchen.” [1931 WICA Annual Superintendent’s Report.]

Oct. 9, 1931. Local paper runs a big article about work on new water system and notes only local men will be hired for the project, with priority given to those married and with children. [“Work on $50,000 Wind Cave Water System to be Started Soon: Only Local Men to be Employed,” *Hot Springs Evening Star*, October 9, 1931, Vol. XLIII N. 99, 1]

December 9, 1931. Work began on residence (HS-07). [December 1931 WICA Superintendent's Monthly Report.]

1932 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1932: Construction of Residence, (now HS-07).

1932
Master Plans for all national parks were completed by 1932, and all were updated annually through 1942. [McClelland, 304-305.]

January 19, 1932. Work started on a new two car garage at the rear of the superintendent's residence. Frame, "sealed inside with metal lath and stucco outside." [January 19, 1932 WICA Superintendent's Monthly Report.]

Feb. 26, 1932. Work on the new employee's residence (HS-07) completed and accepted with one day to spare on the contract. [February 26, 1932 WICA Superintendent's Monthly Report.]

1932. Annual superintendent's report says construction for the year consisted of one residence (HS-07) and a 2-car garage on the superintendent's residence. (Since removed) "Both buildings are of native stone and Spanish stucco, conforming to the approved design." [1932 WICA Annual Superintendent's Report.]

1933 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1933: Design of HS-03, HS-06, HS-11.
Civil Works Crews arrived at the park this year as well.

1933
National Park Service Field Headquarters in San Francisco renamed the Branch of Plans and Design. ["Brief Organizational History of the Office of Design and Construction, National Park Service 1917-1962."]

September, ca. 1933. Superintendent's Annual report notes that "ramshackle combination of car shelter, oil and icehouse" was moved to a less conspicuous location. [Oct., 1933 WICA Superintendent's Monthly Report.]

September, 1933. Monthly superintendent report notes that "Sketch plans and information were submitted to the Branch of Plans and Designs for working drawings. They consist of Machine Shop and Shed, Employee's Residence and Superintendent's Residence." [Oct., 1933 WICA Superintendent's Monthly Report.]

September 18, 1933. Plans completed for a Machine Shop Shed (now HS-11). [Appendix A.]

October 10, 1933. Plans completed for Employee's Residence (HS-06). [Appendix A.]

November 3, 1933. Plans completed for Superintendent's Residence (HS-03). [Appendix A.]

December 5, 1933. Superintendent monthly report says 78 man Civil Works project was approved for tree planting, roadside cleanup shoulder sloping and conditioning cave trails. [Dec. 5, 1933 WICA Superintendent's Monthly Report.]

December 11, 1933. Superintendent's report (written in January 1934) says that "the outstanding event of the month was the beginning of work on the Civil Works Project." Started Dec. 1 with 44 men. [Jan. 5, 1934 Monthly Superintendent Report, 1.]

1934 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1934: Construction of Superintendent's Residence (now HS-03), Employee's Residence (now HS-06), and Machine Shop (now HS-11), all by the Hot Springs Lumber Company.

March 7, 1934. Monthly report says bids received in Feb. for the construction of two employee's quarters and a machine shop. Low bid was $19,000 ml, and the allotment was $12,600. March 1934 WICA Superintendent's Monthly Report.]

April 6, 1934. Contract let to Hot Springs Lumber Co., for "two residences and a machine shop." $19,475.69. (HS-03, HS-06, HS-11) [April 1934 WICA Superintendent's Monthly Report.]

May and June, 1934. Work started in late April on two residences and a machine shop, Federal Projects 201 and 202. Hot Springs Lumber Co. working on Federal Project 201a "which consists of an Employees Residence (HS-06), Superintendent's Residence (HS-03) and a Machine Shop. (HS-11). [June 1934 WICA Superintendent's Monthly Report.]

July, 1934. Word of CCC camp received, approved July 10, and army started work on "tent camp" on the 16th. [August 1934 WICA Superintendent's Monthly Report.]

August 11, 1934. HS-03, HS-06 and HS-11 were completed per plans and annual report. Contractor: Hot Springs Lumber Co for all three buildings. Supervising architect, Mr. Kerr from San Francisco at the park to approve the project. Superintendent E. D. Freeland moved into HS-03 on Aug 16, 1934. Chief Clerk Mr. Parsons, moved into HS-06 on Aug 9, 1934. [1934 WICA Annual Superintendent's Report.]

August 17, 1934. Plans drawn for changes to HS-05, titled "Alteration to Employee's Residence." [Appendix A.]

Sept. 1934. [1934 WICA Annual Superintendent's Report.]
Public Works programs for the year totaled $222,100, and included:

- FP-201a –two employees' quarters and machine shed. (HS-03) (HS-06)
- Elevator and equipment installation.
- Improvements to cave trials.
- Administrative and Park operator's building. (HS-01)
- Road improvements.

Annual also report notes Jewell Cave put under jurisdiction of WICA.

The report also noted that the Emergency Conservation Work (ECW, known later as CCC) camp was established and listed work contemplated. The only construction work listed there was "moving of old buildings." Also noted that part of this work was started under civil works last winter. [August 1934 WICA Annual Superintendent's Report.]

Oct. 15, 1934. Howard Baker writes to director about HS-02 and signs it Associate Landscape Architect—he has apparently been involved in planning for a good while. Did not like new plans for HS-02. [WICA Historical Files, Years of Growth 1931-1946, B2.]

October 15, 1934. Plans Drawn for Plantings at HS-03, HS-06, and HS-07. [Appendix A.]

1935 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1935: HS-05 was moved and remodeled to meet new design theme, Remodeling of HS-04 to match new design theme was begun. (HS-01 was also completed.)

1935 Administration Building (HS-01) completed. [1940 Master Plan.]
January, 1935. Superintendent reports that the new foundation for HS-05 was complete, and work had begun to moving the building. [Feb. 1935 WICA Superintendent's Monthly Report.]

Feb 22, 1935. Howard Baker, Associate Landscape Architect, Ralph Kerr, Supervising Architect P. W. and Sam Sarreno from Rocky Mountain office arrived in park. "Mr. Baker was making a hurried inspection trip to Wind Cave, Devils Tower and Scotts Bluff; Mr. Kerr to go over the work with the contractor on the new Administration and Operators building." [March 1935 Superintendent's Monthly Report.]

Feb. 1935. HS-05 Remodeling Old Residence Project No. 5b: Project progressing, building moved to new location, interior additions, partitions relocated. Lath almost complete. Getting ready for plaster. Wiring complete. [March, 1935 Superintendent's Monthly Report.]

March 8, 1935. Plans completed for remodeling of HS-04. [Appendix A.]

May 16, 1935. Alteration to Employee's residence (HS-05) complete. [June, 1935 Superintendent's Monthly Report.]

1935. Annual superintendent report notes that "greater development occurred in this park during the past year than in any year in its history." The outstanding accomplishment was the virtual completion of three physical improvement projects and the elimination of the last of the unsightly old buildings at park headquarters [1935 WICA Superintendent's Monthly Report.]

October, 1935. Newspaper article about open house for HS-01 notes 20,207 people went through the cave in the previous year, and approx. 265,000 passed through the park. That issue of the newspaper had several articles about the park. [WICA Historical Files, Years of Growth 1931-1946, B2, F5.]

1936 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1936: HS-04 received a ranger's dormitory addition, and the remodeling to match new design theme was completed.

July 25, 1936. A new power plant (HS-15) and first elevator building (precursor or base for HS-02) completed during the year. HS-13 became a workshop after the new power house was completed. [Superintendent Annual Report, July 1936,] Note, the 1940 Master Plan says HS-02 was completed in 1938, but that might have been in reference to final finishes.

November, 1936 – HS-04 "A small crew worked most of the month on the addition to the ranger's clubhouse, placing a stone foundation and starting the framework. Most of the old stonework around the entire building was veneered with new stone to make this structure conform in general appearance with the other buildings in this area." [November, 1936 WICA Superintendent's Monthly Reports.]

November, 1936. Small basement enlarged under one of the residences for storage and laundry. Plans were completed for alterations to HS-08. [Dec. 1936 WICA Superintendent Monthly Report.; Appendix A.]

1937 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1937: Expansion and Remodeling of HS-04, including ranger's dormitory wing; basements added to unspecified residences; HS-08 remodeled from Ranger's Dormitory and Mess Hall to a residence.

January 20, 1937. "Howard W. Baker and S. Serrano arrived in the park in the morning, made an inspection of the projects being worked on that require landscape supervision, and left the park the following day for the Badlands." "An ECW crew, under supervision of stone mason, completed stone retaining walls in basement of employees' residences. (Possibly HS-05, HS-06 and HS-07 [Jan. 1937 WICA Superintendent's Monthly Report.]

January, 1937. [ECW] crew worked entire month on dormitory addition for Rangers Club House. (HS-04) [Feb. 1937 WICA Superintendent's Monthly Report.]

February 25, 937 “Resident Landscape Architect Sam Serrano returned to the park from Denver… spent the balance of the month here and in Custer State Park.” [March 1937 WICA Superintendent’s Monthly Report.]

March, 1937. “The old ranger’s dormitory (HS-08) being remodeled for use as a residence will make one of the most convenient houses on the park. It was completed in April. [May 1937 WICA Superintendent’s Monthly Reports.]

July and August, 1937. July-Assistant Regional Landscape Architect, [Howard] Baker arrived in park. ECW Associate Architect, Cecil Baker (Omaha) in park for elevator project. August-Visitors to Park: Howard W. Baker, Assistant Regional Landscape Architect and Thomas E. Carpenter, Deputy Chief Assistant. [August and September 1937 WICA Superintendent’s Monthly Reports.]

November, 1937. Removal of [retaining] wall and sloping of the bank in front of HS-04. [April 1937 WICA Superintendent’s Monthly Report.]

1938 Summary
Superintendent: Edward D. Freeland.
Relevant Projects Completed in 1938: Construction of HS-12.

March, 1938. Fire house/3 stall garage (HS-12): pouring of roof slab, drain tile installation. Water, sewer and lights installed. Waterproofing exterior walls with pitch. [April 1938 WICA Superintendent’s Monthly Report.]

July, 1938. Stone veneer work being done on HS-12. [August 1938 WICA Superintendent’s Monthly Report.]

July 11, 1938. Omaha office sends a large batch of plans to D.C., including many plans of the housing area buildings. [Memo on file at WICA Library.]

1939 Summary
Superintendent: Edward D. Freeland to March; Howard B. Stricklin: March to May; Harry J. Liek, after May. Relevant Projects Completed in 1939: Additional Employee’s Residence planned, but never built.

1939
January 1, 1939. Site Plan Drawn for Master Plan. Site map identifies HS-12 as a ‘fire equipment shed. [Appendix A.]

March, 1939. “Plans for a new employee’s residence were submitted to Omaha for revision and comment.” This building was included in the 1939 Master Plan map, but does not appear to have ever been constructed. [March 1939 WICA Superintendent’s Monthly Report.]

July 15, 1939. Plans drawn for a sunroom addition to HS-03. [Appendix A.]

1939. Annual superintendent report notes CCC camp was scheduled to be closed in the fall but hoped it could be kept open. Work yet to be done included: Additional landscaping called for in Master Plan. Employee's residence for additional permanent ranger. The report also noted that the elevator building had been done almost completely with CCC labor, and that CCC crews transplanted 102 native trees and shrubs around the headquarters that year. [1939 WICA Annual Superintendent's Report.]

August, 1939. Supervisor visits to park: Associate Regional Landscape Architect, Charles A Carter; Associate regional Architect Halsey Davidson; Vint and Baker. [August 1939 WICA Superintendent's Monthly Report.]

September 1939. Baker visits park. [Sept. 1939 WICA Superintendent's Monthly Report.]

November 1939. Baker visit park for "inspecting areas within this region proposed for National Parks and Monuments." [November 1939 WICA Superintendent's Monthly Report.]

October 31, 1939. Annual superintendent report notes CCC camp NP-1 closed October 31, 1939. August 14, 1939. A letter from Francis Case (S.D. 2nd District Congressional House Rep.) is sent to Conrad Wirth, Supervisor of Recreation and Land Planning, NPS, asking him not to relocate the WICA CCC camp. [WICA Library Historical Files, CCC Projects]

November 22, 1939. Plans completed for an addition to HS-07, which would have increased the number of bedrooms from 2 to 3. This change was never made. [Appendix A.]

1940 Summary
Superintendent: Harry J. Liek

September, ca. 1940. Superintendent's Annual report notes CCC Side camp of 50 men was transferred back to do some unfinished tasks. The report focused on wildlife management and roadwork. [1940 WICA Annual Superintendent's Report.]

June, 1940. Howard Baker, Regional Landscape Architect and Fletcher, Assistant Landscape Architect in park. [June 1940 WICA Superintendent's Monthly Report.]

August 19, 1940. Howard Baker and Associate Park Planner Neal Butterfield in park. Report may have been prepared by Harry Liek; he signed the May report. [August 1940 WICA Superintendent's Monthly Report.]

1941 Summary
Superintendent: Harry J. Liek
Relevant Projects Completed in 1941: Completion of Sunroom Addition and Basement for HS-03.

January, 1941. Completion of basement at Superintendent's residence (HS-03). Report may have been prepared by J. Estes Suter, Acting Superintendent. [Feb, 1941 WICA Superintendent's Monthly Report.]

July, 1941. Park visit: Architect Dick Sutton and [Howard] Baker, Regional Headquarters Chief of Planning. [August 1941 WICA Superintendent's Monthly Report.]

November, 1941. Foreman James C. Johnson assigned to Wind Cave to be in charge of building construction, sun porch, Superintendent's Residence (HS-03). [December 1941 WICA Superintendent's Monthly Report.]

1942 Summary
Superintendent: Harry J. Liek
Relevant Events of 1942: CCC Camp at Wind Cave permanently closed.

January 1, 1942. General Site Plan and Utilities Layout drawn as part of a Master Plan. [Appendix A.]

1942. Annual Superintendent's report states that "The outstanding occurrence during the year was the abolishment of the Civilian Conservation Corp and the liquidation of the camps," and noted that travel by the end of the fiscal year was 35.4% less than it had been the year before. [1942 WICA Annual Superintendent's Report.]

End of the Period of Significance

Episode 3. 1943-1983: Working Housing
Few major additions or alterations occurred to the study group during this episode. In 1951, incoming superintendent Earl M. Semingsen set a goal to upgrade all buildings and utilities over the next five years. [1953 report 1676-78] As a result, most of the houses were insulated, some windows were changed, and most roofs were changed from wood to asphalt shingles.

1943
The number of visitors to the Cave dropped in half from the previous year, from 19,174 in 1942 to 9,417 in 1943. [1942 and 1943 WICA Annual Superintendent's Reports.]

1945
Annual report shows that two employee residences were "completely redecorated" and two others partly so. Mentioned new linoleum and plaster. [1945 WICA Annual Superintendent's Report.]

1947
Superintendent annual report notes “visitation increased 305 percent over the last pre-war travel year.” The park had to add staff to handle the increased numbers. [1947 WICA Annual Superintendent’s Report.]

1948
WICA was also handling the business matters of Badlands, Devil’s Tower, Fossil Cycad, Mount Rushmore, and Jewell Cave. [1947 WICA Annual Superintendent’s Report.]

1950
March 1950. Site Plans drawn as part of a new Master Plan. [Appendix A.]

1951
July, 1951. Acting Superintendent, William J. Watson replaces Harry J. Liek on May 17.

Aug, 1951. Earl M. Semingsen becomes superintendent. Semingsen sets a goal to upgrade all buildings and utilities over the next five years. [1953 WICA Annual Superintendent’s Report.]

September 1951. Annual report noted upgrade of heating and hot water in two residences, and complete new wiring in two residences—not clear if they were the same ones. [1951 WICA Annual Superintendent’s Report.]

1952
Report by Superintendent Earl M. Semingsen report claims one of heaviest years of public use in park history. Construction work included insulation of 8 residential and Administration office buildings, plus new windows for two residences. [1953 WICA Annual Superintendent’s Report.]

1952. New windows added to HS-07, maybe others [Photo, WICA 4266.]

1953
WICA 50th anniversary, Golden Jubilee celebration. [1953 WICA Annual Superintendent’s Report.]

September, 1953. Annual report notes that rental rates for employees saw a jump of more than 100%, causing a “serious feeling of unrest” and putting employee morale “at the lowest ebb in the history of the park.” [1953 WICA Annual Superintendent’s Report.]

1953. Staff included 11 permanent staff and 12 seasonal. Superintendent said 23 seasonal workers would be optimal, considering increase in annual visitors from 12,000 in 1932 to 65,000 in 1953 with no increase in seasonal staffing level. [1953 WICA Annual Superintendent’s Report.]

1953. Four residences redecorated inside; two tiled baths installed, storm sashes on all residences. “The five year goal set by the Superintendent for bringing all buildings and utilities

up to a high maintenance level appears to be in sight at the close of the second year." [1953 WICA Annual Superintendent's Report.]

1954
Annual report says all residences had been redecorated inside and out (except for the game ranch). [1954 WICA Annual Superintendent's Report.]

1957
"Park's MISSION 66 prospectus approved by all offices concerned." [1957 WICA Annual Superintendent's Report.]

1957
New porch added to HS-03. [1957 WICA Annual Superintendent's Report.]

1957. List of existing buildings as of 1957 included in a 1962 master plan.

1958
Upgrades to HS-03 includes bathroom wiring and painting, plus new drains in basement. [1954 WICA Annual Superintendent's Report.]

1960
Superintendent, Jess H. Lombard: 1960-1965. Superintendent's report lists 11 year round staff and 29 seasonal. [1960 WICA Annual Superintendent's Report.]

1961
"Master Plan for the Preservation and Use of Wind Cave National Park: Mission 66 Edition." The plan called for the demolition of "residences across the road from the Administration building" (HS-05, HS-06, HS-07) once they had "served reasonably their useful lives." ["Master Plan for the Preservation and Use of Wind Cave National Park: Mission 66 Edition." (WICA November 1961), 9.]

1963
March, 1963 Site Plans drawn as part of a Master Plan. [Appendix A.]

September, 1963. Site Plans. Part of Master Plan. Two revised dates 3/1965 and 2/1966. 1 sheet. [Appendix A.]

1965
Superintendent report notes contract let Aug. 21, 1964 for a 12 unit employee apartment building, due to be completed May 29, 1965. [1965 WICA Annual Superintendent's Report.]

1966
Superintendent, Warren D. Hotchkiss: 1966.

1966
Site plan begun in 1963 approved, called for a second elevator shaft and a new housing area. The second elevator shaft was not built, but the new housing area was added southeast of the administration building. [Plans in the WICA Museum Collection #15854]

1967
Park Service drops requirement for annual reports by park superintendents. [1967 WICA Annual Superintendent's Report, 196-97.]

1976
Classified Structure Field Inventory Reports are prepared for structures in the in the park, including all of the buildings in the historic housing area. [Lance R. Williams, Classified Filed Structure Inventory Report." Feb. 1976, on file in the Wind Cave National Park Maintenance Department.]

1978
Mrs. Brazell visited the park again and talked to rangers about living there in the 1920s. [WICA Museum Collection. Misc. photos donated by Mrs. Brazell.]

1980
Visitor center (HS-01) remodeled and expanded. [Maintenance Department Files.]

1982
Wood shingles replaced with asphalt for roofs on most buildings in study area. [Maintenance Department Files.]

Episode 4. 1984-2015: Historic Housing
The buildings of the study group were all listed in the National Register in 1984, and designated as "historical buildings" in park files in 1986. There were not a lot of external changes during this episode, but all buildings saw routine interior updates. All were also tested for hazardous materials, and most were treated for lead based paint in the 1990s.

1984
First nomination to the National Register of Historic Places, prepared by Carolyn Torma in 1982, results in National Register designation on July 11, 1984. [Carolyn Torma, "Administrative and Utility Area Historic District, Wind Cave National Park," (August 24, 1982.) accessed February 10, 2015 http://www.nps.gov/nr/research/.]

1986
All buildings in the housing area reclassified as "Historical Buildings". [Maintenance Department Files.]

1987
Edward D. Freeland dies. The *Hot Springs Star* publishes a long obituary. ["Edward Dixon Freeland," *Hot Springs Star*. January 13, 1987, (Clipping on file, Wind Cave National Park Historical Files: Years of Growth 1931-1945, Box 1. South Dakota: Wind Cave National Park Library, F REF 1931, B1 #1-10.)

1992
Historic Resource Study of Park Resources. "Historic Contexts and National Register Guidelines" prepared for the historic resources of Wind Cave National Park. [Long.]

1993
List of Classified Structures includes recommendation for restoration of all buildings in the study area. [LCS]

Testing begins for Lead Based Paint in the historic buildings of WICA. (Most associated reports include sketch floorplans, and some have photos.) [Maintenance Department Records.]

1994
Six residences tested for lead, including HS-05, HS-06, and HS-07. [Maintenance Department Records.]

1995
January 26, 1995. *Wind Cave National Park Multiple Property Submission Cover Document* and *Wind Cave National Park Administrative and Utility Area Historic District* nomination accepted by the National Register of Historic Places.

1995. Lead Abatement work completed. Final report has some photos and descriptions of work. Doors and casing were stripped, as was all hardware. [Maintenance Department Records]

January1995. Multiple Property Documentation Form and Historic District Nomination for the National Register of Historic Places are accepted.
[http://pdfhost.focus.nps.gov/docs/nrhp/text/64500591.PDF.]

2005
Cultural Landscape Report completed.

2008
Historic Structure Report for the former CCC Officer's Quarters.

2011
Historic Resource Study for the entire park.

2014
Work begins on a Historic Structures Report for the historic housing area.



HS-08 ca. 1931. (WICA Museum Collection #WICA 4267)

Historic Building Materials

Historic Building Materials

The exterior and interior building materials for the Historic Housing Area were fairly uniform amongst the collection of residences and utilitarian buildings. Exterior materials such as roofing, box gutters, native stone masonry, colored stucco, wood or steel windows, shutters, doors, trim details and exterior lighting lend a cohesive aesthetic to this grouping of buildings, which continues today. Through the years, exterior materials have been preserved, maintained and replaced, sometimes appropriately and other times, without careful thought as to how these changes affect the overall historic integrity of the individual structures. Interior materials, such as plaster walls, stained wood millwork and doors, wood flooring, cabinetry, hardware and lighting all add to the charm and appeal of living within these historic structures. With the ultimate goal to protect the buildings within the Historic Housing Area, a closer inspection of some of these individual elements is conducted within this section of the report.

Roofing

All of the roofs for the buildings in the Historic Housing Area were originally wood shingles. These shingles were specified in the original construction drawings to be 24-inch length with exposures ranging from 7 ½-inches to 10-inches. All shingles were specified to be laid over building paper and 1 x 6 sheathing. The sheathing on HS-08 was specified to be laid 2-inches apart, but it does not appear this type of spacing was accounted for during construction. In the attic, most sheathing was tightly laid, with an occasional one-half-inch spacing. This is typical for all of the buildings, except for HS-04, which does typically have the sheathing spaced 1-inch or more apart. When the roof shingles on HS-04 were originally laid, the gap in the sheathing would have provided space for the shingles to air out. The buildings constructed in the 1930s by the National Park Service all had building paper installed under the shingles, so the sheathing spacing would not have been required. The species of the wood shingles is unknown and is not specified on the drawings.

The wood shingle roofs lent a distinctive crisp appearance to the newly-constructed and remodeled buildings. The shingles were random width, but laid in straight lines, with the butts of the shingles aligned. The shingles were laid with roof combs on the windward side to protect the ridges, as well as hip caps, which defined the hipped roofs. Valleys were open and were narrow.

A 1935 Superintendent's Report mentions 'staining of the roof' at HS-05.[205] No other references to this type of shingle treatment has been found. Photographs from this era are black and white. Perhaps fragments of wood shingles yet remaining in the attic of HS-05 or other buildings could provide evidence that the shingles were stained. Colored wood shingles would have added another layer of sophistication to the design and detailing of these residences.

[205] The staining of the early shingles was mentioned in the May, 1935 WICA Superintendent's Monthly Report. The date of shingle replacement is noted in maintenance files.

HS-13 was the only building constructed in the uniform architectural style to not have a wood ridge cap. This roof was designed with a decorative metal ridge cap with metal finials at each end (Figure H-1 below and Figure X12 in the HS-13 individual volume). This metal ridge cap with finial was reflective and was likely unfinished galvanized steel. HS-5 also had a decorative metal ridge cap with the same finials before the building was renovated (WICA 4265). HS-05 was originally built in 1924. HS-13 was built in 1931. This may reflect a typical construction technique for this area in this period. Other park buildings constructed after HS-13 did not include this detail, and when HS-05 was moved and expanded in 1935, the metal ridge and finials were removed and a wood shingle ridge cap was installed.

Gutters on HS-05, before the move, were half-round (Figure H-2). When the building was moved and renovated in 1935, they were replaced with a standard gutter with a box profile. HS-13 was originally constructed with half-round gutters and was the only building built in the 1930s to have half-round gutters (Figures H-1 and H-3). These were roof-mounted with straps and had exposed brackets. These were open at the ends on the high side and had closed ends on the downspout sides. All remaining buildings were constructed with standard gutters with a box profile (Figures H-4 – H-6). The gutters were a standard box style with a box channel and a squared front lip to assist with rigidity. The front face of these gutters appears to have a slight inward slope or bevel. These gutters appear to have been painted. Downspouts were rectangular and were fastened with plain metal straps.

Photographs of the houses in the 1950s show that the wood shingle roofs were in need of repair. HS-08, for example, had numerous nails driven through the hip caps to keep them in place (Figure H-7). Many of the shingles were curling. Long flat boards had been installed across rows of shingles to keep them in place. Most of the buildings in the Historic Housing Area were re-roofed at least once with wood shingles, prior to the 1980s, when the buildings were re-roofed with asphalt shingles for the first time.

Asphalt composition shingles were selected for the contemporary re-roofing projects, as a substitute material for the wood shingles. These were likely selected for their lower cost and ease of maintenance compared to wood shingles. While the wood shingle roofs are one of the earlier character defining features that are now missing, the roof forms have not changed and the asphalt shingles continue to convey the overall feeling of the original wood roofs. Asphalt shingle installation is considered to be a reversible change.

The most recent roofing installations in the 2000s are Heritage 40 Laminated asphalt shingles, manufactured by Tamko Roofing in the Rustic Cedar color (Figure H-8).[206] The K-style (ogee) aluminum gutters and downspouts were also installed, as the roofs were installed. Some of the roofs have integral fall protection fasteners installed near the ridgelines. These are a safety feature which has little effect on the overall character of the building and are prudent for staff safety for all future roof installations.

[206] Maintenance Files, Letter from McCarthy Anderson to Steve Schrempp, January 16, 2002.

Future replacement products may include several options. One option may be to restore the roofs with wood shingles for a more authentic aesthetic. Wood shingles, such as the 24” Royal cedar shingles manufactured by S&W Forest Products Ltd. Offers Number 1 Grade shingles that are ½” thick with a recommended exposure of 7 1/2". These shingles can be preservative and fire treated to lengthen their life and created a fire resistant roof. Warranties for a treated shingle roof may be as long 40 years with proper maintenance. Wood shingles roof manufacturers should be members of The Cedar Shake and Shingle Bureau and carry the Certi-Label.

Stone coated steel roofing is another option. This is the type of roofing that is manufactured to emulate wood shingles and is currently installed on the HS-01 Visitors Center. This roof is manufactured by Decra and is also warranted for 40 years. These shingles are manufactured in earth tone colors and have natural shadow lines to emulate wood shingles. They install as interlocking panels for strength and to withstand high windows.

A third roofing shingle option may be an engineered or composite product like that manufactured by Enviroshake, EcoStar, CertainTeed, or DaVinciRoofscapes. Enviroshake’s cedar-look products have a shake and shingle option to be a durable option. These are made of 95% recycled materials and are resistant to moss, mold, mildew and insects and have a Class A fire rating. These are durable enough to take foot traffic and are hail and wind resistant. These products have a lifetime warranty. Composite shingles tend to cost more – approximately three to four times the cost of asphalt shingles and require a certified contractor for installation. Care should be taken to select a composite shingle that replicates the historic sawn shingles. Many of these products appear to be more rustic, like shake roofs, which is not appropriate for installation in the Wind Cave Historic Housing Area.



Figure H-1. Detail of the HS-13 metal ridge cap and finial. (WICA 4127)



Figure H-2. Detail of HS-05 before it was moved and renovated with the metal ridge cap and finials. (WICA 4265)



Figure H-3. Detail of half-round gutter. (WICA 4256)



Figure H-4. Detail of box gutter. (WICA 6853)



Figure H-5. Detail of box gutter. (WICA 4272)



Figure H-6. Detail of box style gutter on HS-08. (WICA 6320)



Figure H-7. West roof detail. Note the curling shingles and wood nailers along the roof. (WICA 6855)



Figure H-8. Contemporary asphalt shingle roofing, HS-03. (SRJA 2014)

Native Stone

The native stone throughout the Historic Housing Area is one of the most significant character defining features utilized in the construction of every building. The stone is most prevalent as foundation material, raised terraces, steps and chimneys.

The sandstone used for much of the construction was quarried on site in the early 20th century. A stone quarry was opened at the park in 1905.[207] The first major stone structure that was constructed was the Superintendent's Residence, now the Fire Office, HS-04 in 1905. This entire structure was constructed of stone (walls and foundation), which has since been clad with stucco and the foundation was veneered with an additional layer of stone. Some of this original material is still visible in the Crawl Space 004. HS-04 has two variations of stone on the exposed foundations and the terrace. The south elevation of the building features a stone veneer that is laid in a random ashlar pattern. The stone is dressed, most with defined corners and finished faces, free from large clefts and heavy texture (Figure H-9). Stone used on the terrace is also laid in a random ashlar pattern with defined corners, but the faces are rustic with heavy texturing and natural clefts in the faces (Figure H-10).

Native stone was used in the construction of the foundations, chimneys, terraces and stone steps for all of the buildings. The stone foundations are anywhere from 16-inches to 36-inches thick, and unless fully exposed, they were specified to a minimum depth of only 18-inches below grade. Most of the foundation and terrace walls are battered and feature stones laid in a random ashlar pattern. The edges of the stones are not perfectly squared, giving the walls a more rustic appearance than dressed stone (Figures H-10 and H-11). The stone foundation for HS-13 is the most rustic of all of the foundations, with irregular-shaped cut stones (Figure H-12).

Historic Quarters HS-03, HS-04 and HS-06 have raised stone terraces and steps. These historic stone terraces are significant features. HS-03 and HS-04 have concrete porch floors, while HS-06 features a stone porch floor. It is not clear if the stones at HS-06 are original, as they are a reddish-colored flagstone appear to have been at least partially replaced during a recent underpinning project.

HS-03 features native stone at the chimneys and the interior fireplace which is a reddish color (Figure H-14). This stone is different in overall character and coloring than the other stone throughout the site. The source for this stone is unknown at this time.

Stone for HS-12, the Old Fire Cache building has a very different characteristic than the other stone foundations and walls throughout the housing area (Figure H-15). These stones are dressed with squared edges and laid in a random ashlar pattern. The façade is much for formal than the other more random native stone foundations seen in the study area.

The stone throughout the Historic Housing Area is in overall good condition, requiring only spot repointing, spot mortar wash replacement at the top of the stone foundation walls, crack repair and monitoring for future movement, and general cleaning of dirt and biological material. There

[207] WASO microfilm notes compiled by Lyle K. Linch, 1953. WICA Library Historical Files.

are several stones that require replacement due to fracturing or deterioration. The fracturing is most frequent where concrete abuts the walls, where there was no soft joint installed to cushion the expansion and contraction of the two materials. Replacement stone should match the existing historic stone in color, texture, dressing, dimensions and installation methodology. The park has a reserve of historic stone available for repairs.

Repointing mortar should match the existing historic mortar hardness, texture, coloring, aggregate and joint profile. Mortar samples were taken from three foundations and analyzed by a conservator. These results can be found in the Appendix C of this report. All of the mortars were found to be lime/Portland cement based with sand aggregate. The proposed repointing mixture, based on the analysis, would be a mortar mix by volume ranging from a 1 part white Portland cement : 1 part lime : 6 parts aggregate to a weaker 1 part white Portland cement : 2-1/2 parts lime : 8 parts aggregate. This seems to be consistent with what the park has been using for repairs, based on a memorandum from 1985 that suggested the park use a 1:1:5 mortar for the 'rock mortar.'[208] Further handwritten notes on this memorandum suggest that mixtures of 1:1:3 have been used at the Visitor's Center. Based on the testing, the weaker mortar may be more appropriate for use on the residences.

New mortar should only be matched to cleaned historic mortar. Cleaning the stone for dirt and biological growth should be done in the gentlest means possible. Test areas of cleaning should be done to find the most sensitive solution to meet the cleaning requirements.



Figure H-9. Detail of south foundation wall, HS-04. (SRJA 2015)

[208] Memorandum between Rodd L. Wheaton, Chief, Branch of Historic Preservation, Rocky Mountain Region to Chief of Maintenance, WICA, Maintenance Department Files, October 10, 1985.



Figure H-10. Detail of east terrace walls, HS-04. (SRJA 2014)



Figure H-11. Detail of basement, porch and retaining walls, HS-03. (SRJA 2014)



Figure H-12. Detail of foundation wall, HS-13. (SRJA 2014)



Figure H-13. Detail of stone steps, HS-03. (SRJA 2014)



Figure H-14. Stone chimney, foundation and terrace walls, HS-03. (SRJA 2014)



Figure H-15. East stone facade, HS-12. (O'Bright 2014)

Stucco

The exterior of all of the buildings in the Historic Housing Area, with the exception of HS-12 (the Old Fire Cache), are clad with stucco. The stucco is applied in the Spanish style, with heavy textured trowel finish (Figure H-16). The troweled finish is stylized with pronounced ridges and shadows, creating an overall texture throughout the facades. The stucco appears to be a traditional 3-coat system, with a scratch coat, brown coat and a finish coat, or perhaps only a base and finish coat as seen in HS-06. The stucco is applied directly over the stone masonry walls at HS-04 and over terra cotta clay tiles walls at HS-13. At all other locations, it is applied to metal lath (over building paper) which is attached to the wood frame walls.



Figure H-16. Spanish stucco at HS-04. (SRJA 2014)

The top layer of the original stucco has an integral ochre coloring, which has been obscured by several layers of finish latex paint (Figure H-17). The paint is peeling in certain areas, revealing the original ochre-colored stucco below. The original finish stucco has a much warmer color than the light yellowish latex paint color. It is assumed that the stucco buildings have been painted in order to cover previous stucco repairs. The paint gives the buildings a more uniform appearance and allows for the stucco repairs to be done without the tedious task of trying to match the historic stucco finish coloring.

The stucco has been well maintained on the exterior of the buildings in most locations. However, there are certain locations, where systemic failure is occurring. The stucco is deteriorating in many cases where the surrounding grade has risen above the top of the foundation walls over time and is now in contact with the stucco walls. The increased moisture in these walls is causing stucco deterioration. Other locations where stucco deterioration occurs is in the form of cracking. Cracks appear above areas where the foundation has settled or where dissimilar materials are in contact with the walls. An example of this is where the concrete courtyard, driveway or porch slabs are in contact with the stucco walls and there is no soft joint installed between the dissimilar materials. These materials expand and contract at different rates, causing failure of the softer (stucco) material. Another location where widespread failure of the stucco is occurring is on the west and north walls of the HS-04 dormitory addition. The walls are riddled with vertical cracks or varying sizes (hairline to wider open cracks), a majority of which appear to be aligned with the exterior wood wall studs. The cause of this is unknown, and is further discussed in the HS-04 Existing Conditions Section of this report. Widespread stucco failure at HS-13 is caused from a combination of issues, including the settling of the stone foundation, the shifting of the clay tile walls and potentially the deterioration of the steel window frames, which are embedded in the tile walls.

Samples of stucco were taken from HS-05, HS-06 and HS-07. The laboratory analysis for the stucco mixture can be found in Appendix C of this report. The samples were found to be extremely strong and dense. The stucco is a lime/Portland cement based mixture. The finish coat contains light brown/yellow ochre pigment fines and very fine to small aggregate. A suggested stucco mixture, based on the analysis is 5 pounds, dry, hydrated lime : 1 bag Portland cement (white for the finish coat) : 3 cubic feet (3 bags) sand. For the finish coat, add 10 pounds of pigment per bag of cement used.

The finish coat of the stucco was color matched for future painting and maintenance reference. This color formulation can be found in the Appendix C report. The stucco finish coat was reduced down and the pigment was separated. The pigment was matched to the Munsell Earth Colors. The pigment color is concentrated and is much stronger than the overall stucco finish color, since the stucco finish also contains cement and aggregate in addition to the pigment. The Munsell color that was matched to the pigment would result in a concentrated and more vibrant color than the true, more subdued overall stucco finish color, so this Munsell color should not be used for matching the final paint color. Therefore, the overall stucco finish sample was viewed against commercially available paint colors, in order to find a more appropriate finish color for the exterior of the historic residences. The closest commercially available

standard paint finish color to the stucco finish was found to be Benjamin-Moore, Morgan Hill Gold, 189-3B (Figure H-18). It should be noted that only one historic stucco sample was viewed for this match. The finish color of the other residences is assumed to be within a close range to this sample, but this should be further verified.

While these colors were determined through laboratory analysis, the human eye is the best judge of a good and appropriate color match. In order to create a mock-up for future color, a large section (a minimum of forty square feet) of stucco should be selected. The existing paint should be stripped and neutralized, with an appropriate paint stripper, such as a product by Cathedral Stone or ProSoCo that will not discolor or alter the historic stucco finish. The area should be allowed to dry. Sample paint colors, based on the Benjamin-Moore paint color should be done. The paint can be custom lightened or darkened, as required to match the historic stucco finish. The challenge with matching paint to a stucco finish, is that the stucco has a characteristic where the aggregate is exposed as part of the matrix, since the pigment is combined with the binder. Therefore, a perfect match will not be able to be made, but a match which appears to be consistent with the color at a distance of fifteen feet, should suffice as a good color match. In order to determine a standardized exterior wall stucco paint color, this same method may be done on several buildings, in order to witness the potential variation or range in the stucco finish color between the separate buildings.



Figure H-17. Exterior stucco sample with integral-colored finish coat and top coats of paint. (SRJA 2015)



Figure H-18. Exterior stucco sample with integral-colored finish coat and top coats of paint. (SRJA 2015)

Exterior Paint and Stain

The exterior finishes (stucco, wood trim and wood siding) of the buildings are covered with paint or stain. Only the stucco finish was not originally painted. The stucco had an integral ochre color in the top finish coat, which is now covered with paint (Refer to the previous section on Stucco). The date the stucco exterior walls were painted in unknown. It is assumed they were painted to conceal stucco repairs, in order to provide a uniform colored surface.

The original stucco ochre finish color was a much warmer color than the existing yellow paint color currently used. This ochre coloring is a natural earth tone that would have blended with the surrounding natural environment; this color choice was likely a conscious design decision to create a warm and inviting appearance to the buildings, while receding into the landscape.

In several instances, specifically noted at HS-07, the brown trim paint is not well adhered to the underlying paint. This may be due to one or more issues: incompatibility between the bottom and top coats; lack of cleaning and preparation of the undercoat before painting; or paint failure.

Existing Paint and Stain Finishes:
According to a Narrative Statement found in the maintenance files, the existing exterior paint and stain consists of the following materials:[209]

Stain for the Gables:

1 gallon of stain for the gables (makeup – 2 ½ gal turpentine, 2 ½ gal linseed oil, 1 qt burnt umber and ¼ qt stove black).

[209] Narrative Statement for Exterior Painting of Quarters #4, completed 10/25/1993, Maintenance Department Files.

Trim Paint:
Sherwin Williams Java Brown, SWP oil exterior alkyd paint.
Alkyd primer.

Stucco Paint:
Sherwin Williams A-100 flat latex, color “Boston Cream” #75-10. (This is the current yellow color used, which is much brighter than the original ochre color).

Proposed Paint and Stain Finishes:
Refer to the Appendix C Material Analysis Paint Analysis Summary for historic paint sample colors. A proposed paint color by Benjamin-Moore for the exterior stucco paint color should be sampled and adjusted to ensure a good color match to the historic stucco finish color (Figure H-18). This work is discussed in the Stucco section of this report.

Exterior Wood Trim and Siding

The exterior wood trim and horizontal siding is standardized throughout the Historic Housing Area (Figure H-22). The trim consists of painted wood cornice at the eaves, rakes and cornice returns. Where gutters are installed, L-shaped wood fascia have been mounted in recent years over the cornice in order to provide a plumb installation for the modern K-style aluminum gutters (Figure H-19). This is a typical detail found throughout the Historic Housing Area. The original gutters were roof-mounted with straps and brackets. This new wood fascia detail provides a nice installation methodology for the guttering, but conceals the cornice eave details from below, which were originally visible. The cornice returns are capped with painted metal flashing.

The horizontal siding is found in the end gables of the buildings (Figure H-20). Many of the gables also contain wood vent louvers, in varying shapes and sizes. Some of the louvers are triangular to match the roof slopes, while others are square or rectangular. In HS-11, there is a design with three small louvers in each end gable wall (Figure H-21). The siding is stained, instead of painted.

The wood trim is in overall very good condition throughout the Historic Housing Area. There are only select areas where the trim requires repair or replacement. The trim in the worst condition is on HS-13, where squirrels have chewed or woodpeckers have hammered through multiple locations in the wood cornice or siding.

Wood birdhouses can be found throughout the complex, installed in the end gables, where there have been previous issues with woodpeckers. These wood birdhouses are stained to match the surrounding horizontal trim and have a metal backing to prevent the birds from drilling through the siding.

Drawings from 1931 for HS-08 show the proposed construction details for a wood fuel box, to be placed on the porch (Figure HS-23). These wood fuel boxes can be seen in photographs, placed behind the residences (Figures HS-24 – HS-25). They have since been removed.



Figure H-19. Exterior wood trim and siding at HS-06. (SRJA 2014)



Figure H-20. Exterior wood siding and louver at HS-03. (SRJA 2014)



Figure H-21. Exterior wood siding and louvers at HS-11. (SRJA 2015)

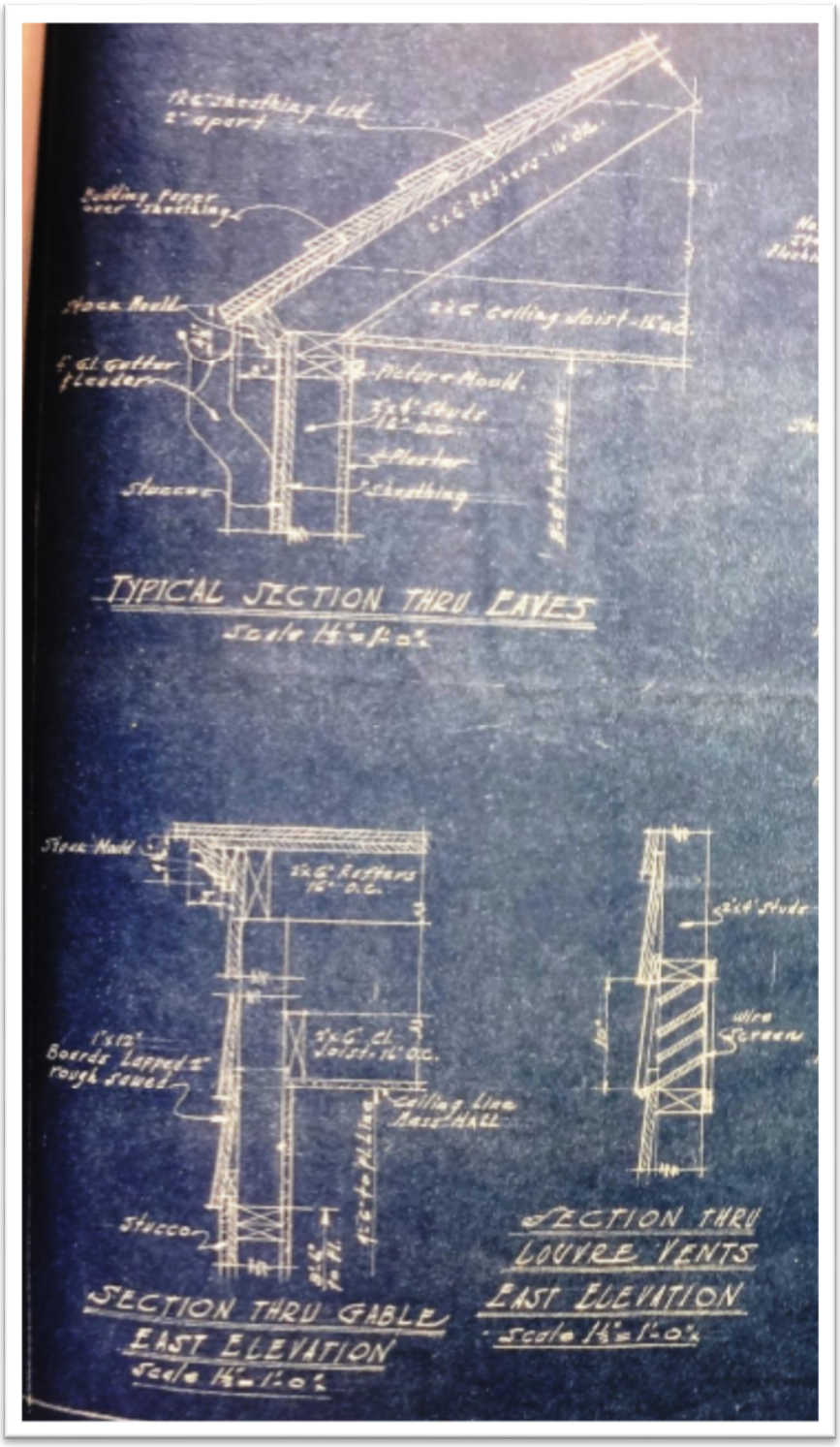


Figure H-22. Historic drawing details of exterior trim and louvers, Rangers Dormitory and Mess Hall, Sheet 5, WC313A, May 7, 1931. Plans from Maintenance Department Files.

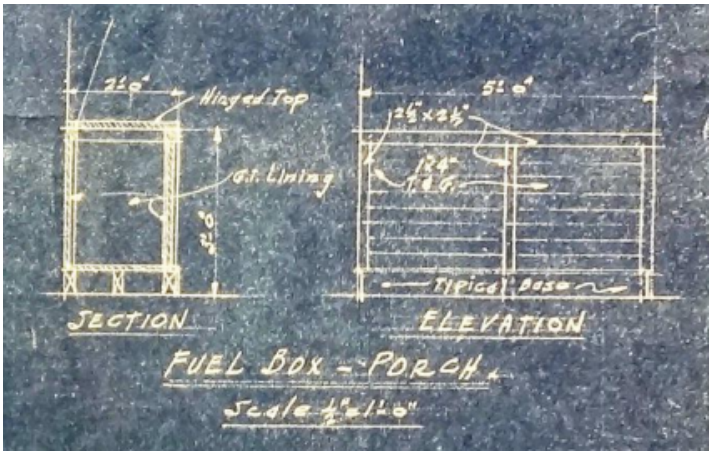


Figure H-23. Historic drawing details of exterior trim and louvers, Rangers Dormitory and Mess Hall, Sheet 5, WC313A, May 7, 1931. Plans from Maintenance Department Files.



Figure H-24. Fuel Box detail behind HS-07, 1932. (WICA 4430)

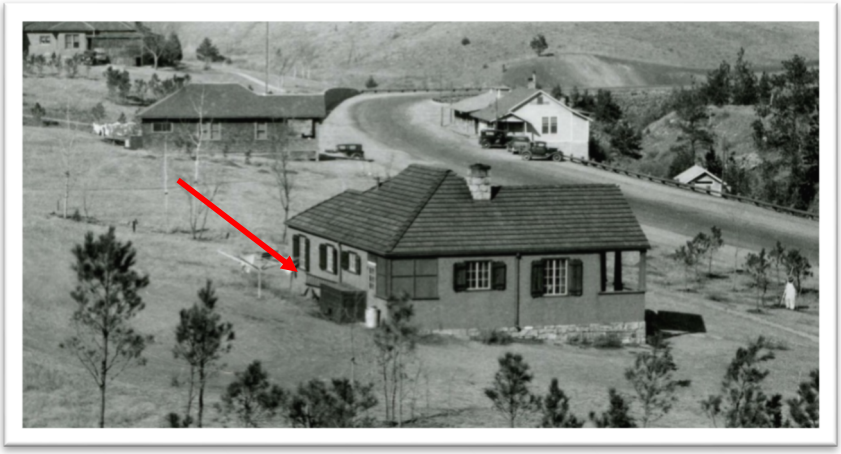


Figure H-25. Fuel Box detail behind HS-07, 1934. (WICA 4493)

Windows and Shutters

Window styles and materials vary throughout the Historic Housing Area. The historic windows are one of the most character defining features of the exterior of the buildings. Many of the original steel and wood windows have been removed and replaced with both appropriate and inappropriate replacement windows. The evolution of the windows (restoration and replacement) throughout the area is fairly consistent since replacement began in the 1950s. Incompatible replacement windows can have a negative impact on the overall character and style of a building.

Window shutters are also a major character defining feature that have been removed from the exterior of the buildings. HS-03, HS-04, HS-06, HS-07 and HS-08 were all designed to have rustic board and batten shutters installed on some of the windows. The details for these can be found in the original historic drawings and throughout the historic photographs. Wood shutters and the historic wood and steel windows and their contemporary replacements are discussed in each individual volume.

HS-04, the first building to be constructed ca. 1905, originally contained large wood double-hung 1/1 windows. The date of the removal is unknown, but the existing windows are a replacement single-pane sash that resembles an interior storm window. The prefinished metal does not match the surrounding stained interior trim (Figure H-26). The windows also have an exterior storm window installed. These single pane replacement sashes throughout the house are not compatible replacements and are not energy efficient. The only historic wood windows that remain at HS-04 are the dormitory windows and two attic windows, and they are in need of rehabilitation. The windows are deteriorated and should have compatible storm windows installed after they are restored. Windows at the second floor on the east and south elevations were installed in the 1980s and have exposed white jamb liners.



Figure H-26. HS-04 Dining Room replacement window. (SRJA 2014)

HS-05, originally constructed in 1924, had 1/1 wood double-hung windows. HS-03 and HS-06 were originally constructed with multi-lite wood double-hung windows. HS-07 and HS-08 Quarters were both originally constructed with steel outswing casements (Figure H-27). A majority of the windows in HS-07 and HS-08 were replaced in 1952, as part of an overall insulation project. It is unknown when the windows in HS-05 and HS-06 were replaced, but likely also in the 1950s. Replacement windows in the 1950s appeared to be wood 2/2 double-hung windows with a single horizontal muntin in each sash (Figure H-28). These windows were removed sometime in the 1980s and were replaced with the single pane metal sash windows that resemble interior storm windows.

Bedroom windows in the historic quarters, HS-03, HS-05, HS-06, HS-07 and HS-08 have been replaced in several phases since 2004. These previous bedroom windows did not meet current life safety egress dimensions and many of the windows were replaced with Pella out-swing aluminum clad wood replacement windows in order to meet current life-safety egress code. The remaining windows in HS-03 and HS-08 were replaced in 2008/2009 (Figures H-29 and H-31).

Some of the aluminum wood clad replacements windows match the original historic window configuration, as in HS-03, Window 101 (replicating a 4/6) and HS-05, Window 100 (replicating a 1/1). Unfortunately, a majority of the windows do not closely match the historic predecessors, as in HS-08, Window 100 (does not replicate the historic steel out-swing sashes, Figures H-30 and H-31) and HS-03, Window 200 (does not replicate the 8/12 double-hung, Figures H-32 and H-33).

Many of the aluminum clad wood replacement windows were installed so that the interior wood trim did not have to be removed. Unfortunately, the appropriate historic detailing of the exterior trim and sills was not as closely considered. These aluminum replacement windows generally fall under one of two categories. The first being metal panning to conceal the exterior trim and sills, which is wider than the original trim and taller than the original sills (Figures H-34 and H-35). This exterior metal panning is sometimes attached with exposed fasteners through the metal panning, which is not acceptable. The panning on the sills is left with untidy corner cuts sometimes with exposed wood sill edges. Much of this panning is covering the historic wood trim, but the efficacy of the waterproofing is completely dependent upon the condition of the sealant installations. The second type of panning is the ‘picture-framed’ windows. This installation is most prevalent on HS-08 and HS-03 (Figures H-29 and HS-31). These windows have extremely wide trim with profiles with mitered corners and completely eliminates the historic window sills. The detailing on these windows also eliminates the historic appearance of the center mullions between pairs of windows.

The detailing for the replacement windows is paramount in preserving the historic character of the exterior of these buildings. Future replacement windows should closely follow the historic precedence and the original designs, while accommodating for replacement materials, such as the aluminum cladding, which is a prudent decision for future maintenance. Future installations should closely preserve the historic wood window jambs and sills.

Several original wood windows remain in HS-03, HS-04 and HS-05 that should be carefully restored and retained in all future rehabilitation projects.

HS-11 Upper Garage and HS-13 Window House retain their original Truscon steel windows (Figure H-36). These windows require complete rehabilitation, including re-glazing. These windows should be tested for lead based paint and asbestos prior to initiating a work plan. These are important character-defining features of these historic buildings and are the only remaining historic steel sash in the Historic Housing Area and should be retained and preserved.

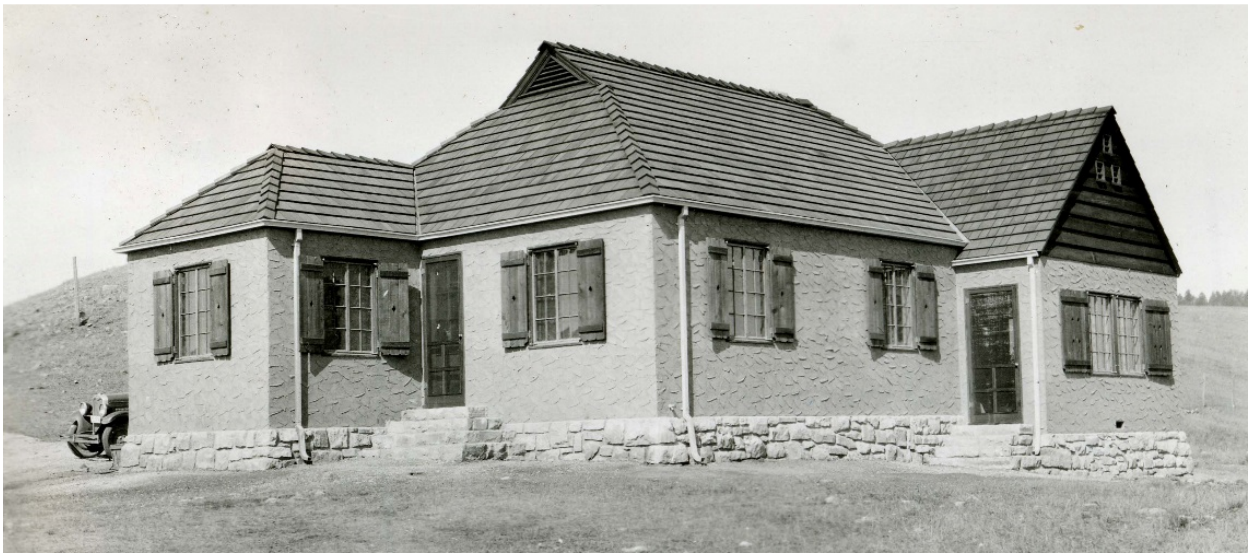


Figure H-27. HS-08 Steel casement windows soon after construction, ca. 1933. (WICA 4727)



Figure H-28. HS-08 Wood 2/2 1952 replacement windows, ca. 1969. (WICA 6710)



Figure H-29. HS-08 Current aluminum-clad wood replacement window installations. (SRJA 2014)

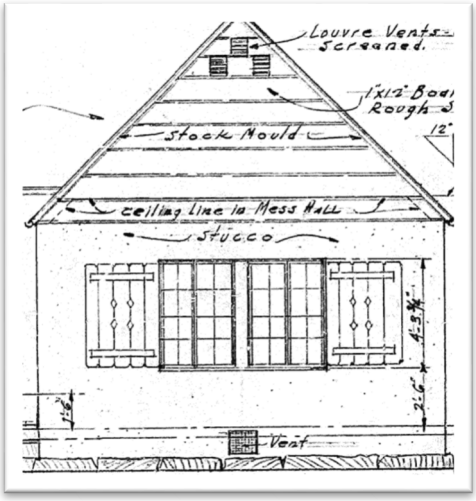


Figure H-30. HS-08 Window 100, Historic drawings, 1931. (WICA_108_313A_[id278462])



Figure H-31. HS-08 Window 100, 2009 replacement aluminum-clad wood out-swing windows with wide picture-framed metal panning. (SRJA 2015)

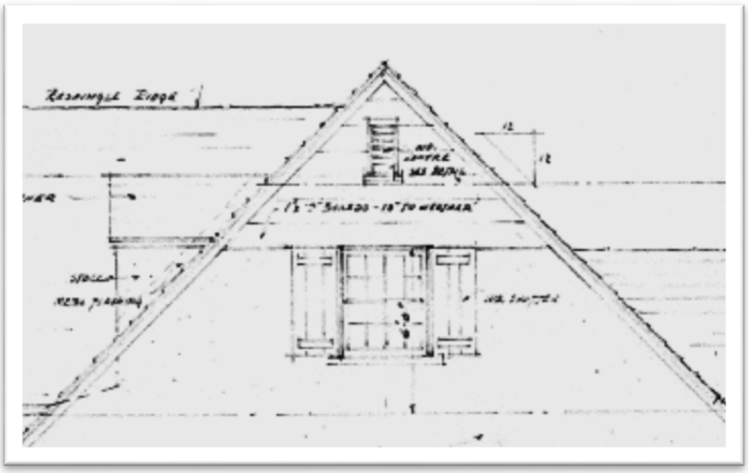


Figure H-32. HS-03 Window 201, Historic drawing with 8/12 double-hung window. (WICA_108_3010_[id278449])



Figure H-33. HS-03 Window 201. (SRJA 2014)



Figure H-34. HS-05 Typical aluminum panning. (SRJA 2014)



Figure H-35. HS-03 Typical aluminum panning at window sill. (SRJA 2015)



Figure H-36. HS-13 Typical steel window. (SRJA 2014)

Storm Doors

Storm doors were installed on many of the historic residences at an early date. The storm doors were originally constructed of wood in a variety of styles (Figures 37 - 39). Some appear to have been only screened doors, while others were infilled with glass for better efficiency. It is likely that many of these doors had interchangeable glass and screen panels, which could be changed for the season.

The original front doors for a majority of the residences are the decorative V-groove vertical board doors that remain today. These front doors were well protected on HS-05 and HS-07 by the front porches, but the other residences, HS-03, HS-04, HS-06 and HS-08 did not have porches for protection. While the screened doors would allow natural air ventilation and guard from insects and flies, they do not offer protection of the historic wood doors like a glass storm door would offer.

Currently, there are many styles of storm and screened doors installed throughout the historic housing area. Since these doors are the first line of protection at many of the entrances and were under continued use, these doors deteriorated more rapidly than other parts of the houses.

There is not a standard storm or screened door style between all of the residences seen in the historic photographs. In the 1950s, when the windows were updated in many of the residences and the exterior walls were insulated, new storm doors were also installed at many of the exterior doors. These storm doors had horizontal divided lites that matched the 1950s replacement windows. Since the 1950s, many of the storm doors have been replaced with a variety of metal storm doors that have operable glass and screens. These more contemporary storm doors are functional, but convey a more contemporary aesthetic to the historic entrances than a wood door would convey. These may be appropriate for a back door or for a door that cannot be seen from the public right of way, but front entry doors or doors that are visible from the main entry should be replaced with a more sensitive door.

Storm and screened doors are a necessity for these historic residences. They offer protection for the historic doors and much-needed ventilation. Storm and screened doors are reversible and assist with energy efficiency. The goal with any of the storm or screened door replacement options is to minimize the visual impact on the historic character of the entry. This means that simple doors with large screened openings that reveal the historic doors is desired. Installing screens that are have the most transparency and painting the door to match the surrounding door trim. Based on the historic photographs from the 1930s and 1940s, a simple storm/screened door with a single upper lite and one lower lite, separated with a mid-rail would be an appropriate replacement style for these historic residences (Similar to Figure 37 below). Another option would be for a single lite, like that seen in Figure 38 below. Reproduction storm doors must have tempered glass installed and can be ordered with door seals or weatherstripping. Many of the historic doors have half-surface butt hinges, which should be replicated.



Figure H-37. Screened door at north entrance to HS-03. (Detail of photograph, WICA 4319)



Figure H-38. Full-lite screened door at main entrance to HS-06.
This may have also had an interchangeable glass panel insert. (Detail of WICA 4728)



Figure H-39. Storm door at south entrance to HS-08. (Detail WICA 4268)



Figure H-40. Existing early screened door at east entrance to HS-03. (SRJ 2014)

Photographs of HS-03 do not clearly indicate whether or not there was originally a storm or screened door installed. The first clear photograph of a storm or screened door appears in the 1950s, but the photograph is too dark to determine the exact configuration. The door is wood and is arched to match the opening. The hinges are half surface mounted butt hinges. The current front door is protected with an early wood screened door. The recommendation for long term protection of the historic wood front door and for added energy efficiency, would be to install a reproduction wood door with an arched top with interchangeable glass and screen panels.

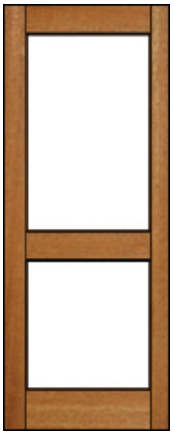


Figure H-41. Standard combination storm/screened door style with a mid-rail.
Rendering of the Gardenia Style door by Vintage Doors, www.vintagedoors.com.

The first option for replacement storm/screen doors would be to have traditional mortise and tenon wood doors constructed of durable hard wood. If natural ventilation is desired, the doors could be made to have an interchangeable screen and glass panel. The screens would be installed during summer months and the glass during off-season. These could be constructed of Honduras Mahogany, old growth Western Red Cedar, old growth Oak, Old growth Douglas Fir, or other suitable exterior-grade durable wood. These doors would be painted to match the brown door trim. These doors could be produced locally, or ordered through a custom woodworking contractor, such as Vintage Woodworks, Vintage Doors, Coppa Woodworking or Weston Millwork. Almost all of these manufacturers have simple designs that would be appropriate for these residences. These doors can be ordered primed. This may be the only option for HS-03, which has an arched opening.

The pros to installing a wood door would be the continuity of historic character and ability to control the final design, including the width and location of stiles, rails and potential mid-rail. They can also be manufactured with the interchangeable glass and screen panels and can be installed with the historically-appropriate half-surface butt hinges. The cons to installing a wood door would be the required maintenance, including painting and potentially long-term re-glazing requirements for the glass panel.

The second option for replacement storm/screen doors would be to install pre-finished metal storm doors. Most modern metal doors look out of place on historic buildings, so careful selection for an appropriate door is imperative. These doors are considered to be removable, without causing irreversible damage to the overall door jambs, but installing a door that at least attempts to look historic or as inconspicuous as possible is important. Metal replacement doors usually have a very thin rail and stile construction and are manufactured with continuous piano hinges, which is not a historic detail. Pella manufactures PCA makes a simple heavy-duty aluminum door with single lite (or full-view) in a powder coated bronze finish. Larson manufactures a full-view door in a dark bronze that would offer a relatively unobstructed view of the decorative V-joint board doors and glass of the historic doors. These metal doors are clearly contemporary and are low maintenance. White or un-finished galvanized metal doors or doors with panels or other decorative configurations are not appropriate.

The pros to the metal replacement doors are the low maintenance. The cons may be that the doors do not appear to be historic and the full-lite doors do not offer ventilation screening. Hardware options for the half-surface butt hinges are not possible.

Interior Hardware

The door hardware throughout the houses in the historic housing area are mostly original to the buildings. The hardware is an important feature of the houses because they not only add to the historical character of the buildings, but help date the structures and show the evolution of their construction. The houses in the historic housing area were built over a span of about thirty-two years (1905 – 1937) and due to this the door hardware styles reflect their installation dates.

The oldest hardware is in the original portion of HS-04 which was built in 1905. This hardware consists of a simple round knob with two lines imbedded into the face. Behind the knob is a plain back plate with a beveled edge (Figure H-37). This original hardware can only be seen in its entirety in a few places in the building, but there are several locations where the plain back plate is installed on doors with the more decorative oval knobs from 1918 (Figure H-38). The hinges used during this time period where ball-tipped, butt hinges.



Figure H-42. Exterior Door Hardware on HS-04 Door 109/3. (SRJA 2015)



Figure H-43. Door Hardware on HS-04 Door 104/2. (SRJA 2014)

When the north addition was added to HS-04 in 1918 the door hardware installed was very different than the plain hardware that was previously used. Both the face plate and the knob became oval and were cast to have a decorative floral motif along the edges (Figure H-39). A ball-tipped, butt hinge was used during this time period, as well.



Figure H-44. Door Hardware on HS-04 Door 102/2. (SRJA 2014)

In 1924, a ranger's cabin was built (HS-05). While built a few years after the addition to HS-04, the hardware used throughout the building is more similar to the hardware used during the early phases of construction. The back plates appear to be the same back plate with beveled edges seen in HS-04 (Figure H-38), but the knob is plain with no decorations (Figure H-40). The only knob used in HS-05 that is different from the simple hardware is the hardware on the interior door 100/1. The knob on this door is more decorative with a single ring embedded into the face and the back plate keyhole shaped with a slight decoration around the edge (Figure H-41). With the building of this house the hinges change to a ball-tipped, half-surface butt hinge (Figure H-42).



Figure H-45. Door Hardware on HS-05 Door 103/2. (SRJA 2014)



Figure H-46. Door Hardware on HS-05 Door 103/2. (SRJA 2014)



Figure H-47. Door Hinge on HS-05 Door 103/1. (SRJA 2014)

Built in 1931, HS-08 has door hardware that is different than the rest of the structures (Figure H-43). The knobs seen throughout most of the house are glass. Their back plates are much smaller than those previously noted and are an hourglass shape.

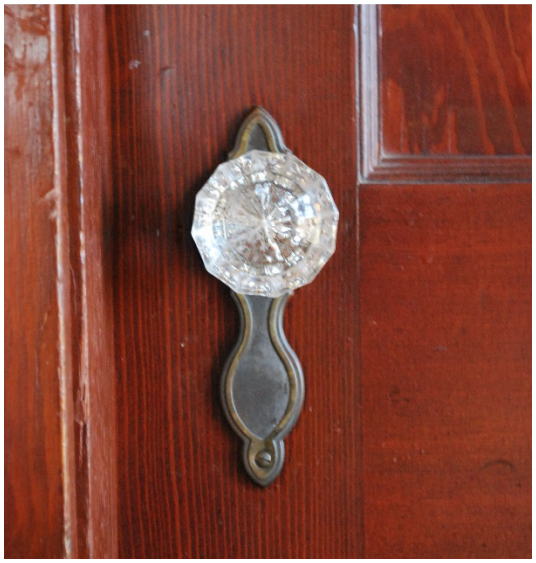


Figure H-48. Door Hardware on HS-08 Door 109/1. (SRJA 2015)

On the interior of the closets in HS-08, instead of installing the glass knobs, a small metal knob was installed with a stamped sunburst design on the face (Figure H-44). It also the same back plate as the rest of HS-08.

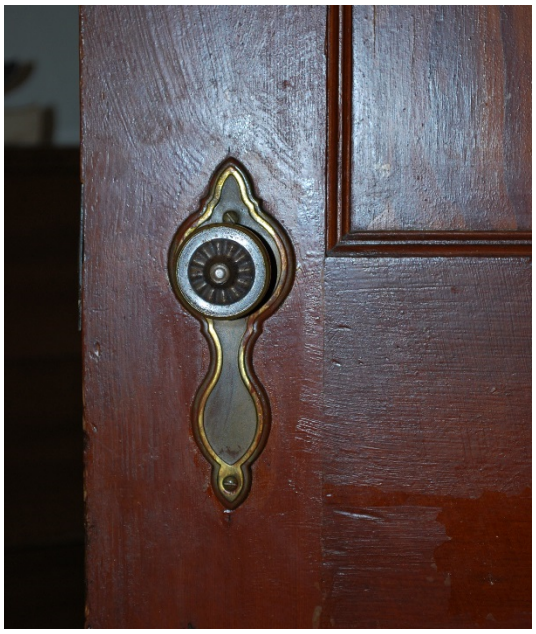


Figure H-49. Door Hardware on HS-08 Door 102/2. (SRJA 2014)

HS-08 also has one of its original door stops installed (Figure H-45). This is one of the few still installed in any of the houses.



Figure H-50. Historic Door Stop for HS-08 Door 104/1. (SRJA 2015)

At the beginning of the 1930s, the historic housing area was expanding and several new buildings were added to the area. As each new building was constructed, the door hardware transitioned toward the Art Deco style. In 1932, HS-07 was built and its hardware reflects Art Deco influences. On the face of the knob there are deeper recessed concentric circles and the

back plate has a more defined and profiled frame (Figure H-46). The hinge used in this house was a traditional ball-tipped butt hinge. The hardware was made by Yale Junior Company.



Figure H-51. Door Hardware on HS-07 Door 107/2. (SRJA 2015)

HS-07 does have one set of hardware that is different than the rest seen in the building. The interior side of the main entry doors has nickel hardware. The knob has a stamped decorative motif to it (Figure H-47).

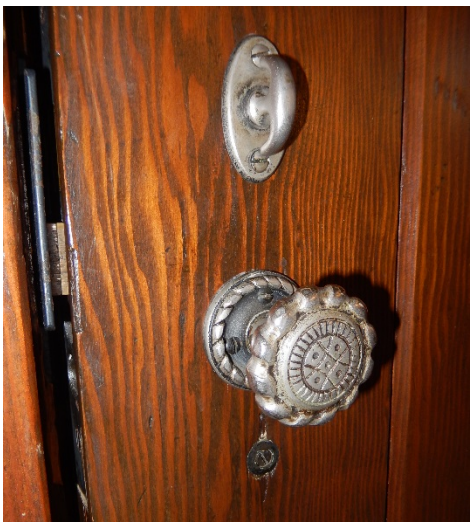


Figure H-52. Door Hardware on HS-07 Door 100/1. (SRJA 2015)

In 1934, HS-03 and HS-06 were built and utilize the same hardware. This hardware is similar to the hardware used in HS-07, but it is a little more stylized. It is also influenced by the Art Deco style with influences from the turn-of –the-century. The knob in HS-03 and HS-06 is similar to HS-07 with deeper recessed concentric circles. The back plate has a defined frame, but instead of being rectangular like HS-07, it is stylized with ogees at each corner (Figure H-48). The hinges in HS-03 and HS-06 are ball-tipped, half-surface butt hinges. The hardware was made by Yale Junior Company.



Figure H-53. Door Hardware on HS-06 Door 102/2. (SRJA 2015)

In earlier houses, the bathroom hardware was the same as the rest of the hardware found in the house. In HS-03 and HS-06, for the first time, specialty hardware was used in the bathroom. The knobs are plain chrome with round rosettes (Figure H-49). The hinges are chrome ball-tipped, half-surface butt hinges (Figure H-50). The hardware at the hall side of the door is brass finish to match the remainder of the house.





Figure H-54 and H-55. Door Knob on HS-03 Door 106/1. (SRJA 2014) and Door Hinge on HS-06 Door104/1. (SRJA 2015)

HS-03 does have two sets of hardware that is different than the rest seen in HS-03 and HS-06 on the French doors. Door 111/1 is a set of French doors that leads to the sun room. On the side facing Room 101, the hardware is very similar to the rest of the hardware in the house, but the Room 111 side has a lever handle instead of the knob (Figure H-51). The back plate is the same. Room 111 was added in 1941, so it is unclear if the lever had been in place or if it was changed when the sun room was added.



Figure H-56. Door Hardware on HS-03 Door 111/1. (SRJA 2015)

By the time the Ranger's Dormitory was added to HS-04 in 1937 the door hardware was fully in the Art Deco style. The knob had centric circles engraved in the face. The back plate is not rectangular, but a geometrical motif with chevrons and vertical lines that emphasize the verticality of the back plate (Figure H-52). The hinge used in this addition was a traditional ball-tipped butt hinge.



Figure H-57. Door Hardware on HS-04 Door 112/1. (SRJA 2014)

Similar to HS-03 and HS-06, the HS-04 1937 addition utilizes chrome hardware in the bathrooms, but unlike the previous houses, HS-04 utilizes hardware more similar to the rest of the hardware installed at the time (Figure H-53). The hardware was made by Yale Company.



Figure H-58. Door Hardware on HS-04 Door 111/1. (SRJA 2014)

Exterior Hardware

While the interior hardware dramatically changes throughout the phases of construction in the historic housing area, the exterior hardware does not change as dramatically. With the exception of HS-04, all of the exterior door hardware is different than that found on the interior. The exterior hardware is all metal and much larger than the interior. They are also more organic in nature to fit into the standardized design of the historic housing area.

HS-05 has a thumb latch with a large metal handle and a separate lock as the main exterior door hardware (Figure H-54). It is finished with stamped design.



Figure H-59. Door Hardware on HS-05 Door 100/1. (SRJA 2014)

HS-07 is more rustic than the other exterior hardware and has a Tudor revival feel. The hardware has a thumb latch with a large handle and a separate lock (Figure H-55). They both have a hammered finish.



Figure H-60. Door Hardware on HS-07 Door 100/1. (SRJA 2015)

HS-03 and HS-06 hardware match because they were built at the same time. The hardware is wrought iron with a hammered finish (Figure H-56). It has a thumb latch with a large handle and a large stylized back plate.



Figure H-61. Door Hardware on HS-06 Door 100/1. (SRJA 2015)

Historic Exterior Light Fixtures

Most of the exterior light fixtures throughout the historic housing area have been changed or replaced since the buildings were originally constructed. There is currently only one historic exterior light fixture still installed on a primary elevation in the historic housing area on the east elevation of HS-06 (Figure H-57). The existing light fixture can be seen in a photograph taken at the completion of HS-06 in 1934 (Figure H-58). While the fixture currently has no glass, a close inspection of the photograph reveals it may have originally not have glass as there are no tabs on the interior to hold glass.





Figure H-62 and H-63. HS-06 Exterior Light Fixture. (SRJA 2014) and
Detail of HS-06. 1934, Nov. 6. (WICA 4269)

Glass jelly jar light fixtures that date from the period of significance are installed on the non-primary elevation of many of the buildings.

Historic Interior Light Fixtures

There are very few interior light fixtures that are original from the construction of the housing in the historic housing area. Most of the light fixtures have been removed and replaced.

Two of the earliest remaining light fixtures are found in HS-05. On the north wall in Living Room 100 there are two wall sconces that date to the 1935 remodel of the house. The back and arm are cast metal and within the candle sleeve there is a socket for an incandescent light bulb (Figure H-59).



Figure H-64. Wall Sconce in HS-05 Living Room 100. (SRJA 2014)

In HS-07 there is pair of wall sconces on the west wall in Living Room 100. The wall sconce is metal with a hammered finish and has a Tudor influence. On top of the candle sleeves is an exposed incandescent light bulb (Figure H-60).



Figure H-65. Wall Sconce in HS-07 Living Room 100. (SRJA 2014)

Similar in style to the wall sconces in HS-05, there are four wall sconces in HS-06 Living Room 100. Instead of having only one arm, they have two. Both arms hold candle sleeves that cover the socket for an incandescent light bulb (Figure H-61).



Figure H-66. Wall Sconce in HS-06 Living Room 100. (SRJA 2014)

In the HS-03 Dining Room 102 in HS-03, the original chandelier is still installed. The cast metal light fixture has five down lights that are attached to a center decorative ring (FigureH-62). It is supported on five chains and has a floral motif.



Figure H-67. Chandelier in HS-03 Dining Room 102. (SRJA 2014)

Until at least 1990, there were wall sconces installed in the HS-03 Living Room 100. They appear to be similar to the chandelier in the Dining Room (Figure H-63). If the walls sconces are in storage they should be reinstalled.



Figure H-68. HS-03 Living Room 100 Wall Scone that has since been removed. 1990. (Maintenance Department Files)

When the 1937 Ranger's Dormitory was added to HS-04, period light fixtures were installed in the space. Throughout the dormitory there are six Art Deco flush mount up-lights fixtures (Figure H-64). They are white and chrome circular lights that end with a round-pointed pendentive.



Figure H-69. Art Deco Pendent Light in HS-04 Dormitory 112. (SRJA 2014)

At the same time that the dormitory was added Bathroom 111 was remodeled and has an Art Deco wall sconce that dates from the same time period (Figure H-65).

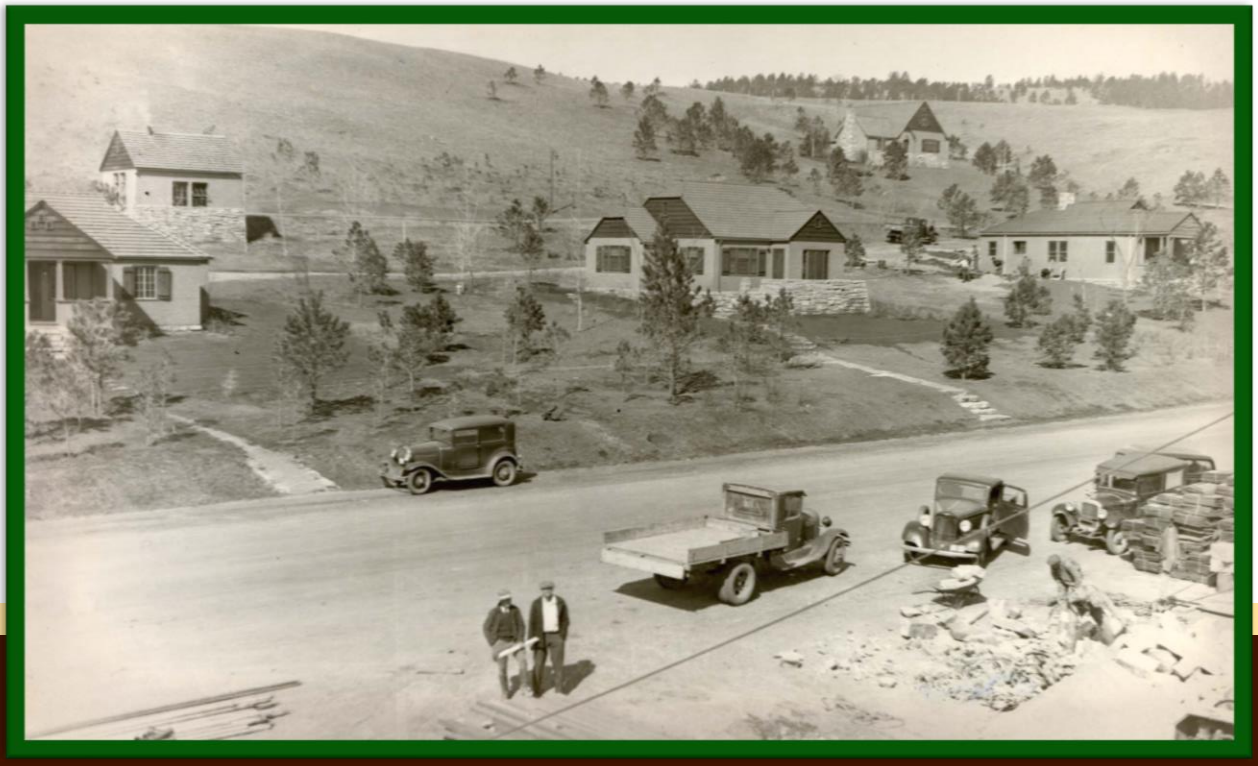


Figure H-70. Art Deco Wall Sconce HS-04 Bathroom 111. (SRJA 2014)

There are other miscellaneous historic light fixtures throughout houses in the historic housing area, but it is unknown if they are original to the buildings or date to the period of significance (Figure H-66).



Figure H-71. Light Fixture in HS-05 Room 103 (SRJA 2014)



Wind Cave National Park ca. 1935. (WICA Museum Collection #WICA 8754)

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Wind Cave National Park Historical Files: Years of Growth 1931-1946, Box 2. South Dakota: Wind Cave National Park Library.

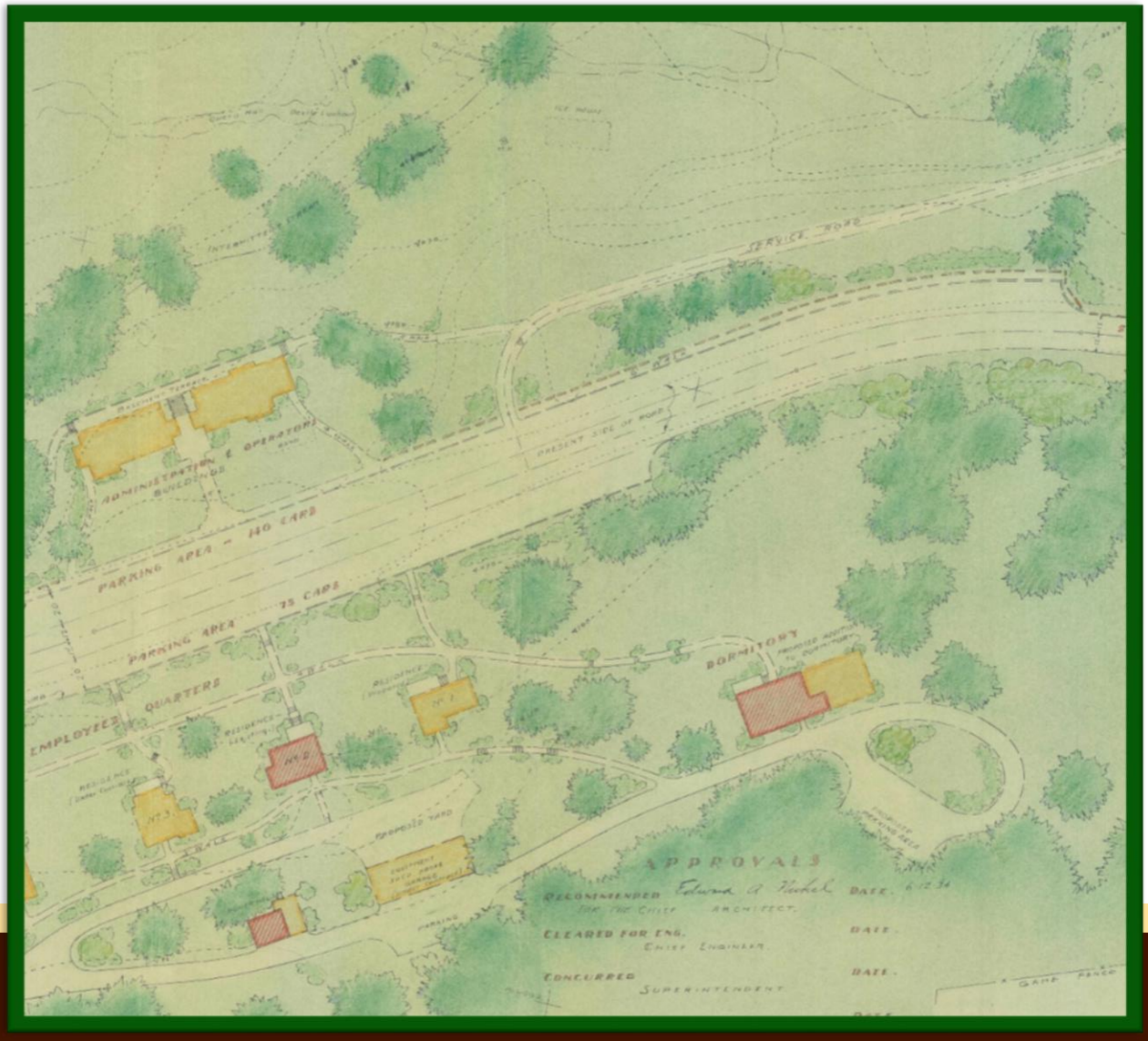
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RG 79, Central Classified Files; 446-450, 1688-1691 1907-1949
RG 79 Central Files; Boxes 198-204

RG 79 Records of the San Francisco Field Office, Classified Files; Boxes 14, 44.

National Archives at Kansas City. Kansas City Missouri.
RG 79 National Parks and Monuments.4709017; Archives Identifier 2579433, Boxes 1-3.
RG 79 Wind Cave Box List 2579433; Boxes 1-3.
RG 77-2 Omaha Office-Special File Folder List; RG 79 Special File Box 6.



General Development Plan of Wind Cave National Park, from the 1936 park master plan. (National Archives RG 79, Stack Area 330, Master Plans. Cartographic Department, National Archives II, College Park, MD.)

Appendix A
List of Known Historic Plans

Appendix A: Historic Plans

Included here:

List of Master Plans on file at the National Archives

Scans of selected pages from Master Plans on file at the National Archives

List of all known historic plan pages, sorted by issue date.

List of all known plan pages, sorted by building.

1939 Site Plan, from the 1940 Master Plan on File in the WICA Library (Years of Growth Box 1 F 5)

1963 Site Plan, from WICA Archives Collections.

Right: Detail from a page of the 1938 master plan.



Appendix A.

Historic Master Plans for Wind Cave National Park

List of Pages on File at the National Archives

National Archives II, College Park, MD.
RG 79, Series 4
Cartographic Records;
Stack Area 330. Master Plans.

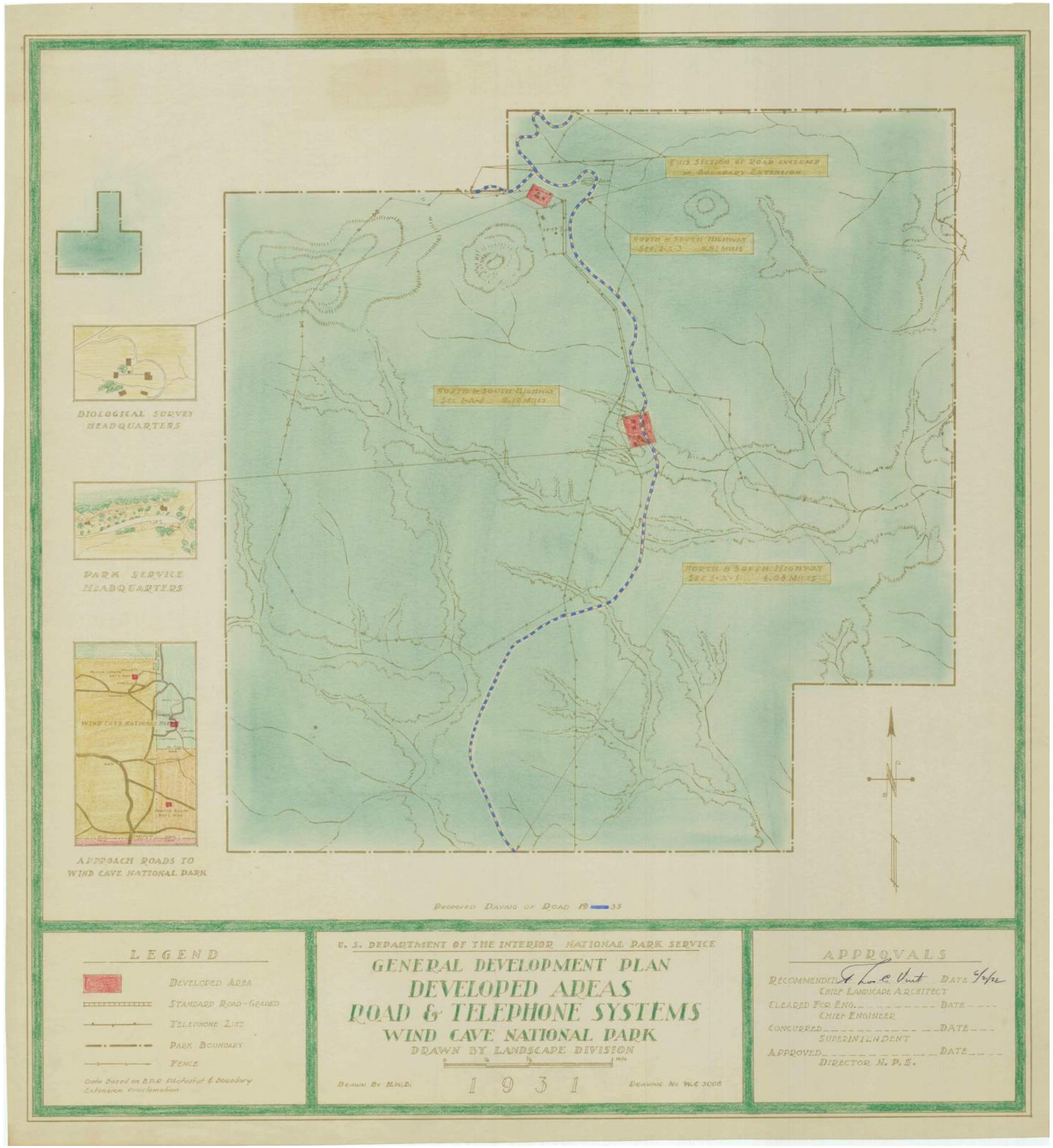
National Archives II, College Park, MD. Cartographic Records RG 79, Stack Area 330, Master Plans			
Year Issued	**Sheets on file at NARA**	**Drawn by**	**Notes**
1931	• Cover sheet	not signed	Folder 3
	• General development plan	H. W. B.	
	• Headquarters area site plan	H. W .B.	
	• Headquarters area utilities	not sgined	
1932	• General development plan	not signed	
	• General development road and telpohne	H. W. B.	
	• Headquarters area site plan	H. W. B.	
	• Headquarters planting plan	H. W. B.	
1933	• Cover sheet	not signed	Folder 2
	• General development road and telephone	H. W. B.	
	• Cave trails	H. W. B.	
	• Headquarters area site plan	J. G. L.	
1935	• Cover sheet	not signed	Folder 2
	• General development plan	H. W. B.	
	• General topographic map	H. W. B.	
1936	• Cover sheet	not signed	Folder 2
	• General development plan	H. W. B.	
	• Cave trails	H. W. B.	
1937	• Cover sheet	not signed	Folder 2
	• General development plan	H. W. B.	not dated but matches other pages for theyear
	• Cave trails	H. W. B.	
	• Game ranch site plan	H. W. B.	
	• Topographic	H. W. B.	not dated but matches other pages for the year
1938	• Cover sheet	not signed	
	• General development plan	H. W. B.	
	• Cave trails	H. W. B.	
	• Game ranch site plan	H. W. B.	
	• Game ranch utilities	H. W. B.	
	• Vegetation Type Map	E. C. W.	Mapped in 1936 by E.C.W. Signed in 1938

Appendix A.

Historic Master Plans for Wind Cave National Park

Page from the 1931 Master Plan

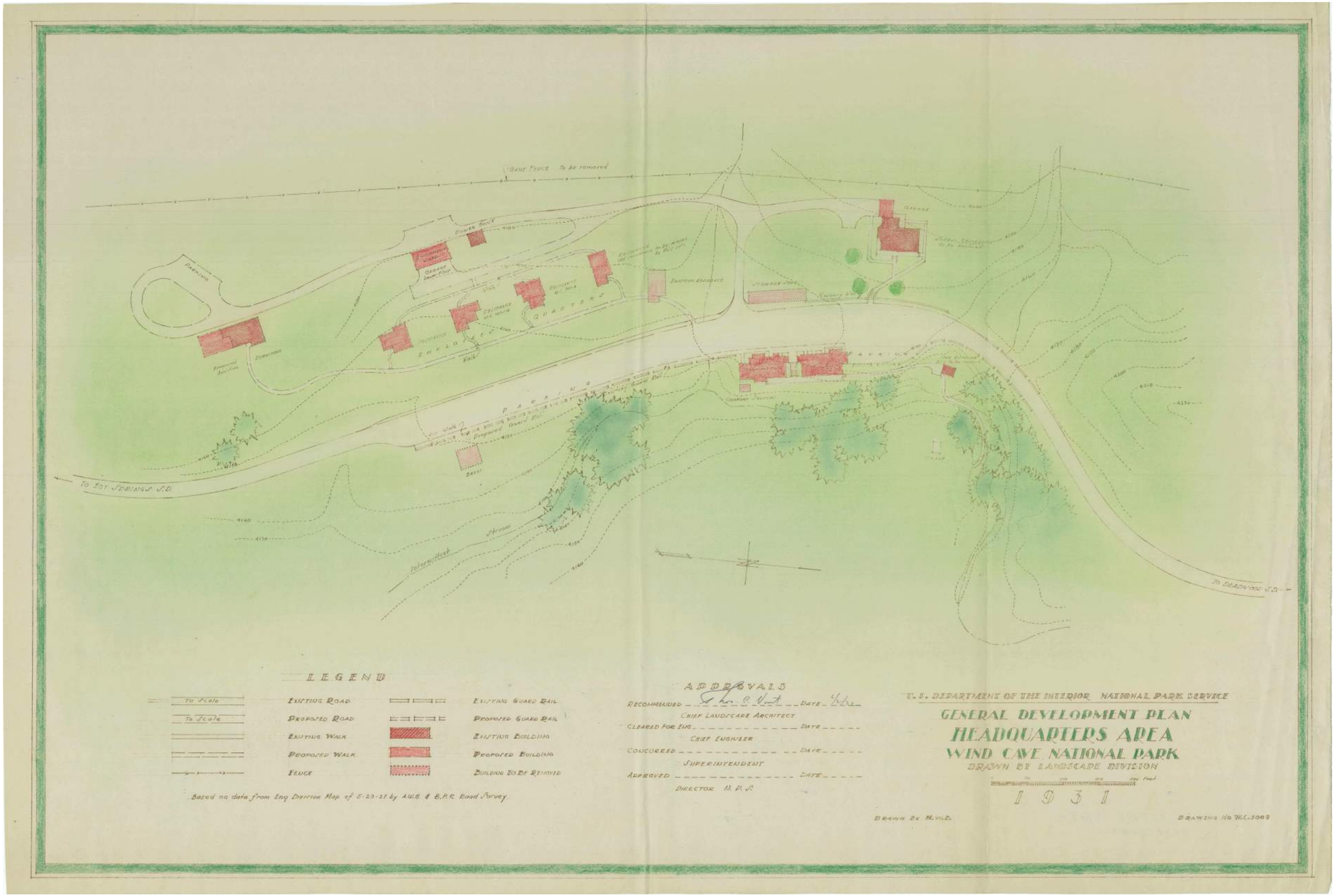
National Archives II, College Park, MD.
RG 79, Series 4
Cartographic Records; Stack Area 330. Master Plans.



Appendix A.

Historic Master Plans for Wind Cave National Park

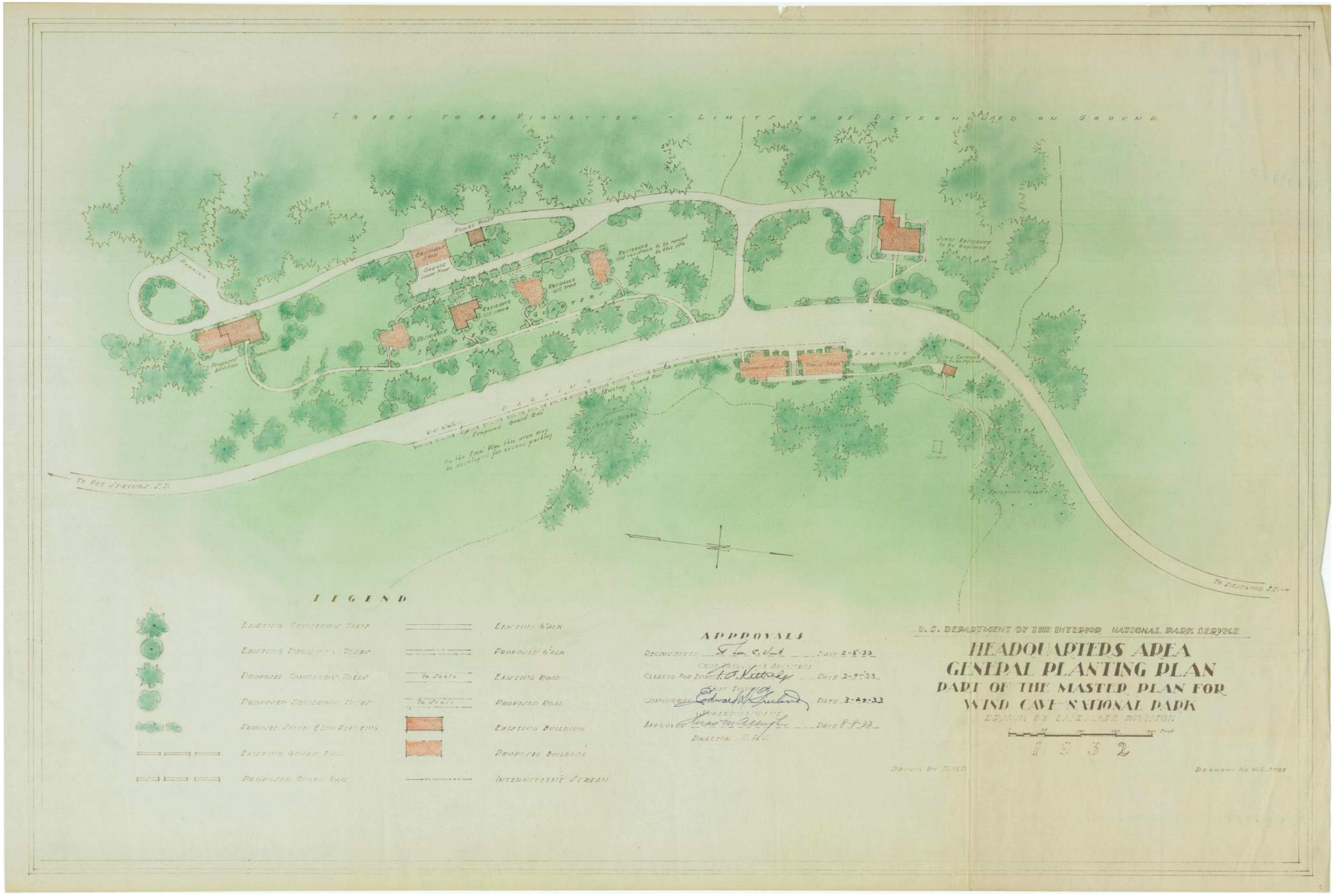
Page from the 1932 Master Plan


Game Fence To be removed
Fence
Entrance Road
Garage
Residence
Residence
Residence

Appendix A.

Historic Master Plans for Wind Cave National Park

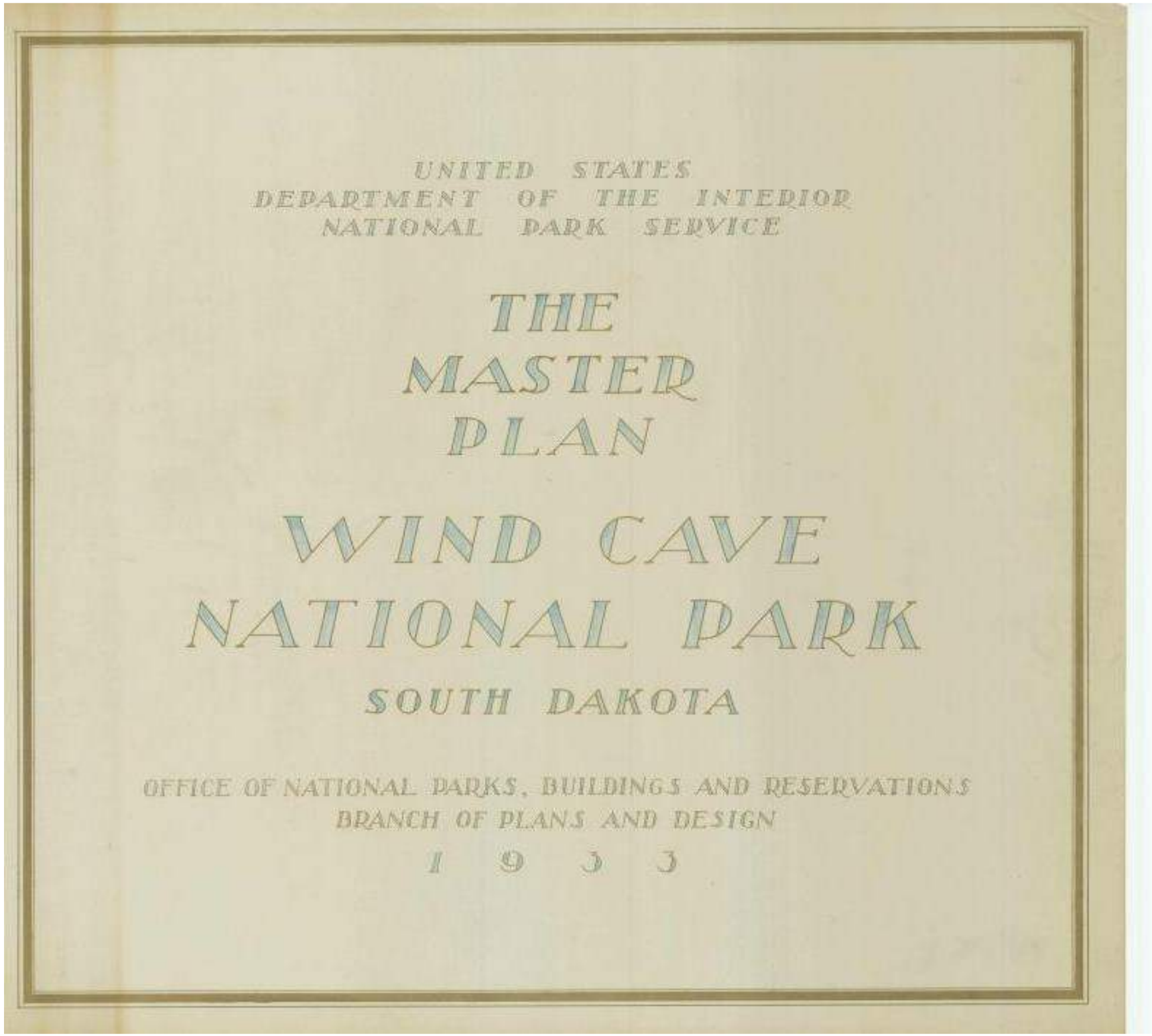
Page from the 1932 Master Plan



Appendix A.

Historic Master Plans for Wind Cave National Park

Page from the 1933 Master Plan

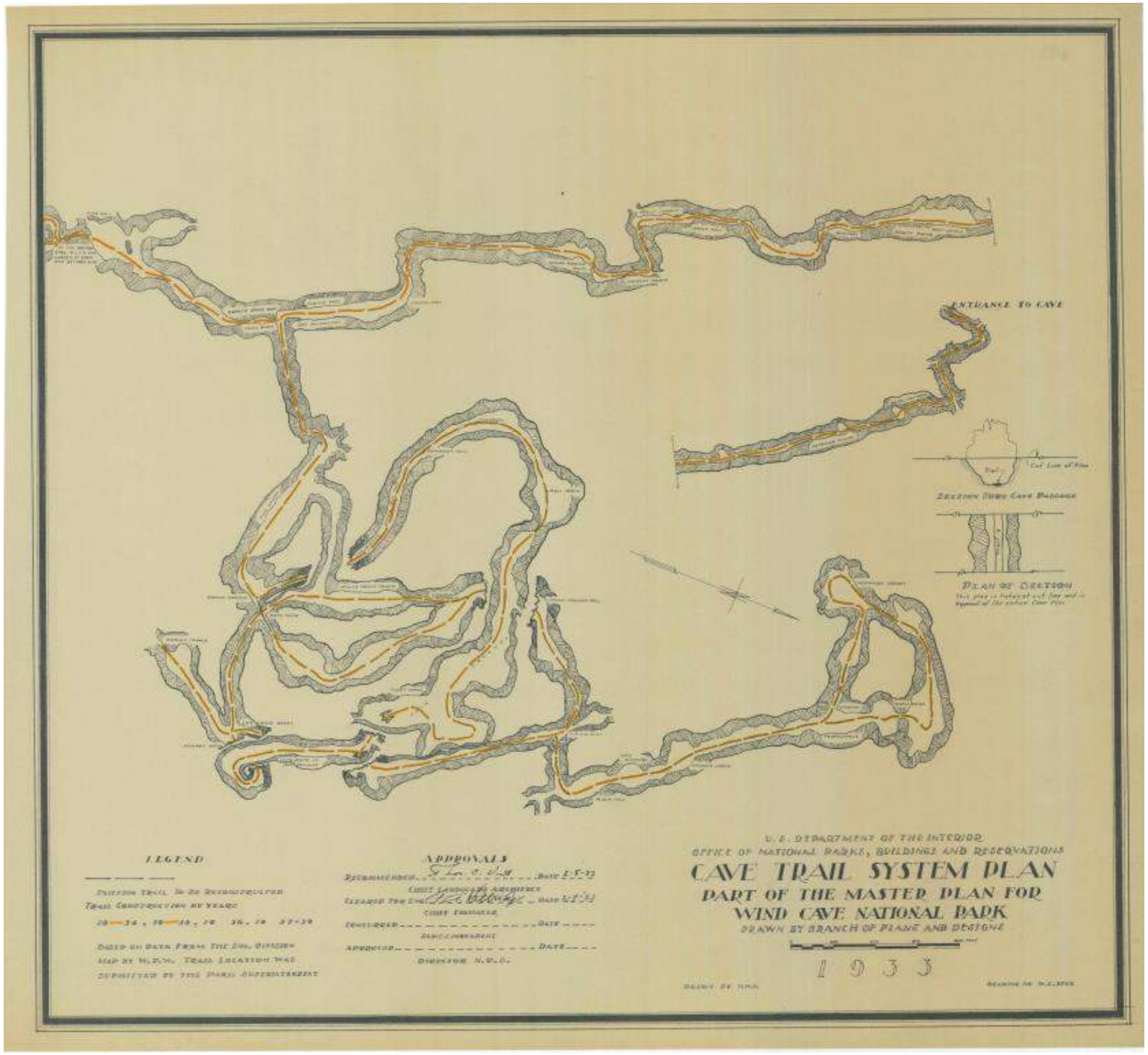


Appendix A.

Historic Master Plans for Wind Cave National Park

Page from the 1933 Master Plan

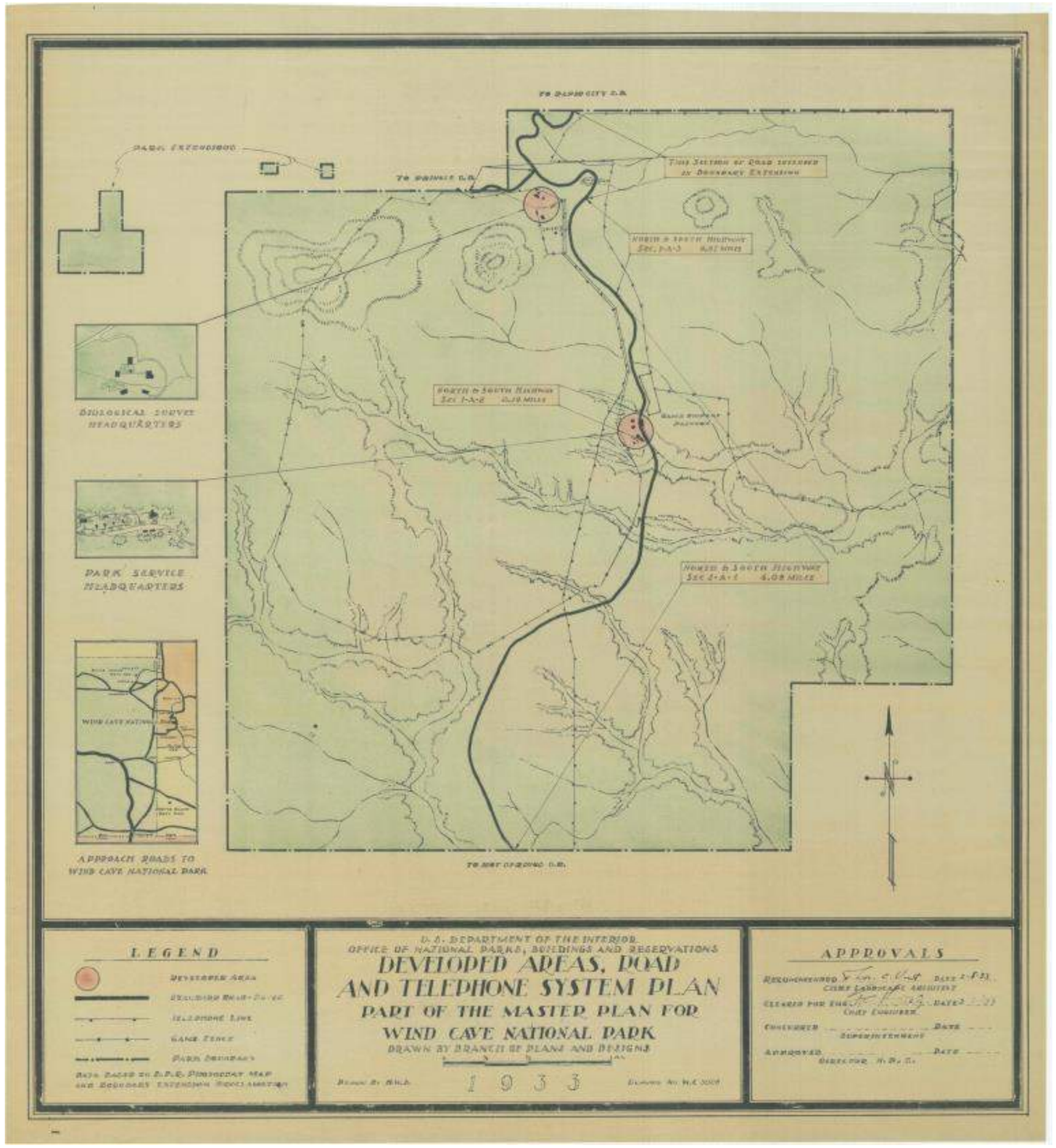
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Appendix A.

Historic Master Plans for Wind Cave National Park

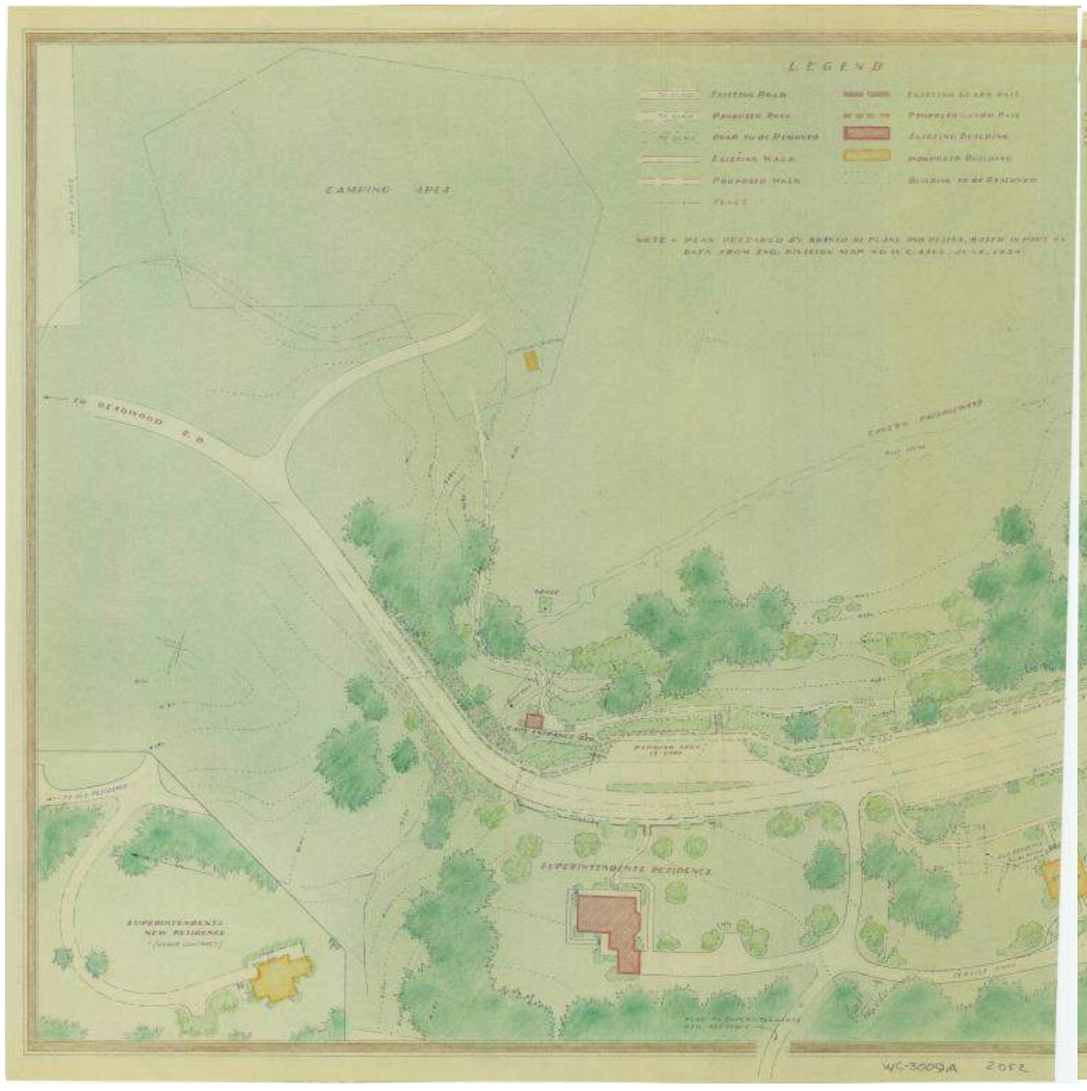
Page from the 1933 Master Plan

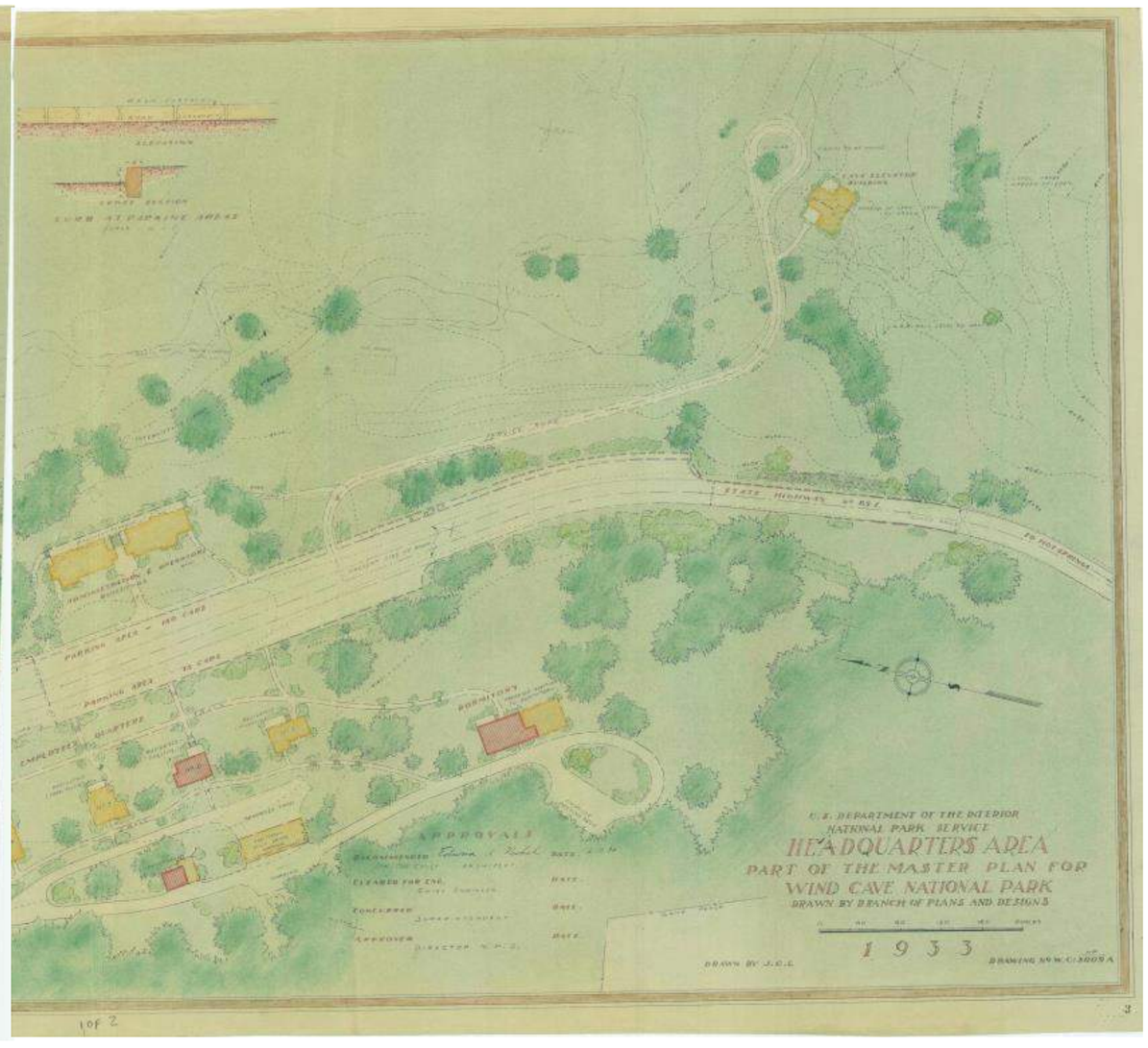


Appendix A.

Historic Master Plans for Wind Cave National Park

Page from the 1933 Master Plan This page was in two pieces.

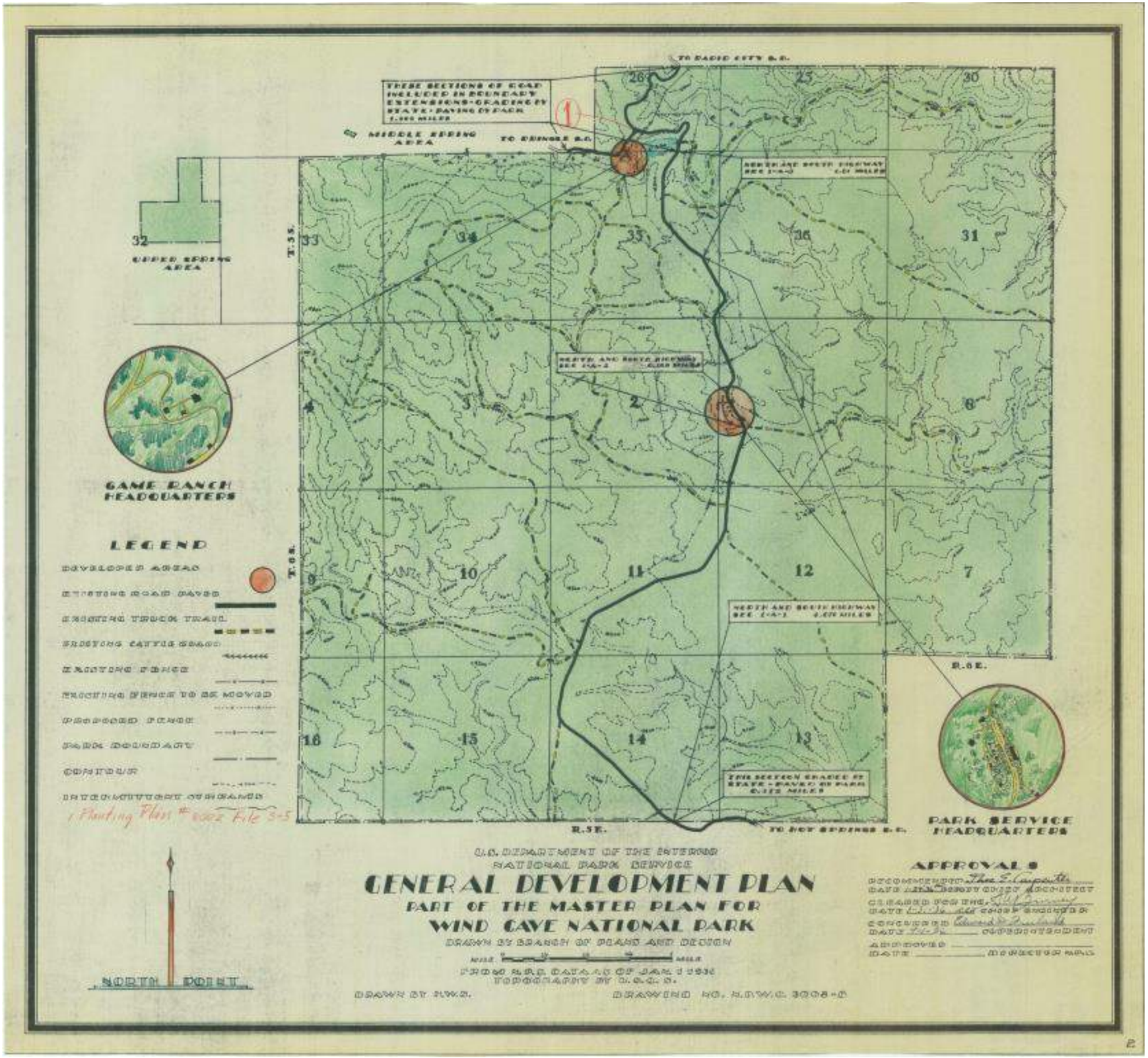




Appendix A.

Historic Master Plans for Wind Cave National Park

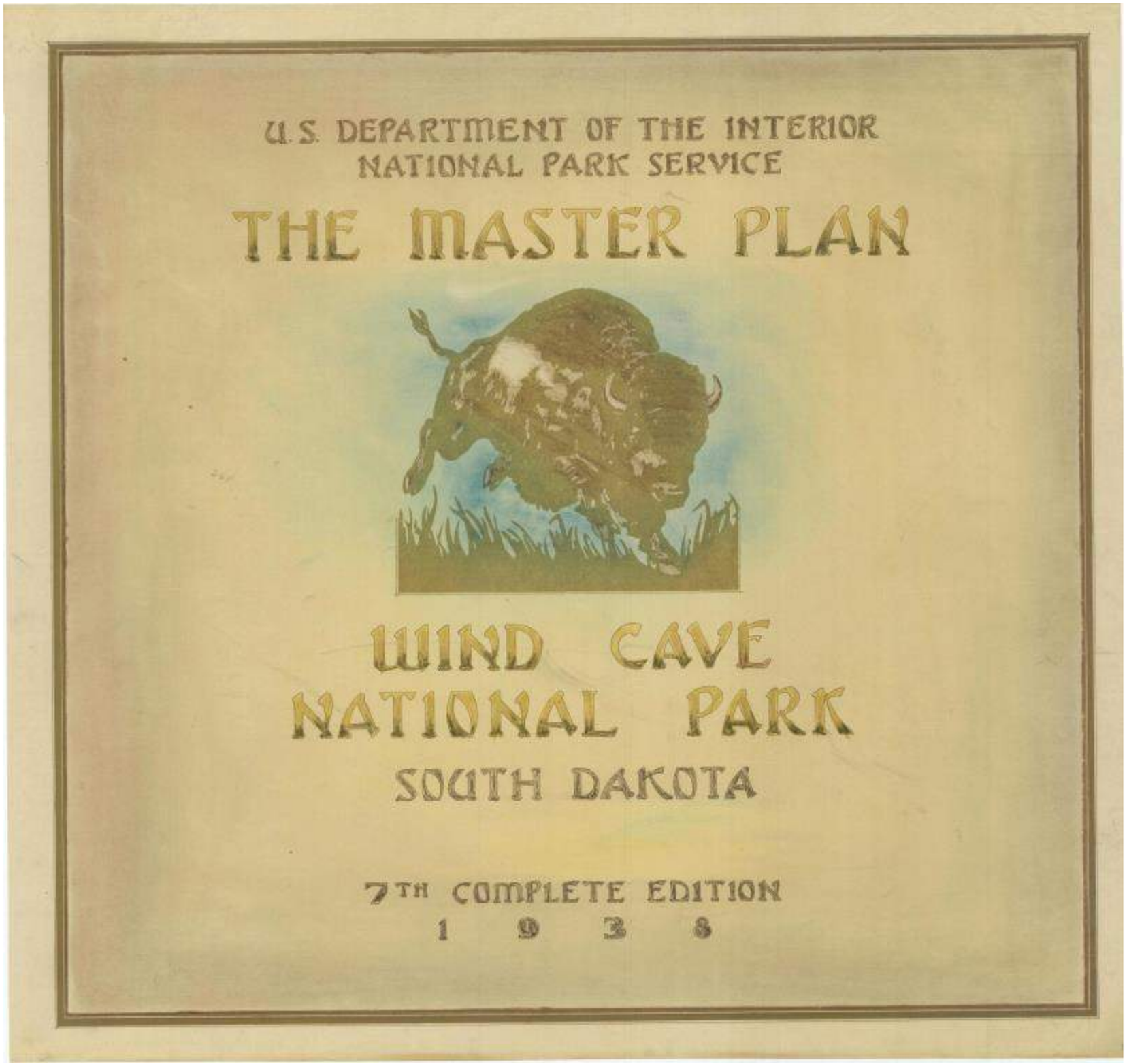
Page from the 1936 Master Plan



Appendix A.

Historic Master Plans for Wind Cave National Park

Page from the 1938 Master Plan



Appendix A
Plan Pages by
Issue Date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**File Name**	**Building Number**	**Drawing Title**	**Issuing Office at US Dept of Int.**	**Drawn by**	**Drawing Date**	**Sheet # of #**	**Public Works Project No.**	**Recommended by and title**	**Recommended Date**	**Approved by and title**	**Approval Date**	**Job Completed Date**	**Notes**
2	WICA_108_312A_[id190762]	**HS 13**	Power House/ aka Window House	Landscape Division	J.H.G	5/1/1931	1 of 1		Thomas C Vint/ Chief Landscape Architect		Arno B Cammerer/ Acting Director NPS	6/1/1931		Look at bottom of right lower corner for possible notes on Completion Date. Info. may have been cut off by first scan.
3	Hs8_1a 1931 maint file	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	1 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	unreadable		In maint dept files.First Floor Plan, site plan, elevation through chimney footing, section through vents to space under floor. Blue print from photos of plans from maintenance files.
4	HS8_3a 1931 maintenance files	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931		In Maint dept files. Door jamb detail, kitchen and bath interior elevations, bath section, common shutter detail, section of foundation through steps, fuel box-porch. Blue print from photos of plans from maintenance files
5	HS8_3b 1931	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3							In Maint dept files. section for eaves, gables, window, door jambs, and door elevation
6	HS8_81b 1931 maint file	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931	9/15/1931	In Maint. Dept files. Foundation plans. Title block for this page is not visable. See photo file Hs8_ title block maint files.
7	WICA_108_313A_[id278462]	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	2 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931	9/15/1931	Elevations, and one section
8	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	1 of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Floor Plan, Foundaton Plan, 1 section, dorr detail
9	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	2 of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Elevations
10	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	3of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Window and door dtail, kitchen detail, section of footing, roof wall detail
11	WICA_108_1004B_[id278464]	**HS 11**	Machine Shop Shed	Branch of Plans and Design	R.W.A.	9/18/1933	1 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. East / West Elevation, plan

Appendix A
Plan Pages by
Issue Date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
12	WICA_108_1004B_[id278464]	**HS 11**	Machine Shop Shed	Branch of Plans and Design	Corner Missing	9/18/1933	2 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. North/ South Elevation, details, plan.
13	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	1 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Floor Plans and window detail
14	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	2 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Elevations, one section and roof truss framing detail
15	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	3 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Sections and detail of Porch, doors, built-ins and kitchen
16	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	4 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Foundation plan, simple floor plan, piping system
17	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	2 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	First and Second Floor Plans, Window and Door detail
18	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	3 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Elevations
19	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	4 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Window and door detail
20	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	5 of 5	1	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Sections, window elevations, kitchen detail, fire place detail
21	WICA_108_3010_[id278449] and Wind Cave 262	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	1 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Foundation and Basement plans and sections

Appendix A
Plan Pages by
Issue Date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
22	WICA_108_3014_[id278472]	**HS 05**	Alterations and Additions to Employee's Residence	Branch of Plans and Design	Kerr?	8/17/1934	1 of 1	ECW Project #2	Edward A Nickel?, for Ex. Chief Architect	10/25/1934	Arno B Cammerer/ Director	11/13?/1934	5/16/1935 (From Monthly supt. Reports 1935)	4 elevations, floor plan, window detail, typical footing detail, wall/roof, overhang detail. Look at bottom of right lower corner for possible notes on Completion Date. Info. may have been cut off by first scan. Camp no. DNR? #1 listed after ECW Project #2 along top of title block.
23	WICA_108_3017_[id3216]	**HS 03**	Planting Plans for Superindendent's Residence	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)
24	WICA_108_3018_[id3227]	**HS 06**	Planting for Residence No. W.C. 3004 A	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)
25	WICA_108_3019_[id3239]	**HS 07**	Planting for Residence No. W.C. 1000A	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)
26	WICA_108_3023_[id278474] Also recored as WICA_108_3023_[13417]	**HS 04**	WCNP Old Supt. Res. Remodeling	Branch of Plans and Design	G.W.N.	3/8/1935	1 of 2		W.G. Carnes, Deputy Chief Architect	3/19/1935	Arno B Cammerer/ Director	4/8/1935	4/30/1937 ECW reports 1937	Look at bottom right corner for possible notes on Completion Date. Info. may have been cut off by first scan.
27	WICA_108_3023_[id278474] Also recored as WICA_108_3023_[13417]	**HS 04**	WCNP Old Supt. Res. Remodeling (Dormitory Addition)	Branch of Plans and Design	G.W.N. ? Unreadabl e	3/28/1936	2 of 2		W.G. Carnes, Deputy Chief Architect	4/25/1936	Arno B Cammerer/ Director	5/15/1936		3 elevations, dormitory floor plan, 1 section, foundation details. Note written left of the title block lists this building as ECW Project #6
28	WICA_108_313C_[id278461] and Wind Cave 257	**HS 08**	Alterating [sic]Ranger's Dormitory into a Residence	Not Listed	Not Listed	Dec-36	page not numbere d		W.G. Carnes, Act. Chief Architect	1/22/1937	Arno B Cammerer/ Acting Director	1/27/1937		Floor plan, north and west elevation, notes
29	WICA_108_3010B_[id278471] Also listed under WICA-108_3010B_[id96249]	**HS 03**	WCNP Addition to Superintendent's Residence	Branch of Plans and Design	Kreinka ? MP	7/15/1939	2 of 2							Foundation section, Basement plan, kitchen detail, F.S.D counter detail
30	WICA_108_1000C_[id278466] and Wind Cave 258, 260	**HS 07**	Addition to Employee's Residence No. 3	Regional Office 2 Branch of Plans and Design	Possibly Wilfred S. Hill. Designed by L.E. Wilkie	11/22/1939	1 of 1		Wilford G. Hill/ Acting Regional Landscape Architect	12/12/1939	Thomas J Allen Jr.?/ Regional Director			Handwritten notes on plans have residence #3 circled with "This alteration never made, see 1000b." Elevations, window and door detail, foundation and first floor plan.

Appendix A
Plan Pages by
Issue Date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
31	WICA_108_3009H[id140613] 1942	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park	Branch of Plans and Design		1/1/1942	1 of 1 Two copies in e-file, same plan							Hanwritten note lists sht. 1 of 1, Part 1 of 2. Sheet 7 also listed on origianl copy (right lover corner)
32	WICA_108_5308B_[id140845] 1942 util	**Site Plan/ Utilities**	Headquarters Area, Utilities Layout, Part of the Master Plan for Wind Cave National Park	Branch of Engineering		1/1/1942	8 of ?							
33	Wind Cave 251	**Rewire Electrical**	Rewire Electical	NPS, Rocky Mountain Region	J.S. ?	Mar-85	1 of 27		Homer L. Ro??e	3/24/1985	Jack Huckels ?	3/28/1985		
34	Old Fire Cache	**HS 12**	Historic Structure HS-12 Old Fire Cache		Steve Schrempp	4/15/2005	1 of 1							Newer Drawing
35	HS-13	**HS 13**	Window House HS-13 as-Maintained		Steve Schrempp	5/20/2005								Newer Drawing
36	WICA_108_3009N[id194754] 1966	**Site Plan**	Headquarters Area, Part of the Master Plan Wind Cave National Park	San Francisco Plan Service Center, Office of Design and Construction	unreadable	09/00/1963 Two revised dates: 3-65 JAR, and 2-66 VA			W. L. Bowen/Chief DCSSC	2/24/1966	J.E.N. Jensen/ Asst. Director	5/25/1966		Basic Data Drawing Nos. : 3009-H, 2009-A, 2010-A, 5311-B, 3144-D
37	park files, paper copy	**Site Plan**	Administritive Area. Part of the Master Plan for Wind Cave National Park	Branch of Plans and Design, NPS	N. G. R.	01/-1/1939								
38	WICA_108_3009J[id168608] 1958	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park			03/00/1963 ? Scan unclear, see lower right corner.	1 of 1		Earl M Semingsen?/ Superintendent	4/3/1958	Conrad L. Werlt?/ Director	4/10/1958		Two revised dates listed: 8/55 initialed by GWH and 3/58, initialed by WSH. Basic data drawing numbers listed on bottom left margin, NP-WC 3009-H, 2009-A, 2010-A, 5311-B
39	WICA_108_3009M_[id] 1963	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park	Western Office Division of Design and Construction		09/00/1963	1 of 1		? Smith/ Acting Director of ?	3/25/1965	Edward S. Peetz	5/25/1965		E-file lists as WINDCAVE 1963 001. See revised schedule for list of dates.
40	WICA_108_3010B_[id278471] Also listed under WICA-108_3010B_[id96249]	**HS 03**	WCNP Addition to Superintendent's Residence	Branch of Plans and Design	W.G. Hill and Kreinka? MP	7/15/1939 and 6/30/1939	1 of 2		Howard W. Baker, Regional Landscape Architect	9/21/1939	Thomas J Allen Jr.?/ Regional Director	9/23/1939		2 elevations, first floor plan, window detail. W. G. Hill is additional name signed on side bar under "Plans and Design"

Appendix A
Plan Pages by
HS Number

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**File Name**	**Building Number**	**Drawing Title**	**Issuing Office at US Dept of Int.**	**Drawn by**	**Drawing Date**	**Sheet # of #**	**Public Works Project No.**	**Recommended by and title**	**Recommended Date**	**Approved by and title**	**Approval Date**	**Job Completed Date**	**Notes**
2	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	2 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	First and Second Floor Plans, Window and Door detail
3	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	3 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Elevations
4	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	4 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Window and door detail
5	WICA_108_3010_[id278449]	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	5 of 5	1	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Sections, window elevations, kitchen detail, fire place detail
6	WICA_108_3010_[id278449] and Wind Cave 262	**HS 03**	WCNP Superintendent's Residence	Branch of Plans and Design	S.D.	11/3/1933	1 of 5	**1**	W. G. Carnes, Act. Chief Architect	11/14/1933	Arno B Cammerer/ Director	12/28/1933	8/11/1934	Foundation and Basement plans and sections
7	WICA_108_3017_[id3216]	**HS 03**	Planting Plans for Superindendent's Residence	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)
8	WICA_108_3010B_[id278471] Also listed under WICA-108_3010B_[id96249]	**HS 03**	WCNP Addition to Superintendent's Residence	Branch of Plans and Design	Kreinka ? MP	7/15/1939	2 of 2							Foundation section, Basement plan, kitchen detail, F.S.D counter detail
9	WICA_108_3010B_[id278471] Also listed under WICA-108_3010B_[id96249]	**HS 03**	WCNP Addition to Superintendent's Residence	Branch of Plans and Design	W.G. Hill and Kreinka? MP	7/15/1939 and 6/30/1939	1 of 2		Howard W. Baker, Regional Landscape Architect	9/21/1939	Thomas J Allen Jr.?/ Regional Director	9/23/1939		2 elevations, first floor plan, window detail. W. G. Hill is additional name signed on side bar under "Plans and Design"
10	WICA_108_3023_[id278474] Also recored as WICA_108_3023_[13417]	**HS 04**	WCNP Old Supt. Res. Remodeling	Branch of Plans and Design	G.W.N.	3/8/1935	1 of 2		W.G. Carnes, Deputy Chief Architect	3/19/1935	Arno B Cammerer/ Director	4/8/1935	4/30/1937 ECW reports 1937	Look at bottom right corner for possible notes on Completion Date. Info. may have been cut off by first scan.
11	WICA_108_3023_[id278474] Also recored as WICA_108_3023_[13417]	**HS 04**	WCNP Old Supt. Res. Remodeling (Dormitory Addition)	Branch of Plans and Design	G.W.N. ? Unreadable	3/28/1936	2 of 2		W.G. Carnes, Deputy Chief Architect	4/25/1936	Arno B Cammerer/ Director	5/15/1936		3 elevations, dormitory floor plan, 1 section, foundation details. Note written left of the title block lists this building as ECW Project #6

Appendix A
Plan Pages by
HS Number

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
12	WICA_108_3014_[id278472]	**HS 05**	Alterations and Additions to Employee's Residence	Branch of Plans and Design	Kerr?	8/17/1934	1 of 1	ECW Project #2	Edward A Nickel?, for Ex. Chief Architect	10/25/1934	Arno B Cammerer/ Director	11/13?/1934	5/16/1935 (From Monthly supt. Reports 1935)	4 elevations, floor plan, window detail, typical footing detail, wall/roof, overhang detail. Look at bottom of right lower corner for possible notes on Completion Date. Info. may have been cut off by first scan. Camp no. DNR? #1 listed after ECW Project #2 along top of title block.
13	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	1 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Floor Plans and window detail
14	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	2 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Elevations, one section and roof truss framing detail
15	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	3 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Sections and detail of Porch, doors, built-ins and kitchen
16	WICA_108_3004A_[id278447]	**HS 06**	Employee's Residence	Branch of Plans and Design	R.W A.	10/10/1933	4 of 4	PWP #1, Physical Improvements	W.G. Carnes, Chief Architect	10/12/1933	Arno B Cammerer/ Director	11/28/1933	8/11/1934	Foundation plan, simple floor plan, piping system
17	WICA_108_3018_[id3227]	**HS 06**	Planting for Residence No. W.C. 3004 A	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)
18	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	1 of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Floor Plan, Foundaton Plan, 1 section, dorr detail
19	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	2 of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Elevations
20	WICA_108_1000A_[id278465] Also recorded as WICA_108_1000A_[id192697	**HS 07**	Employee's Residence	Landscape Division	H. W. B.	8/31/1931	3of 3		Thomas C. Vint, Chief Landscape Architect	9/5/1931	Plans not signed	No Date	2/26/1932	Window and door dtail, kitchen detail, section of footing, roof wall detail
21	WICA_108_3019_[id3239]	**HS 07**	Planting for Residence No. W.C. 1000A	Branch of Plans and Design, NPS	S.S.	10/15/1934	1 of 1	4	W.G. Carnes, Act. Chief Architect	10/23/1934	Arno B Cammerer/ Director NPS	11/15/1934		Site Plan with plantings and legend. SS may refer to S.Serrano (see monthly Supt. Reports, 1937)

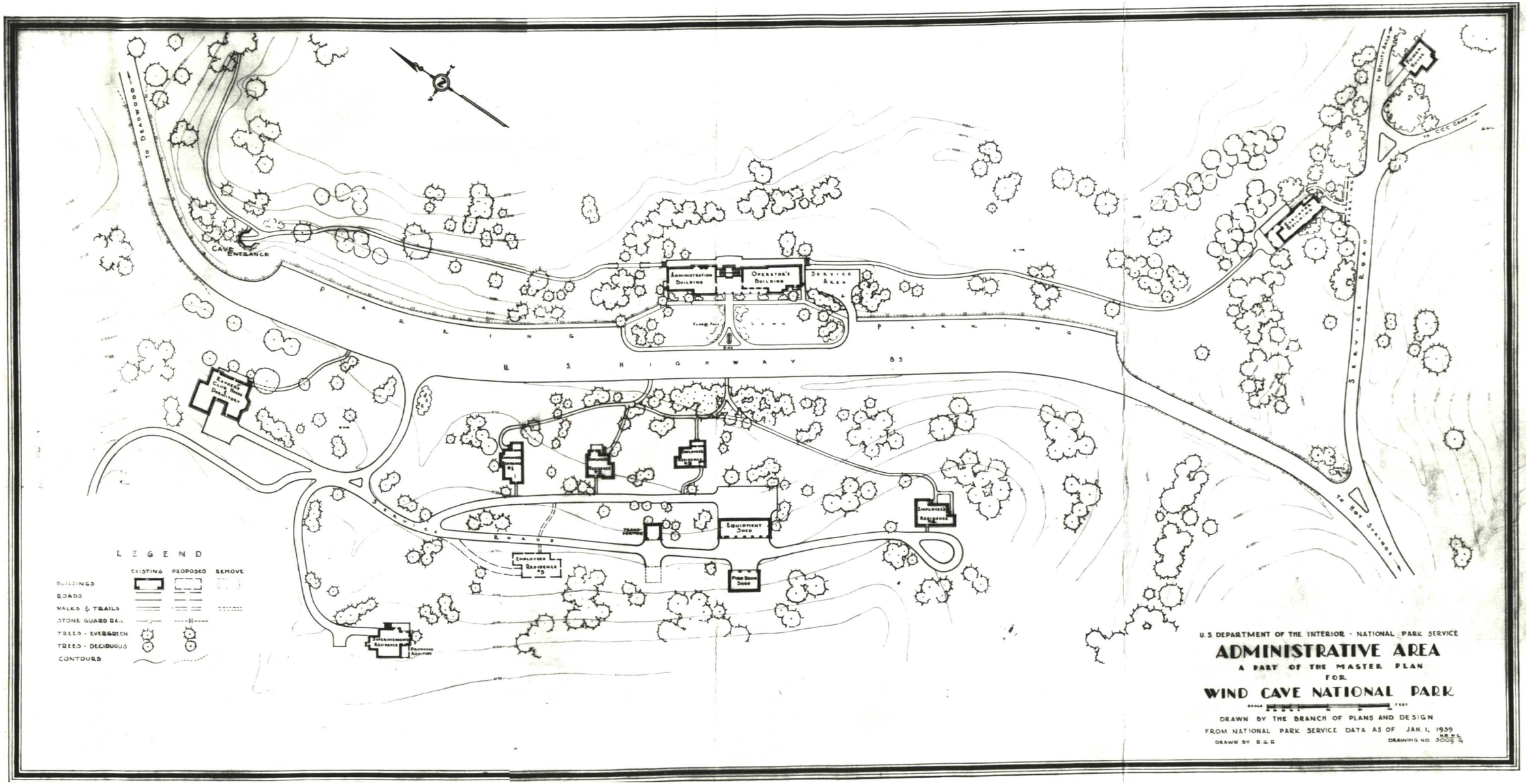
Appendix A
Plan Pages by
HS Number

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
22	WICA_108_1000C_[id278466] and Wind Cave 258, 260	**HS 07**	Addition to Employee's Residence No. 3	Regional Office 2 Branch of Plans and Design	Possibly Wilfred S. Hill. Designed by L.E. Wilkie	11/22/1939	1 of 1		Wilford G. Hill/ Acting Regional Landscape Architect	12/12/1939	Thomas J Allen Jr.?/ Regional Director			Handwritten notes on plans have residence #3 circled with "This alteration never made, see 1000b." Elevations, window and door detail, foundation and first floor plan.
23	Hs8_1a 1931 maint file	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	1 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	unreadable		In maint dept files.First Floor Plan, site plan, elevation through chimney footing, section through vents to space under floor. Blue print from photos of plans from maintenance files.
24	HS8_3a 1931 maintenance files	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931		In Maint dept files. Door jamb detail, kitchen and bath interior elevations, bath section, common shutter detail, section of foundation through steps, fuel box-porch. Blue print from photos of plans from maintenance files
25	HS8_3b 1931	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3							In Maint dept files. section for eaves, gables, window, door jambs, and door elevation
26	HS8_81b 1931 maint file	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	3 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931	9/15/1931	In Maint. Dept files. Foundation plans. Title block for this page is not visable. See photo file Hs8_ title block maint files.
27	WICA_108_313A_[id278462]	**HS 08**	Rangers Dormitory and Mess House	Landscape Division	J.H.G.	5/7/1931	2 of 3		Thomas C. Vint, Chief Landscape Architect	5/14/1931	Arno B Cammerer/ Acting Dir. NPS	5/20/1931	9/15/1931	Elevations, and one section
28	WICA_108_313C_[id278461] and Wind Cave 257	**HS 08**	Alterating [sic]Ranger's Dormitory into a Residence	Not Listed	Not Listed	Dec-36	page not numbered		W.G. Carnes, Act. Chief Architect	1/22/1937	Arno B Cammerer/ Acting Director	1/27/1937		Floor plan, north and west elevation, notes
29	WICA_108_1004B_[id278464]	**HS 11**	Machine Shop Shed	Branch of Plans and Design	R.W.A.	9/18/1933	1 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. East / West Elevation, plan
30	WICA_108_1004B_[id278464]	**HS 11**	Machine Shop Shed	Branch of Plans and Design	Corner Missing	9/18/1933	2 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. North/ South Elevation, details, plan.

Appendix A
Plan Pages by
HS Number

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
31	Old Fire Cache	**HS 12**	Historic Structure HS-12 Old Fire Cache		Steve Schrempp	4/15/2005	1 of 1							Newer Drawing
32	WICA_108_312A_[id190762]	**HS 13**	Power House/ aka Window House	Landscape Division	J.H.G	5/1/1931	1 of 1		Thomas C Vint/ Chief Landscape Architect		Arno B Cammerer/ Acting Director NPS	6/1/1931		Look at bottom of right lower corner for possible notes on Completion Date. Info. may have been cut off by first scan.
33	HS-13	**HS 13**	Window House HS-13 as-Maintained		Steve Schrempp	5/20/2005								Newer Drawing
34	Wind Cave 251	**Rewire Electrical**	Rewire Electical	NPS, Rocky Mountain Region	J.S. ?	Mar-85	1 of 27		Homer L. Ro??e	3/24/1985	Jack Huckels ?	3/28/1985		
35	WICA_108_3009H[id140613] 1942	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park	Branch of Plans and Design		1/1/1942	1 of 1 Two copies in e-file, same plan							Hanwritten note lists sht. 1 of 1, Part 1 of 2. Sheet 7 also listed on origianl copy (right lover corner)
36	WICA_108_3009N[id194754] 1966	**Site Plan**	Headquarters Area, Part of the Master Plan Wind Cave National Park	San Francisco Plan Service Center, Office of Design and Construction	unreadable	09/00/1963 Two revised dates: 3-65 JAR, and 2-66 VA			W. L. Bowen/Chief DCSSC	2/24/1966	J.E.N. Jensen/ Asst. Director	5/25/1966		Basic Data Drawing Nos. : 3009-H, 2009-A, 2010-A, 5311-B, 3144-D
37	WICA_108_3009J[id168608] 1958	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park			03/00/1963 ? Scan unclear, see lower right corner.	1 of 1		Earl M Semingsen?/ Superintendent	4/3/1958	Conrad L. Werlt?/ Director	4/10/1958		Two revised dates listed: 8/55 initialed by GWH and 3/58, initialed by WSH. Basic data drawing numbers listed on bottom left margin, NP-WC 3009-H, 2009-A, 2010-A, 5311-B
38	WICA 15854	**Site Plan**	Headquarters Area, A Part of the Master Plan for Wind Cave National Park	Western Office Division of Design and Construction		09/00/1963	1 of 1		? Smith/ Acting Director of ?	3/25/1965	Edward S. Peetz	5/25/1965		WICA museum collections.
39	park files, paper copy	**Site Plan**	Administritive Area. Part of the Master Plan for Wind Cave National Park	Branch of Plans and Design, NPS	N. G. R.	01/-1/1939								
40	WICA_108_5308B_[id140845] 1942 util	**Site Plan/ Utilities**	Headquarters Area, Utilities Layout, Part of the Master Plan for Wind Cave National Park	Branch of Engineering		1/1/1942	8 of ?							

1939 Site Plan, from the 1940 Master Plan on File in the WICA Library (Years of Growth Box 1 F 5)
This is one of the best early site plans of the study area.



TO CUSTER

PICNIC AREA

PROPOSED TRAILER PARKING-16

A. McDONALD'S GRAVE

ORIGINAL CAVE ENTRANCE

PRESENT ENTRANCE

PARKING AREAS

171 - CARS

RESIDENCE & DORM.

ROAD TO RESERVOIR

PARKING-77

ADMINISTRATION & CONCESSION BUILDING

& PROPOSED EXPANSION

SHELTER

FOOTBRIDGE

SERVICE

RESIDENCES-3

STORAGE

GARAGE

FIRE EQUIPMENT SHED

RESIDENCE

SUPERINTENDENT'S RESIDENCE

RESIDENTIAL AREA

PARKING-94

EXPANSION

PROPOSED ROAD WIDENING FOR PARKING EXPANSION, SEE SHEET 2

INTERPRETIVE FACILITY

ELEVATORS-TOUR NO.2 TO SUPPLEMENT EXISTING SERVICE IN BUILDING NO.2

PARKING-50

EXPANSION

FOOTBRIDGE

ELEVATOR BUILDING

TOUR NO.1

TRAINING & CONFERENCE BUILDING

U.S. 385 TO HOT SPRINGS

ROUTE 1

BUILDING LEGEND

A · OFFICE & SHOP
B · STORAGE
C · GAS & OIL
D · SERVICE RACK
E · VEHICLE STORAGE & MAINTENANCE

PROPOSED CHAIN LINK FENCE ENCLOSURE

MATCH LINE

ROUTE 1 RELOCATION US 385

MIXING CIRCLE TO BE RELOCATED ALSO OIL TANKS

SEWAGE LAGOONS

TO WELL SITE

AREA BUFFALO FENCE

INCINERATOR TO BE RELOCATED

MAINTENANCE AREA INSET

14' BASE COARSE ROAD

MAINTENANCE AREA

SEE INSET

PLAY AREA

ROAD

RESIDENTIAL AREA

DORM.

4-UNIT

PARKING

8-UNITS

APARTMENTS

4-UNITS

S·D·87 TO BLUE BELL

RANKIN RIDGE

U·S 385 TO CUSTER

PROPOSED ROUTES 1&2 RELOCATIONS

CAMP GROUND

HEADQUARTERS AREA

NORTH

SCALE 3/4" = 1 MI

TO HOT SPRINGS

KEY MAP

1963 Site Plan, from WICA Archives Collections.
This shows the study area as it appeared in 1965, and includes paths from several residences that are no longer evident. Note the proposed second elevator building, which was never built.

NOTE:
* APPROVAL FOR ROAD WIDENING AND PARKING EXPANSION SOLUTION ONLY. SEE MEMO 5/25/65

BASIC DATA

D'W'G NOS · · · 3009-H, 2009-A, 2010-A, 5311-B

* REQUIRED

LEGEND

	EXISTING	PROPOSED	OBLITERATE
BUILDINGS			
ROADS			
WALKS & TRAILS			
STONE WALL			

ORIENTATION

NORTH

* CONTOUR INTERVAL 10 FEET

* SCALE IN INCHES 1" = 100'

0 50' 100' 200' 400'

REVISED SUFFIX	DATE	INITIAL
M	1/64	J.A.R.
	3/65	J.A.R.

PREPARED DESIGNED BY

DRAWN BY

CHECKED BY

RECOMMENDED — CHIEF, W.O. — DATE

CONCURRED

/S/ JESS H. LOMBARD, SUPERINTENDENT — 4-14-65

/S/ LEMUEL A. GARRISON, REGIONAL DIRECTOR — 4-16-65

ASSISTANT DIRECTOR, DESIGN AND CONSTRUCTION — DATE

APPROVED /S/ EDWARD S. PEETZ* CHIEF, BRANCH OF MASTER PLAN DWGS. — 5-25-65

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
OF LANDSCAPE ARCHITECTURE
WESTERN OFFICE, DIVISION OF DESIGN & CONSTRUCTION

HEADQUARTERS AREA

PART OF THE MASTER PLAN

WIND CAVE NATIONAL PARK

REGION MIDWEST

NP-WC 3009-M 9/63

2-8-7



CCC Worker installing electricity in Wind Cave ca. 1937. (WICA Museum Collection #WICA 4474)

Appendix B
Historic Photographs

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

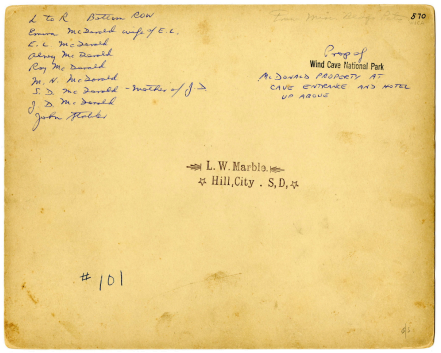
Primary Topic ***HS#*** *General*
General

Photo Date ca. *1890s*
Date Source *other, see HSR notes*
Photographer *L. W. Marble*

Manufact. Date

Catalog #
WICA
570

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

This was prpbably taken before the property became a national park.

Park Database Description

c. 1890's view of McDonald Property old cave house" & hotel up above. People are identified on the rear of the photograph as members of the McDonald family and John Stabler on the far right."

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic ***HS#*** *HS-04*
HS-04

Photo Date ca. *1920*
Date Source *other, see notes*
Photographer *Stevens Studio*

Manufact. Date SD. Stevens Photo

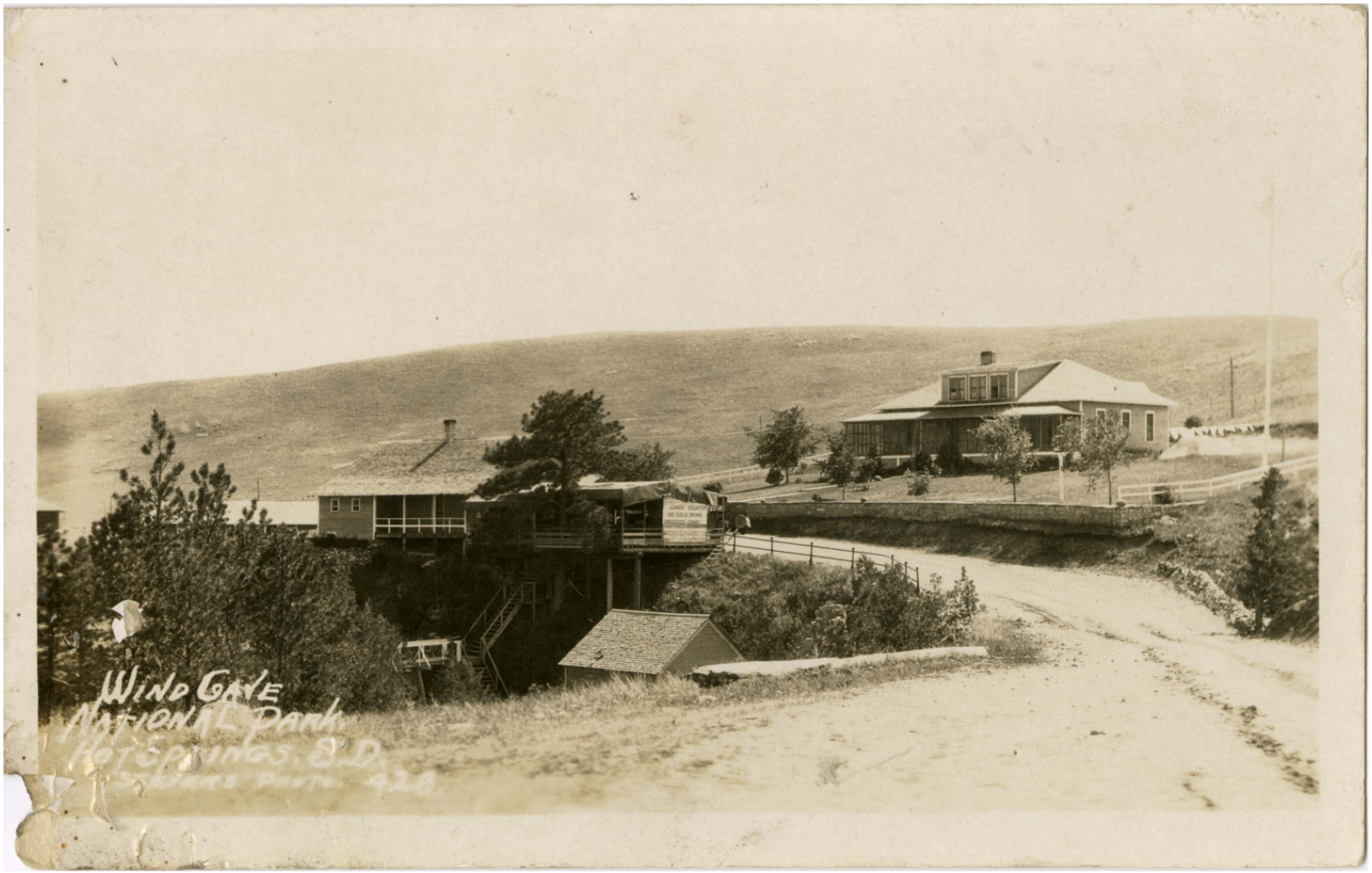
Catalog #
WICA
185

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

After two room addition to HS -04 in 1918, and before front wall was replaced in 1925.



Park Database Description

Postcard view of concession building, Supt. house. Wind Cave National Park

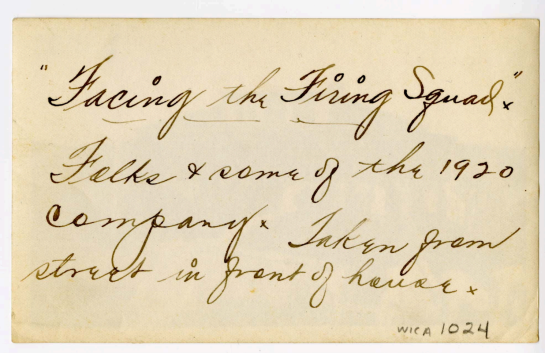
Primary Topic ***HS#*** *HS-04*
HS-04

Photo Date *1920*
Date Source *Handwritten date on back*
Photographer

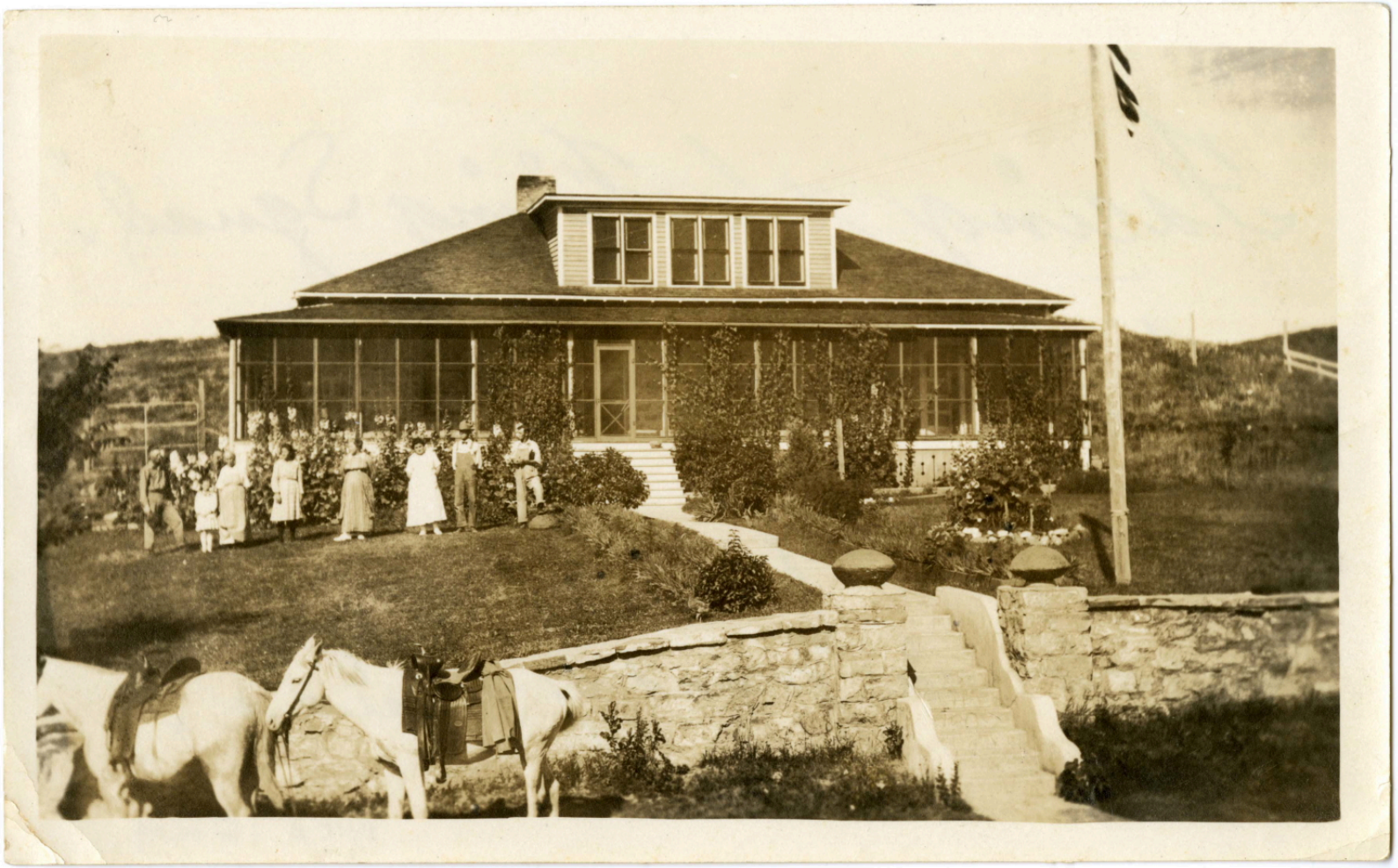
Manufact. Date 1920

Catalog #
WICA
1024

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

B&W photo of a group of people standing in front of a house with two white saddle horses in foreground. Written in ink on back: Facing the Firing Squad x Folks and some of the 1920 company x Taken from street in front of house x" Photo has horizontal format. Bottom corners bent."

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic *General*

HS# *General*

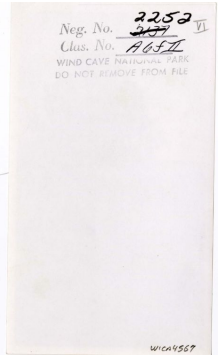
Catalog #
WICA
4567

Photo Date ca. *1930s*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

CCC tree planting; they were at the Park from 1934-1942.

Park Database Description

Photographic Print and Negative of Landscaping - Tree Moving. (Orig. 2252). Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

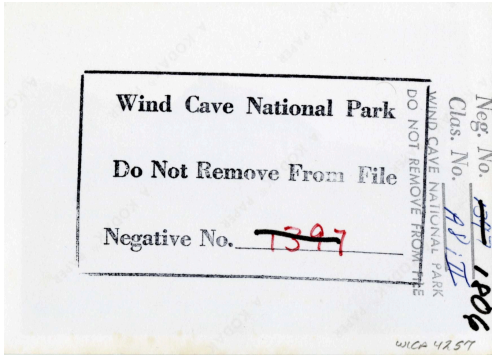
Primary Topic ***HS#*** *HS13*
HS-13

Photo Date ca. *1931*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4257

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS13 was built in 1931.



Park Database Description

Photographic Print and Negative of Buildings - Rear View of Building #13 After Construction Completed. See Also 5345. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

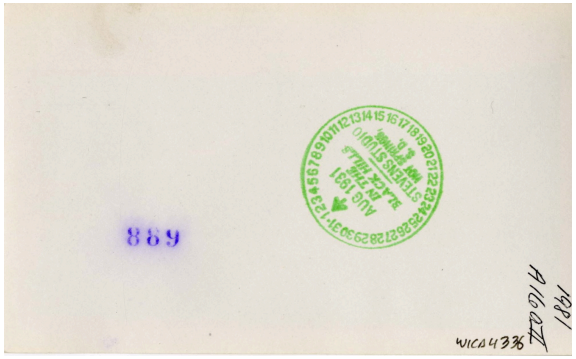
Primary Topic ***HS#*** *HS4*
General *HS5*
HS13

Photo Date *1931, Aug. 1*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 8/31/2014

Catalog #
WICA
4336

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Compare to WICA 4493, which was taken from the dame location ca. 1933.



Park Database Description

Photographic Print and Negative of Headquarters Area. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

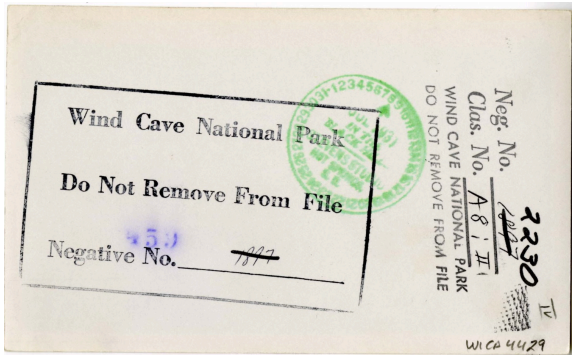
Primary Topic ***HS#*** *HS13*
HS-13

Photo Date *1931, Jul. 8*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 7/31/2014

Catalog #
WICA
4429

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS 5 pre-move in background.



Park Database Description

Photographic Print and Negative of Buildings - Construction of Building 13. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

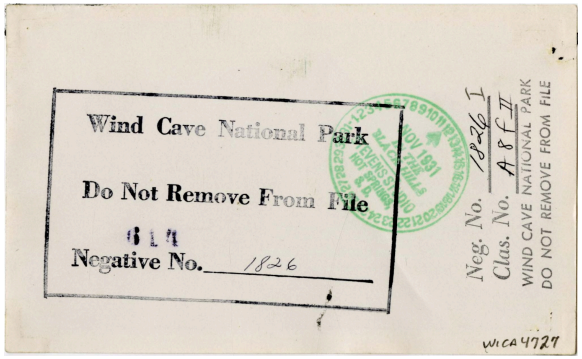
Primary Topic ***HS#*** *HS8*
HS-08

Photo Date *1931, Nov. 12*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

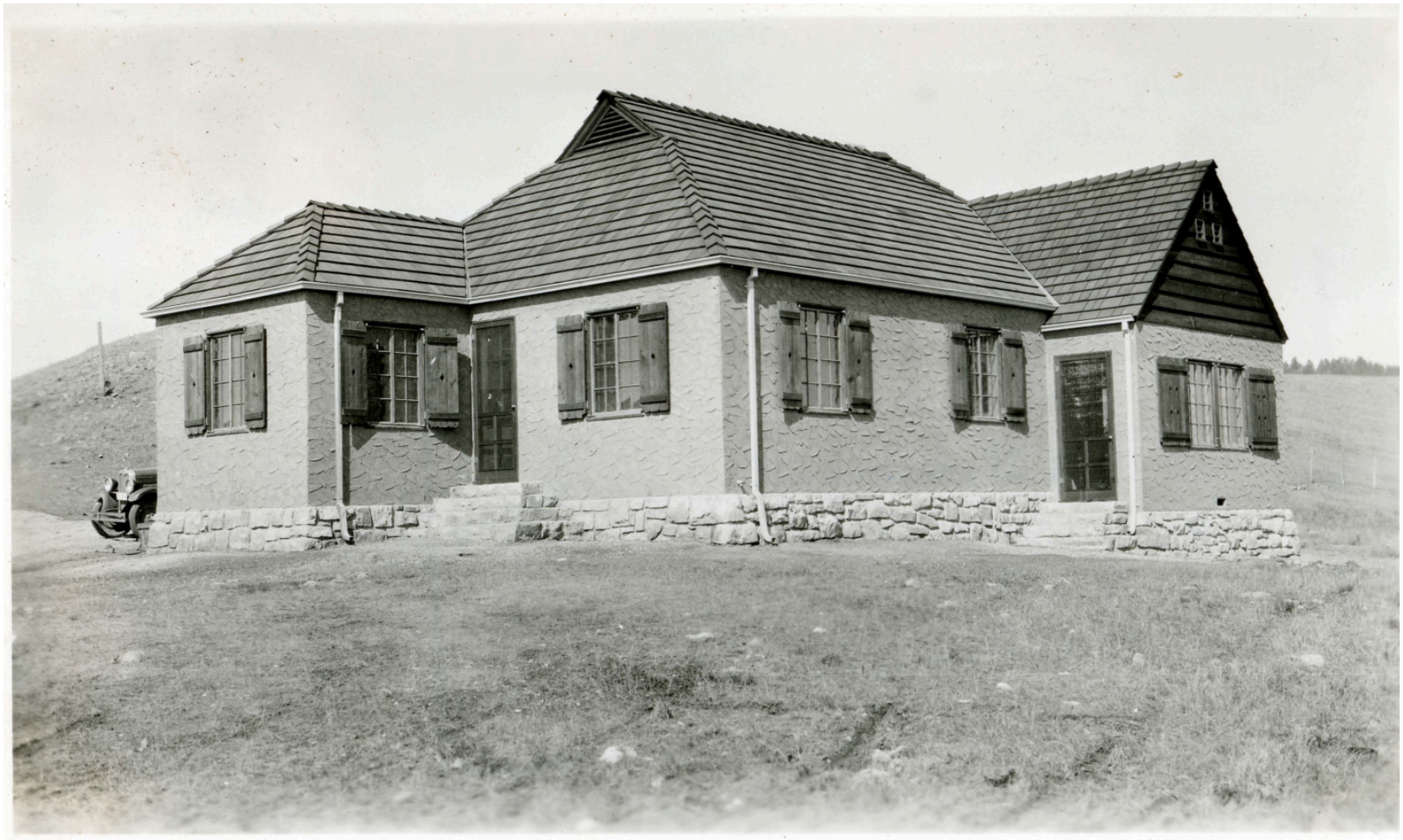
Manufact. Date 11/1/1933

Catalog #
WICA
4727

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Buildings - Residence #8. See Also 1826. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

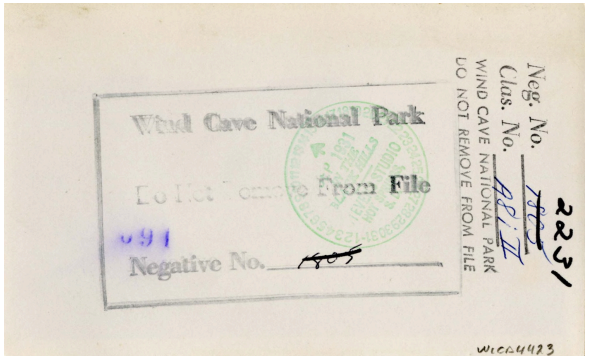
Primary Topic ***HS#*** *HS8*
HS13
HS-13

Photo Date *1931, Sep.*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 3/1/1932

Catalog #
WICA
4423

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Two of the first buildings in Episode 2.



Park Database Description

Photographic Print and Negative of Buildings - Building 13 After Construction. Permanent Housing Area. (Orig. 2231). Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

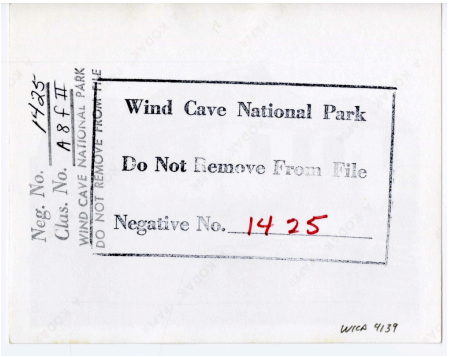
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1931, Sept.*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4139

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS-08 was built in 1931.



Park Database Description

Photographic Print and Negative of Buildings - Residence #8, Construction of Living Quarters. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

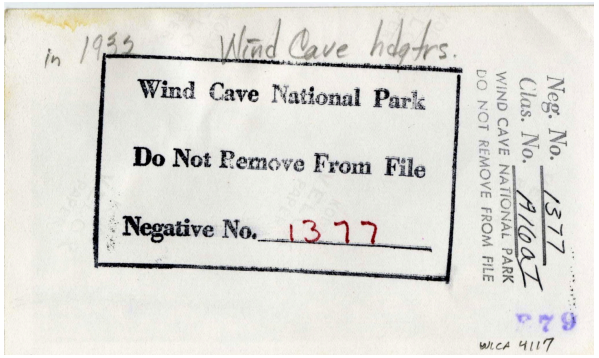
Primary Topic ***HS#*** *HS-13*
General

Photo Date ca. *1932*
Date Source *Handwritten date on back of photo*
Photographer

Manufact. Date 1932

Catalog #
WICA
4117

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

L to Right HS -13, HS-03, HS -05, early Visitor Center.



Park Database Description

Photographic print and negative of wind cave headquarters circa 1932, dated by Mrs. Brazell in 1978. Photographic print is stored at Wind Cave National Park, and the nitrate negative is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

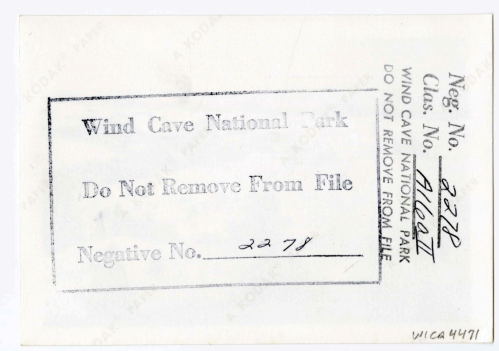
HS#
General
HS-07
HS-08
HS-13

Photo Date ca. *1932*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4471

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

HS-08, HS-07 and HS-13 are shown here, but this is before HS -06 or HS-03 were built, which means it was taken between 1932 and 1934.

Park Database Description

Photographic Print and Negative of Headquarters Area. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

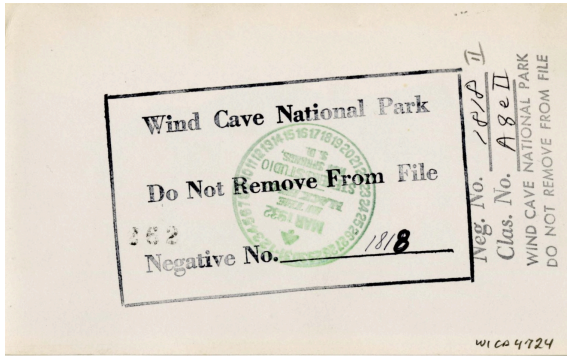
Primary Topic ***HS#*** *HS-07*
HS-07

Photo Date *1932, Mar. 1*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

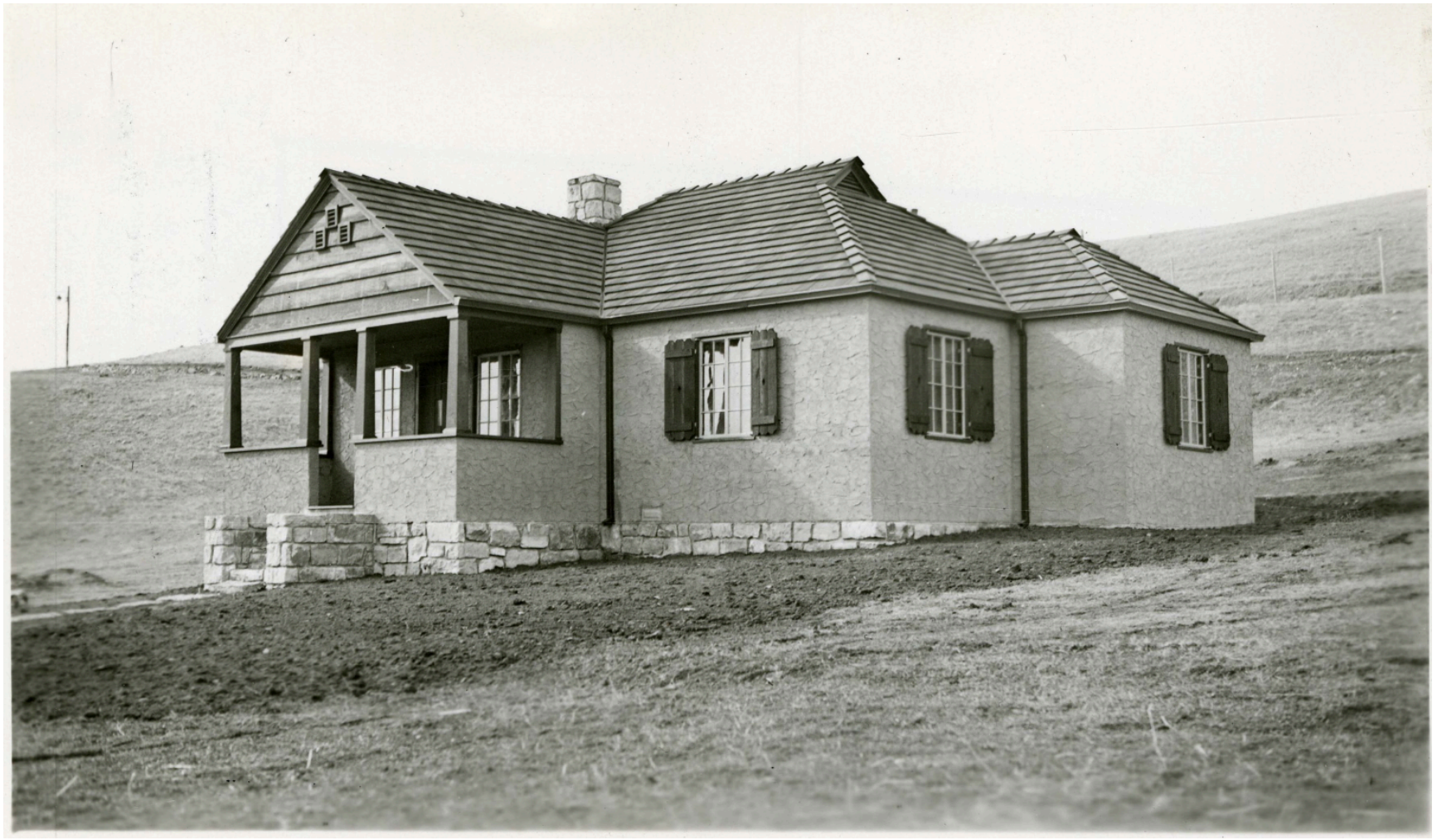
Manufact. Date 3/1/1932

Catalog #
WICA
4724

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Buildings - Residence #7. See Also 1818, 3547. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

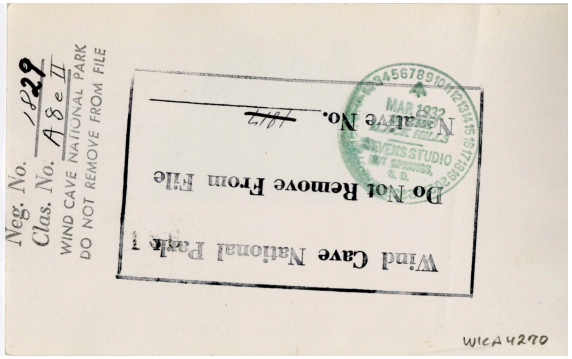
Primary Topic ***HS#*** *HS-07*
HS-07

Photo Date *1932, March 8.*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 1/1/1932

Catalog #
WICA
4270

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Buildings - Construction of Residence #7. See Also 3554, 3555. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

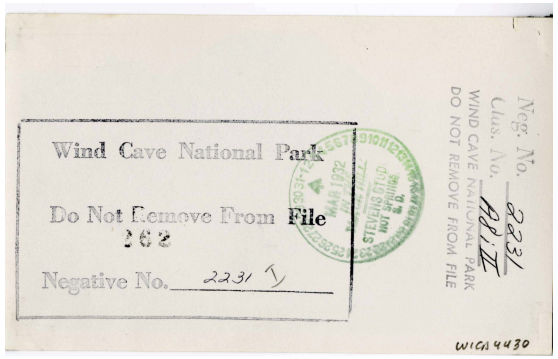
Primary Topic ***HS#*** *HS-08*
HS-13
HS-13

Photo Date *1932, May 31*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 3/1/1932

Catalog #
WICA
4430

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Buildings - Building 13 After Construction Completed. Permanent Housing Area. See Also 2211. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

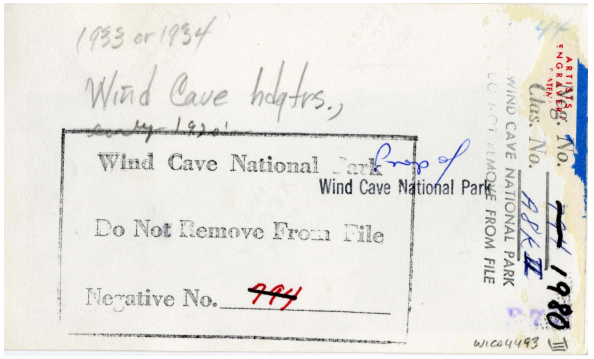
Primary Topic ***HS#*** *HS-07*
HS-13
General

Photo Date ca. *1933*
Date Source *Handwritten date on back*
Photographer *Graphic Artists of SD*

Manufact. Date 9/1/1934

Catalog #
WICA
4493

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Compare to WICA 4336, taken from this same location in 1931.



Park Database Description

Photographic Print and Negative of Headquarters Area. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

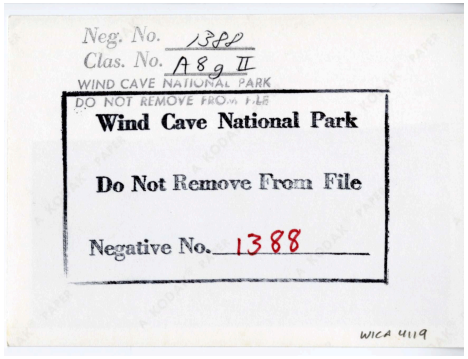
Primary Topic ***HS#*** *HS-11*
HS-11

Photo Date ca. *1934*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

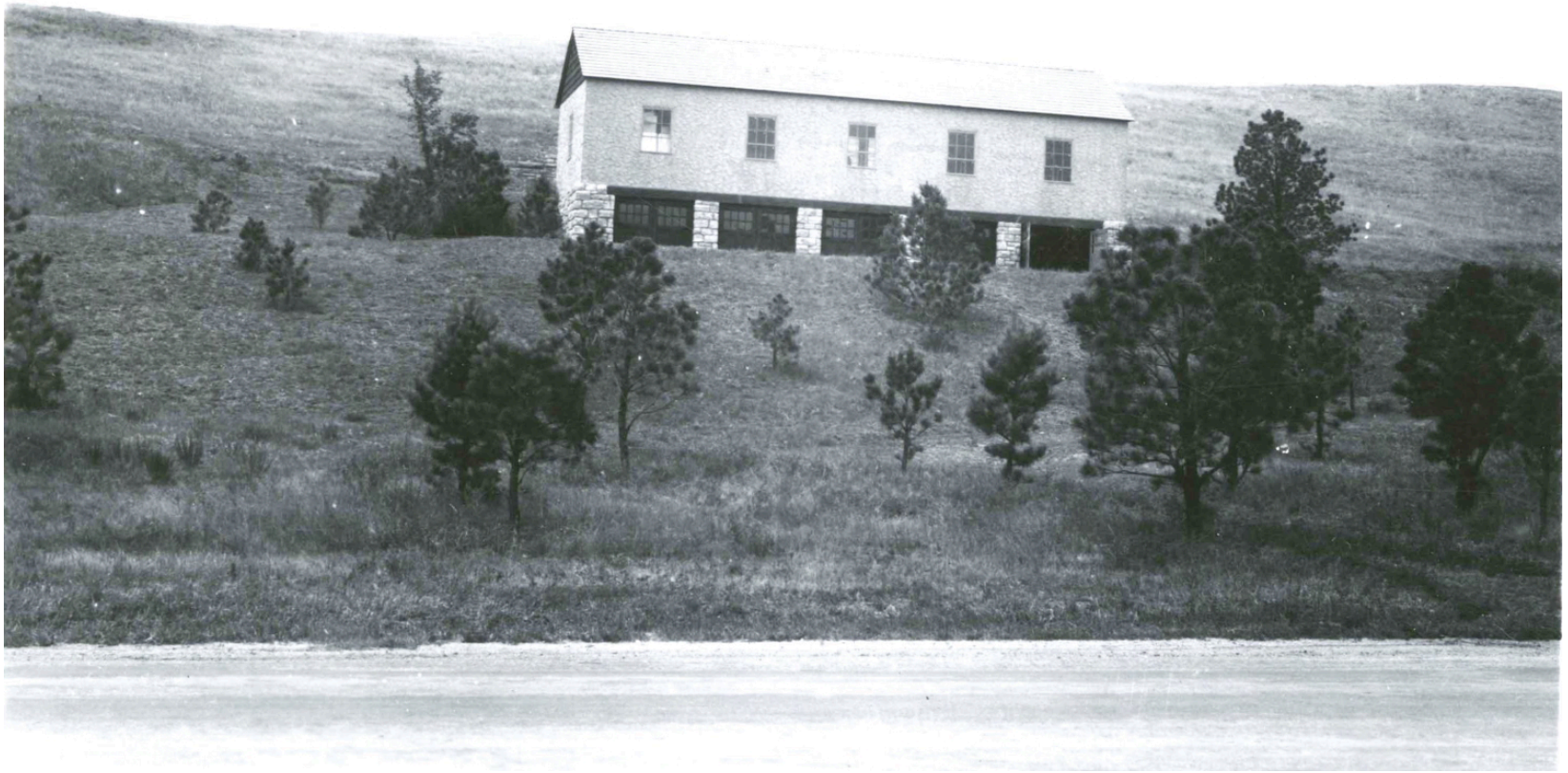
Catalog #
WICA
4119

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

This building was completed 8/11/1934, per the original plans.



Park Database Description

Photographic print and negative of buildings - garage, building #11. Photographic print is stored at Wind Cave National Park, and the nitrate negative is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

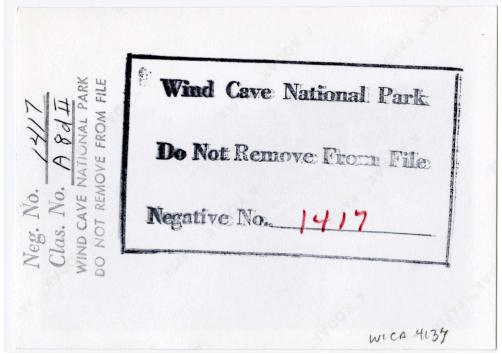
Primary Topic ***HS#*** *HS-06*
HS-06

Photo Date ca. *1934*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4137

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Before CCC landscaping of 1935-36, and probably before HS-05 was moved in 1935.



Park Database Description

Photographic Print and Negative of Buildings - Residence #6. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

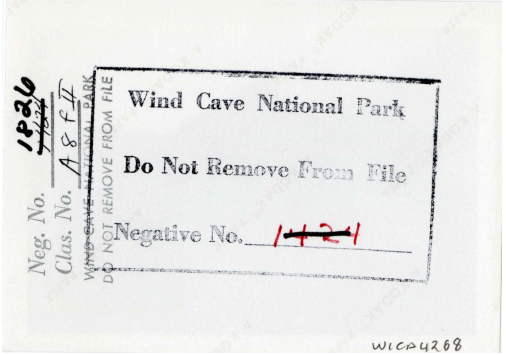
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1934*
Date Source *other, see HSR notes*
Photographer

Manufact. Date 11/1/1933

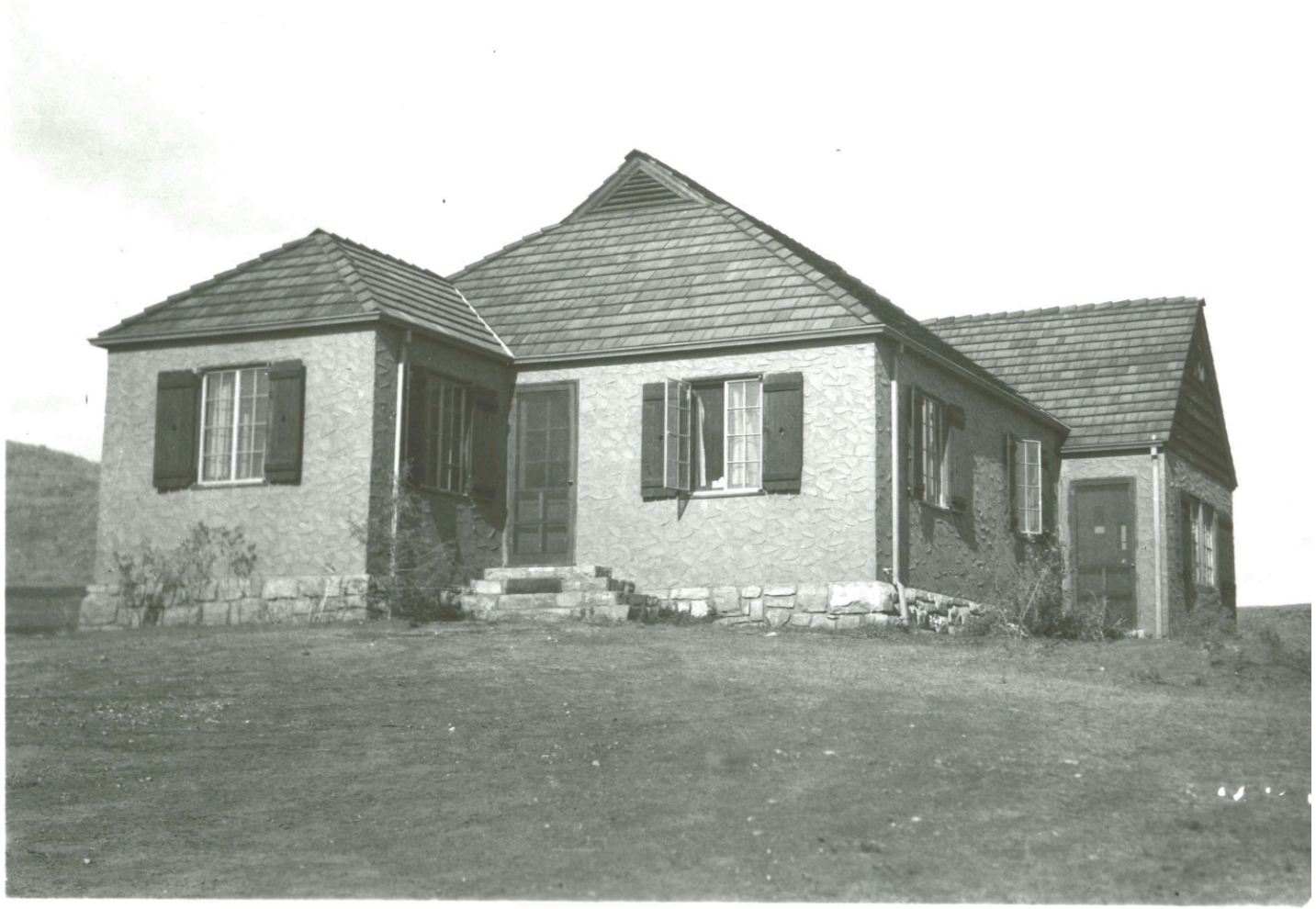
Catalog #
WICA
4268

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

This building was constructed in 1931; plants shown here indicates this photo was taken a year or two later.



Park Database Description

Photographic Print and Negative of Buildings - Residence #8. See Also 3552. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

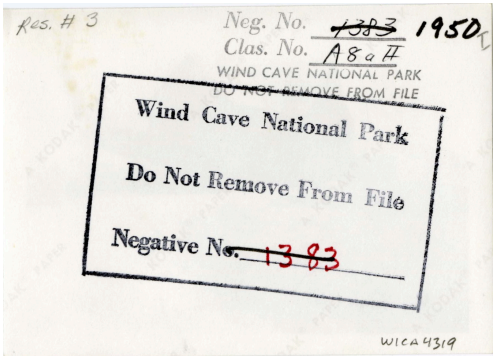
Primary Topic ***HS#*** *HS-03*
HS-03

Photo Date ca. *1934, Aug. 17*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 8/17/1934

Catalog #
WICA
4319

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Buildings Construction - Residence 3 - Completed Building, From North Showing Chimney. See Also 2314. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic *General*

HS# *General*

Photo Date ca. *1934, May 23*

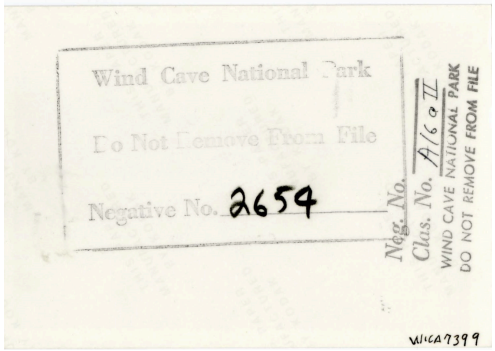
Date Source *"Manufactured Date"*

Photographer

Manufact. Date 5/23/1934

Catalog #
WICA
7399

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Compare to WICA 7393, which was taken from the same view ca. 1936.



Park Database Description

Photographic Print and Negative of Copy of Photo #? Panorama of Headquartters Area.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic ***HS#*** *HS-03*
HS-05
General
HS-03
HS-05

Catalog #
WICA
4335

Photo Date *1934, Nov. 10*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 9/1/1934

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Getting ready to move #5. (left) Duplicate of 8758. This is a better image.



Park Database Description

Photographic Print and Negative of Headquarters Area. See Also 2310 - 2312. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

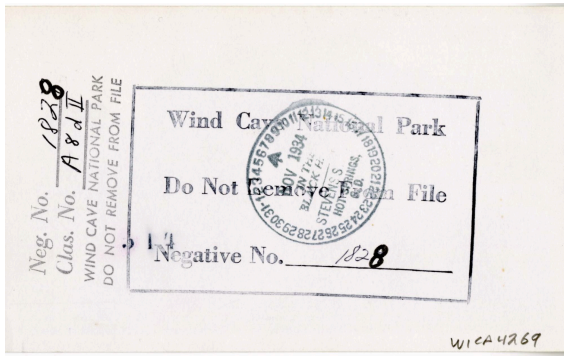
Primary Topic ***HS#*** *HS-06*
HS-06

Photo Date *1934, Nov. 6.*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 8/17/1934

Catalog #
WICA
4269

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Building Construction - Residence #6 - Completed Building. See Also 3553. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

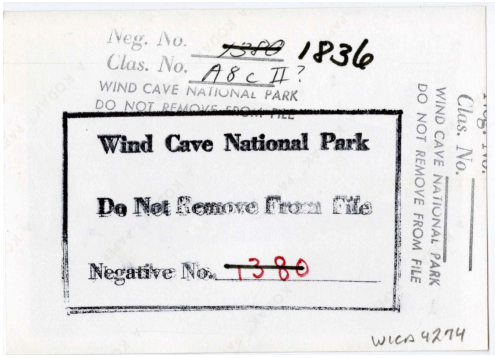
Primary Topic ***HS#*** *HS-05*
HS-05

Photo Date ca. *1935*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 1935

Catalog #
WICA
4274

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Stamped photo #4339 shows this was moved by May 1935.



Park Database Description

Photographic Print and Negative of Buildings - Residence #5 Before Building Was Stuccoed. See Also 3557. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic *HS-11*

HS# *HS-03, HS-11, HS-13*

Photo Date ca. *1935*

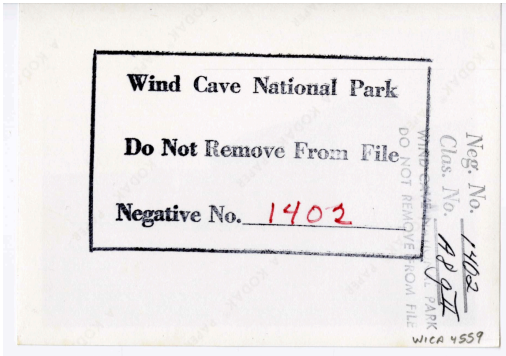
Date Source *"Manufactured Date"*

Photographer

Manufact. Date 1935

Catalog #
WICA
4559

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Buildings - Garage, Building #11. See Also 1402. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Primary Topic
General

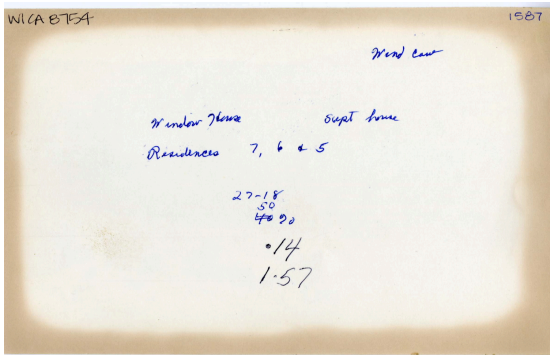
HS#
General
HS-04
HS-05
HS-06
HS-07
HS-13

Catalog #
WICA
8754

Photo Date ca. *1935*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

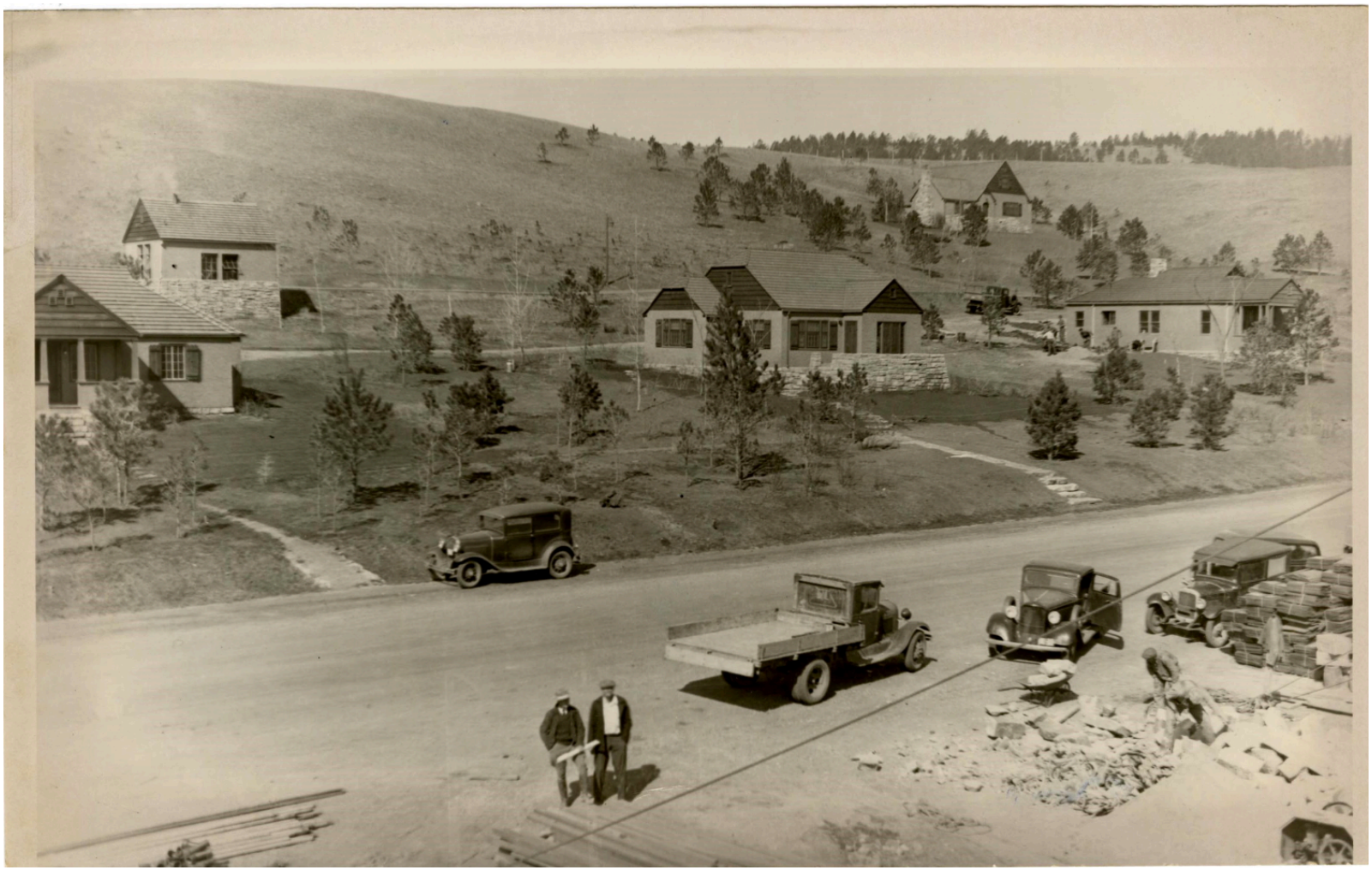
Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS-01 probably under construction, so ca. 1935

Duplicate of WICA #6725



Park Database Description

Window House Residence #7,6,5 and Superintendent House

Primary Topic ***HS#*** *General*
General

Photo Date ca. *1935*
Date Source *"Manufactured Date"*
Photographer *Stevens Studio*

Manufact. Date 1935?

Catalog #
WICA
9422

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

CCC Camp in foreground.



Park Database Description

Photograph Donated By Ray Millard. Labeled #3. Letter of Donation Has Description of the Photo:

Primary Topic ***HS#*** *General*
General

Photo Date ca. *1935*
Date Source *"Manufactured Date"*
Photographer *Stevens Studio*

Manufact. Date 1935?

HSR 2015 Notes

CCC Camp in foreground

Catalog #
WICA
9432

Below: Front of Image. Right: Back of Image



Park Database Description

Photograph Donated By Ray Millard. Labeled

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

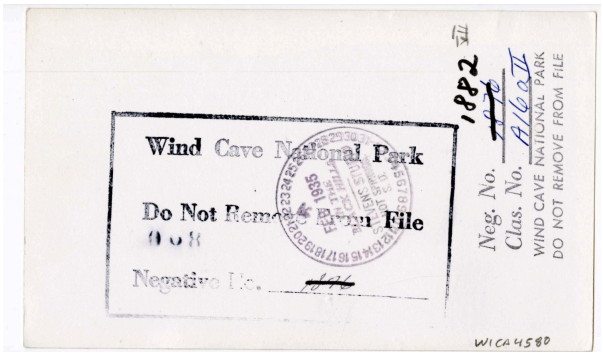
HS#
General
HS-03
HS-05
HS-06
HS-07
HS-08
HS-11

Catalog #
WICA
4580

Photo Date *1935, Feb. 22*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 1935

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Starting HS-01, HS-05 has been moved.



Park Database Description

Photographic Print and Negative of Building Construction - Administration Building, Park Headquarters. (Orig. 1882). Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

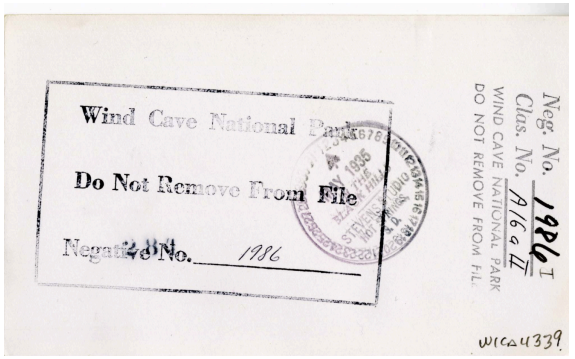
Primary Topic ***HS#*** *HS-03*
HS-05
General
HS-05

Photo Date *1935, May*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 3/1/1935

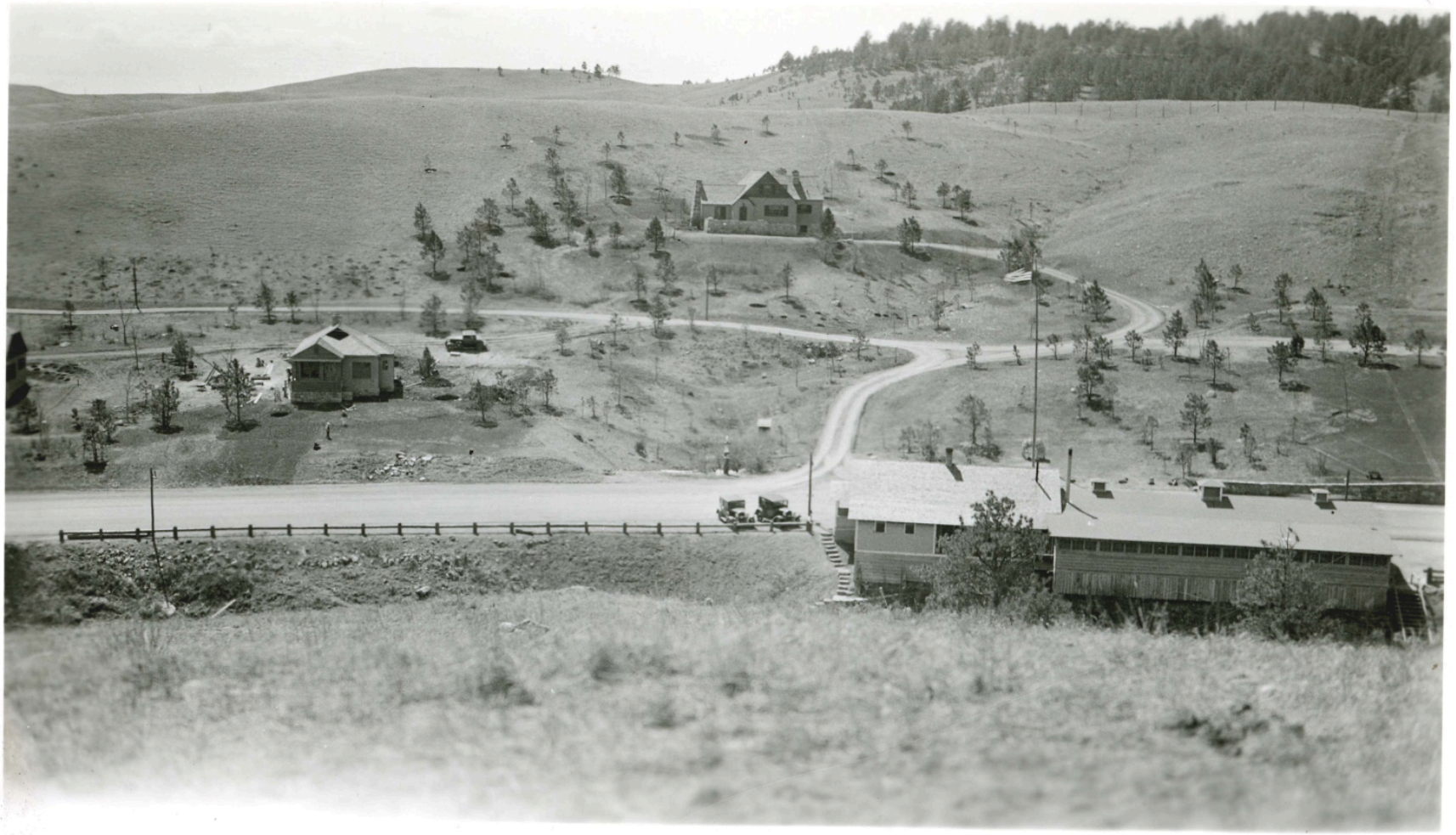
Catalog #
WICA
4339

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Taken soon after HS-05 was moved.



Park Database Description

Photographic Print and Negative of Headquarters Area. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

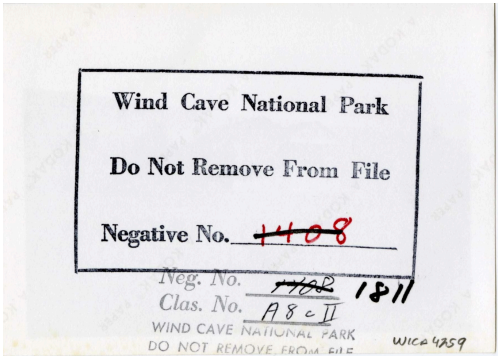
Primary Topic ***HS#*** *HS-05*
HS-05

Photo Date *1935, May 1*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 5/1/1935

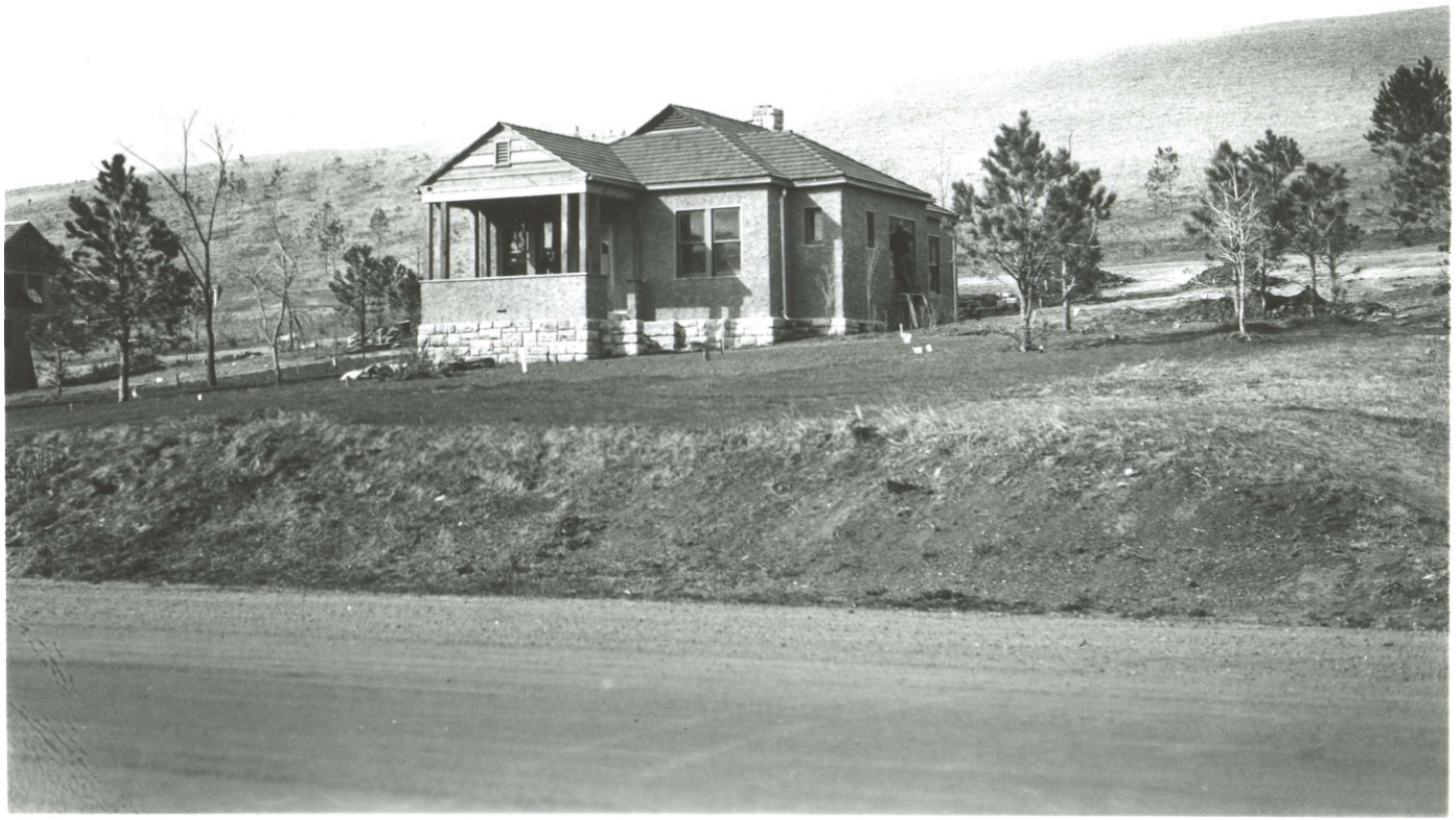
Catalog #
WICA
4259

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Probably just after being moved and remodeled.



Park Database Description

Photographic Print and Negative of Buildings - Residence #5. See Also 3546. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

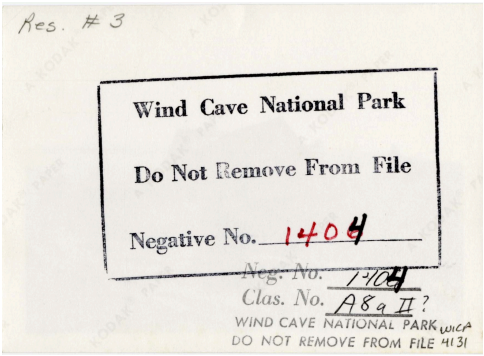
Primary Topic ***HS#*** *HS-03*
HS-03

Photo Date ca. *1936*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4131

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Small trees, probably when new. HS-03 was completed in 1934.



Park Database Description

Photographic Print and Negative of Buildings - Residence #3. See Also 3078. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Primary Topic
General
HS-06

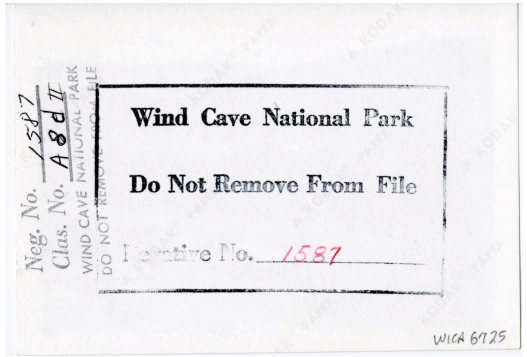
HS#
General
HS-04
HS-05
HS-06
HS-07
HS-13

Photo Date ca. *1936*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

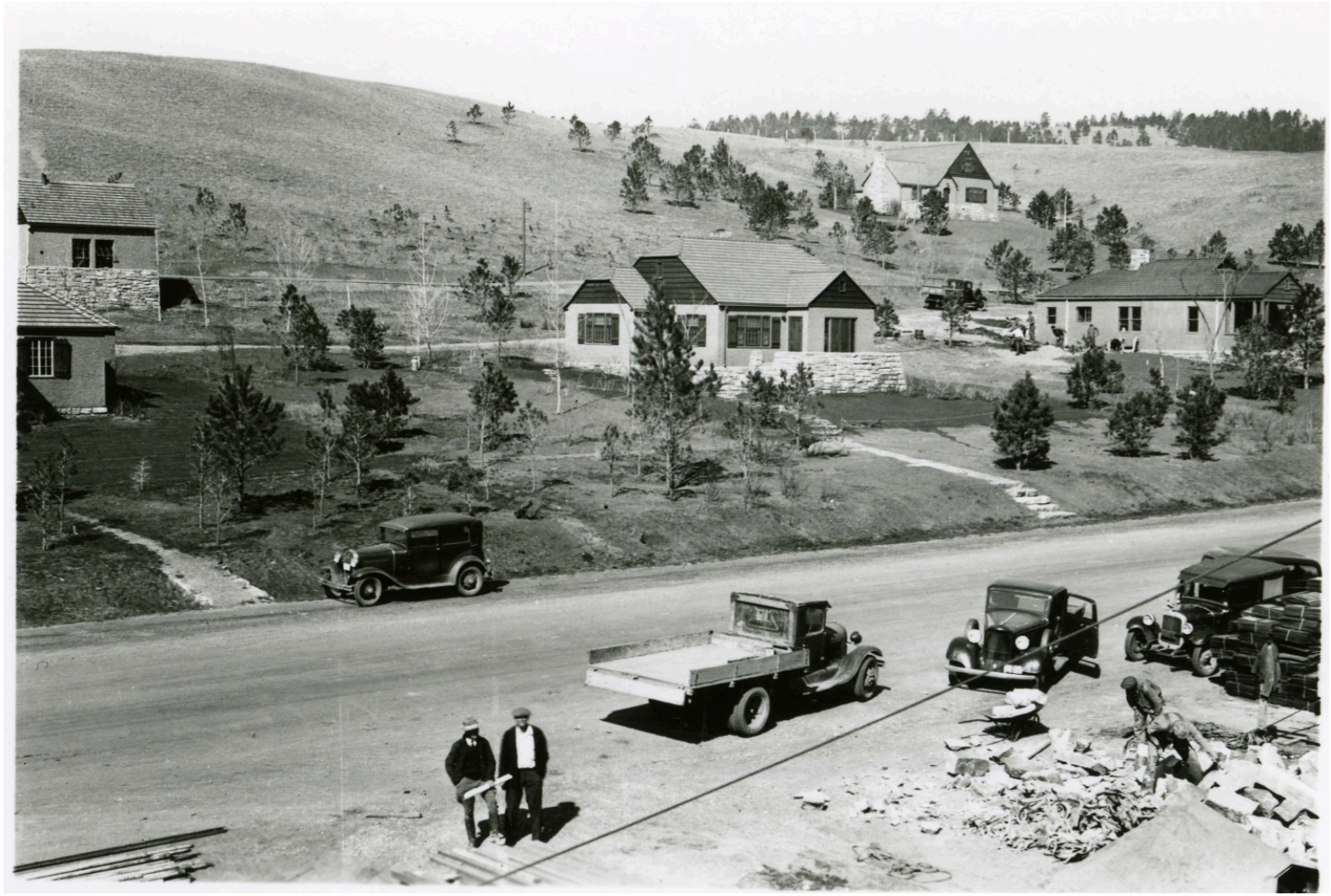
Catalog #
WICA
6725

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Probably during construction of HS-01 in 1936. This is a copy of WICA #8754. This print has better quality.



Park Database Description

Photographic Print and Negative of Headquarters Area.

Primary Topic
General

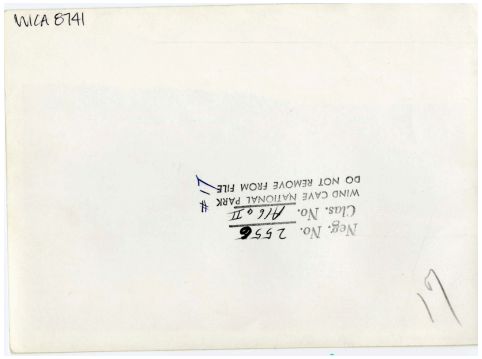
HS#
General
HS-04
HS-05
HS-06
HS-07
HS-08
HS-11
HS-13
HS-01

Catalog #
WICA
8741

Photo Date ca. *1936*
Date Source
Photographer

Manufact. Date

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Wind Cave Park Photo Collection prints or negatives, subject: Wind Cave headquarters area looking to the west from hillside above.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

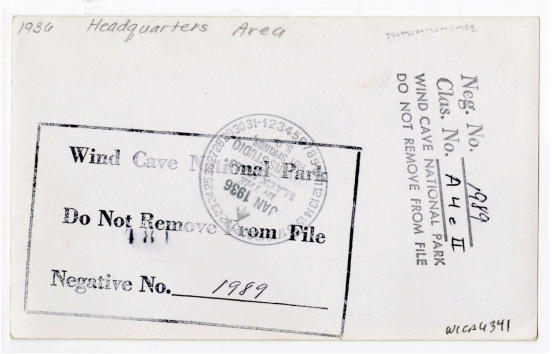
HS#
General
HS-03
HS-04
HS-05
HS-06
HS-07
HS-08
HS-11
HS-12
HS-13

Catalog #
WICA 4341

Photo Date *1936, Jan. 21*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date 1/1/1936

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Headquarters Area. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

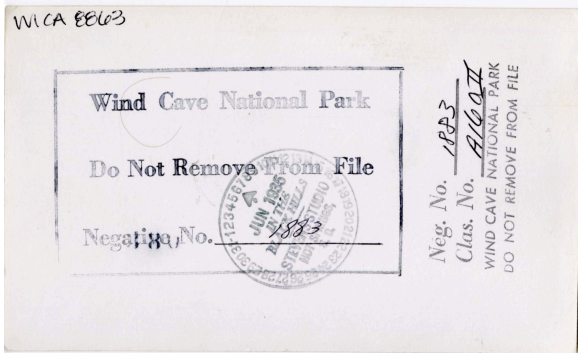
HS#
General
HS-03
HS-04
HS-05
HS-06
HS-07
HS-08
HS-11
HS-12
HS-13

Catalog #
WICA 8763

Photo Date *1936, June 6*
Date Source *Stamp on Photo*
Photographer *Stevens Studio*

Manufact. Date

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Rear of Visitor Center

Primary Topic ***HS#*** *General*
General

Photo Date ca. *1937*
Date Source *Cultural Records Inventory*
Photographer

Manufact. Date

Catalog #
WICA
671

Below: Front of Image. Right: Back of Image

HSR 2015 Notes

HS-01 complete so post 1936.



Park Database Description

120 degree view of headquarters area. Southwest view. Received<CR>1937.

Primary Topic ***HS#*** *General*
General

Photo Date ca. *1937*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
672

Below: Front of Image. Right: Back of Image

HSR 2015 Notes

Comparable to WICA 671, and post HS-01, so after 1936. No sun porch on HS -03 so pre 1941.

Park Database Description

120 degree view of headquarters area, Northeast view.



Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

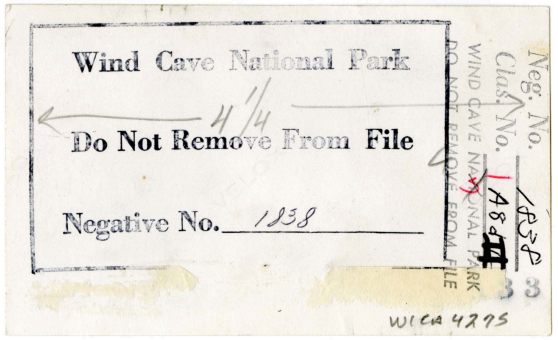
Primary Topic ***HS#*** *HS-06*
HS-06

Photo Date ca. *1937*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4275

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

This photo was included in "Development of National Park Areas in the Black Hills by the CCC," The Black Hills Engineer, Dec. 1937, by Edward D. Freeland.



Park Database Description

Photographic Print and Negative of Buildings - Residence #6. See Also 3558. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Primary Topic *General*

HS# *General*

Photo Date ca. *1937*

Date Source *other, see HSR notes*

Photographer

Manufact. Date

Catalog #
WICA
4474

HSR 2015 Notes

CCC Workers hauling wiring into the cave. HS-05 is moved so this is after 1935.

Below: Front of Image. Right: Back of Image



Park Database Description

Photographic Negative of Utilities - Cave Electrical System - installing Cable For Cave Electrical System. See Also 3669 - 3671. Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

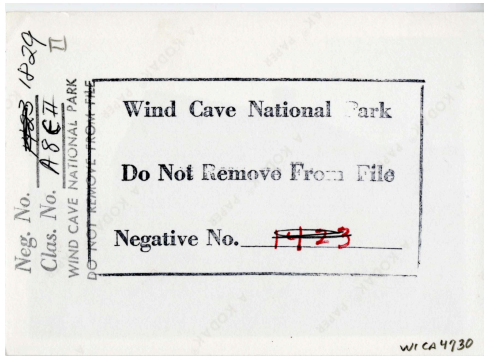
Primary Topic ***HS#*** *HS-07*
HS-07

Photo Date ca. *1937*
Date Source *other, see HSR notes*
Photographer

Manufact. Date 1/1/1932

Catalog #
WICA
4730

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

Note screened porch on back wall. The hole in the foundation wall is a location for a new bulkhead door, which was added with a new basement in the mid 1930s.

Park Database Description

Photographic Print and Negative of Buildings - Construction of Residence #7. See Also 1829, 3554. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

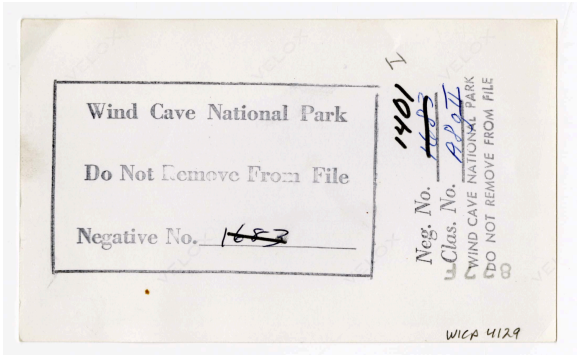
Primary Topic ***HS#*** *HS-11*
HS-11

Photo Date ca. *1938*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4129

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS-11 was completed in 1934, HS-01, in background was built in 1935.



Park Database Description

Photographic Print and Negative of Buildings - Administration Building. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Primary Topic
General

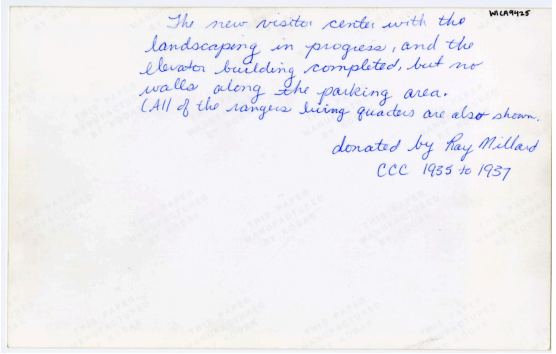
HS#
HS-04
HS-05
HS-06
HS-07
HS-08
HS-11
HS-12
HS-13
HS-01
HS-02

Catalog #
WICA
9425

Photo Date ca. *1938*
Date Source *other, see HSR notes*
Photographer

Manufact. Date 1935?

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Shows HS-02 so taken around 1938.



Park Database Description

Photograph Donated By Ray Millard. Labeled #6. Letter of Donation Has Description of the Photo:

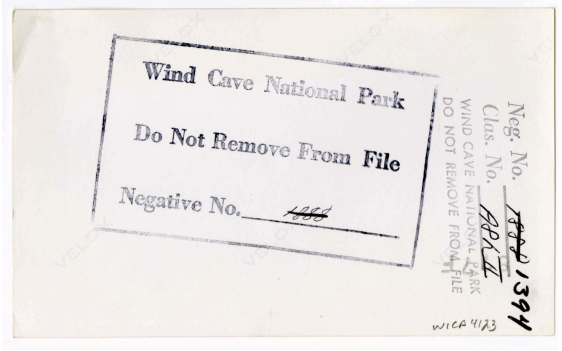
Primary Topic ***HS#*** *HS-03*
HS-12
HS-12

Photo Date ca. *1939*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 8/11/1939

Catalog #
WICA
4123

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of Buildings - Building #12 - Fire Cache - Fire House Equipped With Double Door For Frost Proofing in Winter and Has 2

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

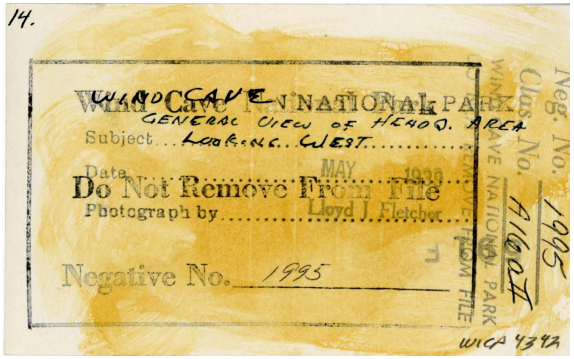
HS#
HS-03
HS-04
HS-05
HS-06
HS-07
HS-08
HS-11
HS-12
HS-13
HS-01

Catalog #
WICA
4342

Photo Date *1939, May 1*
Date Source *Stamp on Photo*
Photographer *Lloyd J. Fletcher*

Manufact. Date 5/1/1939

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Photographic Print and Negative of the General View of Headquarters Area Looking West. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

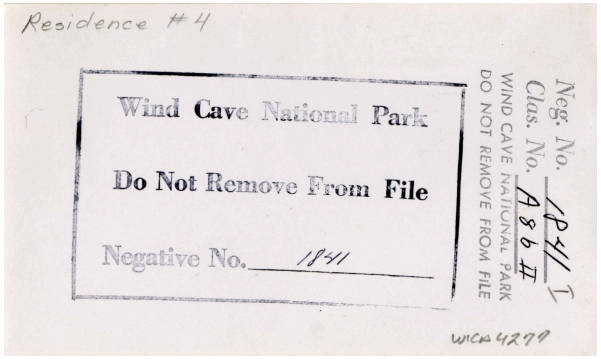
Primary Topic ***HS#*** *HS-04*
HS-04

Photo Date ca. *1940*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Catalog #
WICA
4277

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

After sidewalk moved to south end of lot. Mature landscaping indicates ca. 1940.



Park Database Description

Photographic Print and Negative of Buildings - Residence #4. See Also 3559 - 3563. Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Primary Topic
General

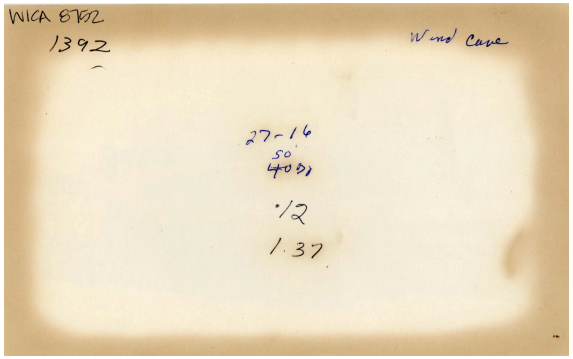
HS#
General
HS-06
HS-07
HS-08
HS-11
HS-13
HS-01

Catalog #
WICA
8752

Photo Date ca. *1940*
Date Source
Photographer

Manufact. Date

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Building 17 and Part of 18, Maintenance Shop and Fire Cache. WICA Description of Photos WICA #8752 -8764 Is included in Photo Envelope WICA #8764.

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

Primary Topic
General

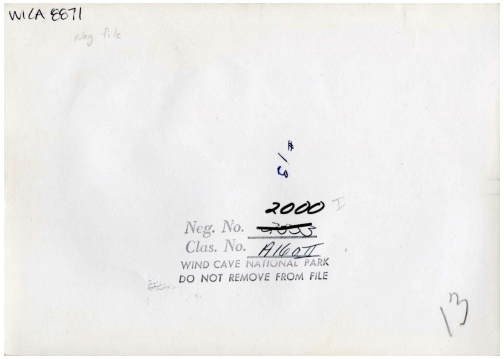
HS#
General
HS-08
HS-13
HS-01

Photo Date ca. *1940s*
Date Source
Photographer

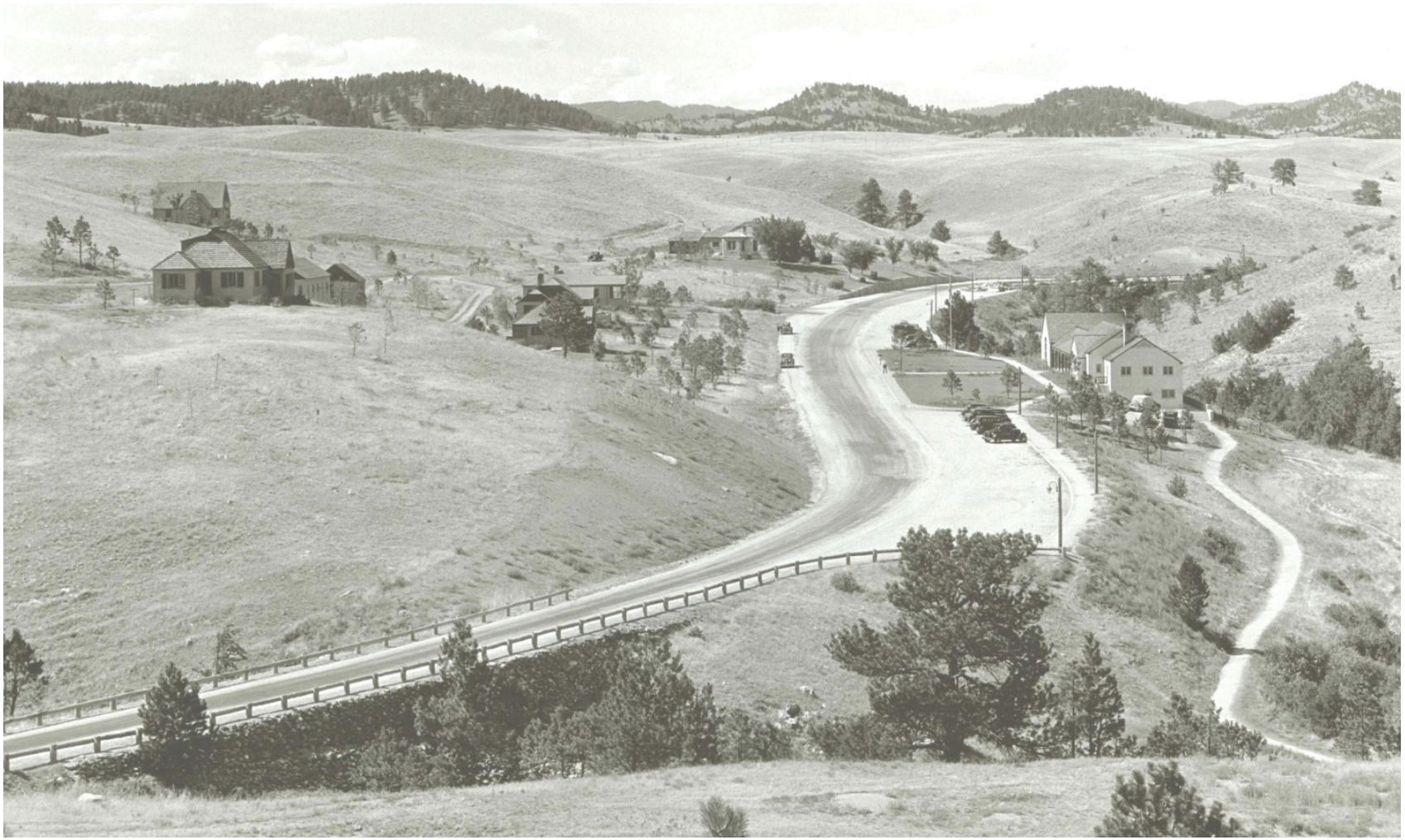
Manufact. Date

Catalog #
WICA
8771

Below: Front of Image. Right: Back of Image



HSR 2015 Notes



Park Database Description

Wind Cave Park Photo Collection prints or negatives, subject: Black and white copy print from a postcard showing a group of visitors to the entrance of Wind Cave circa 1907.

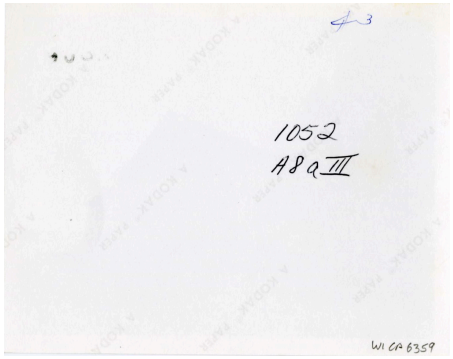
Primary Topic ***HS#*** *HS-03*
HS-03

Photo Date ca. *1959, Nov. 1*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 11/1/1959

Catalog #
WICA
6359

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Buildings - Residence #3. See Also 2394

Appendix B: Wind Cave Park-Selected Database and Photo Files Italicized text added by Deb Sheals in 2015

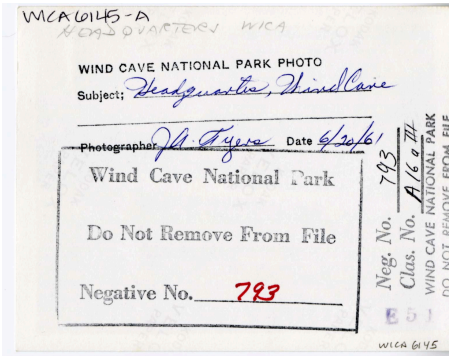
Primary Topic ***HS#*** *General*
General

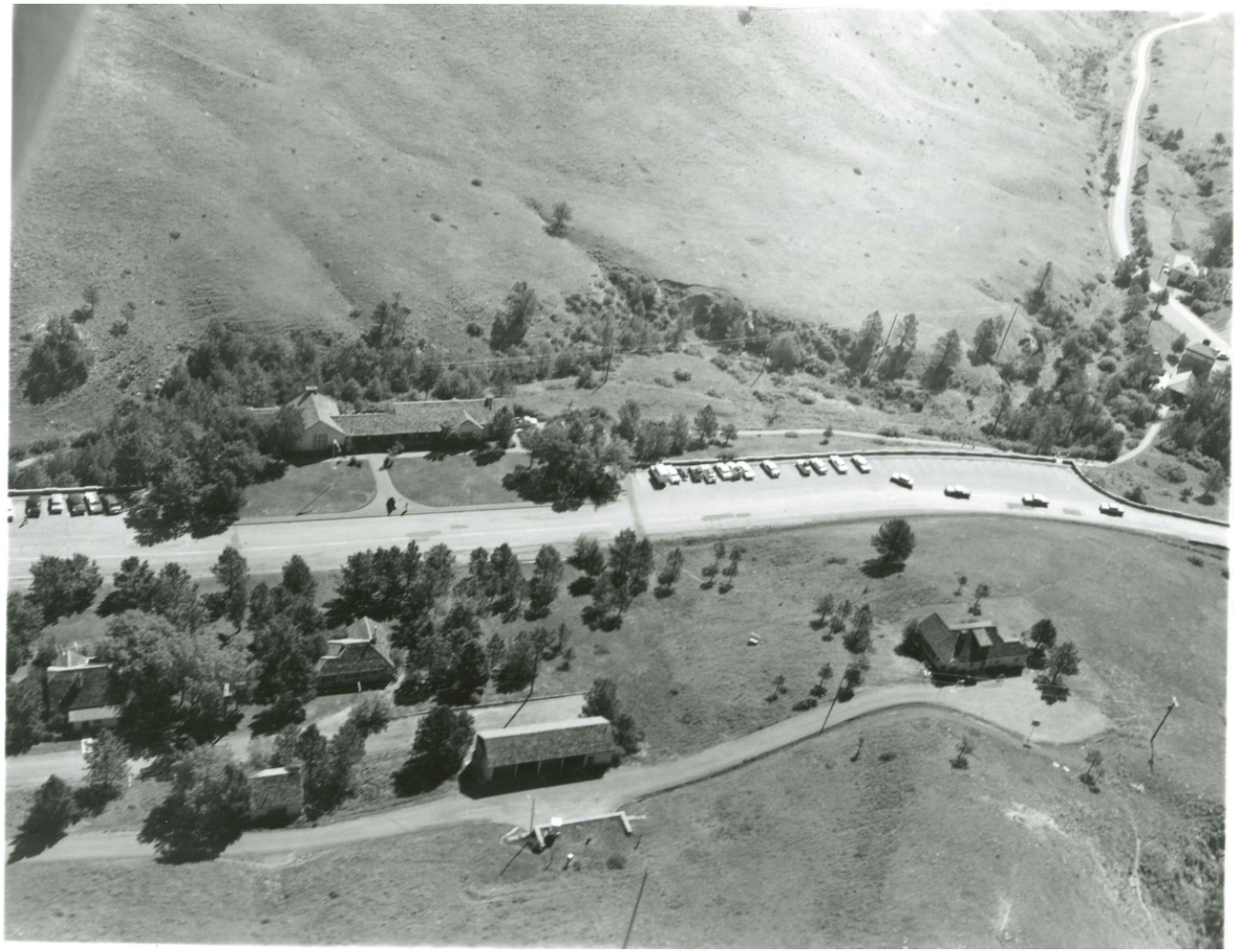
Photo Date *1961, Jun. 20*
Date Source *Handwritten date on back of photo*
Photographer *J. A. Fyers (SP?)*

Manufact. Date 6/20/1961

Catalog #
WICA
6145

Below: Front of Image. Right: Back of Image





HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Aerial View of Headquarters Area.



Stucco Sample from HS-06. (SRJA 2015)

Appendix C
Historic Material Analysis

Materials Analysis

Paint Analysis Summary

Exterior paint sampling at the various buildings in the Wind Cave historic housing area were taken by Susan Richards Johnson & Associates, Inc. in January of 2015. The samples were sent to Conservator Ron Koenig of Building Arts & Conservation, LLC in Saline, Michigan for analysis.

The goal of Building Arts & Conservation in this project was to understand its exterior finishes. Painted surfaces were analyzed through sampling and microscopic analysis. The areas sampled and analyzed included:

1. Quarters 8 (HS-08)
2. Quarters 7 (HS-07)
3. Quarters 6 (HS-06)
4. Quarters 5 (HS-05)
5. Fire Office Building (HS-04)
6. Quarters 3 (HS-03)
7. Storage Building (HS-13)

The target dates for the project is the period of significance (1928 – 1942), and paints applied during these years were the primary focus of this investigation. Paints that appear to have been applied after this time-frame were also documented by color and type.

Microscopic Analysis

Microscopic paint analysis was the primary tool used to determine the evolution of exterior painted elements. Representative samples were taken and analyzed using an Olympus SZ binocular microscope equipped with a Cole Parmer color-correct light-source, allowing matching to occur between 5000 and 5200K; this color temperature is the international lighting standard for color matching. Paint samples were examined in cross-section to determine the color and physical properties of each paint layer, and to determine their likely date of application based on their position in the overall stratigraphy.

Where dirt layers were present, it was assumed the finish beneath that layer had been exposed for a period of time. In some instances, dirt appeared between the substrate and the first layers in a stratigraphy. This was indicative of either; 1) the loss of early paint through degradation or scraping for paint preparation; 2) a period of time elapsing after construction, but prior to the surface being painted; or 3) detachment of paint and then re-adhesion by later paint applications.

In some areas, loss of paint evidence was obvious because of differences in paint accumulation; samples were taken from areas where paint appeared thickest. The inclusion of substrate was important in establishing context and to ensure the target strata could be determined for each sample. Samples were placed in “Ziplock” plastic bags, labeled, and keyed to their locations. Photographs were taken to note specific sample areas.

For this paint study, paint colors were called out by their closest match in The Munsell Book Of Color; Glossy Collection. Some layers were also assigned a general color; i.e. “yellow” or “salmon.”

In some instances color photomicrographs were taken to document stratagraphic information. Micrographs were taken through the Olympus SZ Trinocular microscope using a Sony DSC-F707 digital camera using a Scolar camera mounting system. Photos were captured and downloaded to a Macintosh Macbook Pro. Processing was accomplished via Adobe Photoshop 5.0. A number of these micrographs are included with this report. It should be noted that while micrographs are useful for establishing the contextual relationship of paint layers in an overall stratigraphy, they are not color-correct and are not an accurate tool for choosing specific colors. The written section of the report should be utilized for reinstating historic colors.

Photographs of sample areas with samples swatches of the Munsell colors determined for each sample area are also included in this report. Please note these swatches are for general visual reference only, and are not intended to be used to mix paint colors for reinstatement of original colors; please reference the Munsell numbers for this purpose.

Descriptions of Finishes

The majority of the original finishes applied to the exterior of these buildings were differing shades of brown or cream. The earlier brown finishes tended toward the red-brown part of the spectrum.

HS-08 Quarters

This building was designed in 1931 to function as a Rangers Dormitory and Mess Hall for the park rangers.

The basement window jamb was originally painted a deep ochre-brown (7.5YR 3/6). It was later painted white (N 9.5). The current deeper red-brown is an acrylic that was applied within the past two decades. Samples taken from the north elevation’s cornice showed a heavy accretion of grime directly on the wood substrate; this likely indicates the building was not immediately painted upon construction. The first paint layer was the same ochre-brown found as the first color applied to the East Basement window jamb (7.5YR 3/6). The cornice was subsequently twice painted a muddy-brown (7.5YR 3/4), and then painted tones a red-brown (5Yr 3/4) and finally a brown with a purple cast (10R 3/4).

HS-13: Window House

The Storage Building was originally constructed in 1931 to house a diesel generator

Microanalysis showed the window on the west side of the building was originally covered in a clear-coat (probably shellac) and then painted a deep, vibrant red (10R 3/6). It was later painted deep red-brown, bright yellow (5Y 8/4), light cream, and then three different shades of deep brown (5YR 3/4, 10R 3/2, and 5YR 2/2). The sample taken from the crown-molding just below the roof-line only contained two layers of paint: a medium red-brown, (5YR 4/4) and a slightly darker red-brown (2.5YR 4/4). The heavy layer of dirt directly above the wood substrate, however, suggests that earlier paint layers may have worn or been scraped-off prior to these applications.

HS-11: Upper Garage

This Garage was originally built as a garage and machine shop in 1934.

The finish sample taken from a header on the East Lower Level showed that the wood was coated in shellac prior to painting; this may have been done to keep knots and other imperfections from bleeding through the paint. The building's trim was first painted a medium red-brown (5YR 4/4), then a darker red-brown (5YR 3/4) and finally a deep umber-brown (2.5YR 2/2).

HS-07 Quarters

This house was designed in 1931 for housing National Park Service employees.

Samples taken from the East Elevation window-trim showed these elements were originally painted a medium red-brown (7.5 YR 3/6), and thereafter finished in soft yellow, medium red-brown, cream, and the dark brown presently visible. The porch ceiling was first painted an off-white, and remained this color for an extended period of time. It was later painted a second time in a slightly yellower shade of cream. The porch's ceiling beam was originally a rich red-brown (5YR 4/4). It was later painted cream, the earlier rich red-brown, then deep brown, off-white, and then deep-brown again.

HS-06 Quarters

Quarters 6 is primarily unchanged from when it was designed and constructed as a housing in 1936.

Samples from the east door jamb showed the trim was initially painted a very light coral color, but this appears to have been a primer-coat, over which was applied a rich red-brown (5YR 4/4). There followed coats in a medium red-brown and very dark umber-brown. The side lights

on the French-doors were initially painted a deep red-brown (2.5YR 3/2), and later medium brown, and very dark brown. The French-door trim was first painted a very light cream (10YR 9/2) but it is possible this may have been a primer. This trim was later painted deep red-brown, white, and finally a very deep red-brown.

HS-05 Quarters

The building was originally constructed in 1924. In 1935 it was given its current exterior parging and moved to its present location.

The first paint applied to the porch window mullions was a light sand color (7.5YR 6/4), but this may well have been a primer for the deep red-brown (5YR 4/4) paint that followed almost immediately after. In later years a medium red-brown, white, and a very dense red-brown. Analysis of samples from the front porch ceiling showed fragments of salmon paint (10R 6/6) that was applied as the first coating. It was later soft-yellow and then a creamier yellow. The storm windows were originally painted bright white (N 9.5), and were later painted yellow, and dark brown. The window trim was first painted a rich red-brown (5Yr 4/4), and then very dark brown.

HS-04 Fire Office

Originally built in 1905 as the Superintendent's Cottage, sections were added to the structure between 1918 and 1938.

The dormer windows on the north side of the building were first painted an ocher brown (7.5YR 3/6), and were subsequently painted soft yellow, medium brown, white, and dark brown. The first paint layer on the dormer window trim consisted of fragments of a very bright yellow (2.5Y 7/6). There followed layers of a red-brown, dark brown, white, and very dark brown. Samples from the bathroom window sash contained only two paint layers (N 9.5 white, and 5YR 2/2 Dark brown), suggesting it may have been replaced. The bathroom window trim was originally painted a dark red-brown (2.5YR 2/2) over gray primer, and was later painted white and finally dark brown. The crown on the east side of the house was first painted a medium yellow (5Y 9/4); it was later painted light red-brown, off-white, and dark brown.

HS-03 Superintendent's Residence

This building was originally designed in 1934 for the Superintendent's Residence and constructed by the Hot Springs Lumber Company. The sunroom was added in 1941.

The Dining Room window sash on the east elevation was originally painted a medium yellow (5Y 8/4), and was later painted a lighter yellow, bright yellow, and finally dark brown. The east Dining Room window trim was first painted a deep red-brown (5YR 3/4), and was later dark

brown, cream, and finally dark brown again. Samples taken from the east cornice were severely weathered, making differentiation of paint layering difficult. Tiny surviving fragments, however, suggested the crown was initially painted a dark umber-brown. The Entry window sash was originally painted a medium yellow (2.5Y 8.5/2), and was later painted dark red-brown, cream, and dark brown. The Entry window trim was initially painted a deep red-brown, and was later painted a soft medium yellow.

Figures



Figure 1: Original Color Found On Building HS-8's Window Jam.



Figure 2: The Crown on Building HS-8 Was Originally Painted A Rich Red-Brown

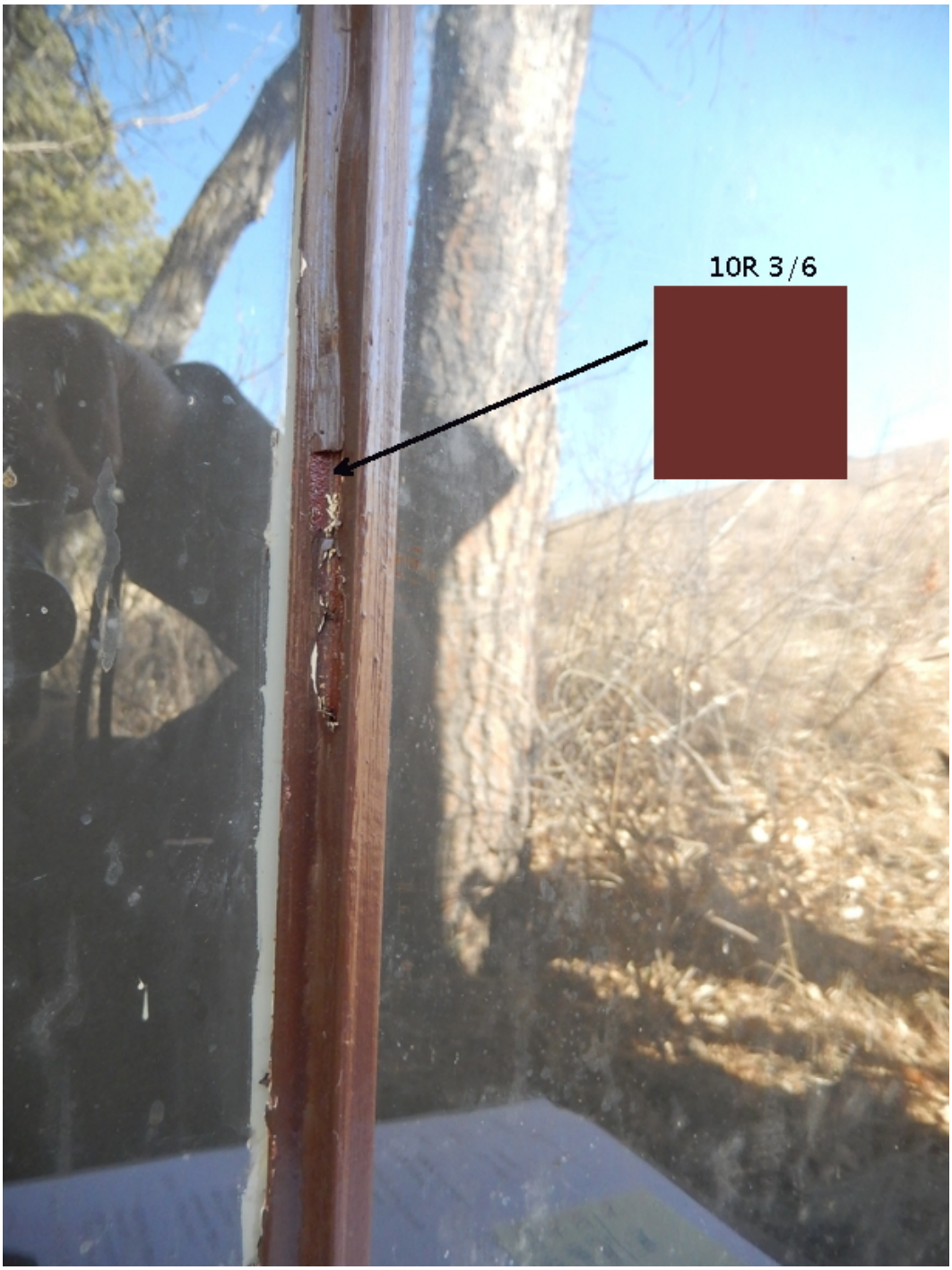


Figure 3: The Window Frames In The Fire Office Building Werte Originally Painted a Deep Red

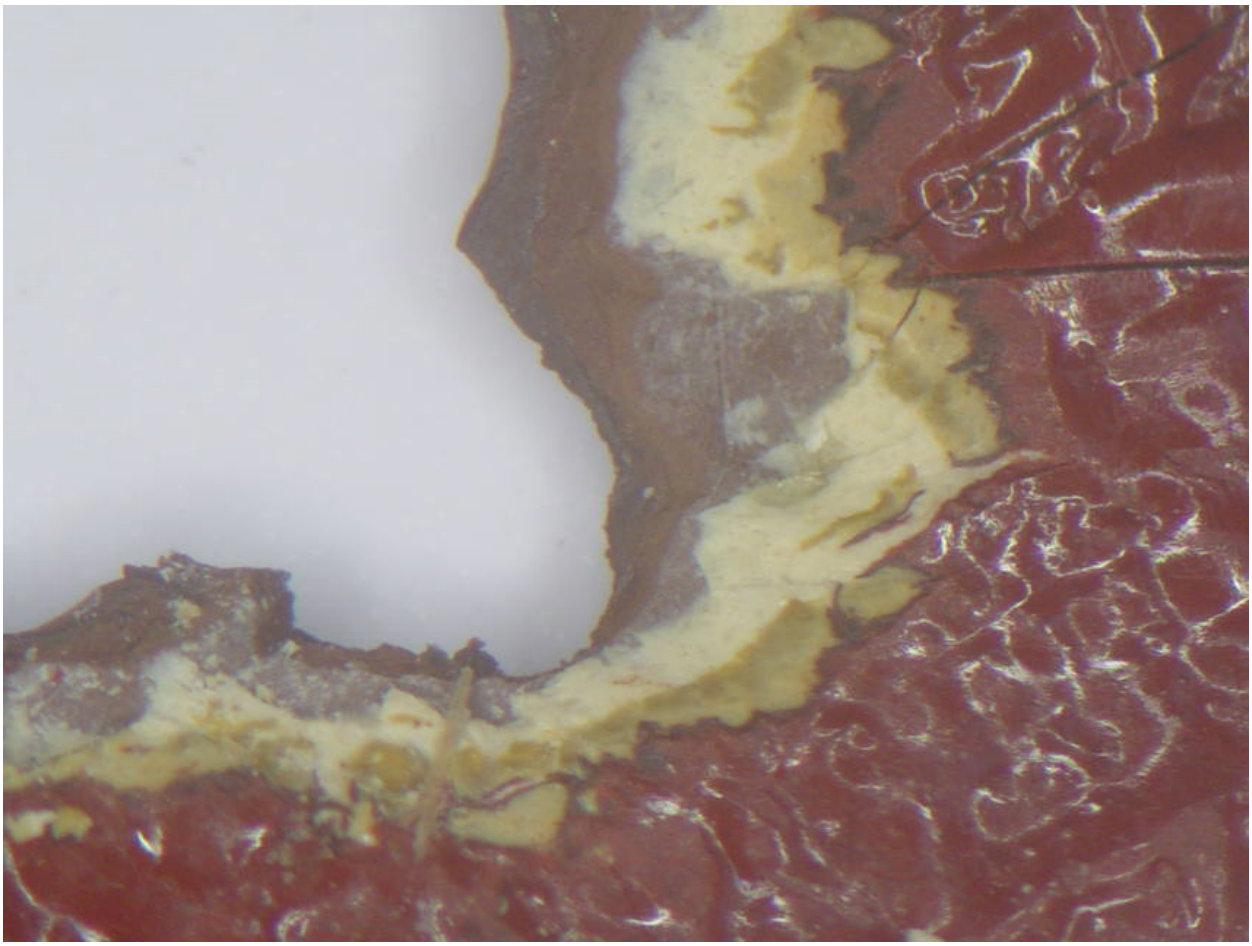


Figure 4: Photomicrograph of Sample P3 Taken From The Window On The North Elevation of Building HS-13. The Deep Red Finish (10R 3/6) Is The First Layer Of A Complex Stratigraphy



Figure 5: The Original Color Of The Exterior Trim On The Garage Was A Medium Red-Brown



Figure 6: The Target Color For The Trim On Building HS-11



Figure 7: Porch Window Trim Color For Residence Quarters No. 7



Figure 8: The Ceiling of The Quarters 7 Porch Was Initially a Light Cream-Yellow



Figure 9: The Original Medium Red-Brown Color For The Porch Beam On Quarters No. 7



Figure 10: The Earliest Color Applied To The Front Door Jamb On Quarters 6



Figure 11: Colors For The French Doors And Trim On The Quarters 6 Building

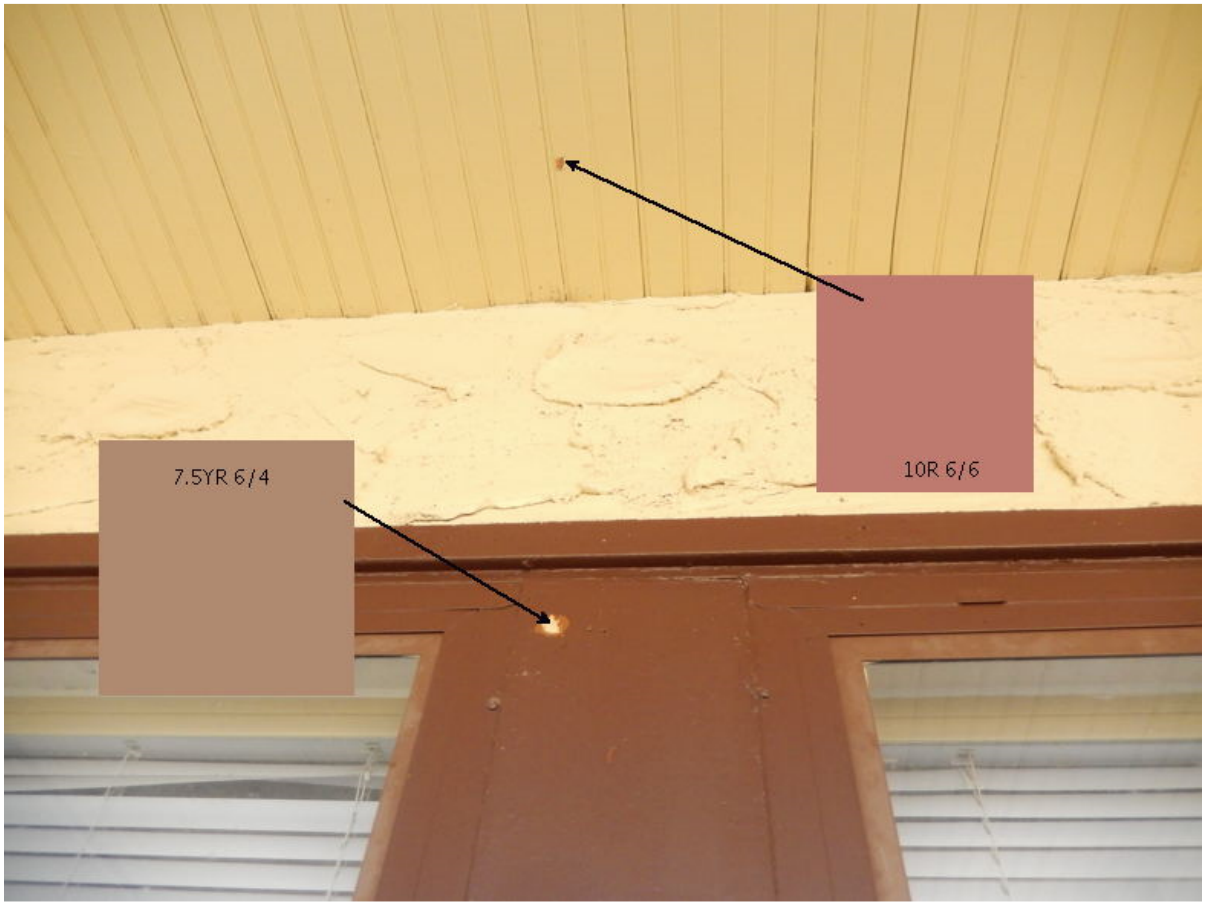


Figure 12: The Ceiling Of The Building HS-5 Porch Was Originally Painted a Coral Color. The Window Muntins Were a Medium Red-Gray

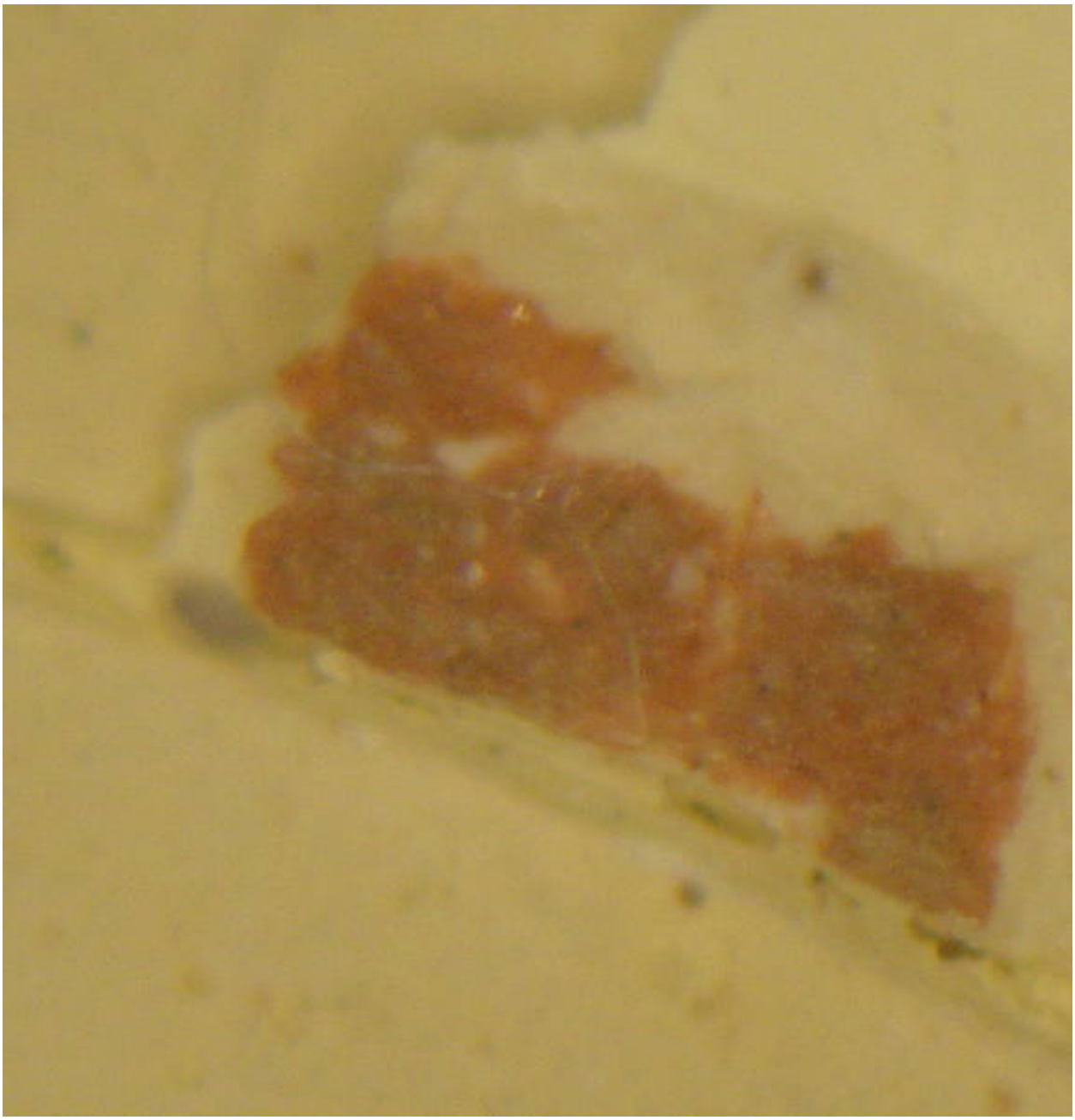


Figure 13: Photomicrograph (Detail) of Sample P-13, Taken From The Porch Ceiling On Building HS-5.

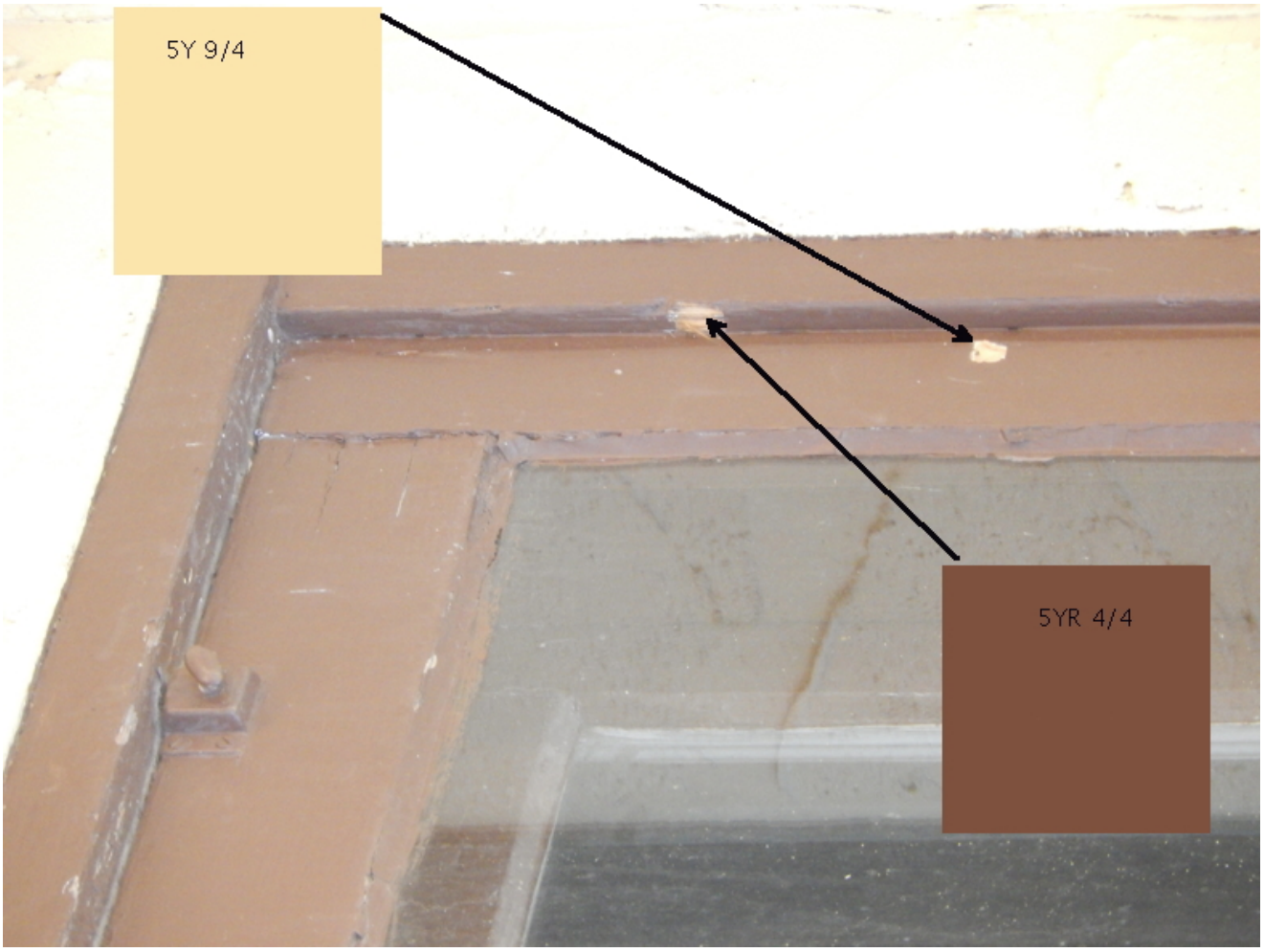


Figure 14: The Storm Window and Trim Colors For Building HS-5



Figure 15: The Exterior Dormer Windows and Trim On Building HS-4 Were Originally Painted The Same Color



Figure 16: The Bathroom Sash and Trim Colors For Building HS-4 Were Slightly Different



Figure 17: The First Color Found On The Cornice For Building HS-14



Figure 18: Colors For Quarters No. 3 Dining Room Windows and Trim



Figure 19: The Cornice Color For Building HS-3



Figure 20: Colors For Sash And Window Trim On The Entry Of Quarters 3

Paint Study Worksheet

Project: Wind Cave National Historic Site

Sample No.	Build.	Area	Element	Layer	Munsell
P1	HS-8	E. Bsmnt-N	WDO-Frame	1	Wood
				2	7.5YR 3/6
				3	N 9.5
				4	5YR 2/4
P2	HS-8	NW Corner	Cornice	1	Wood
				2	Dirt +
				3	7.5YR 3/6
				4	7.5YR 3/4
				5	7.5YR 3/4
				6	5YR 3/4
				7	10R 3/2
P3[1]	HS-13	N. Elev.-W	WDO	1	Clearcoat
				2	10R 3/6
				3	5YR 2/2
				4	Dirt
				5	5Y 8/4
				6	5Y 9/1
				7	5YR 3/4
				8	10R 3/2
				9	5YR 2/2
P4[2]	HS-13	W.Elev-N	Crown	1	Wood
				2	Dirt
				3	5YR 4/4
				4	2.5YR 4/4

1. Inconclusive Data: sample does not include substrate.
2. Weathered substrate indicates full loss of earlier coats of paint

P5	HS-11	East.LL.	Header	1	Wood
				2	Garnet Shellac(?)
				3	5YR 4/6
				4	5YR 3/4
				5	2.5 YR 2/2
P6	HS-7	East WDO	Trim	1	Wood
				2	7.5 YR 3/6
				3	5Y 9/4
				4	5YR 4/4
				5	White
				6	2.5 YR 2/2
P7	HS-7	Porch	Ceiling	1	Wood
				2	5Y 9/1
				3	Dirt
				4	2.5Y 9/2
P8	HS-7	Porch	Beam	1	Wood
				2	5YR 4/4
				3	Dirt
				4	5Y 8.5/2
				5	5YR 4/4
				6	Btwn 5YR 2/4–5YR ¾
				7	White
				8	Btwn 5YR 2/4–5YR 3/4
P9	HS-6	East Door	Jamb	1	Wood
				2	5YR 7/4 (Primer)
				3	5YR 4/4
				4	5YR 3/4
				5	5YR 2/2
P10	HS-6	E. Frnch Dr N. Sd lite		1	Wood
				2	Dirt
				3	2.5YR 3/2
				4	7.5YR 3/6 (traces)
				5	5YR 2/2
P11	HS-6	E. Frnch Dr	Trim	1	Wood
				2	10YR 9/2 (primer)
				3	5YR 3/4
				4	White (primer)
				5	5YR 2/4

P12	HS-5	Porch E. WDO Mullion		1	Wood
				2	7.5YR 6/4 (Primer?)
				3	5YR 4/4
				4	5YR 3/4
				5	White (Primer)
				6	2.5YR 2/2
P13	HS-5	Porch	Ceiling	1	Wood
				2	10R 6/6 (Salmon! Frgmts)
				3	2.5Y 8.5/2
				4	2.5Y 8.5/4
P14	HS-5	W. Closet	N.StormWDO	1	Wood
				2	N 9.5 White
				3	5Y 9/4 Yellow
				4	Dirt
				5	5YR 2/2
				6	N 9.5 (primer)
				7	5YR 2/2
P15	HS-5	W. Closet	N.StormTrim	1	Wood
				2	5YR 4/4
				3	5YR 2/2
				4	N 9.5 (primer)
				5	5YR 2/2
P16	HS-4	N. Dorm	Sash	1	Wood
				2	7.5YR 3/6
				3	10YR 8/4
				4	7.5YR 4/4
				5	N 9.5 White
				6	2.5YR 2/2
P17	HS-4	N. Dorm	Wdo Trim	1	Wood
				2	2.5Y 7/6 (oxidized frgmnts)
				3	7.5YR 3/6
				4	5YR 2/2
				5	White (primer)
				6	5YR 2/2
P18	HS-4	Bath Wdo	Sash	1	Wood (Rplacmnt?)
				2	N 9.5 (primer?)
				3	5YR 2/2

P19	HS-4	Bath Wdo	Trim	1	Wood
				2	10R 5/1 (Gray primer)
				3	2.5YR 2/2
				4	White (primer)
				5	5YR 2/2
P20	HS-4	East	Crown	1	Wood
				2	5Y 9/4
				3	2.5YR 4/4
				4	10Y 9/1 (Thin)
				5	5YR 2/2
P21	HS-3	E. Din. Rm	Wdo Trim	1	Wood
				2	5YR 3/4
				3	5YR 2/2
				4	10Y 9/1 (primer)
				5	5YR 2/2
P22	HS-3[3]	East	Cornice	1	Wood
				2	2.5YR 3/2 (Residue)
P23	HS-3	East Din Rm	Sash	1	Wood
				2	5Y 8/4
				3	2.5Y 8.5/2
				4	5Y 9/4
				5	2.5Y 8.5/2
				6	2.5YR 2/2
P24	HS-3	EntryWdo	Sash	1	Wood
				2	2.5Y 8.5/2 Cream
				3	2.5YR 2/2
				4	2.5Y 8.5/2
				5	2.5YR 2/2
P25	HS-3	EntryWdo	Trim	1	Wood
				2	5YR 3/4
				4	2.5YR 2/2

3. Inconclusive Data: Single layer of finish has weathered/oxidized to an extent only faint residue remains. Recommend re-sampling and Further Analysis.

Mortar & Stucco Analysis for Wind Cave National Park

Hot Springs, South Dakota

Peter T. Ellison
Ellison Conservation
Canandaigua, New York
4/15/2015

Mortar & Stucco Analysis

Introduction

A mortar & stucco analysis of the Historic Housing Area Buildings at Wind Cave National Park was carried out as requested by Susan Richards Johnson & Associates, Inc. Mortar and stucco samples were collected by the team of Susan Richards Johnson & Associates, Inc. in January 2015. Samples were sent to Peter Ellison of Ellison Conservation in Canandaigua, New York.

Wind Cave National Park is located in Hot Springs, South Dakota and includes a collection of residential and service buildings. The buildings that were sampled are typically of wood frame construction with exterior clad in stucco with wood trim resting on stone foundations and were constructed in the 1920's and 1930's.

Representative samples were taken of each building with a total of more than eight samples being taken. The mortars and stuccos were examined microscopically and through gravimetric analysis. Between five and ten grams were used for analysis for the mortars and stuccos.

Analytical Procedures and Findings

The samples were looked at macroscopically and then broken down and their individual constituents analyzed.

Constituent Analysis

The samples were broken down into its components to better examine the aggregate, fines, impurities, etc., and to establish the binder / aggregate ratio. The sample were dried, then ground mechanically by means of a mortar and pestle, followed by dissolving the binder with a solution of muriatic acid.

The resultant sample was rinsed, dried, and analyzed to determine the approximate proportion of ingredients. The table below identifies the calculated aggregate : fines : dissolved material ratio.

Mortar Samples

Four mortar samples were analyzed. The four mortar samples were from different buildings at Wind Cave NPS. The buildings were constructed between 1924-1937.

Sample M-01. HS-11 Upper Garage

Mortar sample taken from HS-11; machine shop/garage. Sample taken at lower level (East Elevation) masonry near top of north jamb of north garage door bay. HS-11 is a two-story wood framed structure clad with stucco. The structure was built in 1934.

Sample M-02. HS-12 Old Fire Cache
Mortar sample taken from HS-12. Sample taken at north face of south upper wing wall. Taken at waterproofing reglet. HS-12 is a fire cache that is used for storage. The building is constructed of poured and reinforced concrete with a stone veneer. The structure was built in 1937.

Sample M-03. HS-13 Window House
Mortar sample taken from HS-13. Sample taken at east wall foundation, 12” below windowsill centered on window. HS-13 is used for storage. The building is constructed of clay tile walls with stucco cladding and stone foundation. The structure was built in 1931.

Sample M-04. HS-05 Quarters
Mortar sample taken from HS-05; employee quarters. Sample taken from north foundation wall, 24” from northeast corner and 12” below top of masonry. The building is wood framed with a stucco veneer and a stone foundation. The residence was built in 1924 and renovated and moved in 1935 onto its current foundation.

Sample M-01, Building HS-11

Weight of Aggregate:	6.61g	69.5%	
Weight of Separated Fines:	0.27g	2.8%	
Weight of Dissolved Material:	2.91g		27.7%
Overall Weight of Sample:	9.51g		100%

Sample M-02, Building HS-12

Weight of Aggregate:	6.76g	72.6%	
Weight of Separated Fines:	0.25g	2.7%	
Weight of Dissolved Material:	2.30g		24.7%
Overall Weight of Sample:	9.31g		100%

Sample M-03, Building HS-13

Weight of Aggregate:	6.80g	71.0%	
Weight of Separated Fines:	0.34g	3.5%	
Weight of Dissolved Material:	2.44g		25.5%
Overall Weight of Sample:	9.58g		100%

Sample M-04, Building HS-05

Weight of Aggregate:	7.51g	76.9%	
Weight of Separated Fines:	0.36g	3.7%	
Weight of Dissolved Material:	1.89g		19.4%
Overall Weight of Sample:	9.76g		100%

In general, the mortar samples had a similar dissolved material (binder) : aggregate ratio. The amount of dissolved material ranged between 19%-28% of the sample weight and the weight of the aggregate ranged between 69%-77% of the sample.

The dissolved material / un-dissolved material ratio of the analyzed mortar was determined to range from approximately 1:3 to 1:4 by weight (not by volume). The binder is assumed to be mostly cement, perhaps with some lime. The original mortar mix was probably a 1 part binder to 2.5-3 parts aggregate by volume. The lean mix (low binder content) is most likely caused by converting the volume to weight, i.e. the aggregate weight is more than the binder and therefore a 1:3 mix by volume may be a 1:3.8 mix by weight.

Macroscopic Examination
The mortars were visually inspected in their removed state. The samples were all extremely strong and dense. The samples were all light gray in color with random sized aggregate. The binders were gray/beige in color with no white nodules noted. Some voids were found in the mortars as well.

Aggregate
The aggregate for the mortar samples are composed predominantly of natural particles of clear to milky-white quartz and some pink quartz. The larger aggregate tends to be non-quartz. The quartz aggregate is generally slightly angular to slightly rounded, with a smooth surface and is translucent. The aggregates were sieved and found to be similar in gradation to the other mortar samples with a vast majority of the aggregate found to be between 0.3mm -1.18mm in size.

Fines
The examination of the fines revealed them to be light grey in color. The fines include very fine aggregate and un-dissolved binder. No pigment was noted in the mortar fines.

Stucco Samples
Four stucco samples from three different buildings were analyzed. The buildings' construction dates ranged from 1924-1936, with all of the buildings receiving stucco in the 1930's. Three of the samples were finish samples and one sample was a base coat (S-02B).

Sample S-01, Building HS-05

Weight of Aggregate:	3.08g	32.6%	
Weight of Separated Fines:	2.53g	26.8%	
Weight of Dissolved Material:	3.84g	40.6%	
Overall Weight of Sample:	9.45g	100%	

Sample S-02A, Building HS-06

Weight of Aggregate:	1.75g	35.3%
Weight of Separated Fines:	0.83g	16.3%

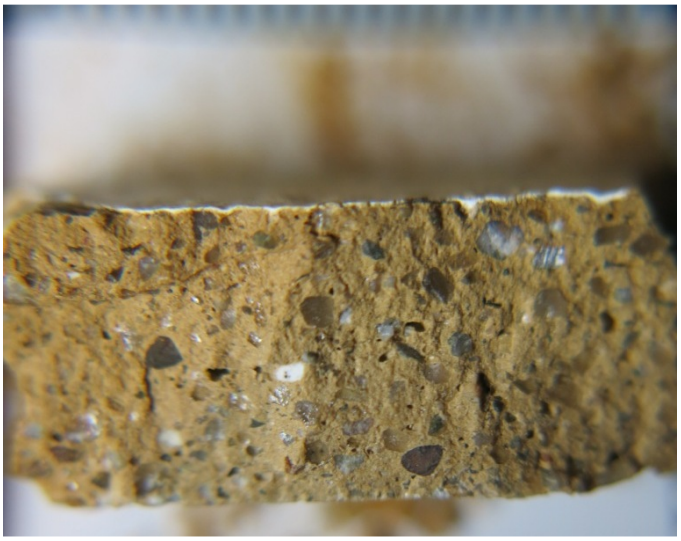
Weight of Dissolved Material:		2.52g	49.4%
Overall Weight of Sample:		5.10g	100%

Sample S-02B, Building HS-06

Weight of Aggregate:	5.85g	58.6%	
Weight of Separated Fines:	0.44g	4.4%	
Weight of Dissolved Material:		3.69g	37.0%
Overall Weight of Sample:		9.98g	100%

Sample S-03, Building HS-07

Weight of Aggregate:	6.0g	74.1%	
Weight of Separated Fines:	0.47g	5.8%	
Weight of Dissolved Material:		1.63g	20.1%
Overall Weight of Sample:		8.1g	100%



Stucco Sample with Paint on top surface.

In general, the stucco samples had a very broad range of dissolved material (binder) : aggregate ratio. The amount of dissolved material ranged between 20.1%-49.4% of the sample weight and the weight of the aggregate ranged between 32.6%-74.1% of the sample weight. Those samples with a high dissolved content may have had an aggregate that was dissolved during dissolution of the sample.

The dissolved material / un-dissolved material ratio of the analyzed mortar was determined to range from 1:1 to 1:3 by weight (not by volume). Sample S-01 and S-02A both had high dissolved material and low aggregate ratios in addition to having a high amount of fines. The fines appear to have a high content of an ochre pigment.

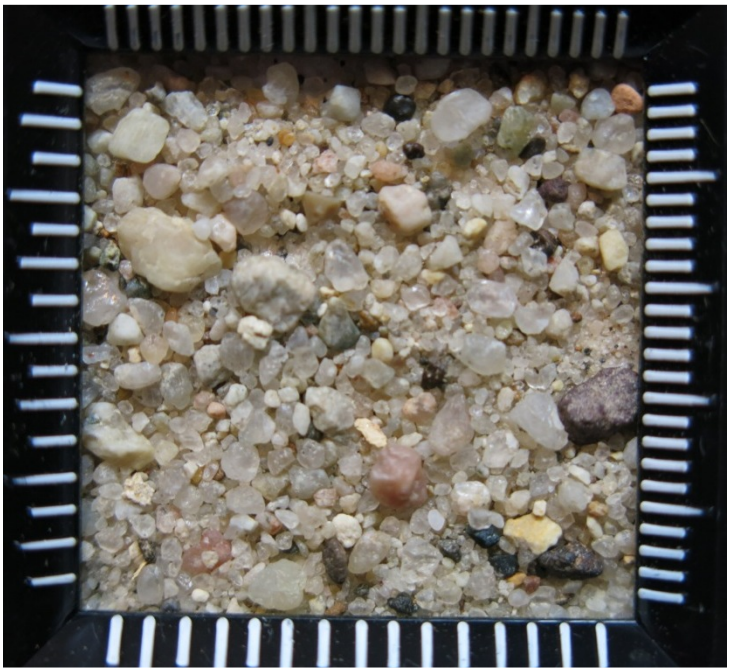


Fines/Pigment from Stucco Sample S-01. Munsell Color 10YR 7/8.

Sample S-02B did not have any apparent pigment as it was a base coat.

The binder is assumed to be mostly cementitious. The original stucco mix was probably a 1 part binder to 2.0-2.5 parts aggregate by volume. The rich mix (high binder content) is most likely by design as stucco mixes are generally rich. In addition, the possibility of a calcareous aggregate dissolving in dissolution could have contributed to the high dissolved material content in most of the stuccos.

Aggregate
The aggregate is composed predominantly of natural particles of clear to milky-white quartz and some pink quartz. The aggregate is generally slightly angular to slightly rounded, with a smooth surface and is translucent. Included in the aggregate was some un-dissolved bits of stucco. The aggregate was sieved and found to be similar in gradation to the other stucco samples.



Aggregate from stucco sample S-03

The below is a more descriptive review of what was found for each of the four stucco samples.

Sample S-01
Stucco sample taken from HS-05 Quarters. Sample from north elevation at northwest corner of living room near grade. HS-05 is a wood framed structure clad with stucco and a sandstone foundation. Structure built in 1924 and moved and stucco applied in 1935.

Macroscopic Examination
The stucco was visually inspected in its removed state. The sample was extremely strong and dense. The stucco was generally observed to be light brown/yellow ochre in color with smaller aggregate. Stucco surface is painted yellow ochre. It appears that earlier paint layers are similar to the light brown/yellow ochre color.

Fines
The examination of the fines revealed them to be yellow ochre in color. The fines include pigment (Munsell 10YR 7/8), very fine aggregate and un-dissolved binder.

Sample S-2A
Stucco sample taken from HS-06 Quarters. Sample was taken at the basement stairwell at wall head over lower landing. Sample S-2A is a finish coat that was over a base coat (Sample S-2B). HS-06 is a wood framed structure clad with stucco with a sandstone foundation. The structure was built in 1936.

Macroscopic Examination
The stucco was visually inspected in its removed state. The sample was extremely strong and dense. The stucco was generally observed to be light brown/yellow ochre in color with smaller aggregate. Stucco surface is painted off-white. Stucco color is similar to Sample S-01.

Fines
The examination of the fines revealed them to be yellow/brown in color. The fines include pigment, very fine aggregate and un-dissolved binder. Pigment color is the same as Sample S-01, Munsell 10YR 7/8.

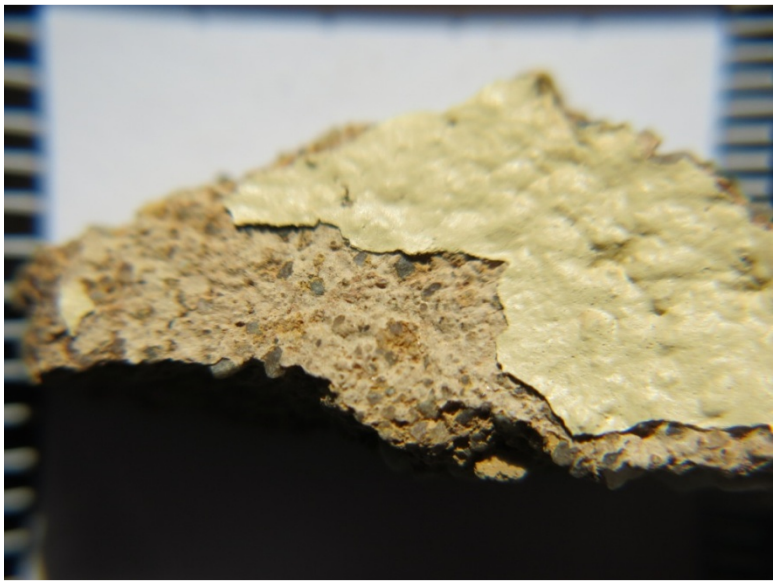
Sample S-2B
Stucco sample taken from HS-06 Quarters. Sample was taken at the basement stairwell at wall head over lower landing. Sample S-2B is base coat from under a finish coat (Sample S-2A). HS-06 is a wood framed structure clad with stucco with a sandstone foundation. The structure was built in 1936.

Macroscopic Examination
The stucco was visually inspected in its removed state. The sample was extremely strong and dense. The stucco was light gray in color with slightly more coarse than the finish coat (Sample 02-A).

Fines
The examination of the fines revealed them to be light gray in color. The fines include very fine aggregate and un-dissolved binder.

Sample S-03
Stucco sample taken from Building HS-07 (employee quarters). Sample from the southwest corner of the building near grade. Sample is has an ochre finish coat and was over Portland cement base coat. HS-07 is a wood framed structure clad with stucco and a sandstone foundation. The structure was built in 1927 and has had few changes to the exterior.

Macroscopic Examination
The stucco was visually inspected in its removed state. The sample was extremely strong and dense. The stucco was generally observed to be light brown/yellow ochre in color with smaller aggregate. Stucco surface is painted yellow ochre. It appears that earlier paint layers are similar to the light brown/yellow ochre color (Munsell Earth Colors, 7.5YR 8/4). Stucco color is Munsell 10YR 7/6.



Coatings on Stucco Sample S-03.

Fines
The examination of the fines revealed them to be yellow/brown in color. The fines include pigment, very fine aggregate and un-dissolved binder.

Conclusion
The mortars and stuccos that were analyzed appear to be contemporary to the buildings construction. The mortars and stuccos appear to be lime/cement based. The cement/lime ratio could not be determined by this analysis. The assumption of the use of cement is based on the construction date of these buildings, the mortar and stucco hardness, and the fact that Portland cement was widely in this time period. Visually, no lime nodules were noticed in the samples, which puts into doubt the use of lime putty.

A lime/Portland cement based mortar and stucco would be appropriate for the use on these buildings. A mortar mix by volume ranging from a 1 part white Portland cement: 1 part lime : 6 parts aggregate to a weaker 1 part white Portland cement : 2-½ parts lime : 8 parts aggregate. To determine the amount of cement present in the mortar and stucco, further analysis should be considered. Calcimeter analysis is one method that can determine the amount of soluble salts present.

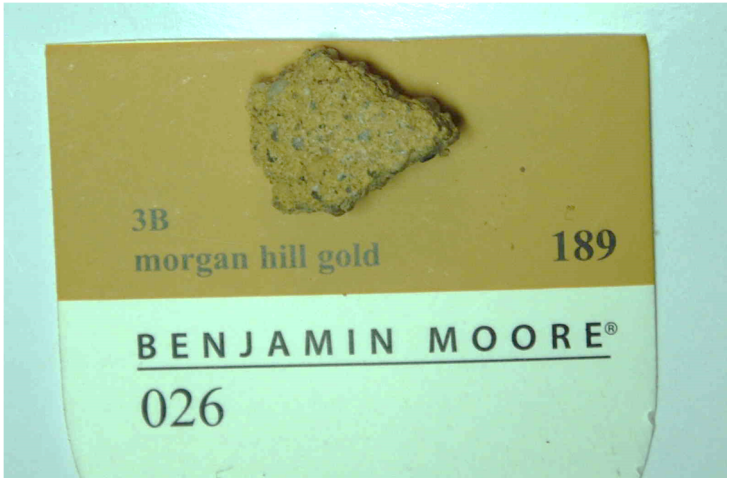
The stucco should be a lime/cement based mix. In 1929, the Portland Cement Association recommended a stucco mix as follows:

- 5 pounds, dry, hydrated lime
- 1 bag Portland cement (94 lbs.)
- 3 cubic feet (3 bags) sand

The Portland Cement Association recommended using a finish coat in the same proportions as above, but using white Portland cement versus grey Portland, and adding 10 pounds of pigment per bag of cement used.

In general, the aggregate for the mortars and stucco is similar and is a beige-colored quartz based sand. The gradation of the aggregate is concentrated (over 70%) between 0.3mm-1.18mm.

The fines/pigments for the stuccos range from Munsell Earth Colors 10YR 7/6 to 10YR 7/8. These pigment colors should not be used for a match for a new exterior stucco paint color. The pigments are a concentrated form of the overall stucco color and would appear to be too vibrant as a stand-along color, without the aggregate and cement binder mix. Therefore, a match for a commercially available paint color was explored. Benjamin-Moore, Morgan Hill Gold, 189-3B was found to be a close color. This should be sampled and adjusted as a custom mix, as required. Refer to the Volume I, Historic Building Materials, Stucco section of the report for more recommendations for paint color matching.



Finish Stucco sample on color card.

In closing, what is important to remember is that any replacement mortar or stucco should be similar to the original mortar matching in color and texture and should take in to account the strength, permeability and other properties of the original mortar. Most importantly, the mortar should be sacrificial to the original mortar, stucco and stone.

Peter T. Ellison,
Conservator