Historic Housing Area
Historic Structures Report

HS-08 Quarters

Wind Cave National Park

Volume VII of VIII

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Cover Photo:
HS-08 Quarters Existing Structure, View Southeast. (SRJA 2014)

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Introduction

Volume I of the Wind Cave National Park Historic Housing Area Historic Structures Report (HSR) covers the history of the development of the park and the historic housing area. This individual Volume VII is to serve as a guide for the future caretaking of this significant property, HS-08 Quarters. This volume focuses on the individual history, review of existing conditions and treatment recommendations unique to HS-08.

The one-and-one-half story HS-08 Quarters was originally built in 1931 (Figures 8 and 9). This roughly 1,700 square feet residence currently serves as seasonal housing for park staff. The house is built into the hillside and faces east toward the Administration Building. HS-08 was extensively renovated in 1937 and retains its form from that date, with very few alterations, with the exception of a large raised wood deck that was added to the south and east sides of the house in 1990. The house is visible from the public right of way and should be preserved in its current condition to the extent possible.

The shell of the HS-08 is in overall good condition, having been very well maintained for the last 84 years. Raised grade along the west and north sides of the house is causing deterioration of the stucco exterior. The stone foundation appears to be settling along the west and north sides of the house. This requires further investigation. The foundation along the east and south sides of the house is in good condition, requiring mostly cleaning and spot repointing. The exterior stucco walls require extensive repairs on the west and north walls of the house due to the raised grade and foundation settlement. The wood deck requires stabilization to meet current code. The original steel casement windows are missing. Besides these issues, the house requires basic maintenance and remodeling.

With the ultimate treatment recommendation to *Rehabilitate* the building, great care shall be taken to rehabilitate and maintain the house in the gentlest means possible, while preserving the house's most significant features.

Significant Features

Care should be taken to preserve the following significant historic features routine maintenance and through future rehabilitation projects.

Exterior:

- Site – Sloped site. House built into grade.
- Massing – One and one-half story with gable and hipped roofs.
- Roofline – Gable and hipped roofs with shed dormer.
- Basic Footprint – Rectangular with projections to the east and south.
- Stone stoops – Original stone stoops currently not visible due to deck.
- Stonework—Native stone laid in a random ashlar pattern. Slightly-battered exposed foundations.
- Chimney – Native stone laid in a random ashlar pattern.

- Stucco – Spanish stucco.
- Gable – Wood horizontal siding with louver.
- Trim – Wood cornice, typical throughout historic housing area.
- Patterns of fenestration – Original window and door openings.
- Windows – No original window sash remain. Original trim may remain under the metal panning.
- Doors – Original V-joint tongue and groove front door with original hardware (Door 100/1). 1931 front door (Door 103/1) with glass lites.

Interior:

- Ca. 1937 wood doors and hardware.
- Ca. 1937 millwork, including door and window trim and baseboards.
- Plaster wall and ceiling finishes.
- Built-in cabinet in bathroom.
- Historic flooring (may remain below installed laminate and carpeting).
- Ca. 1937 floor plan and room layout (living, dining and bedroom areas most important. Kitchen and bath finishes have been altered).

History and Significance of HS-08 Quarters

Note: See Volume One for a full bibliography and additional information about the early development of the Historic Housing Area of Wind Cave National Park.

HS-08, now known as Quarters 8, was built in 1931 to serve as a Rangers' Dormitory and Bunkhouse (Figures 8 and 9). The building was erected by the W. A. Kepp Construction Company. Construction drawings were completed by the Landscape Division of the National Park Service in May, 1931, and the building was placed in service in August, 1934.[1] The plans were drawn by "J. H. G." of the Landscape Division.[2]

The new building provided much-needed housing for seasonal rangers. The annual superintendent's report for 1930 requested funding for a new ranger's dormitory and mess hall, and noted that "At present temporary rangers are in tents."[3] Construction was made possible by a significant increase in funding for the park, which was announced in a 1930 press release. A federal appropriation bill that was signed by the President on May 14, 1930 increased appropriation for the park from $13,500 to $54,900, with $39,900 earmarked for "physical improvements."[4] This was one of the first buildings to be constructed with that funding.

HS-08 served as the primary housing for seasonal workers until 1937, when it was remodeled to serve as a residence. The change was made possible with the construction of a new superintendent's residence (HS-03) in 1934, which in turn allowed the older superintendent's residence (HS-04) to be remodeled for use as a "Ranger's Clubhouse." The 1937 remodeling of this building included reconfiguring first floor spaces to create a traditional residential floorplan and new second story living space. A dormer was added to west slope of the roof as part of that project (Figure 10). The building has been used as a residence since 1937. It is a contributing building in the Wind Cave National Park Administrative and Utility Area Historic District, and it is significant as the first residence in the park which utilized the uniform architectural design style established for Wind Cave National Park by the Landscape Division of the National Park Service.

[1] September, 1934 Superintendent's Monthly Report, Wind Cave National Park, (Copy on file at the WICA Library.) Hereafter referred to by month and year as WICA Superintendent's Monthly Report.
[2] Appendix A, H-08, WICA_108_313A_[id278462].; List of Qualified Structures for Wind Cave National Park.
[3] 1930 Superintendent's Annual Report, Wind Cave National Park, (Copy on file at the WICA Library.) Hereafter referred to by year as WICA Superintendent's Report.
[4] WICA Historical Files, Difficult Years 1914-1931, B2.F1.

Current Title HS-08 Quarters 8 **FMSS Asset Number 27936** **LCS ID 010746**		
Previous Name	**Date of Name**	**Source of Name and Notes**
Rangers' Dormitory and Mess House	1931	Plans, Annual Reports
Residence	1937	Annual Reports
Employee's Residence #4	1940	1940 Master Plan
Q-08	ca. 1949-1995	Maintenance Department Files
Residence 8	1963	1963 Site Plan
#8 Residence	1976	Classified Structure Filed Inventory Report
Residence 1931	1988	1988 Management Plan
Ranger's Dormitory and Mess House (HS-8)	1995	National Register Nomination
Quarters 8	2000	Current WICA Staff, LCS
H-B-8 Employee Residence (Ranger's Dormitory & Mess House) (HS-8)	2005	Cultural Landscape Report

Figure 1. Table of Previous Titles

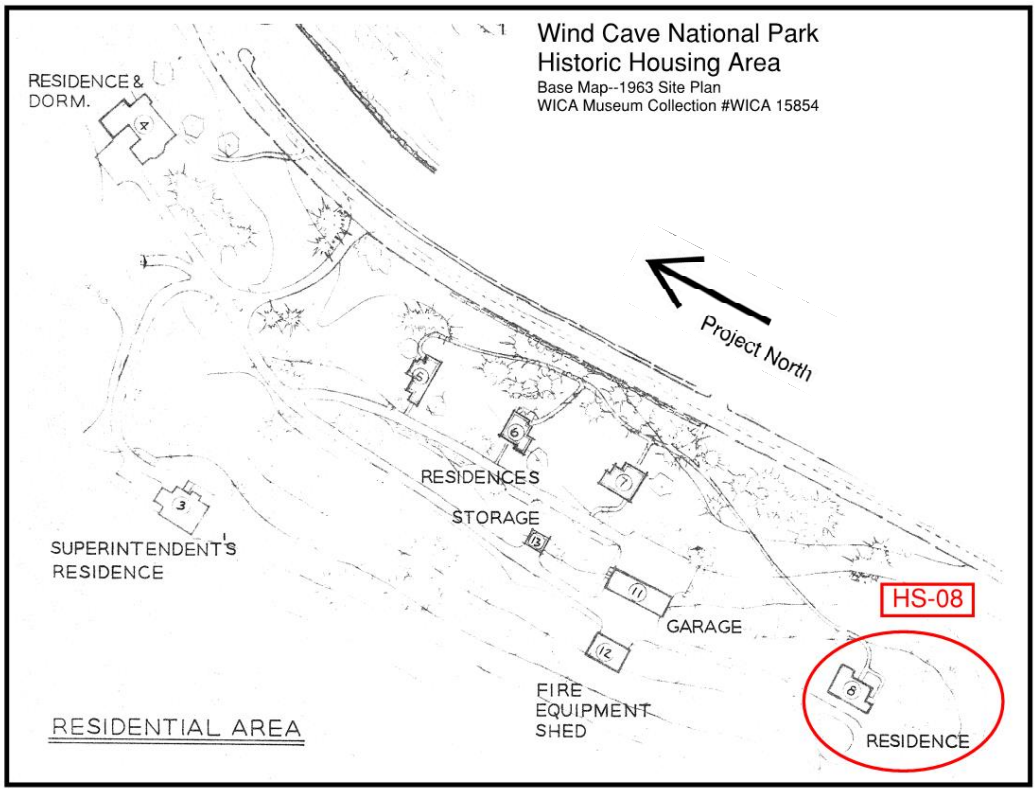


Figure 2. Location Map

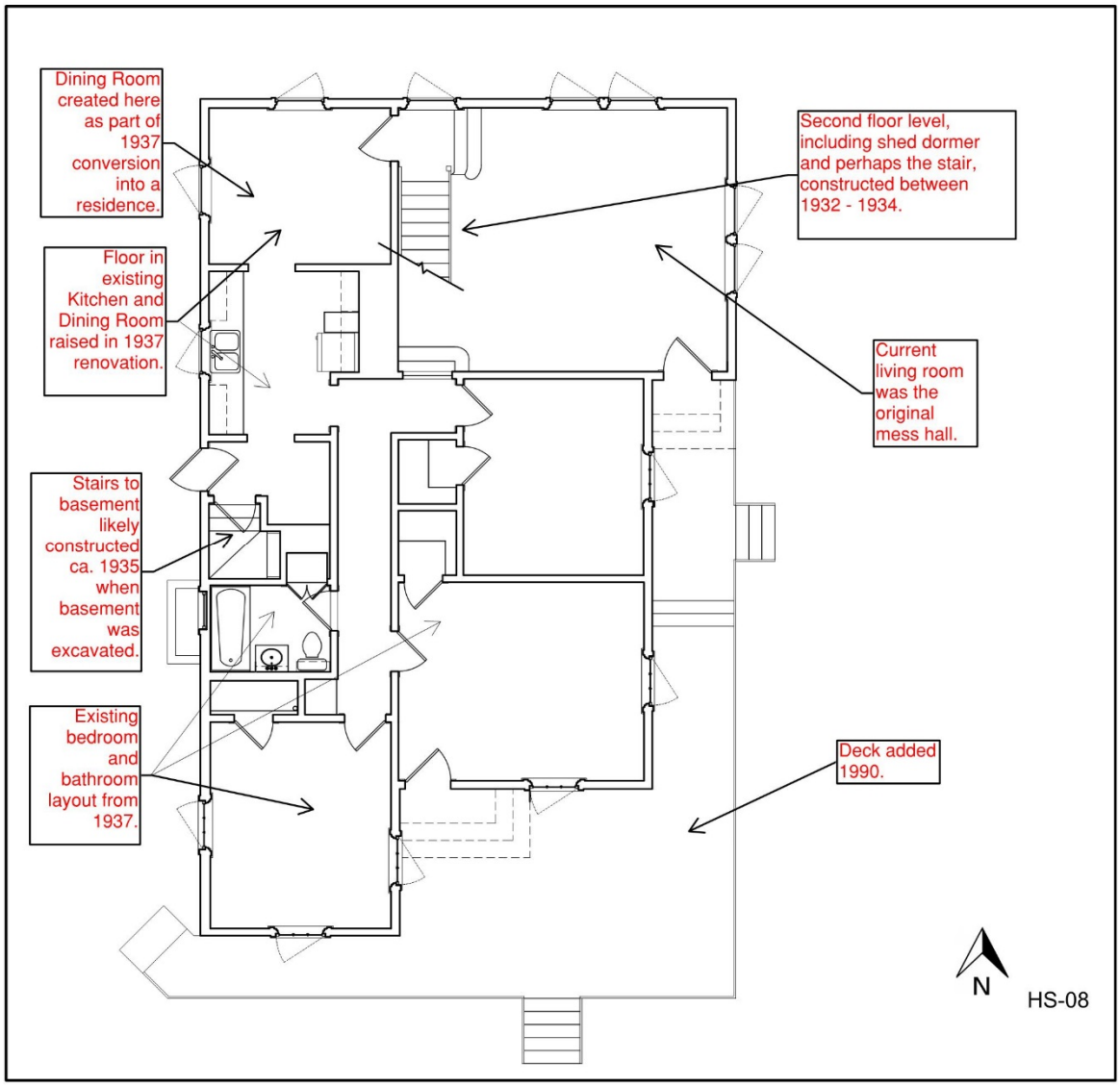


Figure 3. Summary of Alterations

Timeline of Major Events and Alterations.

Historic Primary Function Use: Dormitory, "Rangers Dormitory and Mess House." [List of Classified Structures.]
Current Primary Function and Use: Single Family Dwelling. [List of Classified Structures.]

1930
February 1930. Park superintendent reports that "Plans for the new Rangers' bunkhouse…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, B2, F1.]

1931
Built. Howard Baker is listed as the designer in the List of Classified Structures, but no further evidence that Baker was directly involved has been found. [List of Classified Structures.]
Original cost $11,000.00 [Maintenance Department Files.]

May 7, 1931. Plans completed for Rangers Dormitory and Mess House. Plans were drawn by "J.H.G." of the National Park Service Landscape Division, recommended by Thomas C. Vint, Chief Landscape Architect, 5/14/1931, and approved by Arno B. Camerer, Acting Director on 5/20/1931. [Appendix A.]

July 18, 1931. Construction begins. [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." [August, 1931 WICA Superintendent's Monthly Report.]

ca. September. 1931. Superintendent annual report 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.]

"The building plans show a different door and window arrangement on the rear wall than is found in some of the historical photographs or the building as it presently exists. One of the historic photos show the building was constructed as planned and the rear end altered at a later time." [Karsmizki, "Administrative and Utility Area NR Nomination," 7.52-53]

1934, ca.
"Historical photographs including overview of the site show an excavated trail leading from this historic quarters to the lower residences and visitor center" [Karsmizki, "Administrative and Utility Area NR Nomination," 7.53.]

1935
Remodeled, per maintenance department files. This may refer to the addition of the basement, which was not shown on the original construction drawings. CCC crews added basements to several building in the park in the mid-1930s. [Maintenance Department Files, Karsmizki, "Administrative and Utility Area NR Nomination," 7.53.]

1937
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. [April and May, 1937 WICA Superintendent's Monthly Reports.]

1949
Value $13,620.00 [Maintenance Department Files.]

1951
June 15, 1951. Hot water heating system replaced, piping modernized [Maintenance Department Files.]

1954
January. New floor covering in bathroom. [Maintenance Department Files.]

1958
Recircuit wiring, redecorate and paint interior, floor covering in living room. [Maintenance Department Files.]

1960s
Solar Hot Water. [Maintenance Department Files.]

1965
March to August. New floor tile, Rerouted hot water, dismantled furnace, refinish inside, paint outside [Maintenance Department Files.]

1969
August. Paint Stucco. [Maintenance Department Files.]

1974
June. Rewire; October, ca. Reshingled [Maintenance Department Files.]

1976
March. Remodel bath. [Maintenance Department Files.]
1978
October. “In-O-Vent” heat saver, bathroom faucet and vanity. [Maintenance Department Files.]

1979
February and March. Cupboards and countertop, wall paneling, molding. [Maintenance Department Files.]

1980
May. New kitchen cabinets. [Maintenance Department Files.]

1980-81
Storm windows and door. [Maintenance Department Files.]

1982
20 August 20, 1982. Removal of existing wood shingle and reroofed with asphalt shingles. Part of a project by Life Roofing of Chamberlain SD. Direct Cost $3,921.67. (Recorded Date 23 Apr 1987) [Maintenance Department Files.]

1983
May and July. Carpet, refinish woodwork. [Maintenance Department Files.]

1984
August 29, 1984. Erik Airtight Wood-burning Stove, 23-3/4” high x 27 -1/2” deep 8” flue diameter, 2,000 sq. ft. heating capacity. (Recorded 1 May 1985.) [Maintenance Department Files.]

1985
August 23, 1985. Work completed for old 2 wire system; removed, installed new wiring, grounding, entrance to weather head, panels and baseboard electric heaters. Clint's Electric. Direct Cost $6,666.33. (Recorded 30 May 1986) [Maintenance Department Files.]

1986
July. Building transferred from G.L. acct. 210 General Buildings to G.L. acct. 215 Historical Buildings. (Recorded 16 Apr 1987.) [Maintenance Department Files.]

1988
January and February. Kitchen Faucets and Spray, Kitchen Cabinets. [Maintenance Department Files.]

1990
October and November. Construct Redwood Deck, Pellet Stove. [Maintenance Department Files.]

1993
Tested for lead. [Maintenance Department Files.]
October 1, 1993. Structure Ultimate Treatment (UT): Restoration. Not approved, Not completed [List of Classified Structures.]

1994
Work done to address basement drainage issues. [Maintenance Department Files.]

1997
Lead abatement. [Maintenance Department Files.]

1998
November. New motor for pellet stove. [Maintenance Department Files.]

2000
Carpet 3 bedrooms and hallway, Installed vinyl kitchen flooring. (FY 00), Completed lead based paint mitigation (FY 00) [Maintenance Department Files.]

2003
December. New range/ hood and new refrigerator. [Maintenance Department Files.]

2004
Bathroom rehab. [Maintenance Department Files.]
New egress windows installed in the bedrooms, Park Project # WICA-04-13.

2008
New Pella brand casement windows installed. [Maintenance Department Files.]

2010
Tested for Radon. [Maintenance Department Files.]

Historic Photos

Figure 4. HS-08, ca.1931, looking northeast. (WICA 4725)

Figure 5. HS-08, ca.1931, looking northwest. (WICA 4267)

Figure 6. HS-08, 1931, Aug., looking southeast. (WICA 4726)

Figure 7. HS-08, ca.1931, looking northwest. (WICA 4139)

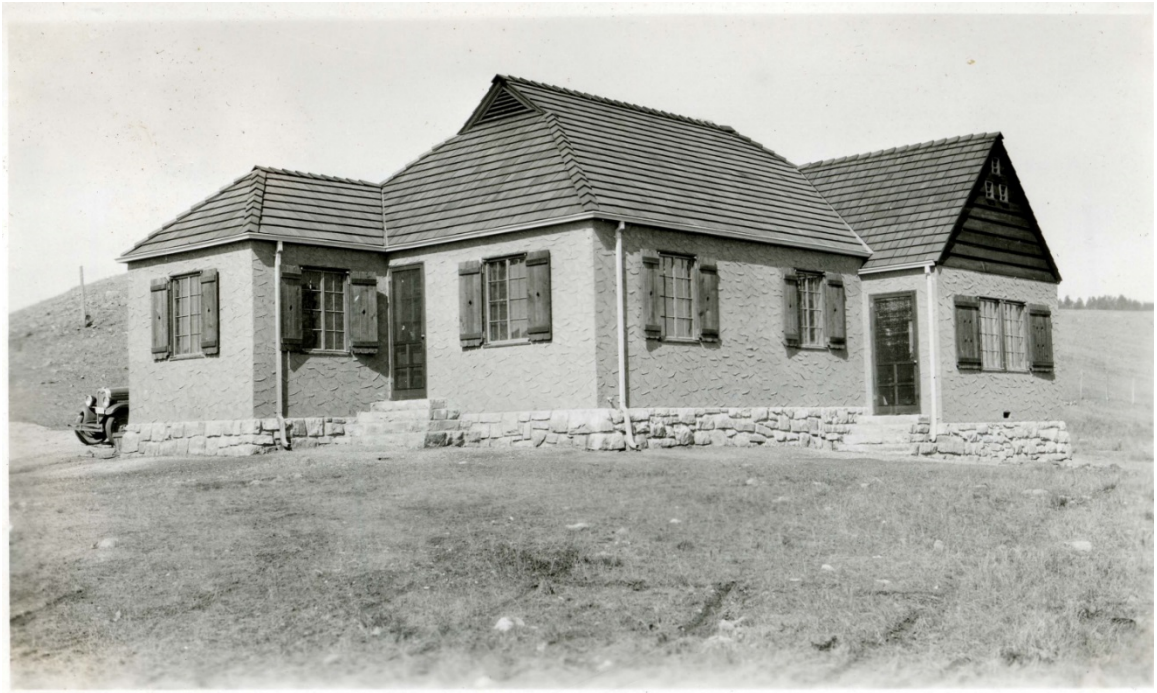


Figure 8. HS-08,1931, Nov. 12, looking northwest. (WICA 4727)

Figure 9. HS-08, ca.1934, looking north. (WICA 4268)

Figure 10. HS-08, ca.1952, looking southeast. (WICA 6855)

Figure 11. HS-08, ca.1969, looking east. (WICA 6709)

Figure 12. HS-08, ca.1969, looking northwest. (WICA 6710)

Figure 13. HS-08, ca.1969, looking north. (WICA 7949)

Figure 14. HS-08, ca.1969, looking north. (WICA 7950)

HS-08 Chimney detail. (SRJA 2015)

Existing Conditions

HS-08 Quarters Existing Conditions

HS-08 Quarters was constructed in 1931 and is the southern-most of the all of the houses. This is a one and a half story house with a partial basement.

This house, like most buildings in the historic housing area, is oriented with the north face of the building facing more northeast. For consistency in this report, all buildings are referred to in the north/south/east/west cardinal directions. Therefore, the elevation facing northeast is referred to as the north elevation, and the elevation facing southeast is referred to as the east elevation and so on.

Exterior

The one and a half story wood frame house is clad with Spanish stucco and has a partially exposed native rubble stone foundation The grade slopes slightly up towards the west side of the house, exposing none of the stone foundation at the west side. The house is essentially hipped-roofed with a gable over the living room and a shed dormer off the back of the house. A contemporary raised wood deck wraps the south and east sides of the house.

Roof

The original wood shingle roof was replaced with asphalt shingles for the first time in 1982. The existing asphalt shingle roof dates to 2002 and appears to be in good overall condition, except for a small bowed area in the center of the north roof. This area requires closer inspection. The roof is a Heritage 40 Laminated asphalt shingle, manufactured by Tamko Roofing in the Rustic Cedar color.[5] The K-style aluminum gutters and downspouts were also installed at that time. Aside from the stone chimney, four roof penetrations include the flue for the non-extant pellet stove on the north-facing roof, a vent for the kitchen sink, a vent for the kitchen exhaust and a vent for the bathroom plumbing - all on the west-facing roof. The original 1931 construction documents call for 24-inch shingles with 10-inch exposure. Fall protection fasteners are installed near the ridgelines. These are a safety feature which has little effect on the overall character of the building. A small bow in the shingles is present in the upper center portion of the north-facing roof. The cause of this is unknown.

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

Figure R1. West-facing Roof. Arrow points to location of bow in shingles. (SRJA 2015)

Figure R2. Roof valley detail. (SRJA 2015)

Windows and Shutters

The original windows for HS-08 were very different than windows designed for the other historic quarters. These were originally steel casement windows. The original 1931 construction drawings clearly indicate the original steel multi-lite casement window designs and historic photographs of the construction show the steel windows and rustic wood board and batten shutters installed. The steel windows were manufactured by Truscon Steel Company.

The steel windows were removed and replaced in 1952 as part of a larger insulation and window replacement project. The new windows were a wood double-hung window with horizontal lites, as seen in the 1950s photographs. These windows were later covered on the exterior with a metal storm window.

Two campaigns of more recent window replacement have occurred. The first project in 2004/2005 replaced the windows in the bedrooms (Figures W1 and 2).[6] The windows installed in the bedrooms were replaced in order to meet current life safety fire egress dimension requirements. In 2008, the remainder of the windows throughout the house were replaced (Figures W3 – W8). Windows in both replacement projects are out-swinging aluminum wood clad casements with simulated divided lites in a twelve-lite configuration. The manufacturer of the bedroom windows is unknown, while 2008 windows were manufactured by Pella.

The detailing and the color of the windows between the two installation projects are different.

Bedroom replacement windows – may be Pella (Example Figures W1 and W2):

Specification: Contract # P1505040114, Replaced 8 windows in bedrooms and bathroom. Manufacturer information not in file.

Color: dark reddish-brown aluminum color on the exterior of the window and a darker brown aluminum panning.

Exterior panning detailing: The panning for these windows is wider than the historic trim. Also, the panning is picture-framed around each window. The picture-framing leaves a strange detail for the mulled windows. Historically, the paired windows were mulled together with a large wood mullion and a continuous wood sill running between the windows. The metal picture-framing panning has essentially erased the center wood mullion and the continuous wood sill from the bottom of the windows and is wider than the historic wood trim. The sealant used on the panning is a lighter brown color than the panning itself, making the sealant a feature of the detailing.

Interior trim finish: The interior trim was finished and stained and is relatively close to the surrounding trim color.

Pella replacement windows throughout the remainder of the house 2008 (Figures W3 – W8):

Specification: Pella Architect Series, Clad, Model 2, Spec Enduraclad Plus, 5/8" InsulShld IG Glazing, Champagne screen with Traditional Grille.

Color: darker chocolate brown color.

Exterior panning detailing:

The exterior trim on the bedrooms is panned over the original wood window trim and the fasteners for the panning are exposed. The fasteners are painted a non-matching brown color, which makes them appear they are rusting.

The sills are panned separately. Since the side trim panning is wider than the original wood trim, the side panning extends past the ends of the sills, leaving an unusual condition where the sills do not appear wide enough to receive the trim (Figure W2).

The sealant used at the edge of the exterior panning a reddish-brown color and does not match the panning or the stucco (Figure W8).

[6] Maintenance Files, Construction Specifications, Project to Replace Windows Historic Quarters HS-3 & HS-8, August 2004.

Interior trim finish: The interior trim was finished and stained and is not a good match to the interior trim color.
Interior screens and hardware: The interior screens are white and could have been ordered in brown to better match the trim. The hardware is also light-colored and other options for finish are available.

Both installation methodologies have pros and cons as to their approach, but neither truly meets the intention of a historically compatible replacement installation. Both installations change the appearance of the exterior trim and sills by making them wider than the historic trim. The panning has open joints and in some cases exposed fasteners which are not appropriate. Both installations rely on sealants to keep the joints in the panning watertight and the historic wood trim below dry.

The replacement windows are surely an improvement to the mid-century wood windows that were their predecessors, but they are not a good match to the historic steel outswing casement windows that were originally installed and remained throughout the period of significance (Figure W9). For example, an existing twelve-lite out-swing replacement window is actually replacing a pair of eight-lite (sixteen total) outswing steel windows. Steel windows have a smaller frame size and typically a smaller muntin profile. The vertical line down the center, which would have divided the pair of frames is missing. Only the windows in the bedrooms are required for egress compliance. Windows in the public spaces (Living Room, Dining Room and Kitchen) do not have to meet egress and could be better matched to the historic configuration.

The exterior of the house lost some of its historic character when the windows were transitioned from divided multiple-lite steel windows to the existing replacement windows. Another significant missing feature includes the exterior shutters.

Rustic board and batten shutters with a diamond silhouette design in the center were installed on this house when it was first constructed (Figure W10). These shutters were also indicated on the original construction documents. They were installed on the windows on the south, east and north elevations. It is not clear if they were installed on the west (rear) elevation. The last photograph in the file indicates they were removed sometime prior to 1969. These shutters were an important character defining feature of the exterior that lent the ‘rustic’ style to the building.

Figure W1. Bedroom replacement window with exterior metal panning and exposed metal fasteners. (SRJA 2015)

Figure W2. Bedroom replacement window with exterior metal panning detail. Note the trim panning at the sides of the window is wider than the original wood trim. Therefore, the sills appear to be short, with the panning extending beyond the end of the sills. Also, the trim panning was installed using face fasteners, which is not historically appropriate. (SRJA 2015)

Figure W3. Pella replacement window with exterior metal panning. (SRJA 2015)

Figure W4. Pella replacement window with exterior metal panning. This is the detail where the wood mullion between the two windows should rest on the missing sill. (SRJA 2015)

Figure W5. Pella replacement window with exterior metal panning and missing sill detailing. (SRJA 2015)

Figure W6. Pela replacement window with painted exposed fastener and non-matching sealant at the perimeter. (SRJA 2015)

Figure W7. Interior of Pella replacement window in the Living Room. The new installation is not stained to match the historic trim. The screen frames are white. (SRJA 2015)

Figure W8. Living Room replacement window detail. (SRJA 2015)

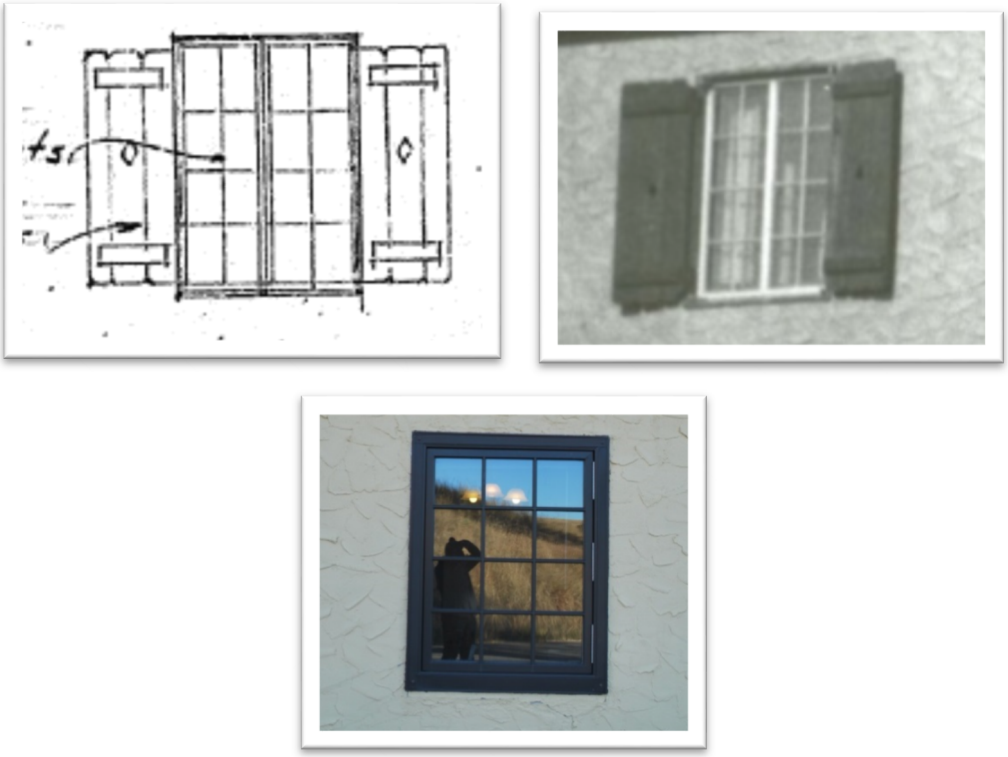


Figure W9. Example of original configuration of eight-lite pair of steel windows (top left and right) versus the single twelve-lite replacement window configuration (bottom). (1931 Construction Drawings, WICA 4268, SRJA 2015)

Figure W10. Shutter dog remaining on the stucco. (SRJA 2015)

Stone Masonry

The native stone foundation is laid in a random ashlar pattern. The original foundations of the house were purely stone with no concrete walls. The foundations were specified to be buried in grade a minimum of 18-inches which is not to current frost depth design. The stone is in good condition throughout. The original mortar is intact in several locations. The foundation has had several campaigns of mortar repointing. Some of the more recent mortar does not match the historic mortar as closely as it could. The existing mortar is dirty and would need to be cleaned

prior to assessing a new mortar match. Only a handful of stones are fractured and require replacement or monitoring.

Stucco and Paint

The exterior Spanish stucco is in relatively good condition, with only minor crack repairs required throughout the elevations, which are typical for the age of the structure. However, there are concentrated areas of stucco deterioration, where there is significant cracking and crazing. These are discussed in each section below. The cause of this deterioration needs to be further investigated. It may be due to moisture in contact with the stucco where grade is raised and is in contact with the walls or in areas where the stone foundation walls are settling.

The original stucco had an integral color in the top coat that was much more of a warm ochre color than the current color. The earlier stucco color can also be seen below peeling paint in certain locations and is most apparent along the grade at the west elevation. The date the stucco was first painted the current yellow color is unknown. The existing paint is latex and is de-bonding from the stucco in certain locations where the stucco is showing signs of water infiltration. The house was likely painted to cover previous plaster crack repairs.

Figure X1. South and East Elevations. (SRJA 2015)

East Elevation

The East Elevation faces the Visitor's Center and is the primary façade of the house (Figures X1 – X11). The one and a half story house rests on an exposed native stone foundation laid in a random ashlar pattern. The first floor walls are clad with Spanish stucco. A projection in the east wall contains a gable and the main side entrance. The roofs are hipped. A large raised contemporary wood deck wraps the south portion of the east elevation and continues along the entire south elevation.

The exposed stone foundation on the east elevation is in good overall condition, requiring cleaning, spot repointing and mortar wash repair at the top of the foundation wall. The stone step at Door 100/1 requires some spot repointing (Figure 1-6). The stucco along the east elevation requires significant repairs. The east-facing gable wall has several large cracks, especially under Window 100. The cause of these cracks is unknown and will require further investigation. A significant amount of vertical cracking and crazing is prevalent throughout the east wall across the remainder of the elevation, as well. These cracks may be due to movement in the foundation walls or issues with attachment to the wood framed walls. This will require further investigation, as the foundation walls do not appear to have any settlement issues in these locations.

The wood trim and horizontal wood siding in the east-facing gable appear to be in good overall condition, requiring only touch-up painting (Figures X2 and X3). The wood louver in the gable has been previously replaced with a pre-finished metal louver. This louver blends in well with the surrounding trim. It was not inspected for an interior screen. Wood trim throughout this elevation requires only touch-up painting. Wood trim repair is required at the south side of the gable cornice. The downspout near the front entry requires a new extension. It is draining very close to the stone foundation. The dryer vent is installed to exhaust through this wall near the front entry. This is a highly visible location and the vent is not painted to match the wall.

The main entry Door 100/1 is actually located in the south-facing wall of the east gable structure. This door serves as the front door, but is likely only used by staff to access the deck or the front yard. The primary entrance in and out of the house is the back door on the west elevation. This door is an original V-joint tongue and groove door with two diagonal glass lites and has original hardware (Figure X7). The door is protected with a pre-finished aluminum storm door.

Basement Windows 001 and 002 were installed when the basement was excavated. The 3-lite wood windows, frames and sills are in good condition and have a wood screen sash attached. Window 100 is an original window location with a pair of aluminum wood clad casement windows installed in 2008. The exterior wood trim is covered with metal panning. Historically, this window opening contained two pairs of steel out-swing casements, separated with a wood mullion and was flanked with a pair of rustic board and batten shutters. Windows 101, 102 and 103 are historic window openings with aluminum wood clad casement windows installed in

2004. The exterior wood trim is covered with metal panning. Historically, these windows contained a pair of steel out-swing casements and were flanked with shutters.

The existing wood deck was constructed in 1990, according to maintenance department records. According to the park staff, the raised wood deck was installed at the request for tenants to have a place to congregate. The deck was installed in a way that it is free-standing and easily removable. No physical alterations to the historic structure were made. The stone steps at both Doors 100/1 and 103/1 are cloaked by the deck. Basement Window 001 is bisected by the deck construction. The deck is highly visible from the entry into the park and is not historically appropriate for the front elevation of the building. Other alternatives should be explored in the future. The integrity of the deck is further discussed in the Structural Section of this report.

Figure X2. East Elevation gable detail. The red line indicates a large crack with some stucco loss. (SRJA 2014)

Figure X3. East Elevation gable metal vent detail. (SRJA 2015)

Figure X4. East Elevation. This wall has some significant cracking in the stucco. (SRJA 2014)

Figure X5. East Elevation Looking north at front entry. (SRJA 2015)

Figure X6. Entry Door 100/1 stone steps landing encompassed within the new wood deck structure. (SRJA 2015)

Figure X7. Entry Door 100/1. (SRJA 2015)

Figure X8. East Elevation deck construction over front entry stone steps. (SRJA 2014)

Figure X9. East Elevation deck construction intersecting basement window.
Note the unpainted dryer vent. (SRJA 2014)

Figure X10. East Elevation Foundation and Window 002 below deck. (SRJA 2014)

Figure X11. East Elevation Window 104.
This wall has some significant cracking in the stucco. (SRJA 2014)

South Elevation

The South Elevation of the house is highly visible by visitors as the building faces the main entrance road (Figures X1 and X12 – X20). The stone foundation is exposed at the east side of the elevation and grade rises towards the back (west side) of the house and is obscured by the existing wood deck. The first floor is stucco and the two roof lines are hipped. The upper roof ridge is extended to have a large wood louver.

The stone foundation, as viewed under the wood deck, appears to be in good condition, requiring cleaning and spot repointing. There are several campaigns of mortar repairs on this elevation, and the more recent mortar does not match the historic mortar. If the deck is removed, this elevation will need to be repointed to match. The amount of relatively recent repointing may be due to shifting in the stone foundation under Window 104. This wall has a significant amount of cracking in the stucco. This should be monitored for movement.

The stucco wall cladding is in good overall condition. Some cracking in the stucco surrounding the Windows 103 and 105 requires repair and monitoring. Door 103/1 is an original 1931 entry door (Figure 1-25). This door originally led to the hall in the dormitory part of the building and now enters Bedroom 103. The six-lite wood door is original and is protected by an aluminum storm door. The wood trim and threshold require painting.

Windows 103 and 105 are historic window openings with aluminum wood clad casement windows installed in 2004. The exterior wood trim is covered with metal panning. Historically, these windows contained a pair of steel out-swing casements and were flanked with shutters.

A hose bibb is installed in the stone foundation wall and in not accessible due to the wood deck. A wall light fixture is mounted to the south wall near the Door 103/1.

The wood trim along this elevation appears to be in good overall condition, requiring only touch-up painting.

The wood louver in the upper roof appears to be in good condition (Figure X20). The screening for this louver is installed on the exterior face of the louver. This is likely due to the presence of a bedroom on the second floor, making it difficult or impossible to access this louver. It should be investigated if this louver is still open on the attic side and providing ventilation to the attic. If it is not open, it could be closed on the inside face and the screening removed.

Figure X12. South Elevation of deck, looking south. (SRJA 2015)

Figure X13. South Elevation of deck, looking north. (SRJA 2015)

Figure X14. South Elevation, looking north at front stone steps under deck. (SRJA 2015)

Figure X15. South Elevation, looking north at east-facing foundation wall under bedroom Window 104. (SRJA 2015)

Figure X16. South Elevation, looking north at foundation wall under Window 105. (SRJA 2015)

Figure X17. South Elevation, looking north at Door 103/1 and Window 103. (SRJA 2014)

Figure X18. South Elevation, looking north at threshold to Door 103/1. (SRJA 2015)

Figure X19. South Elevation, looking at Window 105. (SRJA 2014)

Figure X20. South Elevation roof louver. (SRJA 2014)

Figure X21. West Elevation from parking area. (SRJA 2014)

West Elevation

The west elevation of the house faces the upper road/parking area to the west (Figures X22 – X34). The walls are Spanish stucco and the roof is hipped at both sides. A shed dormer projects from the center of the roof. The stone chimney is near the north side of the roof. The adjacent drive is nearly level with the finish floor of the house.

The west wall of the house is clad in stucco. A concrete slab spans the area between the drive and the house. The concrete landing lies directly against the wood threshold of Door 107/1 and the stucco on the side of the house with no soft joint separating the materials (Figures X23, X26 and X27). The landing and the adjacent grade is well above the top of the stone foundation wall along this side of the house. The stucco wall adjacent to the grade is deteriorated, exhibiting stucco loss, cracking and peeling paint. The original construction drawings for this side of the house show a minimum of six-inches from the top of the stone foundation wall to the landing. Grade along this entire elevation has risen over time to well above the top of the foundation wall and there is no swale to carry water around the house. Therefore, the water drains from the adjacent drive and against this stucco wall.

The stucco cladding on this elevation exhibits some large vertical and diagonal cracks. Cracking is prevalent around Window 106 (Figures X28 and X29). The cracking around Window 107 is due to the replacement of a larger window with the existing small window. The outline for the larger window is evident in the stucco. Cracks in the wall surrounding and below Window 108 are due to the movement of the stone foundation below. This area of the interior crawl space

was excavated too close to the foundation wall. This area is discussed further in the Structural Section of this report. Other minor cracks and crazing appear near the base of the wall due to the contact with the surrounding grade.

A stone window well is set into grade in the center of the wall, below Window 107. This window well was constructed when the basement was excavated. The existing metal cover is flimsy and is a safety hazard. It is unclear if there is a drain in the bottom of the well. The stone walls require repointing.

The shed dormer on the second floor was constructed sometime between 1932 and 1934 (Figures X24 – X26 and X35). The dormer has horizontal wood siding and trim details that match the rest of the house. The trim requires repairs, where there are holes from animals that have chewed through the wood. A wood bird house was added to protect the siding from further bird destruction. The windows are aluminum clad wood replacement casements. The wood trim in this installation was not clad with metal. It appears there may have been some structural modifications to the window frames, as the sill is missing. This dormer originally had three steel casement out-swing windows separated by wood mullions. These likely did not meet egress code as three units, so two units were installed instead. The trim surrounding the window requires restoration.

The wood trim on the west elevation appears to be in good overall condition, requiring only touch-up painting.

Door 107/1 was constructed as part of the 1937 remodel. The wood door frame remains, but the door is a contemporary fiberglass door and is protected with an aluminum storm door. The wood frame and sill requires touch-up painting.

Windows 106, 108 and 109 are historic window openings with aluminum wood clad casement windows installed in 2004 and 2008. The exterior wood trim is covered with metal panning. Historically, these windows contained a pair of steel out-swing casements. It is not known if these windows had shutters, as they are not indicated to have shutters in the 1931 drawings.

Window 107 was a larger opening until it was replaced in 2004 with this smaller unit. This window once opened into the bathroom, but has since been covered over on the interior by the shower.

The electrical meter is installed on this elevation. A wall light fixture is mounted above the door and has a glass shade that matches the light installed on the south elevation. The date of this fixture is unknown. The downspout in the southwest corner is missing its extension and is draining onto the stone foundation (Figure X33).

The stone chimney is most apparent from this side of the house (Figure X34). This chimney has been skirted with metal strapping from a previous antennae installation. The chimney stone

requires cleaning, spot repointing and mortar wash repair or replacement. It is unclear if the flues are used for venting. If not, they can be capped.

Figure X22. West Elevation from parking area. (SRJA 2014)

Figure X23. West Elevation concrete landing at entry. (SRJA 2015)

Figure X24. West Elevation shed dormer detail. (SRJA 2014)

Figure X25. West Elevation shed dormer detail with birdhouse installation. (SRJA 2014)

Figure X26. West Elevation entry. (SRJA 2014)

Figure X27. West Elevation entry Door 107/1. (SRJA 2014)

Figure X28. West Elevation Window 106. (SRJA 2014)

Figure X29. West Elevation stucco cracking near Window 106. (SRJA 2014)

Figure X30. West Elevation detail of Window 107 and window well. (SRJA 2014)

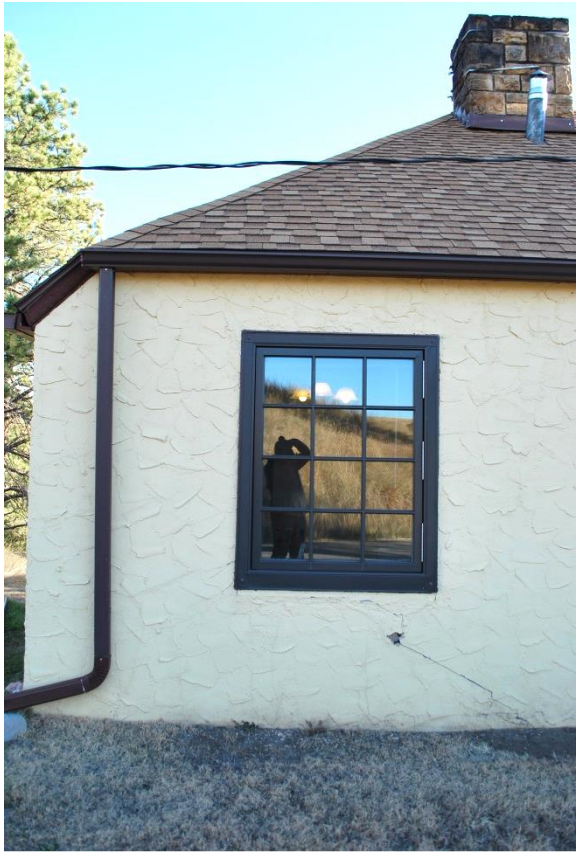


Figure X31. West Elevation Window 109 with missing stucco and cracking below. (SRJA 2014)

Figure X32. West Elevation cornice detail at northwest corner. (SRJA 2014)

Figure X33. West Elevation southwest downspout with no extension. (SRJA 2014)

Figure X34. North and West sides of the stone chimney
with kitchen stove exhaust in foreground. (SRJA 2014)

Figure X34. North Elevation. (SRJA 2014)

North Elevation

The North Elevation is also highly visible from the public right of way and the Visitor Center (Figures X34 – X38). This elevation has exposed stone foundation at the east side and is built into grade along the west side. The wall is clad in Spanish stucco and the roof has an east-facing gable on the east side and a hipped roof on the west side.

The grade appears to extend well over the top of the stone foundation wall about mid-way through the elevation. This is causing a significant amount of cracking and crazing in the stucco walls. It is unclear how the exterior walls in this section of the house were constructed or have changed over time. The original drawings clearly indicate that grade was to be well below the top of the stone foundation at the northwest corner. However, drawings in the 1937 renovation indicate that grade along these walls is an issue. The finish floor in the kitchen and dining room was raised to address the grade at the west entry. What is not shown is how they managed to waterproof the northwest corner by raising the grade to its present configuration. A photograph taken in 1934 shows that the grade was lower under Window 111 (Figure X35). The original foundation vent below the window is seen, just as it was indicated to be drawn in the 1931 drawings. This corner requires further investigation to determine the construction and potential required repairs.

The stone foundation requires cleaning and spot repointing. A section of stone adjacent to the hose bibb in the center of the wall requires repointing (Figure X37).

Extensive stucco cracking is also found surrounding Window 112 (Figure X36). There is a small hole above the window. Windows 110, 111 and 112 are original window openings. The existing aluminum wood clad casement replacement windows were installed in 2008. The exterior wood trim is covered with metal panning. Historically, these window openings contained pairs of steel out-swing casements. Window 112 contained two pairs of windows which were separated with a wood mullion. All three openings were flanked with rustic board and batten shutters.

The center downspout drains to a concrete splash block. A hose bibb extends through the basement wall and is mounted to a wood block that requires painting. Adjacent to the hose bibb, the sump pipe drain extends through the wall. This pipe is screened and is clogged full of debris (Figure X37).

An unused stove pipe flue projects through the roof in the northeast corner of the house (Figure X38). This is a highly visible portion of the roof and the pipe should be removed.

Figure X35. North Elevation ca.1934 – Detail of overall site photograph. The top arrow points to the shed dormer which was not part of the 1931 construction. The middle arrow points to a potential hood over the back door before the door was moved in 1937. The bottom arrow points to the foundation vent located under Window 111, which is not graded over. (WICA 4493.)

Figure X36. North Elevation telephone box and cracking below Window 112. (SRJA 2015)

Figure X37. North Elevation details of hose bibb and clogged sump pipe drain. (SRJA 2015)

Figure X38. North Elevation – Detail of unused stove pipe flue and safety hooks at ridge. (SRJA 2015)

Existing Conditions – Interior

Basement

The footprint of the building foundation is 1349 gross square feet, while the excavated portion of the basement (Room 001) is only 423 square feet (Figures B-1 – B7). Access to the basement is by a wood staircase along the center of the west wall. The house was originally constructed with only crawl space; the basement was excavated and the interior stair constructed in 1937.

The basement is currently used for the hot water heater, laundry and storage. The main excavated area is approximately 22'-10" by 20'-7." The floor is a concrete slab. Clearance under the floor joists from the floor is 7'-3," while the clearance under the beams is only 6'-7." The excavation in the basement is similar to the other houses. The exterior stone foundation walls were only constructed to have a minimum of 18-inches below grade. Therefore, the basement excavations were set in several feet from the perimeter walls and new interior stone retaining walls were laid. A concrete cap was poured on top of these retaining walls to cover the soil. A small crawl space remains under the south bedroom and a second larger crawl space is under the north section of the house.

Four steel columns supporting a steel I-beam are aligned in the north-south direction in the center of the basement and support the first floor framing. Windows 001 and 002 along the east wall and Window 003 on the west wall provide natural light into the basement.

The electrical service panel is mounted on the west wall in the northwest corner of the basement. The water heater is just left of the electrical panel. The water service enters the basement through the north wall. A sump pit is located in the floor in the northwest corner of the room and has a removable drain cover. An electric wall heater in installed on the north wall. Washer and dryer hookups are located along the east wall with the dryer venting through the east wall; the dryer vent it currently disconnected.

The room is lit by four glass globe light fixtures mounted on the ceiling. Piping and conduit serving the first floor are visible throughout the basement. Fiberglass insulation is installed between the first floor joists and is covered with plastic sheeting. The plastic sheeting was installed to help keep the insulation in place and to add an extra barrier between the floors. However, this sheeting also gives mice a convenient travel path between the floor joists. The sheeting is full of mice excrement.

Figure B-1. Basement 001 Looking west. (SRJA 2014)

Figure B-2. Basement 001 Looking northwest. (SRJA 2014)

Figure B-3. Basement 001 Looking north. (SRJA 2014)

Figure B-4. Basement 001 Looking east. (SRJA 2014)

Figure B-5. Basement 001 Looking southeast. (SRJA 2014)

Figure B-6. Basement 001 Looking south. (SRJA 2014)

Figure B-7. Basement 001 Looking southwest. (SRJA 2014)

Crawl Space 002

The crawl space is accessible through a removable panel in the north wall (Figures B-8 – B-11). The overall dimensions are approximately 30'-0" by 14'-6." This portion of the house has always been a crawl space. Original stone piers and framing are visible. A large chimney is constructed in the west central part of the crawlspace. The north portion of the chimney dates to the original house construction, while the south portion was added during the 1937 renovation. There is no vapor barrier installed in this crawl space. Some of the fiberglass insulation between the first floor joists has fallen or is missing. The entire area in the northwest corner that was over-framed is not insulated, nor is the intermediate space. The perimeter walls are not insulated.

Portions of the crawl space have been excavated for access. Several of these areas are very close to the stone piers. Several of the piers are undermined, resulting in settlement issues for the structure above. These locations are discussed in the Structural Section of this report. The first floor kitchen and dining room spaces were over-framed from lower finished spaces as part of the 1937 renovation. This framed area (approximately 18-inches high) is visible within the crawl space (Figure B-12).

Figure B-8. Crawl space 002 Looking west. (SEA 2015)

Figure B-9. Crawl Space 002 Looking north. (SEA 2015)

Figure B-10. Crawl Space 002 Looking northeast. (SEA 2015)

Figure B-11. Crawl Space 002 Looking northwest into over-framed first floor. (SEA 2015)

Crawl Space 003
The crawl space is located under the south bedroom (Figure B-12). This has always been a crawl space and is accessible by removing a panel in the plywood frame wall on the south side of Room 001. This space is approximately 9-feet by 9-feet. There is no vapor barrier over the dirt floor. The hose bibb piping installed on the south exterior wall is visible from this space. The foundation walls are not insulated. The first floor joists are insulated, but the insulation is very thin.

Figure B-12. Crawl Space 003 Looking south. (SEA 2015)

First Floor
The first floor is approximately 1,348 gross square feet and has nine total rooms, plus closets. The first floor has been greatly altered from its initial 1931 construction, with a major renovation in 1937. Remodeling of the house since that time has focused on finishes and renovations of the bathroom and kitchen. Reference to a lead based paint mitigation project in 2000 is recorded in the Maintenance Department Files, but there has been no record found to date of the scope or extent of the work. It is assumed that the historic millwork was removed and stripped off site and refinished and reinstalled in the original locations, as was done in other buildings.

The original construction of HS-08 was for a Rangers Dormitory and Mess House. This building was used in this capacity until a larger dormitory was constructed at HS-04 in 1937, at which time the structure was renovated back into a single family residence. The 1937 renovation drawings show the extent of the scope of the project, which included moving the center hall, reconfiguring bedrooms, relocating the bathroom and kitchen, raising the floor height of the existing kitchen and dining area to its present elevation, and constructing a dining room. The mess hall was converted into a living room.

The second floor was not added until after the initial 1931 initial construction. There is no record for the design or scope of work associated with the addition of the second floor. Photographs indicate that the second floor shed dormer on the west roof was installed between 1932 and 1934, as seen in historic photographs of this residence. The existing staircase may have been installed at that time, but there is no record of its construction. The plans for the renovation in

1937 clearly do not show that the staircase to the second floor was present. This may be due to the plans for the renovation being drawn by someone off site who was not familiar with the building and had likely worked from the initial 1931 construction drawings.

Millwork

The interior millwork throughout the house is consistent, containing simple, flat profiles and eased edges (Figure F-1 – F-2). The door and window trim match and the doors do not have plinths, as in some of the other houses. The baseboards are flat stock with no profile and eased edges. All millwork appears to be pine and is stained a reddish-brown color. This stain color is inconsistent in throughout the house. Only the bathroom has painted trim. Baseboard trim in the kitchen and mud room has been replaced. Typical doors have two panels and are stained pine.

Figure F-1. Typical millwork profile – Window. (SRJA 2015)

Figure F-2. Typical millwork profile – Door. (SRJA 2015)

Living Room 100

Living Room 100 serves as the front entry and main living space for the house (Figures 1-1 – 1-7). The room is 20'-0" by 16'-0" with a ceiling height of 9'-6." This was once the Mess Hall when this house was the Rangers Dormitory. The walls and ceiling are painted plaster. The ceiling is sloped along the north and south sides to match the roof lines. The walls and ceiling are in good overall condition with only minor cracks that are typical for the age of the house.

Door, window and baseboard millwork matches other millwork throughout the house. The floors are a wood laminate. The original floors in the Living Room were specified to be oak plank.

The front Door 100/1 is the original V-joint tongue and groove door and has the original hardware. Door 109/1 is an early wood door that at least dates to the 1937 renovation. The door has brass hardware and a crystal knob.

Windows 100, 111 and 112 were all originally pairs of steel out-swing casement windows. The steel sash were removed and replaced in 1952. The current windows date to 2008. The windows are all Pella aluminum clad wood casements (Figure W3). The windows and trim installed from the window replacement were stained but do not match the existing stained trim. Window 111 is required to be tempered since it is located within a stair, is less than 18-inches to the bottom of the window and is also adjacent to a door. This needs to be verified.

One of the key features of the room is the staircase to the second floor, which is located along the west wall. The Living Room is sunken 18-inches below the kitchen and bedroom portions of the house. Therefore, three treads are located at the door to the hall and also at the door to the Dining Room. This landing near the dining room serves as the landing for the staircase. The staircase treads and risers are wood. The balustrade along the west side of the stair has turned balusters that match the newel. The stair rise and run appear to meet residential code; however, the distance between the balusters is too wide.

The date of construction for this staircase is unknown. What is clear is that the house was originally designed in 1931 with only one story. Photographs from 1931 during and after construction clearly show there was no second floor. The park was tight on space for the park rangers, which is why they added an addition to HS-04 in 1937 to accommodate more rangers. Two photographs taken of HS-08 in 1934 clearly show the dormer was added by that time. The staircase may date to that time period, or it was located elsewhere.

Plans drawn in 1936 for the renovation of the ranger dormitory into a single family residence do not show stairs located on the first floor plan (Refer to Appendix A). The new plans for the Living Room clearly show relocating the Door 109/1 to the Dining Room and adding the three steps at the door. The plans ignore that another set of steps is required at the hall, as well. It seems these plans were perhaps drawn from the old plans without a visit to understand the field conditions. They are riddled with comments from a reviewer who was perhaps more aware of the unique site issues.

Baseboard heaters are installed along the north and east walls under the windows. The room is lit by a ceiling fan in the center of the room. A pellet stove was once installed in the northeast corner of the room which has been removed. A plate covers the hole in the ceiling and in the east wall.

Figure 1-1. Living Room 100 from the stairs. (SRJA 2014)

Figure 1-2. Living Room 100 Looking northwest. (SRJA 2014)

Figure 1-3. Living Room 100 Looking north. (SRJA 2014)

Figure 1-4. Living Room 100 Looking east. (SRJA 2015)

Figure 1-5. Living Room 100 Looking south. (SRJA 2014)

Figure 1-6. Living Room 100 Looking southwest. (SRJA 2014)

Figure 1-7. Living Room 100 Looking west. (SRJA 2014)

Figure 1-8. Living Room 100 Looking west at Door 109/1. (SRJA 2014)

Hall 101

Hall 101 is accessed from the Living Room or the Kitchen and leads to the bathroom and three bedrooms (Figures 1-9 – 1-14). The space is only 3'-0" by 10'-5" and jogs to the east another 4-feet. The ceiling height is 7'-11 1/2." The walls and ceiling are painted plaster. There are small cracks in the plaster that are typical for the age of the house. The scuttle in the ceiling may be original, but it has been converted to an open grille for ventilation between the first and second floors.

Built-in wood shelving is located in the southwest corner of the hall. The stained wood shelving is open to the hall. A small access panel is located below the lowest shelf that appear to have been some type or vent, perhaps when the house had a ducted air heating system (Figure 1-14). The stained pine millwork installed on the doors and windows matches other millwork throughout the house. The floors are a wood laminate over an unknown substrate. The original floors in the hall were specified to be oak plank.

The room is lit by a flush mount fixture in the center of the room. A smoke detector is mounted on the wall.

Figure 1-9. Hall 101 Looking east at Door 102/1. (SRJA 2014)

Figure 1-10. Hall 101 Looking west towards Kitchen. (SRJA 2014)

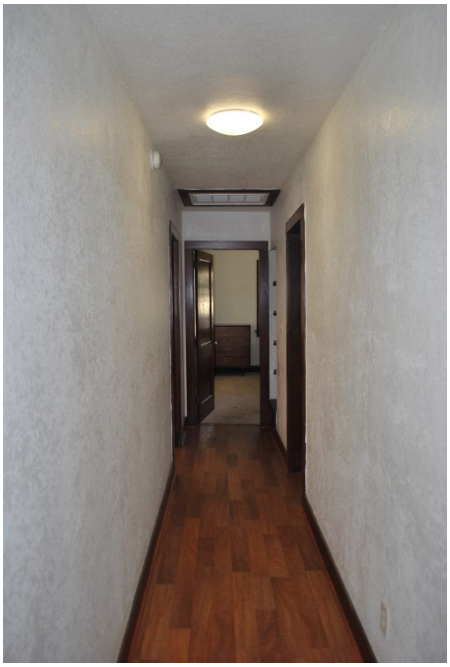


Figure 1-11. Hall 101 Looking south. (SRJA 2014)

Figure 1-12. Hall 101 Looking north. (SRJA 2014)

Figure 1-13. Hall 101 Looking at built-in shelving in west wall. (SRJA 2014)

Figure 1-14. Hall 101 Looking at vent detail in built-in shelving in west wall. (SRJA 2014)

Bedroom 102

Bedroom 102 is the northeast bedroom (Figures 1-15 – 1-20). The room is 10'-10" by 12'-0" with a ceiling height of 7'-11." The walls and ceiling are painted plaster. Several small cracks are found in the walls and ceiling, but they are minor and are typical for the age of the house.

Door, window and baseboard millwork matches other stained millwork throughout the house. The floor is carpeted over an unknown substrate. The original floors in the bedroom were specified to be oak plank.

A closet is located in the center of the west wall of the room. The closet has built-in stained shelving and a hanging rod. A single pull chain fixture provides light.

Both Doors 102/1 and 102/2 are original recessed double panel stained pine doors with original hardware (Figure 1-20). The hardware on the closet door requires repair.

Window 101 was originally a pair of steel out-swing casement windows. The steel sash were removed in 1952. Those sashes were also removed and new aluminum clad wood casement egress windows were installed in 2004.

A baseboard heater is installed along the east wall under the window. The room is lit by a ceiling fan in the center of the room. A smoke detector is installed on the ceiling near the door.

Figure 1-15. Bedroom 102 Looking north. (SRJA 2014)

Figure 1-16. Bedroom 102 Looking east. (SRJA 2014)

Figure 1-17. Bedroom 102 Looking south. (SRJA 2014)

Figure 1-18. Bedroom 102 Looking east. (SRJA 2014)

Figure 1-19. Bedroom 102 Closet detail. (SRJA 2014)

Figure 1-20. Bedroom 102 Closet Door 102/2 hardware detail. (SRJA 2014)

Bedroom 103

Bedroom 103 is the southeast bedroom (Figures 1-21 – 1-26). The room is 14'-11" by 12'-0" with a ceiling height of 7'-11." The walls and ceiling are painted plaster. Several small cracks are found in the walls and ceiling, but they are minor and are typical for the age of the house.

Door, window and baseboard millwork matches other stained millwork throughout the house. The floor is carpeted over an unknown substrate. The original floors in the bedroom were specified to be oak plank.

A closet is located in the northwest center corner of the room. The closet has built-in stained shelving and a hanging rod. A single flush mount fixture provides light.

All three Doors are original recessed double panel stained pine doors with original hardware (Figure 1-25). Door 103/1 is a six-lite exterior door that once served as the one of the primary entrances to and from the ranger dormitory hallway before the renovation in 1937. The glass in this door is required to be tempered by current code and this should be verified.

Window openings 102 and 103 originally contained pairs of steel out-swing casement windows. The steel sash were removed in 1952. Those sashes were also removed and new aluminum clad wood casement egress windows were installed in 2004.

Baseboard heaters are installed along the east and south walls under the windows. The room is lit by a ceiling fan in the center of the room. A smoke detector is installed on the ceiling near the door.

Figure 1-21. Bedroom 103 Looking northwest. (SRJA 2014)

Figure 1-22. Bedroom 103 Looking east. (SRJA 2014)

Figure 1-23. Bedroom 103 Looking south. (SRJA 2014)

Figure 1-24. Bedroom 103 Looking west. (SRJA 2014)

Figure 1-25. Bedroom 103 Door 103/1 details. (SRJA 2015)

Figure 1-26. Bedroom 103 Closet. (SRJA 2014)

Bedroom 104

Bedroom 104 is the southwest bedroom (Figures 1-27 – 1-31). The room is 12'-6" by 11'-0" with a ceiling height of 7'-11." The walls and ceiling are painted plaster. Several small cracks are found in the walls and ceiling, but they are minor and are typical for the age of the house. The east wall, however, does have several diagonal cracks that may be from settlement of the foundation wall. This wall needs to be monitored for further movement.

Door, window and baseboard millwork matches other stained millwork throughout the house. The floor is carpeted over an unknown substrate. The original floors in the bedroom were specified to be oak plank.

A closet is located in the northwest center corner of the room. The closet has built-in stained shelving and a hanging rod. There is no light fixture in this closet. A plumbing access panel for the adjacent bathroom is installed in the north wall. An exposed PVC pipe runs into the attic in the southeast corner.

Both doors are original recessed double panel stained pine doors with original hardware. An original brass plated door stop remains behind Door 104/1 (Figure 1-31).

Window openings 105 and 106 originally contained pairs of steel out-swing casement windows. The steel sash were removed in 1952. Those sashes were also removed and new aluminum clad wood casement egress windows were installed in 2004.

Baseboard heaters are installed along the south and west walls under the windows. The room is lit by a ceiling fan in the center of the room. A smoke detector is installed on the wall near the closet.

Figure 1-27. Bedroom 104 Looking north. (SRJA 2014)

Figure 1-28. Bedroom 104 Looking southeast. (SRJA 2014)

Figure 1-29. Bedroom 104 Looking southwest. (SRJA 2014)

Figure 1-30. Bedroom 104 Closet. (SRJA 2014)

Figure 1-31. Bedroom 104 Door stop detail. (SRJA 2014)

Bathroom 105

Bathroom 105 is the only bathroom in the house (Figures 1-32 – 1-34). The room is 7'-3" by 5'-3" with a ceiling height of 7'-3." The walls and ceiling are painted plaster or gypsum wall board.

Millwork installed on the doors and windows matches other millwork throughout the house and is painted white. The flooring is sheet vinyl. This room was originally specified to have a linoleum floor.

The bathroom has been extensively remodeled since it was constructed as part of the 1937 renovation, but the configuration of the fixtures has not changed. A window was once located in the west wall that has been covered over from the interior but is still visible from the exterior. Door 105/1 is the original double recessed panel door and has the original hardware. A small

built-in cabinet is located over the basement stairs. It has a pair of wood doors with glass knobs and is trimmed to match the millwork in the house.

A baseboard heater is installed on the north wall. Lighting is provided by a wall light fixture installed above the vanity and a flush mount ceiling fixture/exhaust fan. The shower surround is grouted tile with a newer fiberglass liner installed to cover the tile. All fixtures and finishes date to a renovation 2004 and are in working condition.

Figure 1-32. Bathroom 105 Looking west. (SRJA 2014)

Figure 1-33. Bathroom 105 Looking northeast. (SRJA 2014)

Figure 1-34. Bathroom 105 Looking south. (SRJA 2014)

Basement Stair 106 and Mud Room 107

The Mud Room 107 serves as the back entry into the house (Figures 1-35 – 1-40). This is the entry that the occupants would use the majority of the time. The room opens to the kitchen to the north and contains the stair to the basement in the southwest corner. The room is only 5’ by 7’-4” at its largest. The walls and ceiling are plaster. There is a significant amount of cracking above the opening into the kitchen. This may be due to poor infill and drywall when the door frame was removed or due to settlement in the floor framing in this location. This would require further investigation and monitoring. The flooring is wood laminate. Door and baseboard millwork is newer and is a combination of painted door trim and stained baseboard. The door to the basement is an original two panel stained door with original hardware. The back Door 107/1 is a new fiberglass door. The panels do not match the other exterior door panel configurations. The door to the basement is installed to open over the stairs. This is a safety hazard and code violation.

Figure 1-35. Basement Stair 106 Looking south. (SRJA 2014)

Figure 1-36. Basement Stair 106 Looking east. (SRJA 2014)

Figure 1-37. Mud Room Looking north. There is significant cracking above this door, as indicated by the red lines. (SRJA 2014)

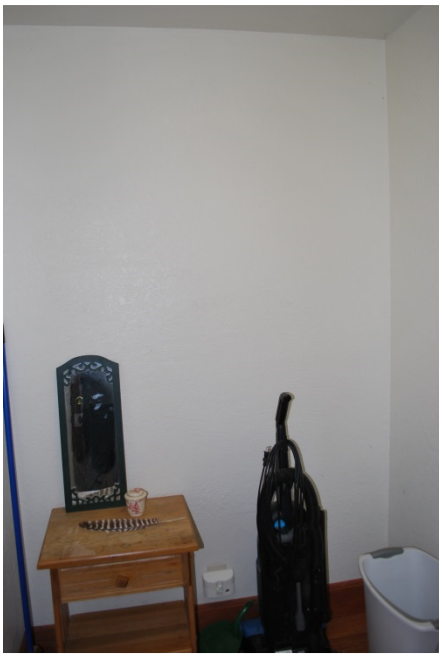


Figure 1-38. Mud Room Looking east. (SRJA 2014)

Figure 1-39. Mud Room Looking south at basement door. (SRJA 2014)

Figure 1-40. Mud Room Looking east at back entry door. (SRJA 2014)

Kitchen 108

Kitchen 108 is located on the west side of the first floor (Figures 1-41 – 1-45). The room is approximately 9’-0” by 10’-0” with a ceiling height of 7’-10.” The kitchen is accessible from the mud room to the south, the hall to the east and the dining room to the north. The walls and ceiling are plastered or are gypsum drywall and in good overall condition with only some minor

cracking. One crack above the door into the Mud Room may be due to settlement and requires further investigation.

The original cooking kitchen stove was exhausted into the north side of the chimney. The thimble is covered with a painted cover. The kitchen was remodeled in 1988 with new cabinets and counters. A new stove, vent hood and refrigerator were installed in 2003. Besides the Door 108/1 into the Hall, all millwork is new and dates to the flooring installation. The flooring is wood laminate and in good condition. The original plans call for the kitchen to have a linoleum floor.

Window 108 opening originally contained a pair of steel out-swing casement windows. The steel sash were removed in 1952. The existing aluminum clad wood window dates to 2008. The trim surrounding the window is not original. The openings between the Dining Room and the Mud Room have had the wood casing removed. Lighting is provided by two flush mount fixtures. The two masonry chimneys are located behind the east wall and are plastered.

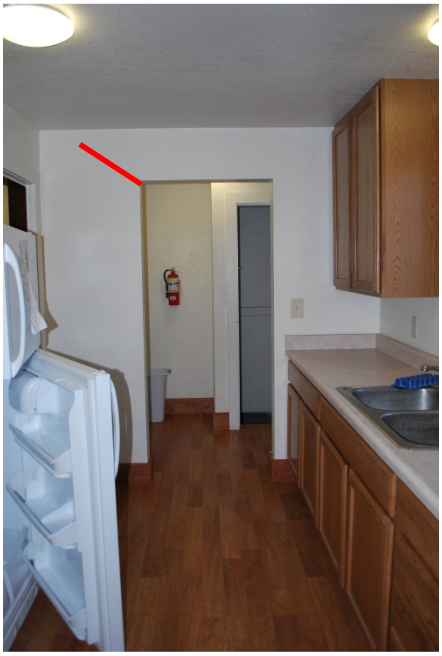


Figure 1-41. Kitchen 108 Looking south. The red line indicates cracking. (SRJA 2014)

Figure 1-42. Kitchen 108 Looking southeast. The red arrow indicates cracking. (SRJA 2014)

Figure 1-43. Kitchen 108 Looking northwest. (SRJA 2014)

Figure 1-44. Kitchen 108 Looking west at sink and Window 108. (SRJA 2014)

Figure 1-45. Kitchen 108 Looking east. (SRJA 2014)

Dining Room 109

The Dining Room 109 is in the northwest corner of the first floor and is accessed from the Kitchen to the south and the Living Room to the east (Figures 1-45 – 1-49). The room is 11' by 9'-6' with a ceiling height of 9'-6." This was once the kitchen when this house was the Rangers Dormitory. When the house was remodeled in 1937, the floor in this room was raised approximately 18-inches. The walls and ceiling are painted plaster. The ceiling is sloped along

the north and south sides to match the roof lines. The walls and ceiling are in good overall condition with only minor cracks that are typical for the age of the house.

Door, window and baseboard millwork matches other millwork throughout the house. The floors are a wood laminate.

Window openings 109 and 110 were originally pairs of steel out-swing casement windows. The steel sash were removed in 1952. The existing windows are all Pella aluminum clad wood casements installed in 2008. The windows and trim installed from the window replacement were stained but do not match the existing stained trim. Window 110 is required to be tempered by current code since the glass is located less than 18-inches above the finish floor. This needs to be verified.

A baseboard heater is installed along the west wall and has exposed conduit run along the top of the baseboard. The room is lit by a chandelier in the center of the room.

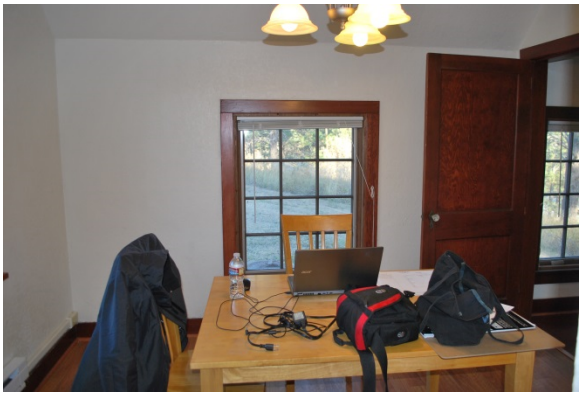


Figure 1-46. Dining Room 109 Looking north. (SRJA 2014)

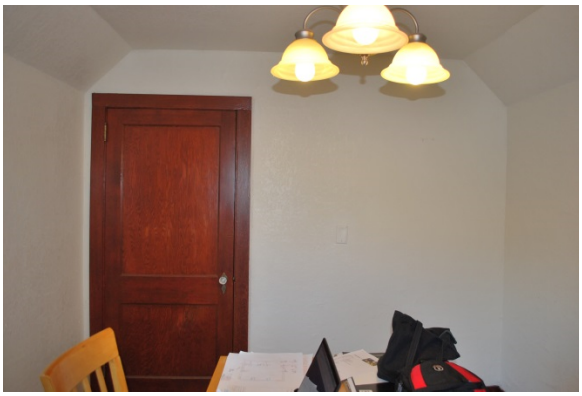


Figure 1-47. Dining Room 109 Looking east. (SRJA 2014)

Figure 1-48. Dining Room 109 Looking south. (SRJA 2014)

Figure 1-49. Dining Room 109 Looking west. (SRJA 2014)

Bedroom 200

Bedroom 200 is the only room located on the second floor (Figures 2-1 – 2-5). The room is approximately 16'-0" by 21'-0" with sloped ceilings to match the roof lines. The ceiling height in the center of the room is 6'-5," while the knee walls are 4'-3." The park does not rent this as a bedroom, due to it not having private access to a bathroom. The walls and ceiling are painted plaster or gypsum wallboard. There are no records indicating this room remodel.

The original 1931 plans for the Rangers Dormitory do not show a second floor. When the house was completed, it had three bedrooms on the first floor. Photographs of the back of the house show a dormer in place as early as 1934 with two pairs of steel casement windows. The dormer could have been installed any time between 1932 and 1934. In 1935, the maintenance files show there was a renovation, but this was very likely the excavation of the basement. No stairs to the second floor are shown on any of the floor plans on file.

The floor is carpeted over an unknown substrate. All finishes, including the baseboard, door trim and door are contemporary and do not have any historic significance. Lighting is provided by three flush mount fixtures. An electric baseboard heater is installed along the east wall and under the window. The existing windows are Pella aluminum clad wood casements. An exhaust fan in the ceiling exhausts warm air to the attic. A vent in the floor in the southwest corner of the

room pulls air from the first floor. This vent does not appear to have a damper to close the opening; the lack of closure may lead to a privacy issue of having the bedroom open to the hall below. There is no fire ladder provided from this space at the windows.

Figure 2-1. Bedroom 200 Looking down stairs to the north. (SRJA 2014)

Figure 2-2. Bedroom 201 Looking north. (SRJA 2014)

Figure 2-3. Bedroom 200 Looking south. (SRJA 2014)

Figure 2-4. Bedroom 200 Looking east. (SRJA 2014)

Figure 2-5. Bedroom 200 Looking north towards closets. (SRJA 2014)

Existing Conditions – Structural

HS-08 is a wood framed one-and-one-half-story structure with a partial basement. The foundation consists of two crawl spaces separated by a basement, Room 001. The basement area was not part of the original construction and was added at a later date.

Basement

The original crawl space in the basement area was excavated to a lower depth to provide head room and furnace installation. The basement Room 001 has a concrete slab-on-grade floor. New stone retaining walls were constructed in ward approximately two to three feet from the face of the existing shallow stone foundation walls to provide for the deeper excavation (Figure S1). The retaining walls are present on the east, west and south walls. The thickness of the retaining walls could not be confirmed. The added stone walls extend up from the slab-on-grade and have a concrete cap covering the soil between the two walls. The concrete cap is cracked and there is some vertical displacement at the cracks (Figure S2). It is likely the soil between the original wall and the newer retaining wall has settled. There is no visible evidence that the cap is anchored to the stone retaining wall.

Figure S1. Basement Room 001 with steel posts and perimeter retaining walls looking southwest. (SEA 2015)

Figure S2. Cracks in retaining wall cap southeast corner. (SEA 2015)

A heavy coating is present on the original stone foundation wall and the newer stone retaining wall. Cracks are visible in the stone retaining wall however no substantial displacement was observed at these cracks (Figure S3).

Figure S3. Cracks in west stone retaining wall. (SEA 2015)

The basement floor is concrete and does not display any significant cracking.

A steel beam is present running north-south in the center of the basement. The beam is 8 ¼-inches deep with a 4-inch wide flange. This beam is supporting the original floor joists. The steel beam is supported by four 3 ½-inch diameter steel posts which bear on concrete pilasters. The beam is performing adequately.

North Crawl Space 003

Two crawl spaces are present. One on the north side of the structure and the other on the south. The north Crawl Space 003 is below Rooms 100, 108 and 109. The interior footings are trapezoidal shaped pilasters that bear at, or a little below the crawl space grade. There are five pilasters running east-west which are spaced roughly five feet on center. The pilasters support a 5 ½" x 6 ½" (actual) girder. The girder supports the 2 x 6 (nominal) floor joists. The girder bears on two wood 2xs which sit on top of the five interior pilasters. The girders pocket into the east and west stone foundation walls.

A notch is present in the girder 38-inches west of the center pilaster. The notch dimension is three inches deep by one-foot wide (Figure S4). This represents a significant reduction of cross section of this girder.

Figure S4. Notch in floor girder. (SEA 2015)

The perimeter foundation walls are stone. Observation of the perimeter stone walls was restricted due to limited access in the crawl space and the presence of insulation.

Trenches have been excavated in the crawl space area some adjacent to the existing pilasters. It is assumed that they were hand dug in order to get access to install or repair plumbing or other utilities. One trench has been excavated between two pilasters (Figure S5). They are the second pilaster from the east and the middle pilaster. This has undermined the capacity of the existing pilasters. The middle pilaster has been severely undermined and has settled and rotated. It has settled to the point that the girder above is no longer bearing on it (Figures S6 and S7).

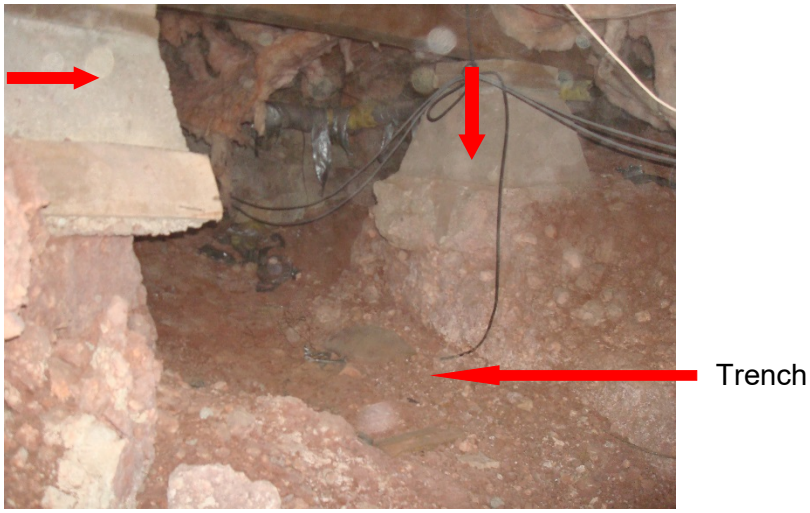


Figure S5. Trench adjacent to two pilasters looking northeast. (SEA 2015)

Figure S6. Undermined pilaster looking northeast. (SEA 2015)

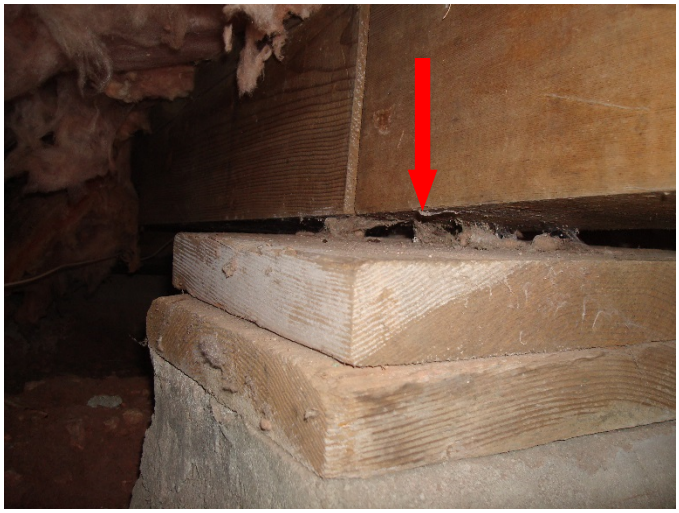


Figure S7. Gap between floor girder and pilaster. (SEA 2015)

There is another trench which runs north-south, adjacent to the west foundation wall. While not as severe, it is excavated too close to the westernmost pilaster and also the west foundation wall (Figure 8).

Figure S8. Trench adjacent to west foundation wall. (SEA 2015)

The two chimneys are founded in the north crawl space. One chimney is concrete brick and the second is clay brick (Figure S9). The concrete brick chimney is directly north of the clay brick chimney. The concrete brick chimney bears on a concrete footing at the original crawl space elevation. The clay brick chimney bears deeper at the bottom of the trench elevation. It appears as if the clay brick chimney is constructed around the footing of the concrete brick chimney indicating that the concrete brick was constructed first, and the clay brick chimney was added at a later date.

Figure S9. Two chimneys looking west. (SEA 2015)

The footing for the newer clay brick chimney could not be observed. Further investigation including some exploratory demolition should be performed to confirm the presence of an adequate footing.

According to the drawings identified as “Alternating Ranger’s Dormitory into a Residence” dated December 1936 the floor of the kitchen and dining room was to be raised 18-inches. While access was very limited, it was confirmed that the 1936 floor framing was installed. The original floor framing remained in place. Posts were installed to support the higher floor level. The floor post bear on the original floor framing. Details of the floor framing and support were not obtained due to limited access (Figure S10).

Original floor

Added floor framing

Figure S10. 1936 Kitchen floor bearing on original floor. (SEA 2015)

South Crawl Space 002

The south Crawl Space 002 is much smaller measuring only about 9’-6” by 11’-6.” The south crawl space is below Room 104. The floor framing consists of 2 x 10 (nominal) joists spanning from the east to west walls (Figure S11).

Figure S11. South Crawl Space 104 looking southeast. (SEA 2015)

First Floor

The first floor is finished. No structural framing members were visible.

Second Floor

A portion of the second floor is finished. There is access to the attic areas around the finished Rooms 200 and 200A. The concrete and brick chimneys are present in the attic. The chimneys appear to be in sound condition in the attic. Surrounding the chimney, the roof rafters butt up to the face of the brick. There are 2xs between the roof rafters. Anchorage of the 2xs to the chimneys was not observed (Figure S12).

Figure S12. Framing at rafter ends at chimney. (SEA 2015)

There is a flue penetration near the northeast corner of the roof framing. New blocking was added and appears to be functioning adequately (Figure S13).

Figure S13. Framing for flue penetration. (SEA 2015)

Exterior Walls

A crack was observed on the west face of the structure near the north end. This is also where a trench has been dug adjacent to the west foundation wall. The crack geometry is consistent with settlement (Figure S14).

Figure S14. Crack in west wall. (SEA 2015)

Deck

A deck has been added to the structure (Figure S15). The deck begins at the east Door 100/1, travels south and extends across the south face of the building. The deck is constructed of wood framing and decking with 2 x 8 (nominal) joists spaced at approximately 24-inches on center. Drawing sheet TS2 shows a plan of the existing deck framing. The joists span either from beam to beam, or from stone steps to beams. In most locations, the beams are double 2 x 8's bolted into 4 x 4 posts. The posts are direct buried into the ground (Figure S16). Along the western one third of the south face, the beam is made up of only one 2 x 8. This is the area south of Room 104.

At Door 100/1 the deck joists bear on the stone step. The decking is cut around the top step (Figures S17 and S18). To achieve accurate elevation, the joists are notched at the bearing location. At Door 103/1 the one beam and the joists at this location bear on stone stairs.

The joist span lengths vary from approximately 9'-2" to 11'-2". The deck joists and beams were checked based on a code required live load of 40 psf for residential decks. The species was not confirmed. A species of Douglas Fir was assumed along with grade 2 lumber. The calculated live load capacity exceeds the code requirement.

Along the west third of the south face, the beams are butt spliced. This is not an effective splice for wood construction. This occurs south of Room 104 (Figure S19). The guardrails are constructed of 2 x 2 pickets that are screwed to the edge joist (Figure S20). The pickets do not

meet the current code requirement for spacing. In accordance with current IBC code requirements, the maximum spacing can only be 4-inches.

The screws anchoring the pickets to the edge joists are approximately 3 ½-inches to 4-inches on center. This does not provide the strength to meet the code requirement of 50 pounds per foot or a 200 pound concentrated load applied in any at any direction at the top of the guardrail.

Figure S15. Deck at south elevation. (SEA 2015)

Figure S16. Deck post direct buried in soil. (SEA 2015)

Figure S17. Joists bearing on original stone tread. (SEA 2015)

Figure S18. Decking cut around top stone tread. (SEA 2015)

Figure S19. Butt splice of wood beam. (SEA 2015)

Figure S20. Guardrail picket connection. (SEA 2015)

Existing Conditions - Mechanical, Electrical and Plumbing

Figure MEP01. Quarters – HS-08. (SRJA 2014)

Introduction

Henderson Engineers conducted a site visit on January 26th through the 29th of 2015. The existing mechanical, electrical, and plumbing (MEP) systems are consistent with residential equipment found in homes of this size. None of the MEP systems currently installed are original to the structure. The current MEP systems consist of 240/120V electrical distribution system, electric heating, electric hot water heating system, a domestic water system, and a drain, waste, and venting system.

This historic structure is not currently used during the winter season. The domestic water is shut off and the sanitary sewer is winterized with glycol during this time. Electricity and minimal heating remain operational during winter unoccupied periods.

Potable and irrigation water is supplied to the park from a remote pumping station. The pumps deliver water to a holding cistern located to the northeast of the site. The stored water is at a higher elevation than the rest of the site. From there the water is gravity fed through a series of water mains to supply the park with potable water and irrigation water.

A series of 4-inch and 6-inch sanitary sewer branches exit the historic structures and gravity drain into a private sewer main system owned by the National Park Service. This private sewer main appears to be routed under the main drive between the visitor's center and the housing area.

The electrical service is supplied to the site by the Black Hills Corporation and is fed from a centrally located, single-phase, pole mounted transformer located on the southwest side of Building HS-06. The electrical service on the secondary side of the transformer is 240/120V, single phase, 3-wire. The service conductors extend overhead along the service road to supply the buildings with power.

The 2012 International Building Code and the 2011 National Electrical Code (NEC) were used for the evaluation of the MEP systems.

Heating and Cooling Systems

The original heating system, dated in the construction set from 1936, consisted of a fuel-fired furnace located in the basement. No cooling system appears in the original 1936 construction set.

The original furnace system was removed and replaced with an electric baseboard heating system (Figure M01) throughout the building. The electric heaters were installed during the remodel that took place in the 1980s. A pellet burning stove was added to Living Room 100 in 1980s and at some point was removed. The flue through the roof remains but has been capped at the ceiling of the Living Room (Figure M02). The flue through the wall has been capped (Figure M03).

Overall the existing heating and ventilation systems appear to be in good working order and are adequate for the building's intended use.

No makeup air is being provided for the exhaust systems. This creates the potential for outdoor air infiltration and the possibility of moisture and mold problems. Refer to the treatment recommendations section for additional information.

Figure M01. Example of electric baseboard heaters In Living Room 100. (HEI 2015)

Figures M02 and M03. Flue cap in Living Room 100 ceiling and wall. (HEI 2015)

This building does not have a cooling system or a forced air system installed. Ceiling fans are installed throughout the first and second floors for general air circulation (Figure M04).

An exhaust hood is located above the stove in the Kitchen 108 and is ducted to the exterior through the roof (Figure M05). Basement 001 has a dryer vent that terminates on the east exterior wall with a wall hood (Figure M06).

Figure M04. Example of ceiling fan in Bedroom 104. (HEI 2015)

Figure M05. Exhaust hood and termination in Kitchen 108. (HEI 2015)

Figure M06. Basement 001, Dryer vent and termination. (HEI 2015)

A ceiling mounted combination exhaust fan and light (Figure M08) serves Bathroom 105. It is ducted to an inaccessible space above the restroom and appears to discharge exhaust air into the attic space. No roof caps or wall hoods serving this fan are visible from the exterior. Per International Mechanical Code section 501.3, air shall not be exhausted into an attic space. Moisture can potentially build up in the attic creating deterioration and mold problems.

A wall mounted electric heater (Figure M08) serves the Basement 001.

A ceiling mounted exhaust fan pulls air from the first floor into Bedroom 200 through a 24” x 14” grille in the ceiling of Hall 101 (Figure M08). The air is then exhausted into the attic space. The fan is controlled by a wall switch.

Figure M07. Bathroom 105, Exhaust fan. (HEI 2015)

Figure M08. Electric heater in Basement 001. (HEI 2015)

Figure M09. Exhaust fan in Bedroom 200 and grille in Hall 101. (HEI 2015)

Plumbing Systems

Prior to entering the building, the water main splits to serve the potable water system in the building and the irrigation system on the site. The irrigation system pipe is routed above grade, through an anti-siphon pressure vacuum breaker, routes back below grade, and then runs to concealed sprinklers (Figure P03). The irrigation system is controlled by manually operated shut off valves. The potable water system is routed below grade and enters the building in the northwest corner of Basement 001. Shutoff valves are located exterior to the building for both systems (Figure P01, P02, P05).

Figure P01. Shutoff valves, irrigation vacuum breaker, and sanitary sewer cleanout. (HEI 2015)

Figure P02. Exterior shutoff valves for water system. (HEI 2015)

Figure P03. Irrigation vacuum breaker. (HEI 2015)

The ca. 1937 plumbing system, shown in the construction drawings, consisted of domestic water piping system, a hot water heater located in the kitchen, and a drain, waste, and vent piping system. The interior plumbing systems original to the structure were removed and replaced with an all plastic piping system in the remodel that took place in the 1980s. Overall the existing water systems and drain, waste, and vent systems appear to be in good working order and are adequate for the building's intended use.

The basement (Rooms 001) plumbing systems consist of the domestic water entry, water heater (Figure P04), sump pump, exposed water piping, and exposed drain, waste, and vent piping. The first floor plumbing systems serve the Kitchen 108, Bathroom 105, and exterior hose bibbs (Figure P05).

A ¾-inch copper domestic water line enters the building through the north basement wall in the northwest corner of Basement 001 (Figure P06). The domestic water goes through a domestic water meter, located along the north wall of this room.

Figure P04. Wall hydrant and sump pump termination. (HEI 2015)

Figure P05. Domestic electric water heater in Basement 001. (HEI 2015)

Figure P06. Domestic water entry in Basement 001. (HEI 2015)

The water then exits the meter to serve the building plumbing fixtures. All domestic water piping downstream of the copper water entry is cross-linked polyethylene (PEX) with brass fittings (Figure P07). The domestic entry does not currently have a building backflow preventer installed.

The sanitary waste piping is polyvinyl chloride (PVC) drain, waste, and vent (Figure P07). The first floor plumbing fixtures and floor drains located in Basement 001 drain into a four-inch sanitary waste system that is routed below the basement floor (Figure P07). Sanitary cleanouts are located in lines prior to the line going beneath the basement floor. The four-inch building sewer is routed to the private sewer system owned by the National Park Service.

The Kitchen 108 has a two-compartment stainless steel sink (Figure P08). Basement 001 has washing machine connections for hot water, cold water, and drain (Figure P09). Bathroom 105 has a counter mounted lavatory, white vitreous china water closet, and a molded fiberglass tub (Figure P10 and Figure P11).

Figure P07. Example of water and sanitary piping system in Basement 001. (HEI 2015)

Figure P08. Stainless steel two-compartment sink in Kitchen 104. (HEI 2015)

Figure P09. Washing machine connections in Basement 001. (HEI 2015)

Figure P10. Lavatory and water closet in Bathroom 105. (HEI 2015)

Figure P11. Shower in Bathroom 105. (HEI 2015)

Additional plumbing systems include a sump pit and pump located in the basement. The sump discharge is routed through Crawl Space 001 out the north wall. The discharge piping is above grade and is subject to freezing (Figure P12).

Figure P12. Sump pump in Basement 001. (HEI 2015)

Storm water from the roof is drained via exterior gutters and downspouts. The downspouts are either daylighted at grade with corrugated plastic pipe or routed to below grade (Figure P14).

Figure P13. Example of gutter and downspout systems. (HEI 2015)

Electrical and Lighting Systems

The electrical service to the property is supplied by the Black Hills Corporation and is fed from a centrally located, single-phase, pole mounted transformer located on the south side of Building HS-06. The electrical service on the secondary side of the transformer is 240/120V, single phase, 3-wire. The service conductors extend overhead along the service road to a power pole located west of the HS-08 house. The service conductors from the power pole are routed overhead to a weatherhead located on the west side of the house and then in conduit to a meter on the exterior of the house (Figure E01). The meter is an Elster digital meter (Figures E02 and

E03). From the meter the conduit goes down the wall and pokes through the wall above ground. It terminates in the electrical service panelboard.

Figure E01. Service conductors at weatherhead on the west side of the house. (HEI 2015)

Figure E02. Exterior electrical service meter on the west side of the house. (HEI 2015)

Figure E03. Exterior electrical service meter on the west side of the house. (HEI 2015)

The electrical service panelboard is located on the west wall of Basement 001 (Figure E04). It is a 225A, 42-pole, 240/120V single phase, 3-wire panelboard with a 225A main circuit breaker (Figure E05). This panelboard serves all of the power loads in the building including lighting, HVAC, kitchen equipment and general purpose receptacles. The panelboard is manufactured by Westinghouse and appears to be in good condition. The date of installation could not be confirmed. There are currently no arc fault circuit interrupter (AFCI) circuit breakers in the panelboard which are required in residential construction by the NEC. Overall the existing electrical system appears to be in good working order.

Figure E04. Electrical service panelboard located in Basement 001. (HEI 2015)

Figure E05. Electrical panelboard located in Basement 001. (HEI 2015)

The electrical distribution and wiring is consistent with methods used in residential construction. The distribution wiring is a combination of exposed NM cable and conductors run in metallic raceways. Most of the branch circuit conductors coming out of the main panelboard are exposed NM cable. General use grounded duplex receptacles are installed throughout the

house. Ground Fault Circuit Interrupting (GFCI) receptacles are installed in the restroom and kitchen.

There is an abandoned panelboard located near the top of Basement Stair 106 that is now being used as a junction box. The electric water heater and basement wall heater located in Basement 001 do not appear to have local disconnect switches but the panelboard serving them is within sight which is acceptable per the NEC. The sump pump has a cord and plug disconnecting means.

The interior lighting throughout the house consists of incandescent and screw base compact fluorescent fixtures that appear to be in good condition. The exterior doors on the west and south side of the house have a single incandescent glass jar sconce mounted above or to the right of the door. The exterior door on the east side of the house does not have any lighting. The exterior lighting is controlled individually by a toggle switch located on the interior side of each door.

Basement 001 has four glass globe fixtures lamped with incandescent lamps (Figure E06). The two fixtures located closest to the stairs are controlled by a toggle switch that is pendant mounted from the ceiling near the bottom of the stairs. The fixture located in the northeast area of the basement is controlled by a toggle switch on the east wall. The fixture located in the southeast area of the basement is controlled via a pull chain.

Living Room 100 has a five-blade ceiling fan with a two-lamp glass bowl light kit and incandescent lamps (Figures E07). The ceiling fan is switched by three-way toggle switches located near the exterior door, Bedroom 102 and Dining Room 109.

Hall 101 has a glass globe incandescent fixture mounted in the center of the hallway. (Figure E08). It is controlled by a toggle switch.

Figure E06. Light fixtures located in Basement 001. (SRJA 2014)

Figure E07. Ceiling fan located in Living Room 100. (SRJA 2014)

Figure E08. Light fixture located in Hall 101. (HEI 2015)

Bedrooms 102, 103 and 104 each have a five-blade ceiling fan with a two-lamp glass bowl light kit and incandescent lamps (Figure E09). They are each controlled by a toggle switch.

Bedroom Closet 102A has an incandescent jar fixture with a compact fluorescent lamp located on the center of the ceiling (Figure E10). It is controlled by a pull chain.

Bedroom Closets 103A and 104A each have a glass globe fixture located on the center of the ceiling similar to the fixtures located in the basement (Figure E06). Each closet fixture is controlled with a pull chain.

Bathroom 105 has an incandescent exhaust fan/ light fixture (Figure E11) and a three-lamp incandescent bathroom vanity fixture (Figure E12). Both fixtures are controlled individually by toggle switches.

Figure E09. Ceiling fan located in Bedrooms 102, 103 and 104. (HEI 2015)

Figure E10. Light fixture located in Bedroom closet 102A. (HEI 2015)

Figure E11. Combination exhaust fan/ light located in Bathroom 105. (HEI 2015)

Figure E12. Bathroom vanity fixture located in Bathroom 105. (HEI 2015)

Basement Stair 106 has a glass globe light fixture similar to the basement fixtures (Figure E06). It is controlled by a toggle switch.

West Entry 107 has a glass globe incandescent fixture similar to the Hall 101 fixture (Figure E08). It is controlled by a toggle switch.

Kitchen 108 has two glass globe incandescent fixtures similar to the Hall 101 fixture (Figure E08). They are both controlled by a toggle switch located above the counter on the south wall.

Dining Room 109 has a three-lamp glass shade incandescent chandelier mounted in the center of the room. (Figure E13). It is controlled by a toggle switch.

Figure E13. Light fixture located in Dining Room 109. (HEI 2015)

Bedroom 200 has three glass globe incandescent fixtures similar to the Hall 101 fixture (Figure E08). Two are mounted in the center of the main room and one is mounted in the center of the northeast closet alcove. The two center lights are controlled by three-way toggle switches located near the stairs on the 1st and 2nd floors. The closet fixture is controlled by a toggle switch located on the wall near the fixture (Figure E14).

Figure E14. Switches located in Bedroom 200. (SRJA 2014)

The exhaust fan in Bathroom 105 has a toggle switch disconnect located next to the bathroom mirror. The exhaust fan in Bedroom 200 has a toggle switch disconnect located in the southwest corner of the room.

The telephone service runs in conduit underground to the telephone demark point located on the north side of the exterior of the house (Figure E15). CAT5e wire runs from the telephone demark point along the wall and pokes through the wall above ground. A TV satellite antenna was installed on the west side of the house exterior but the satellite dish has since been removed (Figure E16).

Figure E15. Telephone service entrance located on the north exterior of the house. (HEI 2015)

Figure E16. Satellite TV antenna pole located on the west exterior of the house. (HEI 2015)

Fire Alarm Systems

The fire alarm system consists of hardwired smoke detectors with battery-backup. There is one located in Basement 001, in Bedrooms 102, 103, 104 and 200, and in Hall 101.

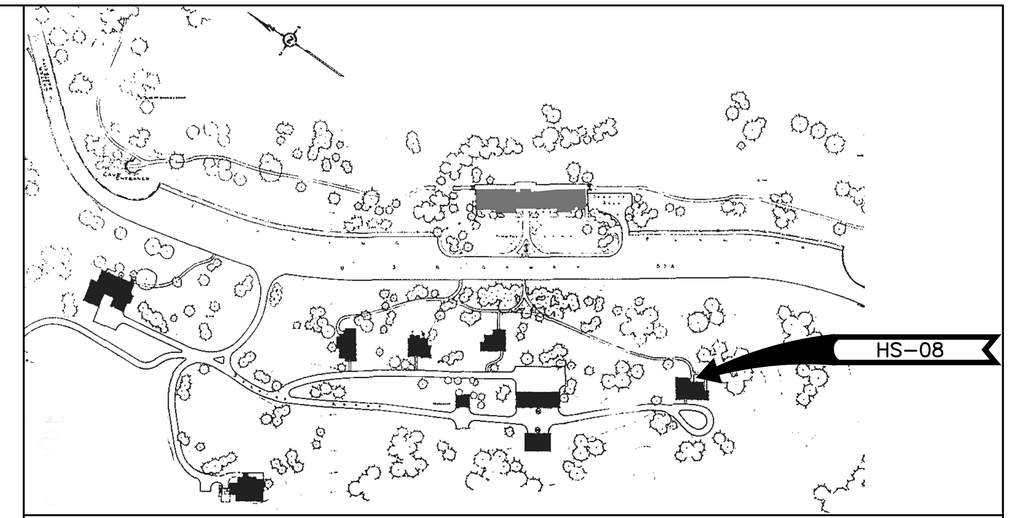
Fire Protection Systems

The house has two hand activated dry chemical fire extinguishers. The first is located in Basement 001 and the second is located in West Entry 103 (Figure F01).

Figure F01. Fire extinguishers. (Basement 001-Left, West Entry 103-Right) (HEI 2015)

HS–08 QUARTERS
HISTORIC STRUCTURES REPORT
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK

EXISTING CONDITION DRAWINGS
HOT SPRINGS, SOUTH DAKOTA



HISTORIC HOUSING AREA, WIND CAVE NATIONAL PARK, HOT SPRINGS, SOUTH DAKOTA
(WIND CAVE NATIONAL PARK HISTORIC CONTEXTS AND NATIONAL REGISTER GUIDELINES REPORT, 1992)

HS–08 QUARTERS (SRJA 2014)

INDEX OF DRAWINGS

00 COVER

ARCHITECTURAL
A0 BASEMENT/FOUNDATION FLOOR PLAN AND FIRST FLOOR PLAN
A1 SECOND FLOOR PLAN AND ROOF PLAN
A2 EAST ELEVATION AND SOUTH ELEVATION
A3 WEST ELEVATION AND NORTH ELEVATION

ELECTRICAL
E0 BASEMENT/FOUNDATION FLOOR PLAN AND FIRST FLOOR PLAN
E1 SECOND FLOOR PLAN

MEASURED IN NOVEMBER 2014

HISTORIC STRUCTURES REPORT UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE DENVER SERVICE CENTER	TITLE OF PROJECT EXISTING CONDITION DRAWINGS HS–08 QUARTERS HISTORIC HOUSING AREA WIND CAVE NATIONAL PARK REGION MIDWEST · COUNTY CUSTER · STATE SOUTH DAKOTA	DRAWING NO. 108 128875 PMIS/PKG NO. 158029 SHEET 1 OF 7	

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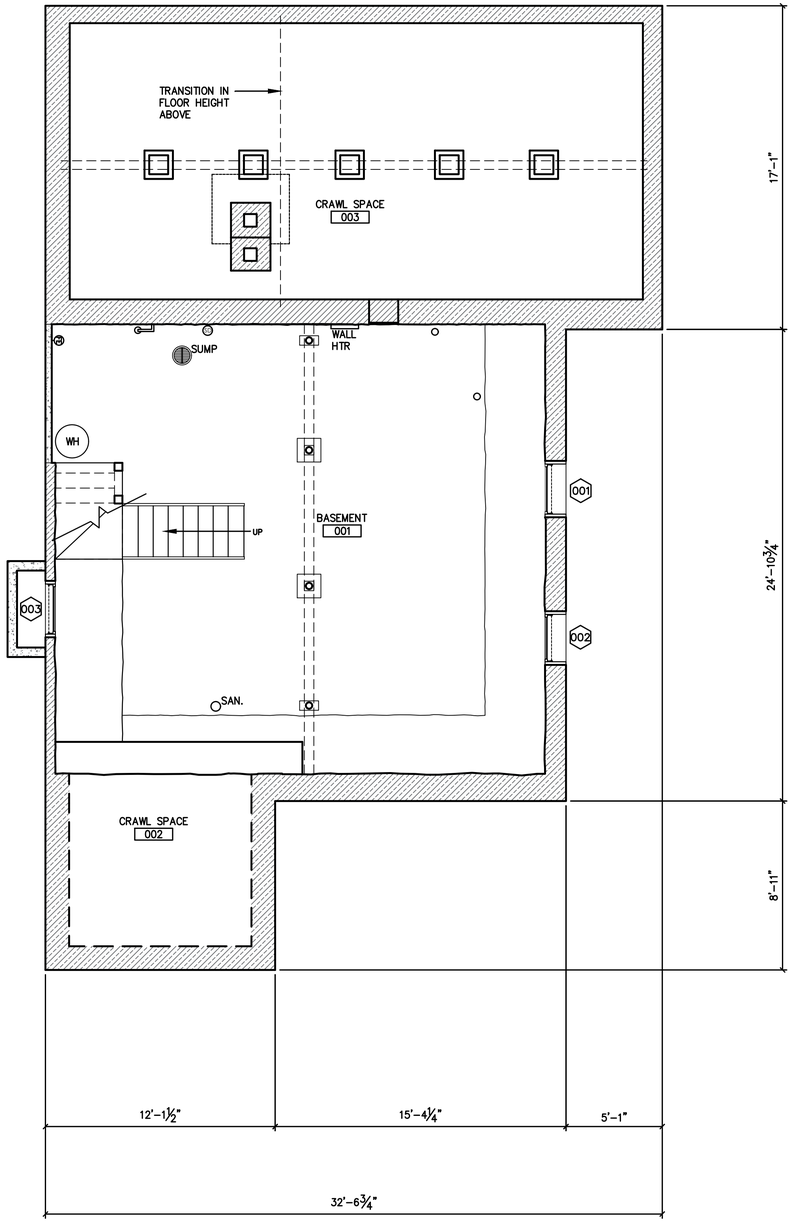

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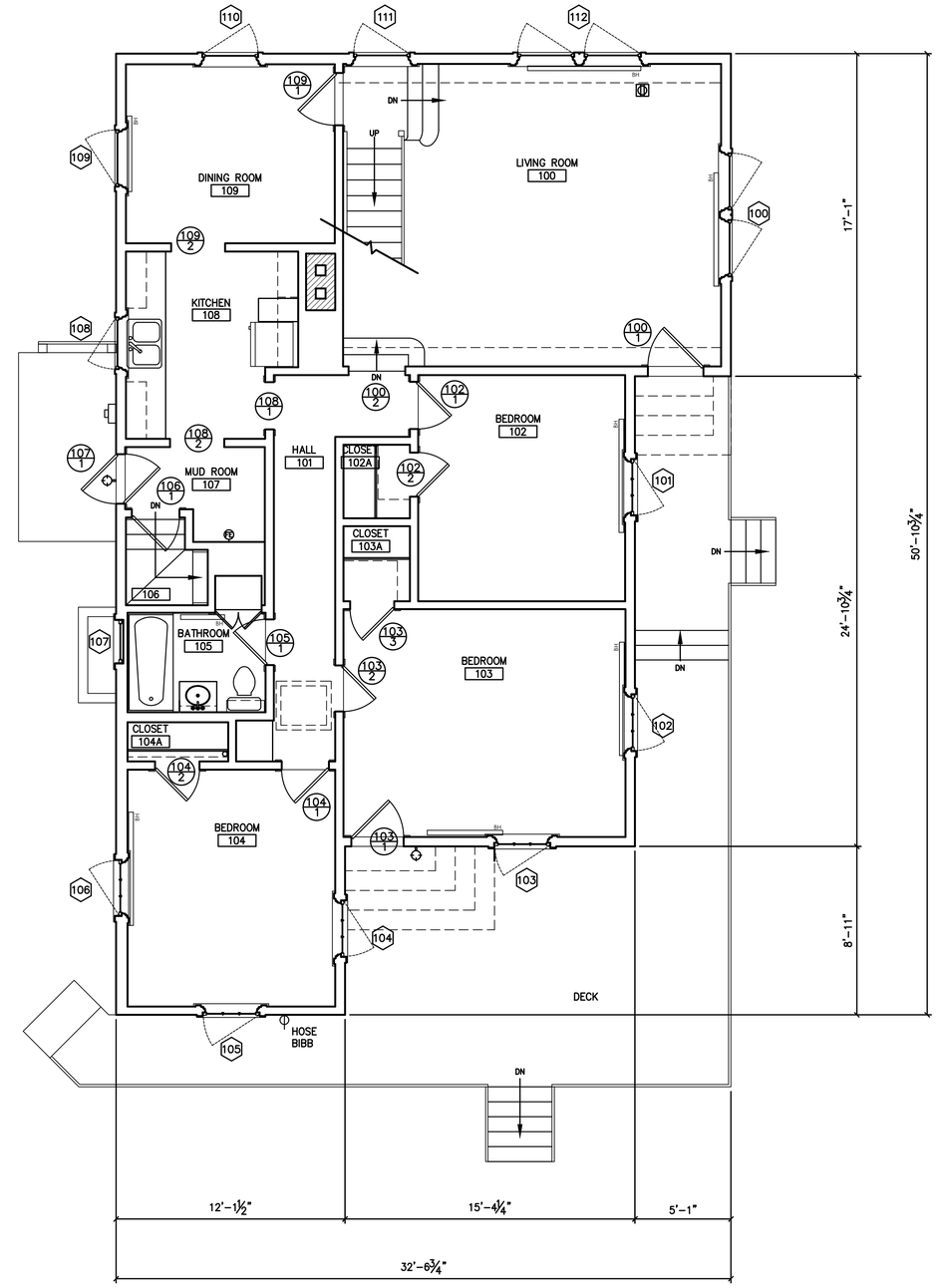

2 A0 EXISTING HS-08 FIRST FLOOR PLAN
1/4" = 1'-0"

DRAWING KEY:

- MASONRY FOUNDATION WALLS
- CONCRETE FOUNDATION WALLS

4 0 4 8
SCALE OF FEET

Susan Richards Johnson & Associates, Inc.
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64106
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DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
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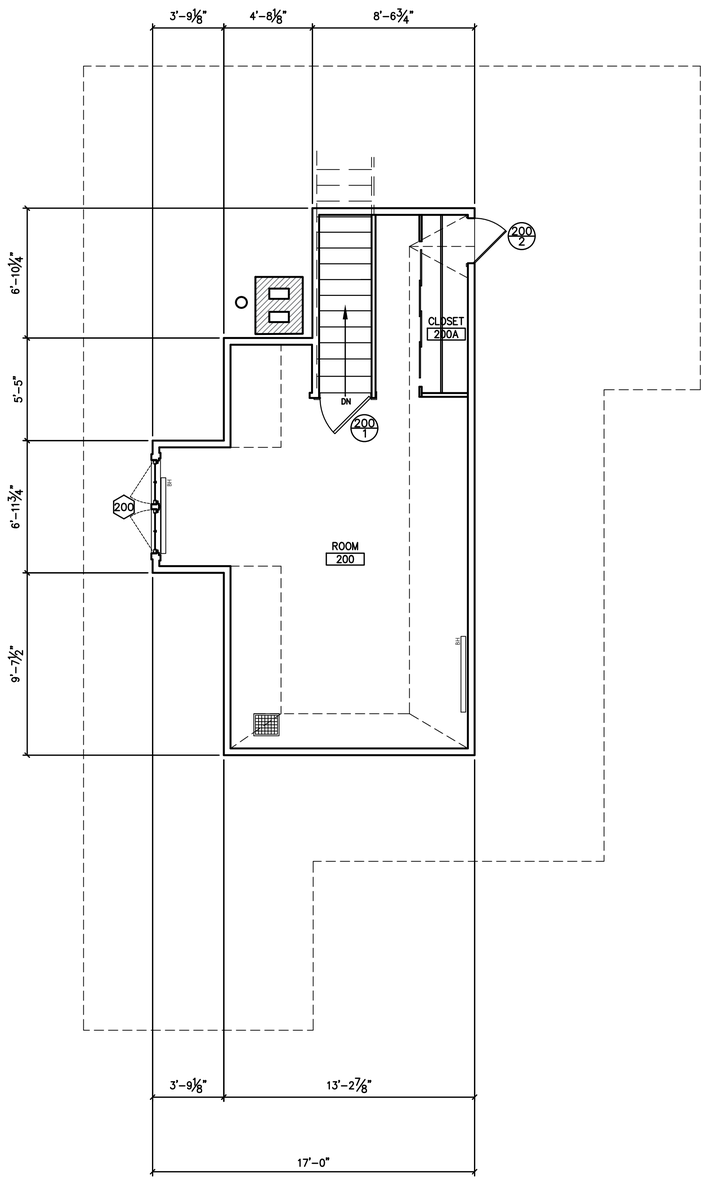
DATE: 10/23/15			



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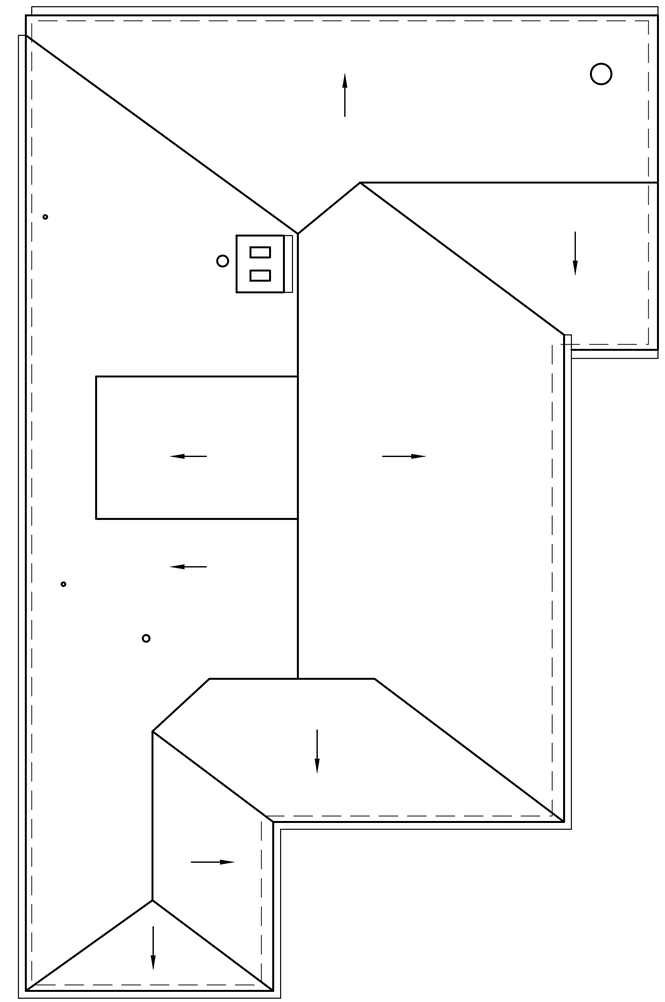

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1 A2 EXISTING HS-08 EAST ELEVATION
1/4" = 1'-0"

2 A2 EXISTING HS-08 SOUTH ELEVATION
1/4" = 1'-0"

3 A2 EXISTING HS-08 EAST ELEVATION WITH DECK
1/4" = 1'-0"

4 A2 EXISTING HS-08 SOUTH ELEVATION WITH DECK
1/4" = 1'-0"

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128875
PMIS/PKG NO. 158029
SHEET 4 OF 7

1 A3 EXISTING HS-08 WEST ELEVATION
1/4" = 1'-0"

2 A3 EXISTING HS-08 NORTH ELEVATION
1/4" = 1'-0"

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HOT SPRINGS, SOUTH DAKOTA

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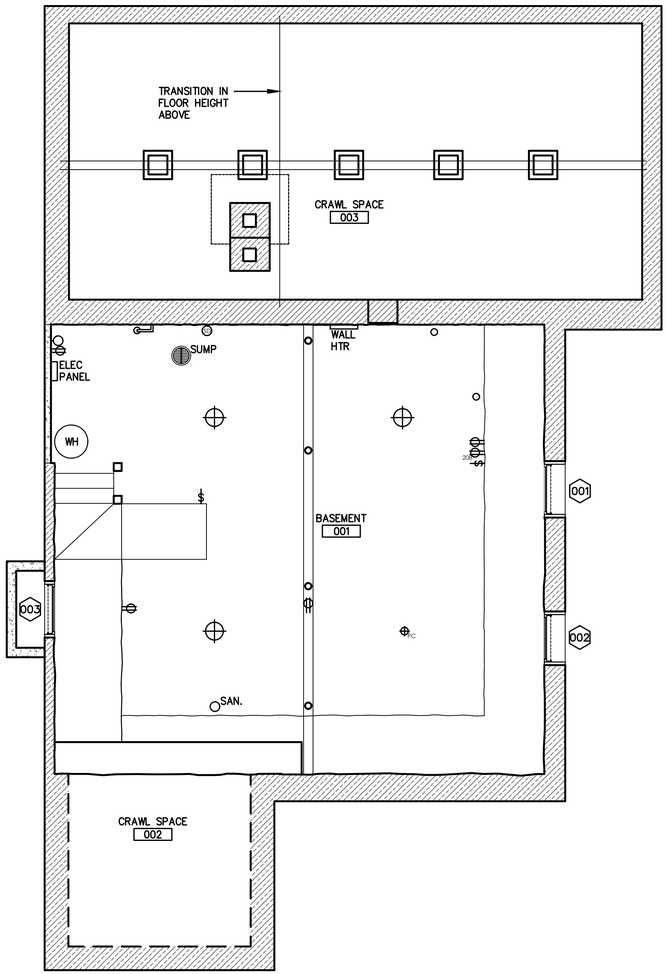

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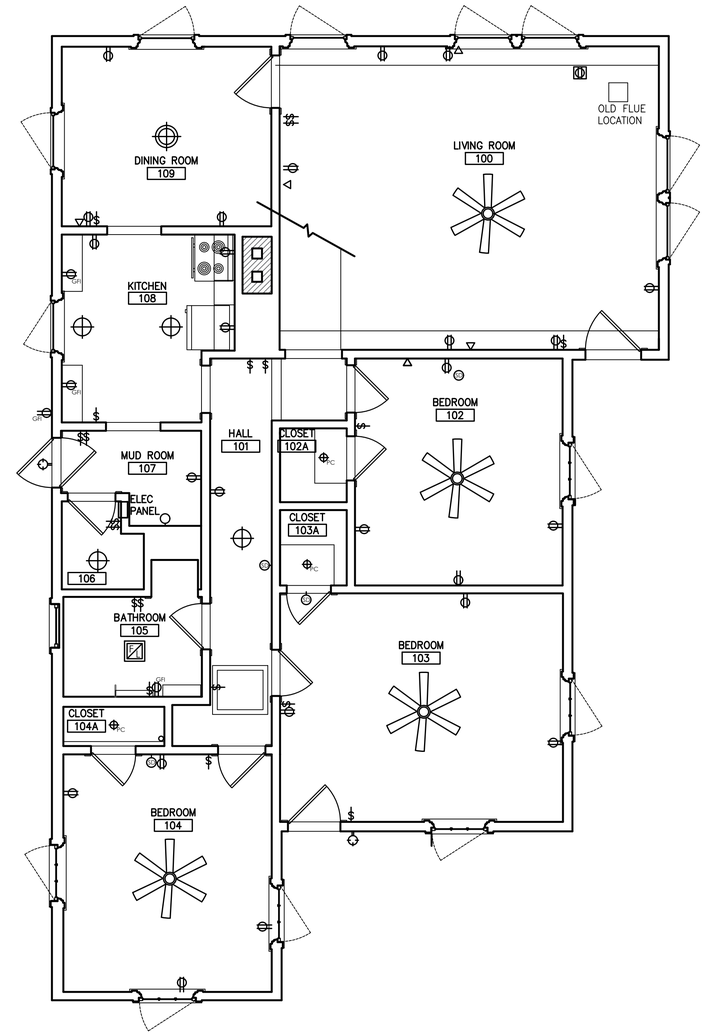

2 EO EXISTING HS-08 FIRST FLOOR ELECTRICAL PLAN AND REFLECTED CEILING PLAN
1/4" = 1'-0"

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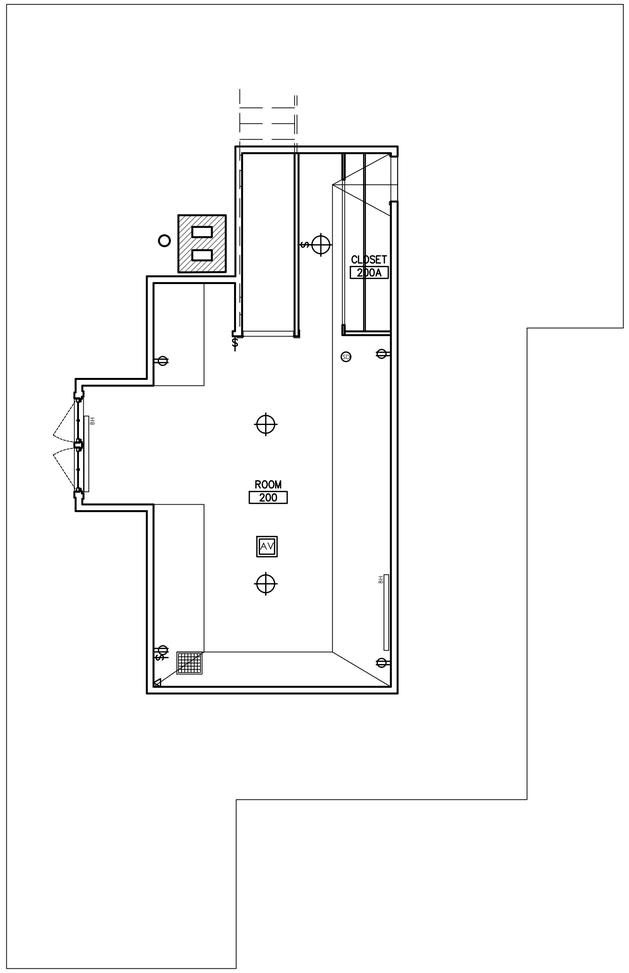

E1 / A2 EXISTING HS-8 SECOND FLOOR ELECTRICAL PLAN AND REFLECTED CEILING PLAN
1/4" = 1'-0"

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HS-08 ca. 1931. (WICA Museum Collection #WICA 4725)

Treatment Recommendations

Treatment Recommendations

Introduction

This Historic Structure Report for the HS-08 Quarters is intended to serve as the primary document to provide recommended treatments for the historic residence. This section of the report provides treatment recommendations to address the immediate preservation and stabilization of the existing historic fabric, and to establish long term rehabilitation and maintenance needs. The immediate recommendations are to be used as a guide for the preservation of the existing structure, while the long term treatment recommendations are items to consider when future maintenance or rehabilitation work occurs.

The period of significance the Historic Housing Area at Wind Cave National park is established to be from 1928 to 1942. HS-08 was initially constructed in 1931 and substantially renovated in 1937. While the existing structure retains a substantial amount of architectural fabric dating to the period of significance, a few important exterior character-defining features are missing. Historical photographs have produced a fairly clear image of the exterior of the house throughout the period of significance, including photographs of some of the missing elements. These missing exterior elements include the multi-lite steel out-swing casement windows and the rustic board and batten shutters. The existing contemporary wood deck along the primary and highly visible south and east elevations is a distraction from the historic form of the building, obscuring the historic front stone steps. Missing features on the interior include the historic light fixtures.

The current use for the HS-08 Quarters is for seasonal housing for park staff and that use is not anticipated to change in the future. Identifying an appropriate historic treatment approach for the residence is important, in order to serve as a guideline for planning and design purposes.

Historic Treatment Approaches

The identification of the possible four following historic treatments is based upon the *Secretary of the Interior's Standards for the Treatment of Historic Properties*:

> ***Preservation:*** *Sustaining the existing form, integrity, and materials of a property.*
>
> ***Restoration:*** *Accurately depicting the form, integrity, and materials of a property as it appeared during a particular period.*
>
> ***Rehabilitation:*** *Compatible use of a property through repair, alterations, and additions while preserving significant historical features.*
>
> ***Reconstruction:*** *Depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape building, structure, or object at a specific period of time and in its historic location.*

Selected Historic Treatment Approach - Rehabilitation

Rehabilitation was selected as the treatment approach in order to allow for the retention of historic authenticity while accommodating the installation of modern amenities. HS-08 is in very good overall condition, requiring maintenance and some rehabilitation to update finishes. Rehabilitation work associated with these repairs and maintenance will affect the exterior and interior of the house and will also affect the grading and the exterior concrete landing west of the house. Work will need to be coordinated and designed to provide the necessary stabilization and repairs, as well as to protect the building's historical features.

While rehabilitating the structure, plans should be made to accommodate for these required repairs: excavation of grade at the west and north elevations; stucco wall repair and painting; stone foundation underpinning, repointing and monitoring; structural stabilization in the basement and crawl space; interior plaster and drywall repair; and general maintenance and repair items. Great care should be taken to respect the existing historic fabric of the building, a majority of which dates to the original 1931 construction and 1937 renovation.

Construction Impact

All construction activities that may impact the grading or soils surrounding the building must be closely monitored by a National Park Service Archeologist. No demolition, excavation or digging can occur without the required notifications, approvals and documentation. Section 106 compliance is also required for any construction activities that may impact the historic structure and surrounding landscape.

Building Egress Fire Code Evaluation

The one-and-one-half story HS-08 was originally constructed in 1931 as a ranger's dormitory and has been modified through the years. The structure consists of exterior stucco-clad wood load bearing walls with interior wood floor, wall and roof framing. The foundation is reinforced concrete and stone.

The structure is currently used for seasonal staff housing. The roughly 1,700 square foot house contains three bedrooms and one full bathroom. The space on the second floor is not utilized as a bedroom, due to the lack of bathroom adjacency. The park anticipates continued use of the building as seasonal housing in the near future. This residence does not meet requirements of the ABAAS for accessibility. The park has other residential facilities to accommodate for accessible housing needs.

The applicable codes and guidelines for the project are:

- 2012 International Building Code (IBC)
- 2012 International Existing Building Code (IEBC)
- 2012 International Residential Code (IRC)
- National Fire Protection (NFPA)
    - 2013 Standard for the Installation of Sprinkler Systems (NFPA 13)
    - 2013 National Fire Alarm and Signaling Code (NFPA 72)
    - 2012 Life Safety Code (NFPA 101)
- Structural Fire Reference Manual 58, National Park Service.
- Department of the Interior Housing Management Handbook, 2008.

For fire egress purposes, the building would be reviewed as follows:

- Type VB Construction, Currently Unsprinklered.
- 'R3' Residential Occupancy, based on the use as a *Congregate Residence* with sixteen or fewer persons. The definition of a Congregate Residence is one that contains sleeping units where residents share bathroom and/or kitchen facilities.

Egress Review:

- R310.1 - The first floor bedroom windows are out-swing casement windows. The windows were replaced within the last ten years and appear to meet egress requirements.
- The second floor (not utilized as a bedroom) should be equipped with a fire ladder at the dormer window. This is not a code requirement, but would be a prudent safety measure.
- R311.2 - First floor egress is compliant, as there are two egress doors in the main portion of the first floor and a third in the southeast bedroom, which lead directly outside.
- R313.2 – An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings. HS-03 meets the *Exception:* an automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not

already provided with an automatic residential sprinkler system. HS-03 is an existing building and there is currently no fire sprinkler system installed.

- R314 - Installation of a hard-wired fire alarm/smoke detection system on the first and second floors is required. The system is currently installed and has a battery back-up system. No exterior alarm notification was found.
- R315.1 – Carbon monoxide alarms are required for new construction. No carbon monoxide detection system was found. A carbon monoxide alarm should be installed outside of each sleeping area in the immediate vicinity of the bedrooms.

The 2012 International Existing Building Code, Chapter 12, addresses Historic Buildings. The intent of the IEBC, Chapter 12, is to provide a means for the preservation of historic buildings. Repairs to any portion of a historic structure are permitted (IEBC-2012.1) to be made with original or like materials and methods of construction. Since the provisions of the IEBC are to be utilized for future potential projects, the building code or person having jurisdictional authority, may require a report from the registered design professional to address compliance issues. The report should identify compliance with Chapter 12, identify each safety feature that is not in full compliance, and describe how the intent of the provisions are complied with by establishing an equivalent level of protection. Existing door and stairway widths will be allowed to remain in their current condition (with the provision of the local authority having jurisdiction making the determination that sufficient width and height for a person's passage through the opening has adequate capacity and meets the occupant loading requirements).

The existing structure as well as any future rehabilitation work should be coordinated with the Park Structure Fire Management Plan and address identified deficiencies.[7] The park may consider posting building evacuation diagrams. Occupants of the residence should be trained for fire prevention for their specific quarters. They should learn how to report fires and how to safely evacuate in the event of an emergency.[8] Pre-occupancy training may also include how to test smoke alarms and how to use fire extinguishers.[9]

[7] Structural Fire Reference Manual 58, National Park Service, 2015, 5.
[8] Department of the Interior Housing Management Handbook, April 2008, 6.
[9] Ibid, 16.

Treatment Recommendations

With the intent of protecting the future integrity of the existing historic fabric and character defining features of the HS-08 Quarters, the following treatment recommendations are proposed. These recommendations were developed based on the assessment of the building during the two site visits in fall of 2014 and winter of 2015 and provide direction for immediate issues and long term historic treatment work.

All architectural and structural recommendations are in keeping with the *Secretary of the Interior's Standards for Rehabilitation* as a guide. The goal of any sensitive preservation or rehabilitation project is to retain and preserve the extant original historic materials with the least amount of visible alterations to the structure, while supporting the proposed interpretive use of the building.

Immediate Treatment Recommendations

These immediate recommendations are based on the stabilization and maintenance of the existing structure in its current configuration. A useful reference for small building caretakers is the National Park Service, *Preservation Brief 47: Maintaining the Exteriors of Small and Medium Size Historic Buildings* by Sharon C. Park, FAIA. This brief outlines example maintenance schedules and checklists, as well as making recommendations for preparation of maintenance and a means for determining qualified contractors who will understand the project objectives for the structure's preservation.
The cost estimate associated with the Immediate and Long Term Treatment Recommendations can be found in Appendix C.

General Treatment Recommendations

All suspect building surfaces and materials should be tested for lead based paint and asbestos containing materials prior to the initiation of any work. Testing should be done by a qualified hazardous materials consultant. Conduct an independent radon test and inspection and install a mitigation system, if required.

Immediate Treatment and Maintenance Repair Recommendations

Refer to the Treatment Recommendation Drawings

Exterior

1. Roof Shingles –
   Inspect bow in roof shingles in center of north facing roof. Repair, as required.

2. Re-grade –
   Re-grade along the west and a portion of the north elevations to achieve a minimum of four-inches below the top of the stone foundation walls. Install a French drain to daylight and a swale. The grade is in contact with the wood frame stucco walls and is causing advanced deterioration in these locations.

This work will require the demolition and reconstruction of the existing concrete landing along the west elevation to be reconstructed at a lower elevation. Install a soft joint between the new concrete and the stone/concrete foundation. Repoint the newly-exposed stone foundation, as required.

This work may also affect the asphalt driveway, depending upon the final grading elevation. This requires further study.

3. Stone Foundation –
   - Clean existing stone foundation, window well and step landing.
   - Repoint foundation walls and stone steps, as required. Match historic mortar.
   - Remove and replace non-matching mortar with new mortar to match historic mortar.
   - Repair/replace mortar wash at the top of the wall, as required.
   - Fill cracks and monitor seasonally for further movement.

4. Window Well –
   - Repoint existing stone window well, as required.
   - Remove existing window grate and replace with painted steel grate similar to HS-03.
   - Verify drain in bottom of well is in working order, if not, install new drain and tie into French drain to daylight.
   - Restore wood Window 003, as required.

5. Stone Chimney –
   - Remove metal strapping from chimney. Patch all holes, in kind.
   - The stone chimney requires cleaning spot repointing and mortar wash repair.
   - Inspect flashing.
   - If the flues are not required for venting, install pre-finished metal flue caps, per SMACNA specifications.

6. Stucco –
   Repair cracks and crazing in stucco. These are prevalent along the west, east and north elevations, with a few on the south elevation.

7. Paint –
   - Paint exterior stucco after repairs repairs are completed. New paint color to match historic stucco color, as defined in the Volume I, Historic Building Materials, Stucco section of this report. A Benjamin-Moore paint color match was determined, but must first be sampled, as recommended.
   - Trim color to match the historic trim color, as defined in the historic finished report.

8. Stovepipe Removal –
   Remove existing unused stove pipe from the north roof. Patch and repair roofing and sheathing, as well as interior plaster ceiling, as required.

9. Wood Louvers –
   - Inspect if the south-facing louver is open to the attic.
     The wood louver in the upper south-facing roof appears to be in good condition. The screening for this louver is installed on the exterior face of the louver. This is likely due to the presence of a bedroom on the second floor, making it difficult or impossible to access this louver. It should be investigated if this louver is still open on the attic side and providing ventilation to the attic. If it is not open, it could be closed on the inside face and the screening removed.
   - Inspect all open wood louvers in the attic. Replaced screens, as required.

10. Wood Deck –
    The deck joists are currently spaced at 2' on center. At this spacing, the joists are capable of supporting the code required live load of 40 psf.

    On the south face two of the beams are butt spliced. This is located south of Room 104. The splice should be strengthened by adding a splice member. F/TS3 provides a detail for this repair.

    The posts supporting the deck are direct buried in the soil. This will promote rot of the posts. While they appear to be in acceptable condition at this time, consideration should be given to constructing concrete footings below grade with the posts bearing on the concrete footings. Detail D/TS3 shows a detail for this repair.
    The existing guardrail system on the deck does not meet current code for picket spacing. Current IBC code requires a spacing such that a four inch sphere cannot pass between the pickets. The spacing should be modified.

    The anchorage of the existing guardrail system does not meet code requirements for strength. Bolts could be installed through each picket to strengthen the connection. Bolts should be 3/8 inch diameter with oversized washers on each face.

    Blocking should be added between the perimeter edge beam where pickets are connected and the next interior joist. Detail E/TS3 shows these repair details.

11. Inspect downspout drains –
    Reinstall or install new downspout extensions to direct water away from the foundations.

12. Shed Dormer –
    - Replace existing deteriorated horizontal siding, in kind, as required.
    - Replace existing deteriorated trim, in kind, as required.
    - Install new window sill under Window 200.
    - Paint/stain entire dormer.

13. Dryer Vent –
    Paint exposed dryer vent on east elevation. Relocate this dryer vent to the west elevation as a long term goal.

14. Remove brush and overgrowth –
    Remove all existing trees and overgrowth from around the stone foundation.

15. Hose Bibb –
    - Paint wood blocking at hose bibb on north elevation.
    - Clean out clogged sump pipe drain.
    - Repoint stone foundation in this location – this may require some below-grade repointing.

Interior

16. Crawl Space 003 –
    - Underpin Piers –
      Some of the interior piers have been undermined. The center pier has to be replaced to regain support of the girder. In the other areas, the piers either need to be replaced with deeper foundations, or the trenches need to be filled to provide lateral support to the trench walls adjacent to the footings. Compaction of the soil to achieve adequate lateral support would be difficult and unlikely. The piers that have been undermined by trenches within a 45 degree angle from the bottom of the pier should be removed and replaced with a deeper foundation. Drawing B/TS3 shows a schematic detail of a possible underpinning solution for the interior piers in the north crawl space. Temporary shoring of the girders will be required during the pier removal and replacement.
    - Underpin Stone Foundation -
      Some of the perimeter stone foundations have also been undermined. This is primarily along the west wall of the crawl space. These stone footings will need to be underpinned with helical or resistance piers. Drawing C/TS3 shows a schematic detail for underpinning of the perimeter footings at HS-8. The north stone foundation may also require underpinning. This will require further investigation.

17. Basement 001 Repairs –
    - Repoint Retaining Walls –
      The retaining walls in the basement area have some cracks. The walls appear to be functioning adequately. The cracks should be repointed.

    - Install New Concrete Caps –
      The caps over the retaining walls are cracked and have settled. These should be removed and replaced. The new caps should be reinforced and anchored into the existing foundation wall and the top of the stone retaining wall. Drawing A/TS3 shows a detail for this repair.

18. Attic –
    The roof framing around the chimney in the attic should be investigated further. The 2x blocking supporting the rafters at the chimneys should be anchored to the chimneys and the connections of the rafters to the blocking should be strengthened.

19. North and South Crawl Spaces –
    - Install foundation ventilation in both crawl spaces, as required.
    - Inspect existing insulation in first floor joists throughout the crawl space areas. Install insulation where there is no insulation.
    - Investigate existing first floor over-framing in west side of Crawl Space 003. This area is framed differently than the rest of the house due to the first floor elevation being raised. This is tight access. A plan will need to be developed to provide access for new insulation installation.
    - Install perimeter foundation wall insulation throughout basement.
    - Install new 12 mil vapor barrier throughout crawl space areas.

20. Weatherstrip Basement Windows –
    Install rope caulking at three basement windows. This is removable for repairs or if windows need to be opened.

21. Basement 001 Ceiling –
    Consider removal of the plastic sheeting at the ceiling in Basement Room 001. This was installed to provide an additional barrier for the insulation installed between the first floor joists. This is, however, providing a space for mice to inhabit and travel between the joists and is filled with mice feces.

22. Plaster Repairs-
    After structural stabilization in the attic and in the basement is completed, repair cracks throughout the house. Paint walls and ceilings when finished.

23. Verify Windows –
    Verify Windows 112 and 113 are tempered. Replace, as required.

24. Door 103/1 –
    Verify this exterior door has tempered glass, per code. Replace, as required.

25. Fire Escape –
    Provide fire ladder for escape from second floor window.

26. Weatherstrip Attic Door 200/2.
    Inspect floor vent in Bedroom 200. If no damper exists, replace with a vent that has a damper for privacy.

27. Monitor Cracking –
    Repair cracks in the east wall of Bedroom 104. Monitor for further cracking. Further cracking may indicate stone foundation settlement.

Repair cracks in the wall between the Mud Room 107 and Kitchen 108. Monitor for further cracking. Further cracking may indicate wood framing issues below that require stabilization.

Mechanical/Plumbing/Electrical/Fire Protection Recommendations

Mechanical

28. It is recommended to inspect all existing ventilation openings to the crawl spaces and the attic to verify that they are free of obstructions. Install screens over all openings to prevent insect and/or animal infestation.

29. The existing HVAC systems should be thoroughly inspected by a qualified service technician and repaired to operational condition or replaced.

30. Exhaust Fan -
    The Bathroom 105 exhaust fan discharges air directly to the attic space should be re-ducted directly through the roof and a roof cap should be added at the penetration (IMC Section 503.1). This is important because warm, moisture laden air discharged into the attic can lead to moisture damage and mold growth.

31. Verify that the existing equipment including accessories being reused for this project are not damaged and are in good working order.

32. Clean existing equipment and equipment components being reused for this project.

33. Lubricate existing equipment being reused for this project in accordance with manufacturer's written instructions.
34. It is recommended for all ductwork penetrations to the exterior of the building have backdraft dampers installed unless not recommended by the manufacturer of the equipment in which the ductwork serves.

Plumbing Systems

35. Verify that the existing equipment including accessories being reused for this project are not damaged and are in good working order.

36. The entire system including the water and drain, waste, and vent systems and all accessories should be inspected by a qualified technician and repaired as needed.

37. The sump pump piping located in the unconditioned crawl spaces and all exterior exposed piping should be heat traced to prevent freezing or supplemental heating should be added to the crawl space.

38. If not existing, provide new access panels for existing plumbing at showers and bathtub or at any other location requiring maintenance access.

39. All vent piping penetrating through the roof should be 3-inch diameter minimum (IPC Section 903.2).

40. Prior to the occupied season, we recommend sanitizing the entire domestic water piping system (cold and hot) with a solution containing not less than 50 ppm available chlorine. Keep solution in the system for a minimum of twenty-four hours, with each valve being operated several times during the period. After completion, flush system with clean domestic water until chlorine residual is lowered to typical water level.

41. At the start of the cold weather season, the existing domestic water piping distribution system should be drained of all remaining water and blown down with compressed air. The compressed air will insure that no water is trapped in the piping that could freeze. This will prevent the pipes from breaking due to freezing. Mineral oil should be added to the p-traps on all plumbing fixtures including the toilets. This will keep the traps primed and prevent sewer gases from entering the house. All fixtures should have signage attached indicating that they have been winterized and are not usable.

Electrical Systems

42. The existing electrical system should be visually inspected for damaged devices and branch circuit conductors. The branch circuits and the service entrance conductors should be megger tested to measure the insulation resistance in the conductors. A report should be supplied documenting the results of the test. Repairs should be made where necessary.

43. The light fixtures should be re-lamped as necessary and cleaned, taking care to remove all dirt and debris. Consider replacing the fixtures and/or lamps with LED technology to save on energy costs. However, the historic lamps and sconces should have historically applicable lamps where exposed to view.

44. The electrical grounding system should be inspected by a qualified, licensed electrician. A grounding electrode conductor should be installed on the metallic water service entrance piping where it enters the house prior to any valves or unions in the piping system. All grounding should be in accordance with 2014 NEC Article 250. Verify that grounding connections from the electrical, and communications systems are interconnected.

45. Protection needs to be installed for all exposed NM cable located on the basement walls in accordance with NEC 334.15 (A) through (C), including the exposed branch circuit conductors coming out of the electrical panel.

46. All GFCI receptacles should be tested to verify they are in working order. Ground-fault circuit interrupter protection for personnel should be installed in accordance with NEC 210.8(A)(1) through (10).

- All receptacles located in the basement should be replaced with GFCI receptacles or a GFCI circuit breaker protecting the receptacle.
- The receptacles in Kitchen 108, not labeled as GFCI protected, should be replaced with GFCI receptacles or if they are protected by a GFCI upstream they will need to be labeled.
- The GFCI receptacle located on the west side of the building exterior should be inspected and replaced if the receptacle is not in accordance with NEC 406.9(B)(1).

47. A disconnecting means should be installed for both the electric water heater and basement wall heater located in Basement 001 if they are not already installed per NEC 422 part III.

Telephone System

48. The telephone system should be inspected and tested by a qualified technician. The system should be placed in operation.

Fire Alarm System

49. The hard-wired smoke detectors should be tested and the battery back-up checked and replaced if necessary.

50. Install outside notification system for smoke detectors. Since the houses are fairly remote, an exterior audible alarm should be considered.

Fire Protection System

51. The existing hand activated fire extinguishers should be evaluated and tested by a fire alarm contractor on an annual basis. Immediate repairs should be made to insure the systems are operational. Corroded or otherwise damaged components should be replaced.

Carbon Monoxide Detection

52. Hard-wired carbon monoxide detection systems with audible notification should be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms.

Insulation

53. Insulation –
    Investigate extent of existing wall insulation. This will require either drilling small holes and investigating with a lighted boroscope or perhaps a very sensitive thermal imaging camera. The walls of HS-08 were last insulated during a 1952 contract to insulate the buildings in the historic housing area and the administration building. Fiberglass insulation was stuffed in walls and in the attic.

    Install additional insulation, as required in walls and in attic.

It is recommended that the existing roof and wall insulation be evaluated and modified to meet the requirements set forth in Table C402.2 of the 2012 IECC.

2012 IECC TABLE C402.2 OPAQUE THERMAL ENVELOPE REQUIREMENTS

Climate Zone	**7**	
	All Other	**Group R**
Roofs		
Attic and other	R-49	R-49
Walls, Above Grade		
Wood framed	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci
Walls, Below Grade		
Below-grade wall	R-7.5ci	R-10ci

ci = Continuous insulation
Refer to 2012 IECC for additional information.

Long Term Treatment and Maintenance Repair Recommendations

Long term maintenance and repair recommendations take into account items that do not required immediate or short term attention, but would be recommended for the long term use of the house. These items include:

A. Replace or retrofit existing replacement windows. The existing aluminum wood clad casement windows installed throughout the house are fine replacement windows; however, the detailing at the exterior is not a historically appropriate solution and they do not replicate the original steel window lite configurations. The historic wood trim is panned and appears wider and the sills appear taller than the original historic windows. The detailing at the metal panning is not tidy and is installed to that the metal seams will shed water from the interior, only if the sealants are well maintained.
B. Replicate and install rustic board and batten shutters with a diamond silhouette, per the historic drawings and photographs. These were installed on the south, east and west elevations.
C. Replace back door with more historically appropriate door to match the one drawn on the 1931/37 construction drawings.
D. Remove wood deck and restore front stone steps. Explore alternatives for a stone patio that is not visible from the road in this location, or install a rear patio on the west side of the house that will be more accessible to the tenants and not visible from the public right-of-way. When deck is removed, repoint the exposed stone foundation and steps to have one color of mortar. There are several campaigns of repointing that do not match.
E. Relocate dryer vent from the east elevation to west elevation. Patch existing hole on the east elevation.
F. Install new carpeting.
G. Painting throughout the house.
H. Inspect original wood flooring below existing laminate flooring in Living Room 100, Hall 101 and Dining Room 109 to see if it is able to be restored. Repair, replace and refinish, as required.
I. Renovate bathroom.
J. Renovate kitchen.
K. When it is time to replace the existing roof, consider the installation of the Decra metal roofing shingles to match the Administration Building. The existing 40 year asphalt roof was installed in 2002, so by the time the roof requires replacement, there may be even newer acceptable substitute products that will have the look of a historic wood shingle, with less maintenance and a longer life span. New roofs should be outfitted with integral fall protection clips. These are a safety feature that has very little effect on the overall look of the roofs.
L. When the roof is replaced, install new reproduction box gutters with rectangular downspouts to match the historic conditions.
M. Inspect the east side of the stone chimney for a cricket. If one exists, it is not apparent from grade. If one does not exist, consider installing a cricket during the next roofing project.

N. Conduct a historic hardware survey and restore all hardware.

Long Term Mechanical/Plumbing/Electrical/Fire Protection Recommendations
The existing electric baseboard heating system is very costly to run during the winter months. Consider installing a high-efficiency forced air HVAC system. Options for this are listed below.

Modifications to the building will require coordination with the National Park Service and existing conditions to conceal as much of the MEP systems from view as possible.

HVAC Systems
If the existing HVAC system is to be replaced, heating and cooling load calculations should be performed per current ASHRAE standards and the new equipment should be sized accordingly. The following design criteria should be used:

Outdoor design temperature: The ASHRAE outside summer and winter design conditions for Custer County, SD should be used for design purposes.

Summer Outdoor Design Temperature: 83.7°F db (1.0%)/ 58.9°F wb (MCWB)
Winter Outdoor Design Temperature: -8.2°F db (99.6%)

Inside Temperatures: The following temperatures (Summer/Winter) should be used for Thermal Comfort Design.

Summer: 75°F DB/50% RH max
Winter: 70°F DB

Upon establishing the heating and cooling demands, a new HVAC system should be selected and sized to handle such demands.

Split System
A split system would consist of an electric resistance heating coil, high capacity blower, MERV 11 filters, and a direct expansion cooling coil. A matching condensing unit for each would be located outdoors. Locations for combustion air intakes and flues for the gas-fired furnaces should be carefully coordinated with the Architect and the National Park Service. A new ductwork system would need to be installed throughout the building. Programmable thermostat(s) should be installed for control of the respective split systems.

A heat pump condensing unit can be used in lieu of a standard condensing unit. An auxiliary electric resistance coil would also need to be provided. Multiple split systems can be installed throughout the building in order to meet the cooling and heating load demands.

One advantage to this system is that most service companies are familiar with this equipment and can provide service and timely repair. Another advantage is the lower first cost. Disadvantages of this system would be the requirement that ductwork be installed throughout the building. There will also be combustion air and flue openings in the building façade. Penetrations through the wall will also be required for piping and electrical conduit to the condensing units.

Geothermal Heat Pump

The geothermal heat pump system would consist of a water source heat pump and an accompanying geothermal well field. The heat pumps would contain MERV 11 filters. A new ductwork system would need to be installed throughout the building. Programmable thermostat(s) should be installed for control of the respective systems.

A geothermal heat exchanger would be installed in the yard or parking area adjacent to the house. A sample bore and conductivity test is required to determine the ground conditions. The results of the test are required to design the depth and number of bores. A typical heat exchanger consists of a series of vertical pipe bores. Polyethylene piping is installed in the bores and is routed to a header. The header would preferably be located in the basement, but could be installed in a vault on site. Water or glycol would be pumped through the pipe to provide a seasonal heat source or sink for the heat pumps.

This geothermal system has several advantages over the split systems. It is considerably more efficient, and would result in lower operating costs. It would eliminate the need for exterior condensing units, which would improve the historic integrity of the site. The system will also be much quieter than a high efficiency furnace and condensing unit.

One disadvantage to this system is that the site will be disturbed. The drilling and site work would need to be carefully coordinated with the National Park Service to reduce the impact and ensure no archaeological artifacts are destroyed. Another disadvantage is that this system will have a higher first cost than the split systems.

A geothermal heat pump system would most likely not be feasible due to the potential disruption the geothermal wells could cause the cave system.

VRF System

A variable refrigerant flow (VRF) system would consist of a condensing unit located outside, individual VRF fan coil units located in each cooling zone, refrigerant piping, and branch selector boxes. The locations of the condensing unit and fan coil units will need to be carefully coordinated with the Architect and the National Park Service. Programmable thermostat(s) should be installed for each VRF fan coil. The VRF system can provide heating but a supplement electric heating system would probably also be required.

Advantages of the VRF system is that it can be configured as a ducted system or a ductless system. Disadvantages of this system would be that the fan coils may need to be exposed in the rooms they serve. Penetrations through the walls and floor will also be required for refrigerant piping and electrical conduit to the fan coils and condensing unit.

Ventilation

The recommendation is to install a separate, dedicated outside air unit in the attic to provide ventilation air. This unit would include an enthalpy heat recovery wheel, filters, heating, and cooling. The unit would include the same heating and cooling equipment that is selected for the main system (split system with furnace or water source geothermal heat pump). The unit would be used to supply ventilation air to all rooms in the building and would exhaust air from the restrooms. Energy recovered from the exhaust air stream would be used to pre-treat the fresh air. The design for the outside air intake and exhaust hood will require careful

coordination with the Architect and the National Park Service to minimize impact on the building's historic integrity.

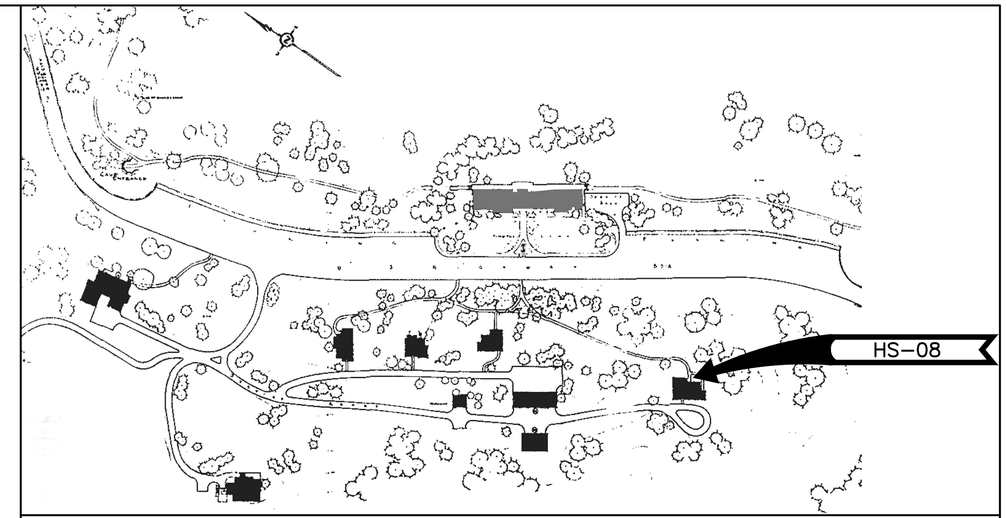
Plumbing
A double check valve or reduced pressure zone backflow should be added to the domestic water entry.

Electrical Systems
A code compliant electrical distribution system should be installed when the building is renovated. All circuit breakers serving loads in the dwelling unit shall be arc fault circuit interrupter (AFCI) circuit breakers per NEC 210.12 (A).

Fire Alarm Systems
Field verify whether the system is 120V hardwired and the devices are interconnected. If not, replace the smoke detectors with a code compliant system when the building is renovated.

HS–08 QUARTERS
HISTORIC STRUCTURES REPORT
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK

TREATMENT RECOMMENDATION DRAWINGS
HOT SPRINGS, SOUTH DAKOTA



HISTORIC HOUSING AREA, WIND CAVE NATIONAL PARK, HOT SPRINGS, SOUTH DAKOTA
(WIND CAVE NATIONAL PARK HISTORIC CONTEXTS AND NATIONAL REGISTER GUIDELINES REPORT, 1992)

HS–08 QUARTERS (SRJA 2014)

INDEX OF DRAWINGS

00 COVER

ARCHITECTURAL
TA0 BASEMENT/FOUNDATION FLOOR PLAN AND FIRST FLOOR PLAN
TA1 SECOND FLOOR PLAN AND ROOF PLAN
TA2 EAST ELEVATION AND SOUTH ELEVATION
TA3 WEST ELEVATION AND NORTH ELEVATION

STRUCTURAL
TS0 BASEMENT/FOUNDATION FLOOR PLAN
TS1 WOOD DECK FLOOR FRAMING PLAN
TS2 STRUCTURAL DETAILS

HISTORIC STRUCTURES REPORT UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE DENVER SERVICE CENTER	TITLE OF PROJECT TREATMENT RECOMMENDATION DRAWINGS HS–08 QUARTERS HISTORIC HOUSING AREA WIND CAVE NATIONAL PARK REGION MIDWEST · COUNTY CUSTER · STATE SOUTH DAKOTA	DRAWING NO. 108 128876 PMIS/PKG NO. 158029 SHEET 1 OF 8	

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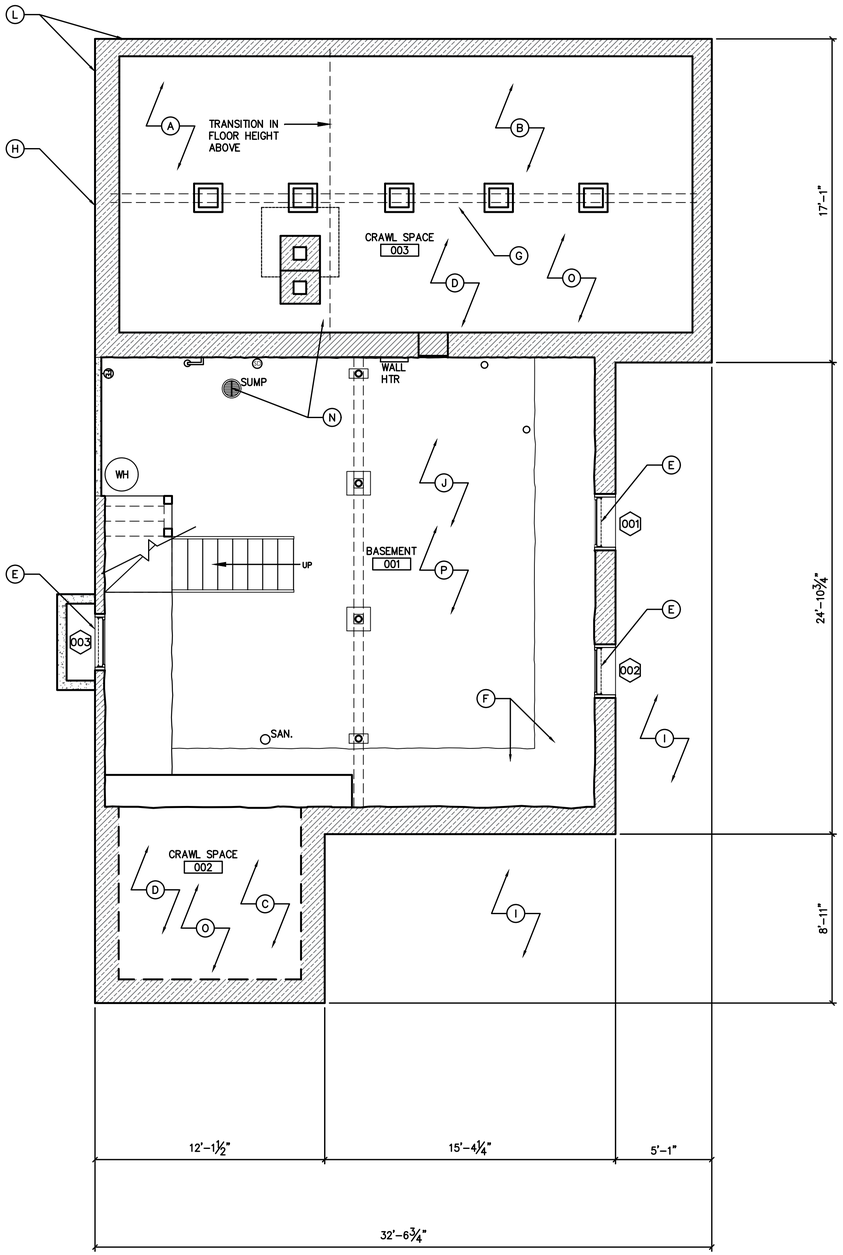
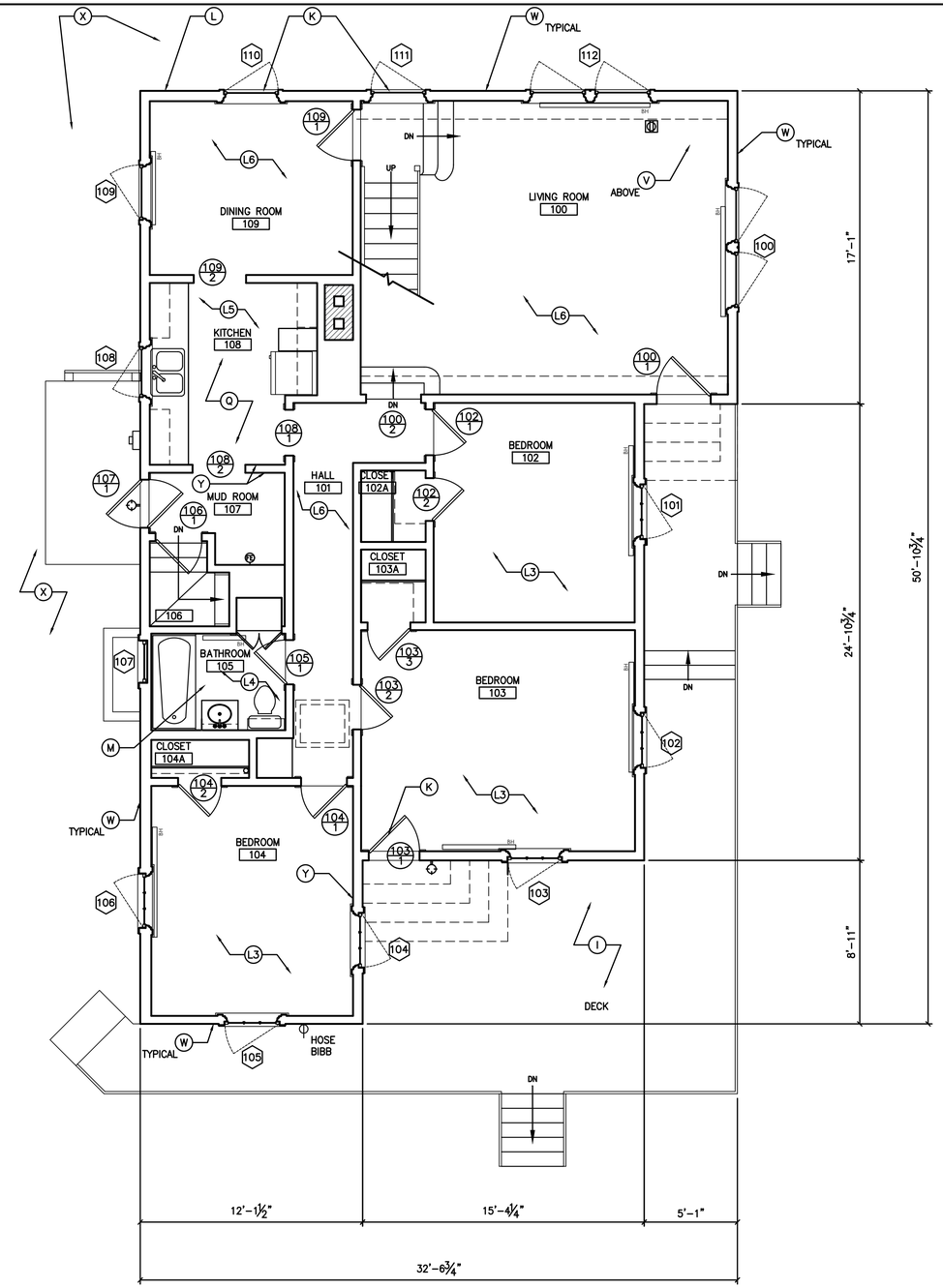


1 TAO HS-08 IMMEDIATE AND LONG TERM TREATMENT – BASEMENT PLAN
1/4" = 1'-0"



2 TAO HS-08 IMMEDIATE AND LONG TERM TREATMENT – FIRST FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES:

1. PERFORM HAZARDOUS MATERIALS TESTING BEFORE INITIATING ANY WORK.

KEY NOTES:

IMMEDIATE TREATMENT SCOPE OF WORK:

A. INSTALL CEILING INSULATION IN NORTHWEST CORNER OF CRAWL SPACE.
B. REPAIR/REINSTALL/INSTALL NEW INSULATION IN FIRST FLOOR JOISTS.
C. INSTALL ADDITIONAL OR NEW INSTALLATION IN FIRST FLOOR JOIST.
D. CLEAN CRAWL SPACE OF DEBRIS. INSTALL NEW 12 MIL VAPOR BARRIER. WRAP 6" UP WALLS. OVERLAP SEAMS MINIMUM 6" AND TAPE FULLY.
E. WEATHERSTRIP WINDOWS.
F. REPLACE CONCRETE CAP PER STRUCTURAL DRAWINGS.
G. INSTALL NEW FOOTINGS AND POSTS PER STRUCTURAL DRAWINGS.
H. UNDERPIN FOUNDATION WALL PER STRUCTURAL DRAWINGS.
I. REPAIR AND STABILIZE DECK PER STRUCTURAL DRAWINGS.
J. CONSIDER REMOVING PLASTIC SHEETING AT CEILING.
K. VERIFY IF GLASS IS TEMPERED.
L. INVESTIGATE FOUNDATION WALL AND STUCCO FOR POTENTIAL REQUIRED REPAIRS AFTER EXCAVATION.
M. DISCHARGE EXHAUST THROUGH ROOF.
N. INSTALL HEAT TRACE TAPE ON SUMP PUMP.
O. EXPLORE OPTIONS TO VENTILATE CRAWL SPACE, 5 MINIMUM (3 IN CRAWL SPACE 003 AND 2 IN CRAWL SPACE 002). CONSIDER INSTALLING NEW FOUNDATION VENTS TO MATCH OTHER RESIDENCE HISTORIC INSTALLATIONS.
P. REPLACE WALL RECEPTACLES IN BASEMENT WITH GFCI'S
Q. REPLACE KITCHEN RECEPTACLES WITH GFCI'S.
R. INSTALL EGRESS LADDER.
S. ENSURE PRIVACY AT FLOOR VENT.
T. WEATHERSTRIP DOOR.
U. INSTALL ADDITIONAL INSULATION IN ATTIC TO ACHIEVE R30 VALUE.
V. REMOVE UNUSED STOVE FLUE. PATCH AND REPAIR ROOF, SHEATHING AND PLASTER CEILING, AS REQUIRED. PREP, PRIME AND PAINT.
W. INVESTIGATE EXTERIOR WALLS FOR EXISTING INSULATION. INSTALL SUPPLEMENTAL INSULATION, AS REQUIRED.
X. RE-GRADE WEST AND A PORTION OF THE NORTH ELEVATION TO A MINIMUM OF 6" BELOW THE FINISH FLOOR. INSTALL SWALE AND FRENCH DRAIN TO DAYLIGHT. THIS WILL REQUIRE DEMOLITION AND RECONSTRUCTION OF THE CONCRETE LANDING AT THE ENTRY. A PORTION OF THE ASPHALT PARKING AREA MAY ALSO REQUIRE RE-GRADING.
Y. REPAIR CRACKS IN WALL(S). PREP, PRIME AND PAINT, AS REQUIRED. MONITOR FOR FUTURE MOVEMENT.

LONG TERM TREATMENT SCOPE OF WORK:

GENERAL INTERIOR WORK:

L1. PAINTING THROUGHOUT ENTIRE INTERIOR OF THE HOUSE, TYPICAL.
L2. CONDUCT A HISTORIC HARDWARE SURVEY AND RESTORE ALL HARDWARE.

SCOPE OF WORK:

L3. INSTALL NEW CARPETING.
L4. RENOVATE THE BATHROOM.
L5. RENOVATE THE KITCHEN. IF A KITCHEN WHICH IS MORE PERIOD APPROPRIATE IS DESIRED, CONSULT WITH THE HISTORIC DRAWINGS FOR PRECEDENT CABINETRY DESIGN.
L6. REMOVE EXISTING LAMINATE FLOORING IN LIVING ROOM, HALL 101 AND DINING ROOM AND REPAIR/RESTORE EXISTING WOOD FLOORING.

MECHANICAL/ELECTRICAL/PLUMBING WORK:

L7. CONSIDER INSTALLATION OF A HIGH-EFFICIENCY FORCED AIR HVAC SYSTEM, PER THE RECOMMENDATIONS.
L8. INSTALL A BACKFLOW PREVENTER ON THE DOMESTIC WATER ENTRY.
L9. BRING EXISTING ELECTRICAL DISTRIBUTION SYSTEM UP TO CODE, PER RECOMMENDATIONS.
L10. INSTALL AUDIBLE FIRE ALARM TO THE EXISTING SYSTEM.

DRAWING KEY:

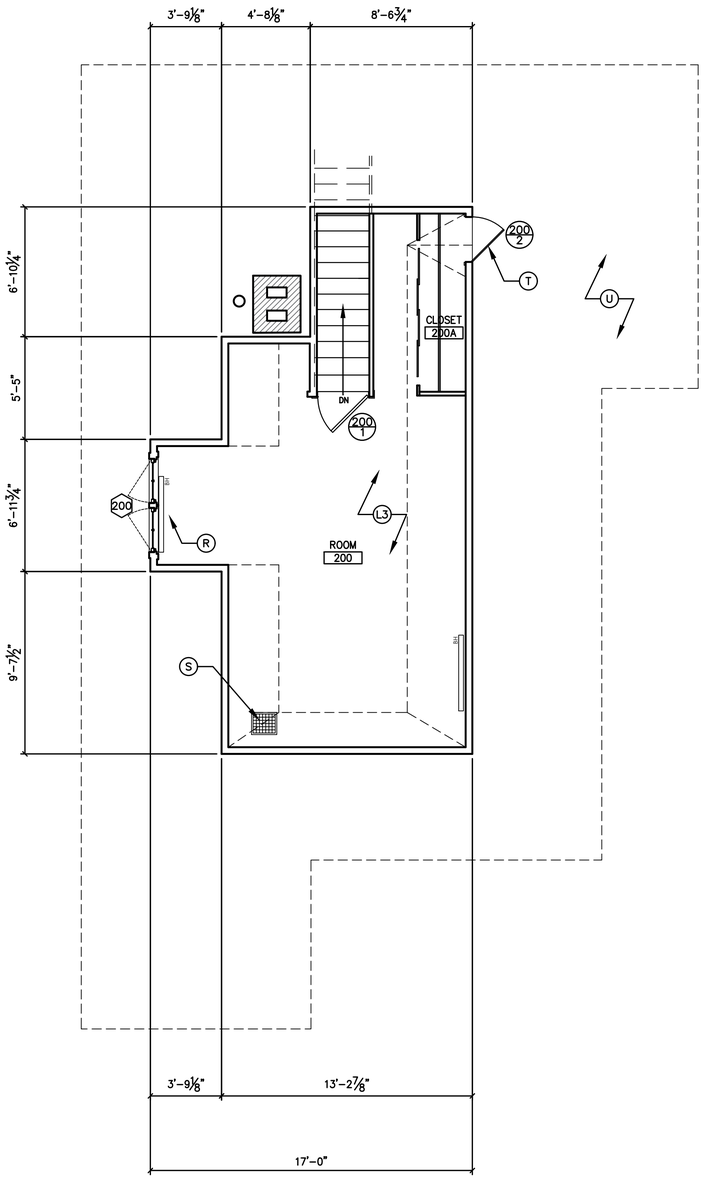
MASONRY FOUNDATION WALLS

CONCRETE FOUNDATION WALLS

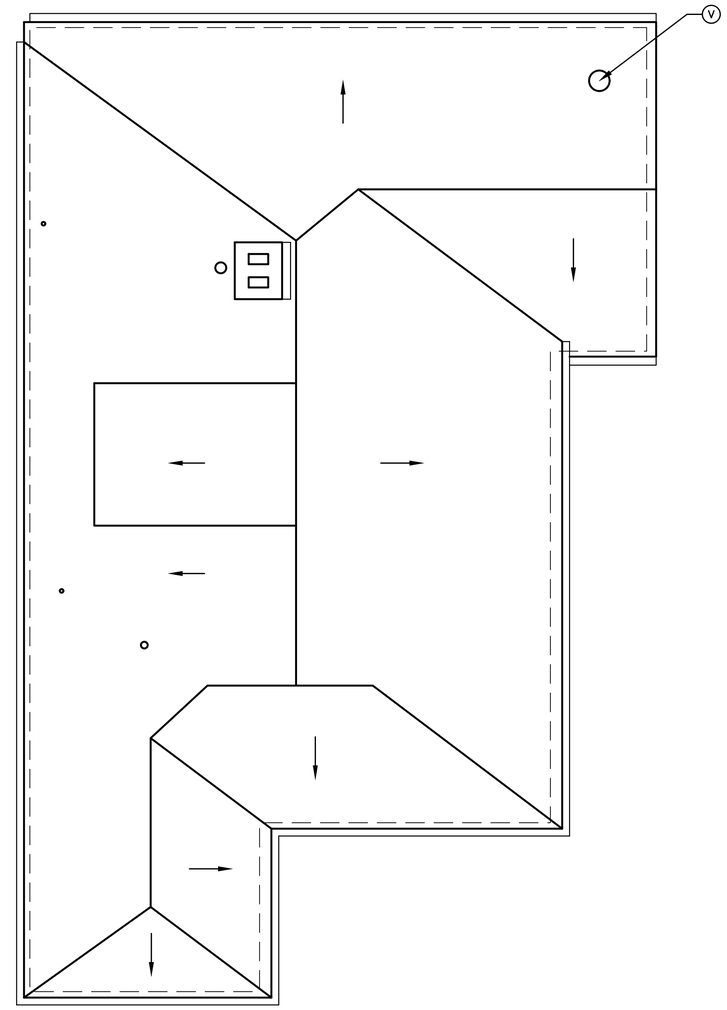
4 0 4 8
SCALE OF FEET

Susan Richards Johnson & Associates, Inc.
818 GRAND BLVD.
SUITE 1150
KANSAS CITY, MO
64106
Ph. 816-474-0900
Fax 816-474-0909

DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
AG	TAO	TREATMENT RECOMMENDATION DRAWINGS HS-08 QUARTERS HISTORIC HOUSING AREA WIND CAVE NATIONAL PARK HOT SPRINGS, SOUTH DAKOTA	108 128876
CADD: AG			PMIS/PKG NO. 158029
TECH. REVIEW: AG			SHEET 2 OF 8
DATE: 1/27/16			



1 TA1 HS-08 IMMEDIATE AND LONG TERM TREATMENT -SECOND FLOOR PLAN
1/4" = 1'-0"



2 TA1 HS-08 IMMEDIATE AND LONG TERM TREATMENT - ROOF PLAN
1/4" = 1'-0"

GENERAL NOTES:

1. PERFORM HAZARDOUS MATERIALS TESTING BEFORE INITIATING ANY WORK.

KEY NOTES:

IMMEDIATE TREATMENT SCOPE OF WORK:

A. INSTALL CEILING INSULATION IN NORTHWEST CORNER OF CRAWL SPACE.
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C. INSTALL ADDITIONAL OR NEW INSTALLATION IN FIRST FLOOR JOIST.
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W. INVESTIGATE EXTERIOR WALLS FOR EXISTING INSULATION. INSTALL SUPPLEMENTAL INSULATION, AS REQUIRED.
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Y. REPAIR CRACKS IN WALL(S). PREP, PRIME AND PAINT, AS REQUIRED. MONITOR FOR FUTURE MOVEMENT.

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GENERAL INTERIOR WORK:

L1. PAINTING THROUGHOUT ENTIRE INTERIOR OF THE HOUSE, TYPICAL.
L2. CONDUCT A HISTORIC HARDWARE SURVEY AND RESTORE ALL HARDWARE.

SCOPE OF WORK:

L3. INSTALL NEW CARPETING.
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L5. RENOVATE THE KITCHEN. IF A KITCHEN WHICH IS MORE PERIOD APPROPRIATE IS DESIRED, CONSULT WITH THE HISTORIC DRAWINGS FOR PRECEDENT CABINETRY DESIGN.
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4 0 4 8
SCALE OF FEET

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DESIGNED: AG
CADD: AG
TECH. REVIEW: AG
DATE: 1/27/16

SUB SHEET NO. TA1

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-08
QUARTERS
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO. 108
128876
PMIS/PKG NO. 158029
SHEET 3 OF 8

GENERAL NOTES:

1. PERFORM HAZARDOUS MATERIALS TESTING BEFORE INITIATING ANY WORK.
2. SPOT REPOINT AS REQUIRED. NEW MORTAR SHOULD MATCH EXISTING IN COMPOSITION, COLOR, TEXTURE AND PROFILE.
3. CLEAN ALL STONE TO REMOVE DIRT AND BIOLOGICAL GROWTH.

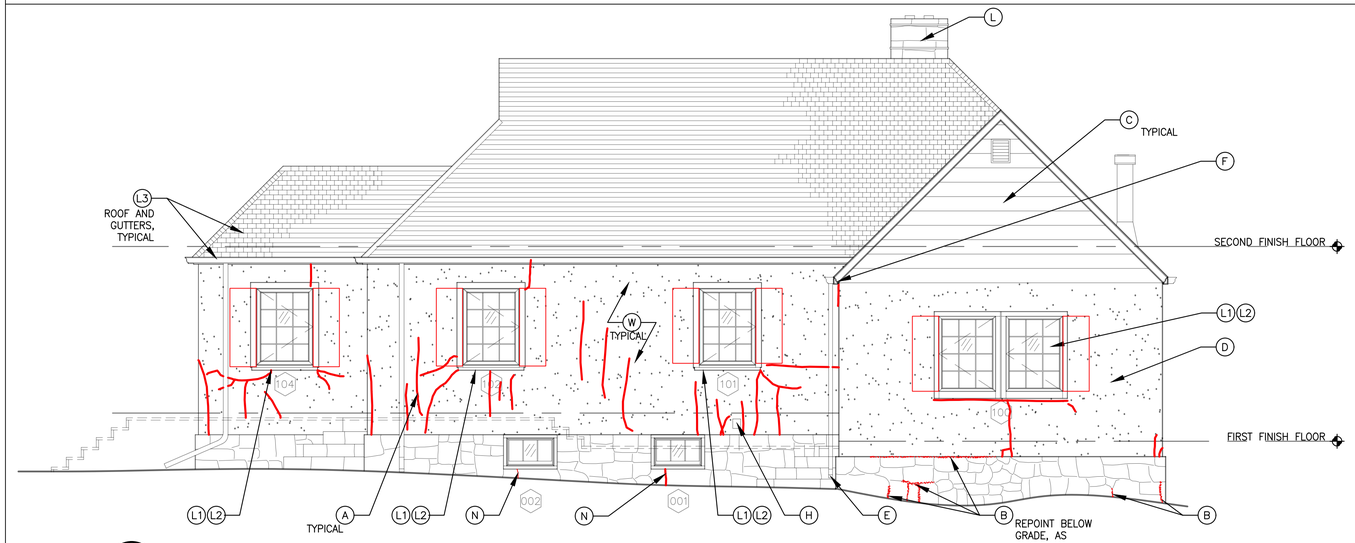
KEY NOTES:

IMMEDIATE TREATMENT SCOPT OF WORK:

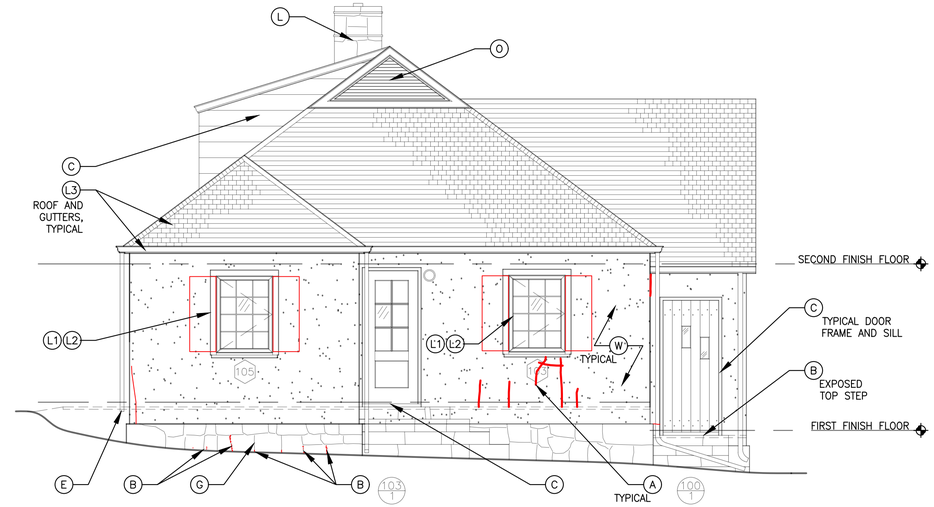
A. PATCH AND REPAIR CRACK IN STUCCO.
B. REPOINT EXISTING MORTAR JOINTS.
C. PREP, PRIME AND REPAINT/STAIN (TRIM, SIDING AND STUCCO).
D. REPAIR CRAZING STUCCO.
E. INSTALL AN EXTENSION ON THE DOWNSPOUT.
F. REPAIR DETERIORATED WOOD TRIM.
G. REMOVE INCONSISTENT MORTAR AND REPLACE WITH MORTAR MATCHING THE SURROUNDING MORTAR.
H. PAINT EXPOSED DRYER VENT. NOTE: LONG TERM RECOMMENDATION WOULD BE TO VENT TO WEST ELEVATION AND INFILL WALL.
I. REPOINT WINDOW WELL. REMOVE EXISTING COVER AND INSTALL NEW GRATE SIMILAR TO GRATES ON HS-03 BASEMENT WINDOWS. VERIFY DRAIN IS IN WORKING ORDER. IF NECESSARY INSTALL NEW DRAIN. REPAIR WINDOW, AS REQUIRED.
J. PATCH AND REPAIR DAMAGED WOOD SIDING.
K. INVESTIGATE THE EXTENT OF DAMAGE AT THE CHIMNEY. STABILIZE AND REPOINT AS REQUIRED.
L. REMOVE METAL STRAPS. CLEAN AND SPOT REPOINT CHIMNEY, AS REQUIRED. REPAIR/REPLACE MORTAR, AS REQUIRED. INSPECT FLASHING.
M. PATCH AND REPAIR HOLE IN STUCCO.
N. REPAIR CRACK IN MORTAR WASH.
O. INVESTIGATE IF LOUVER IS OPEN TO THE ATTIC.
P. RE-GRADE WEST AND A PORTION OF THE NORTH ELEVATION TO A MINIMUM OF 6" BELOW THE FINISH FLOOR. INSTALL SWALE AND FRENCH DRAIN TO DAYLIGHT. THIS WILL REQUIRE DEMOLITION AND RECONSTRUCTION OF THE CONCRETE LANDING AT THE ENTRY. A PORTION OF THE ASPHALT PARKING AREA MAY ALSO REQUIRE RE-GRADING.
Q. REMOVE EXISTING UNUSED STOVE PIPE FLUE IN ITS ENTIRETY. PATCH ROOF AND PLASTER CEILING, AS REQUIRED.
R. REPAIR DAMAGED/DETERIORATED TRIM. INSTALL NEW WOOD REPLICA SILL. PREP, PRIME AND PAINT ALL TRIM.
S. INSPECT BOW IN ROOF SHINGLES. REPAIR, AS REQUIRED.
T. REMOVE VEGETATION GROWING ALONG FOUNDATION.
U. PREP, PRIME AND PAINT BLOCKING AS HOSE BIB. REPOINT STONE FOUNDATION IN THIS LOCATION. THIS MAY REQUIRE SOME BELOW GRADE REPOINTING.
V. REPAIR AND STABILIZE DECK PER STRUCTURAL DRAWINGS.
W. PAINT STUCCO AFTER REPAIRS.

LONG TERM TREATMENT SCOPE OF WORK:

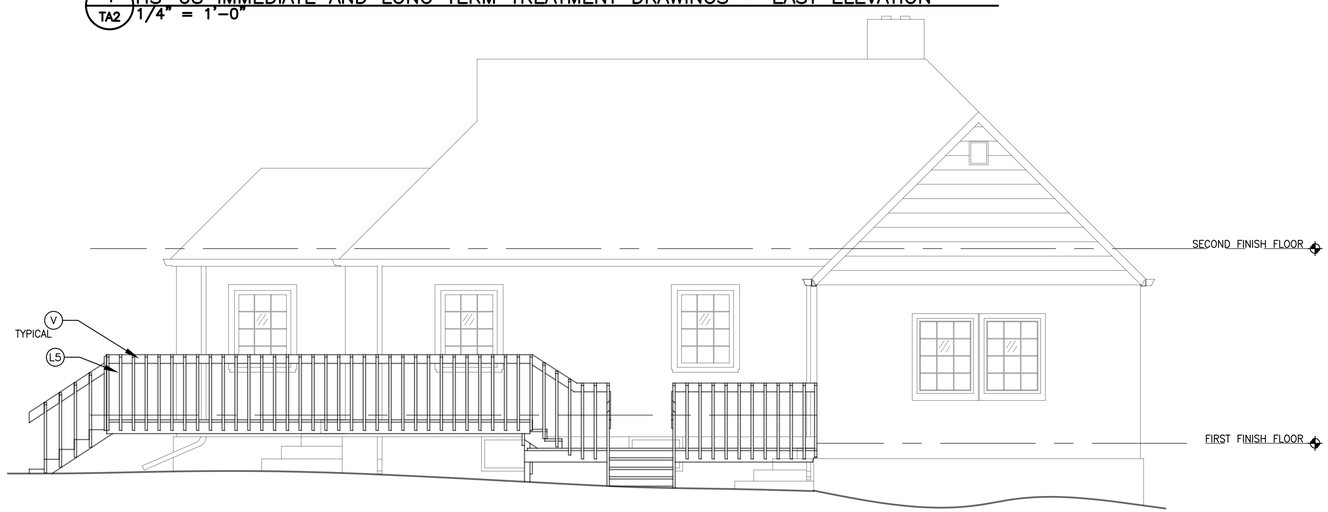
L1. EXISTING EXTERIOR REPLACEMENT TRIM PANNING AT REPLACEMENT WINDOWS IS TOO WIDE AND DOES NOT MATCH THE HISTORIC CONDITION. EXISTING WINDOW LITE CONFIGURATION AND INSTALLATION DOES NOT REPLICATE HISTORIC WINDOWS. INSTALL NEW REPLACEMENT ALUMINUM CLAD WOOD WINDOWS TO MORE CLOSELY REPLICATE THE HISTORIC CASEMENT WINDOWS. MATCH HISTORIC WINDOW LITE CONFIGURATION.
L2. INSTALL REPRODUCTION WOOD SHUTTERS TO MATCH THE ORIGINAL HISTORIC SHUTTERS.
L3. WHEN THE EXISTING ROOF IS READY FOR REPLACEMENT, CONSIDER THE DECRA METAL REPLACEMENT ROOFING SYSTEM OR ONE OF THE OTHER RECOMMENDED REPLACEMENT ROOFS DISCUSSED IN THE TREATMENT RECOMMENDATIONS. REPLACE GUTTERS AND DOWNSPOUTS TO MATCH THE HISTORIC BOX GUTTERS.
L4. REPLACE BACK DOOR WITH MORE HISTORICALLY APPROPRIATE DOOR TO MATCH THE ONE SHOWN IN THE 1936 DRAWINGS.
L5. REMOVE THE WOOD DECK IN ITS ENTIRETY. RESTORE FRONT ENTRY STONE STEPS AT TWO LOCATIONS. EXPLORE ALTERNATIVES FOR INSTALLATION OF STONE PATIO THAT IS NOT VISIBLE FROM THE MAIN ENTRY ROAD. REPOINT STONE FOUNDATION.
L6. INSPECT EAST SIDE OF THE STONE CHIMNEY FOR A CRICKET. IF ONE DOES NOT EXIST, INSTALL A NEW CRICKET DURING THE NEXT RE-ROOFING PROJECT.



1 TA2 HS-08 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS – EAST ELEVATION
1/4" = 1'-0"



2 TA2 HS-08 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS – SOUTH ELEVATION
1/4" = 1'-0"



3 TA2 HS-08 IMMEDIATE AND LONG TERM TREATMENT – EAST ELEVATION WITH DECK
1/4" = 1'-0"

4 TA2 HS-08 IMMEDIATE AND LONG TERM TREATMENT – SOUTH ELEVATION WITH DECK
1/4" = 1'-0"

4 0 4 8
SCALE OF FEET

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CADD: AG
TECH. REVIEW: AG
DATE: 1/27/16

SUB SHEET NO. TA2

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-08
QUARTERS
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO. 108 / 128876
PMIS/PKG NO. 158029
SHEET 4 OF 8

GENERAL NOTES:

1. PERFORM HAZARDOUS MATERIALS TESTING BEFORE INITIATING ANY WORK.
2. SPOT REPOINT AS REQUIRED. NEW MORTAR SHOULD MATCH EXISTING IN COMPOSITION, COLOR, TEXTURE AND PROFILE.
3. CLEAN ALL STONE TO REMOVE DIRT AND BIOLOGICAL GROWTH.

KEY NOTES:

IMMEDIATE TREATMENT SCOPT OF WORK:

A. PATCH AND REPAIR CRACK IN STUCCO.
B. REPOINT EXISTING MORTAR JOINTS.
C. PREP, PRIME AND REPAINT/STAIN (TRIM, SIDING AND STUCCO).
D. REPAIR CRAZING STUCCO.
E. INSTALL AN EXTENSION ON THE DOWNSPOUT.
F. REPAIR DETERIORATED WOOD TRIM.
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O. INVESTIGATE IF LOUVER IS OPEN TO THE ATTIC.
P. RE-GRADE WEST AND A PORTION OF THE NORTH ELEVATION TO A MINIMUM OF 6" BELOW THE FINISH FLOOR. INSTALL SWALE AND FRENCH DRAIN TO DAYLIGHT. THIS WILL REQUIRE DEMOLITION AND RECONSTRUCTION OF THE CONCRETE LANDING AT THE ENTRY. A PORTION OF THE ASPHALT PARKING AREA MAY ALSO REQUIRE RE-GRADING.
Q. REMOVE EXISTING UNUSED STOVE PIPE FLUE IN ITS ENTIRETY. PATCH ROOF AND PLASTER CEILING, AS REQUIRED.
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S. INSPECT BOW IN ROOF SHINGLES. REPAIR, AS REQUIRED.
T. REMOVE VEGETATION GROWING ALONG FOUNDATION.
U. PREP, PRIME AND PAINT BLOCKING AS HOSE BIB. REPOINT FOUNDATION IN THIS LOCATION. THIS MAY REQUIRE SOME BI GRADE REPOINTING.
V. REPAIR AND STABILIZE DECK PER STRUCTURAL DRAWINGS.
W. PAINT STUCCO AFTER REPAIRS.

LONG TERM TREATMENT SCOPE OF WORK:

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L2. INSTALL REPRODUCTION WOOD SHUTTERS TO MATCH THE OI HISTORIC SHUTTERS.
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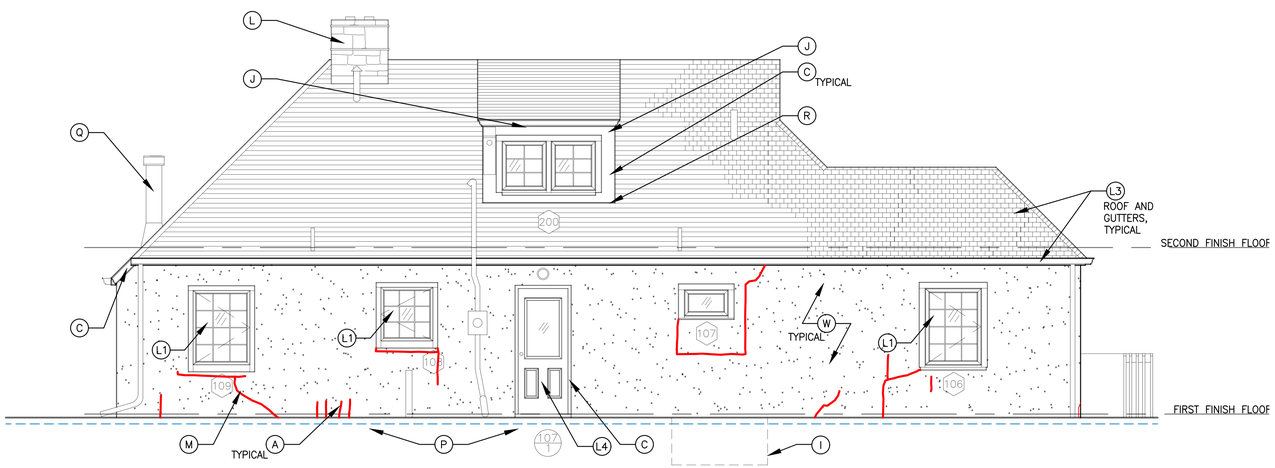
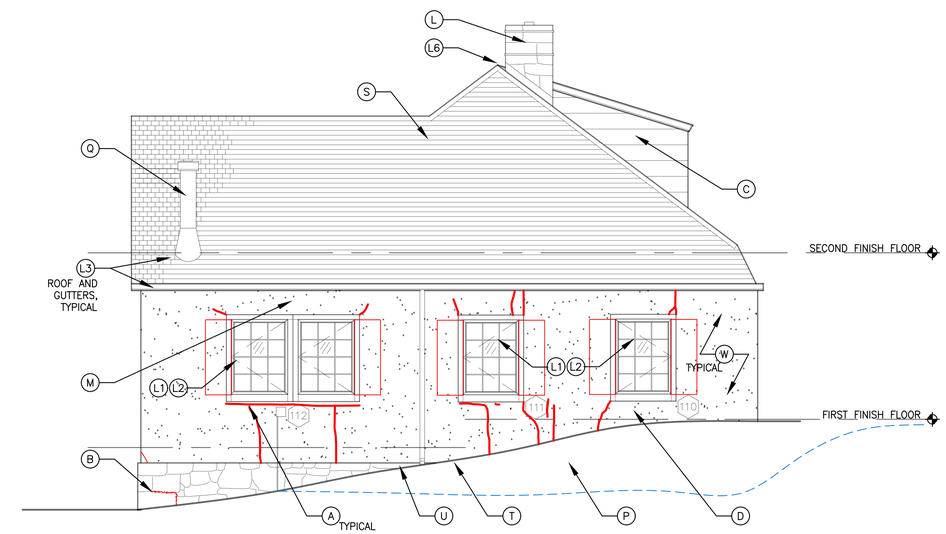


1 TA3 HS-08 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS – WEST ELEVATION
1/4" = 1'-0"



2 TA3 HS-08 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS – NORTH ELEVATION
1/4" = 1'-0"

4 0 4 8
SCALE OF FEET

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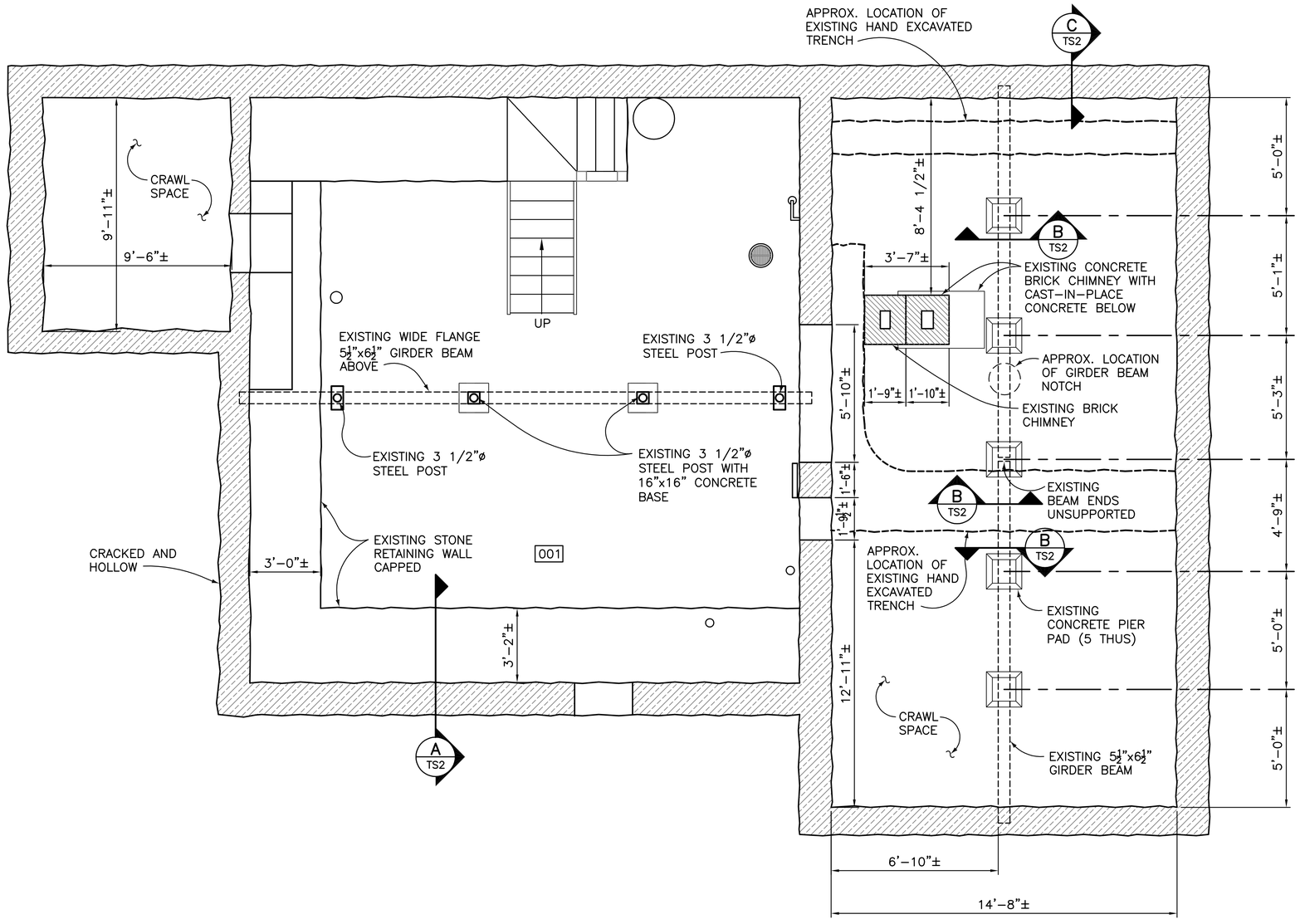
DESIGNED: AG
DRAWN: AG
TECH. REVIEW: AG
DATE: 1/27/16

SUB SHEET NO. TA3

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-08
QUARTERS
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO. 108 / 128876
PMIS/PKG NO. 158029
SHEET 5 OF 8



1 TS0 BASEMENT FOUNDATION PLAN
3/8" = 1'-0"

2 0 2 4 6
SCALE OF FEET

LEGEND

- EXISTING STONE FOUNDATION
- EXISTING BRICK WALL
- EXISTING CONCRETE WALL

STRUCTURAL ENGINEERING ASSOCIATES, INC.
1000 WALNUT
SUITE 1570 KANSAS CITY, MO 64106
Ph. 816-421-1042
Fax 816-421-1061

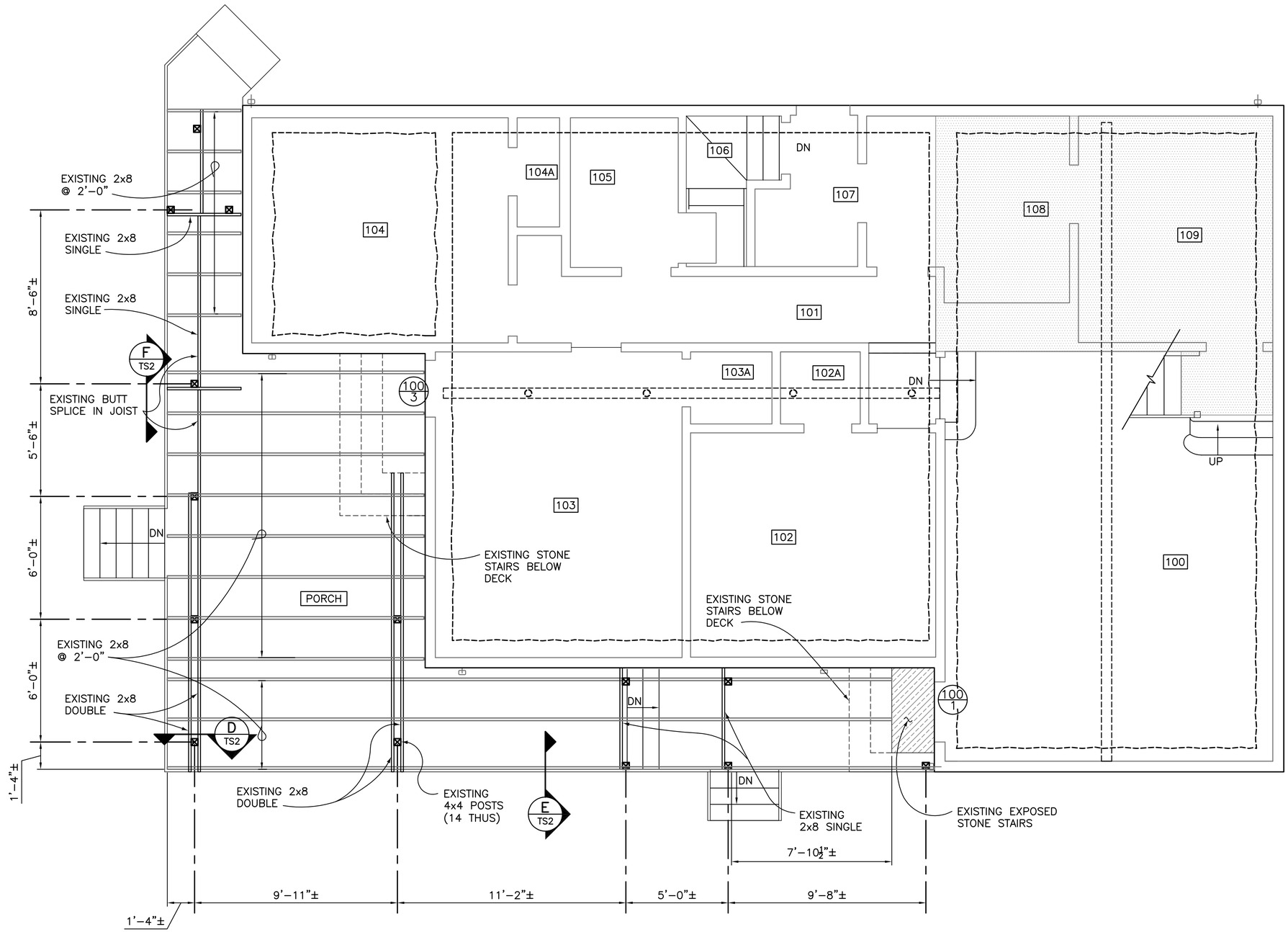
DESIGNED: RCJ
CADD: LEF
TECH. REVIEW:
DATE: 1/27/16

SUB SHEET NO. TS0

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-08
QUARTERS
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO. 108 / 128876
PMIS/PKG NO. 158029
SHEET 6 OF 8

3/30/15 08:52 LFRISBIE R19 G:\2014147\DRAWINGS\02 TREATMENT DRAWINGS\XX- WIND CAVE- SECOND SHT.DWG



LEGEND

- EXISTING RAISED FLR (1'-6" ABOVE FINISHED FLOOR)
- EXISTING STONE FOUNDATION

1 / TS1 WOOD DECK FLOOR FRAMING PLAN

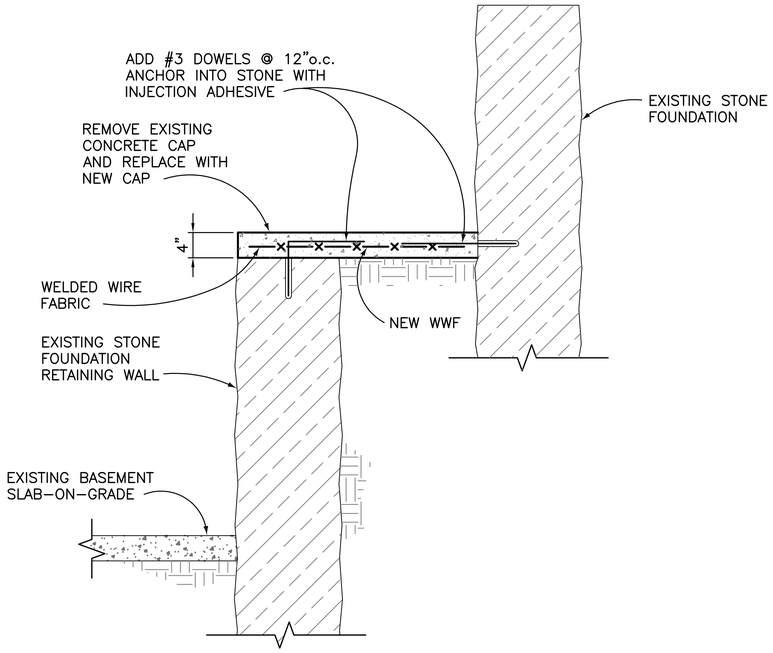
3/8" = 1'-0"

2 0 2 4 6

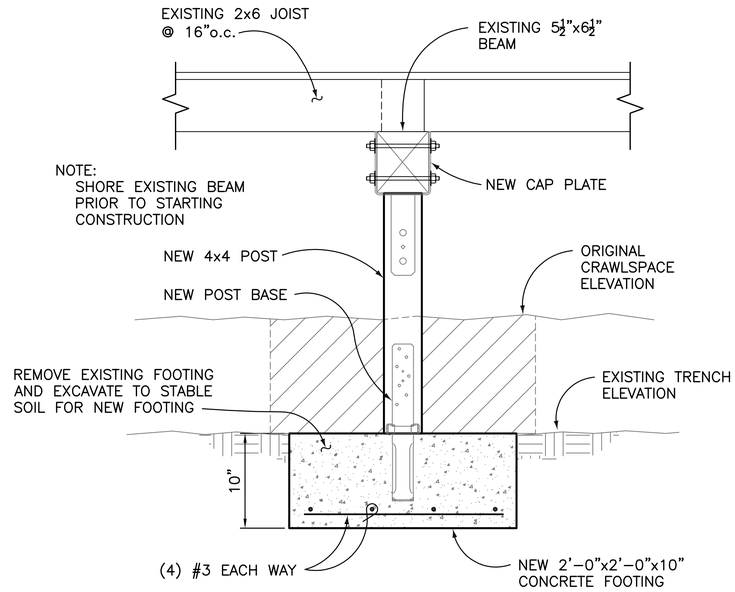
SCALE OF FEET

STRUCTURAL ENGINEERING ASSOCIATES, INC. 1000 WALNUT SUITE 1570 KANSAS CITY, MO 64106 Ph. 816-421-1042 Fax 816-421-1061	DESIGNED: RCJ CADD LEF TECH. REVIEW: DATE: 1/27/16	SUB SHEET NO. TS1	TITLE OF SHEET TREATMENT RECOMMENDATION DRAWINGS HS-08 QUARTERS HISTORIC HOUSING AREA WIND CAVE NATIONAL PARK HOT SPRINGS, SOUTH DAKOTA	DRAWING NO. 108 128876 PMIS/PKG NO. 158029 SHEET 7 OF 8

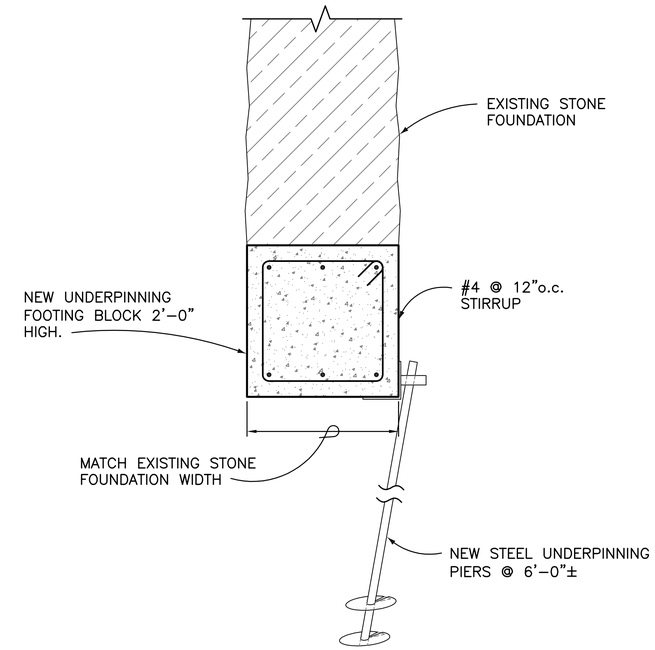
3/30/15 08:52 LFRISBIE R19 G:\2014147\DRAWINGS\02 TREATMENT DRAWINGS\XX- WIND CAVE- SECOND SHT.DWG



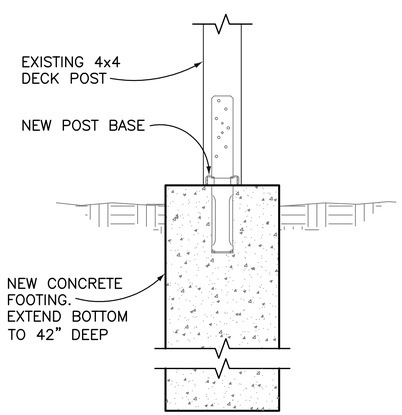
A TS2 CONCRETE CAP REPLACEMENT AT RETAINING WALL
1" = 1'–0"



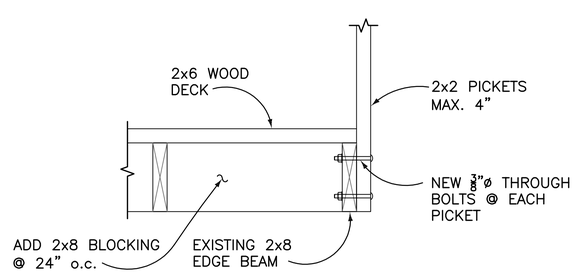
B TS2 SECTION AT NEW FOOTING AND POST
1 1/2" = 1'–0"



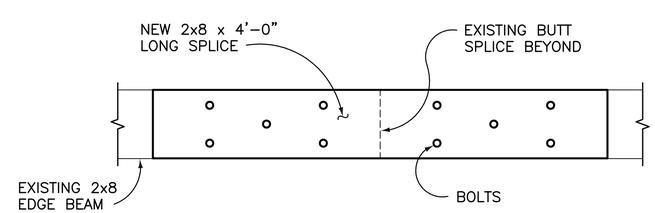
C TS2 UNDERPINNING PIER DETAIL
1" = 1'–0"



D TS2 DECK POST BASE DETAIL
1 1/2" = 1'–0"



E TS2 DECK PICKET ANCHORAGE
1 1/2" = 1'–0"



F TS2 DECK BEAM SPLICE
1 1/2" = 1'–0"

STRUCTURAL ENGINEERING ASSOCIATES, INC.
1000 WALNUT
SUITE 1570 KANSAS CITY, MO 64106
Ph. 816–421–1042
Fax 816–421–1061

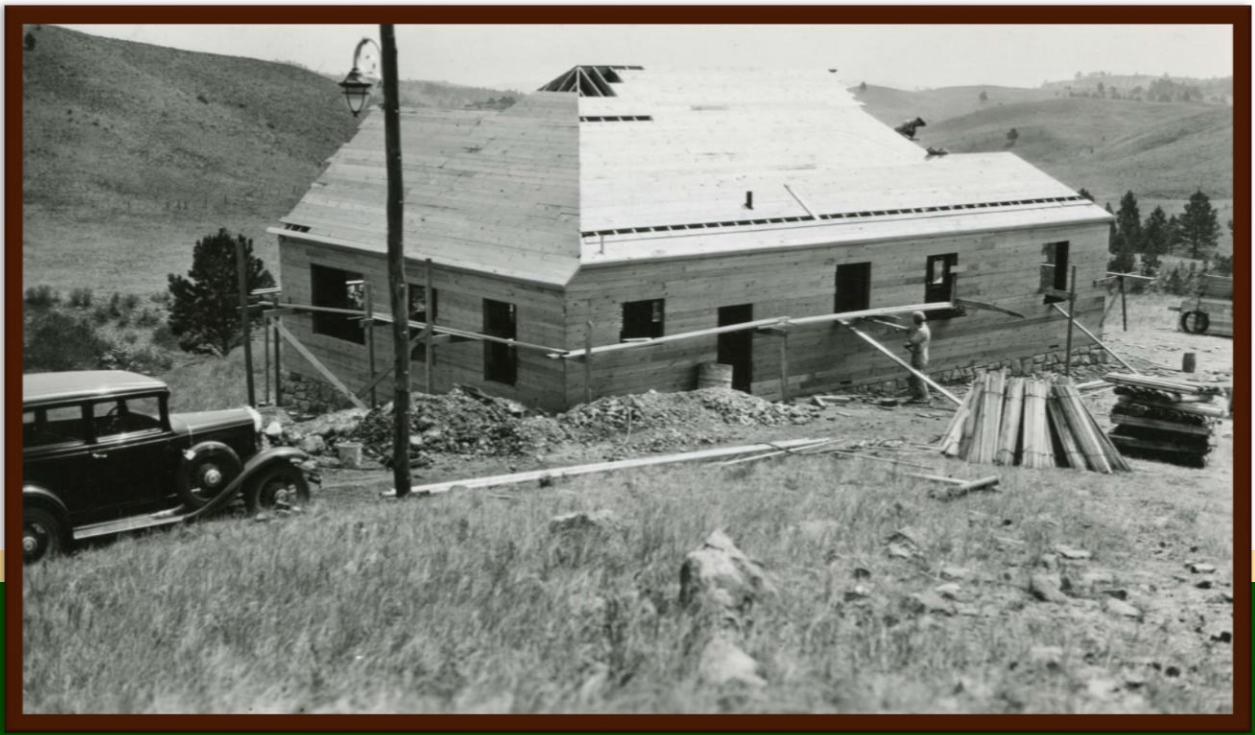
DESIGNED: RCJ
DRAWN: LEF
TECH. REVIEW:
DATE: 1/27/16

SUB SHEET NO. TS2

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS–08
QUARTERS
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO. 108
128876
PMIS/PKG NO. 158029
SHEET 8 OF 8

3/30/15 08:52 LFRISBIE R19 G:\2014147\DRAWINGS\02 TREATMENT DRAWINGS\XX– WIND CAVE– SECOND SHT.DWG



HS-08 1937, Aug. (WICA Museum Collection #WICA 4726)

Appendix A
Historic Drawings

Appendix A

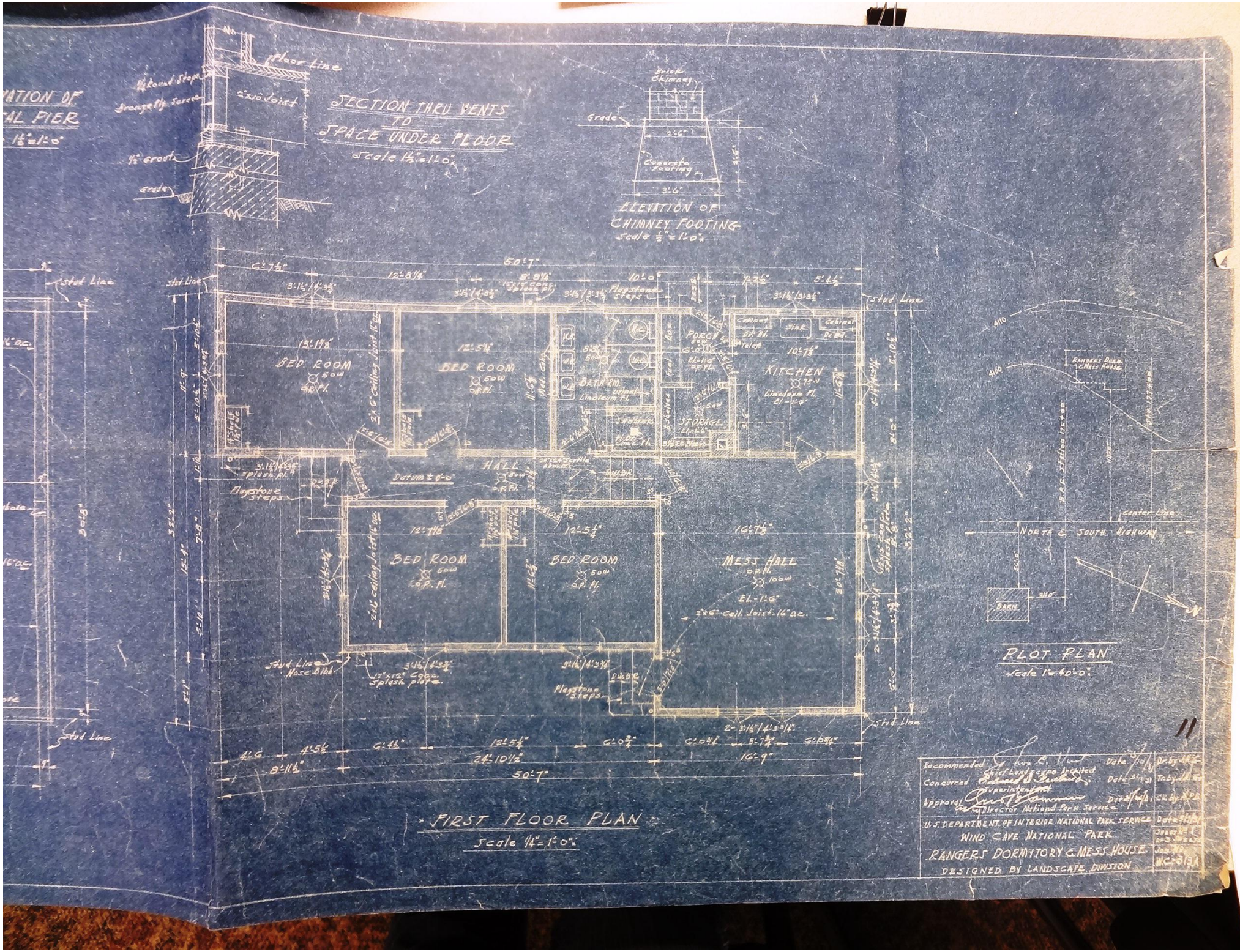
HS-08 Plan Pages

	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	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.
3	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
4	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
5	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.
6	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
7	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

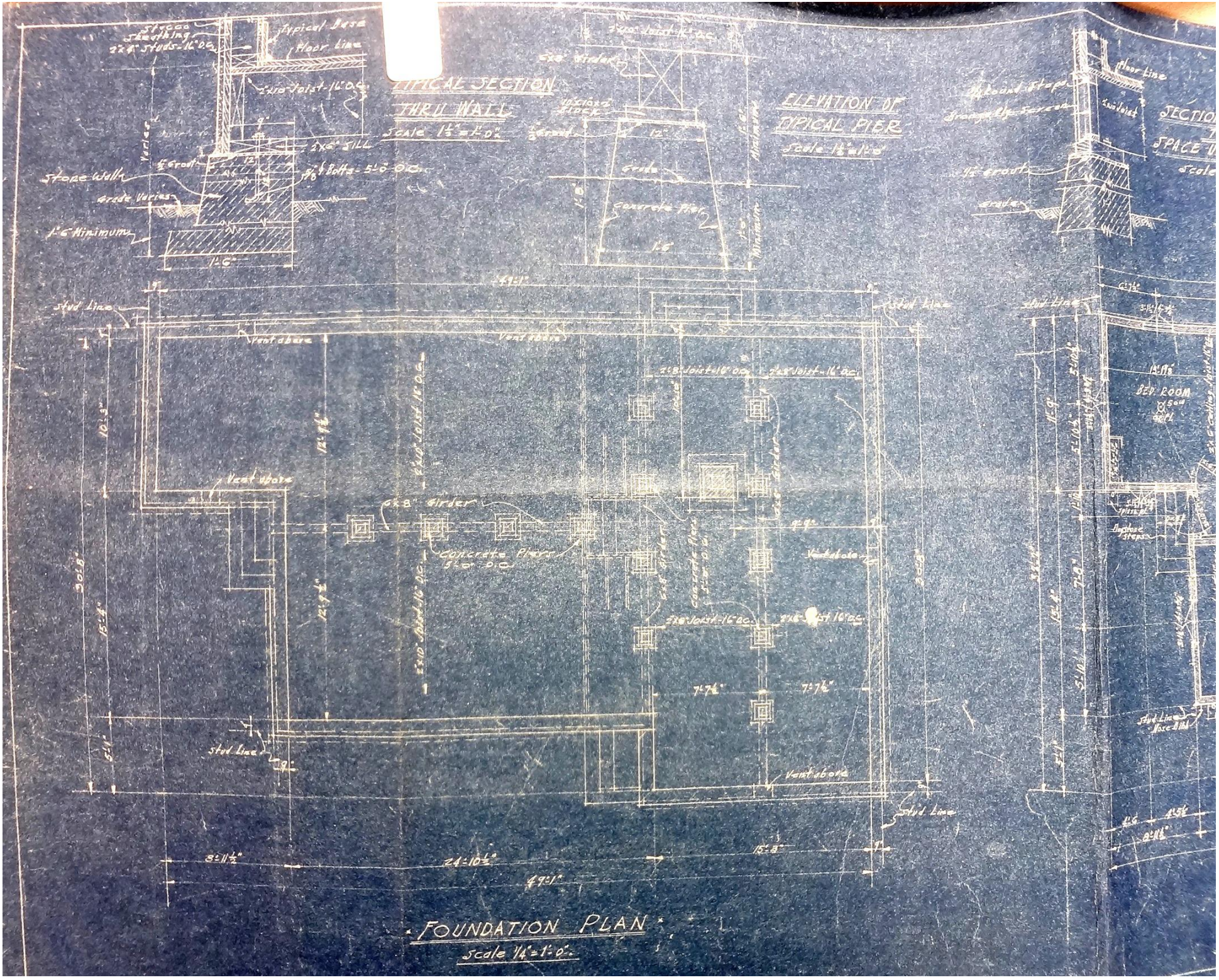
11

Recomended Chief Landscape Architect	Date 5/14/31	Dr. by J.H.G.
Concurred Superintendent	Date 5/19/31	Tr. by J.H.G.
Approve Asst. Director National Park Service	Date 5/20/31	Ck. by A.P.B.
U.S. DEPARTMENT OF INTERIOR NATIONAL PARK SERVICE		Date 5/7/31
WIND CAVE NATIONAL PARK		Sheet No. 3 of 3 Sheets.
RANGERS DORMITORY & MESS HOUSE		Job No. W.C. 313A
DESIGNED BY LANDSCAPE DIVISION		

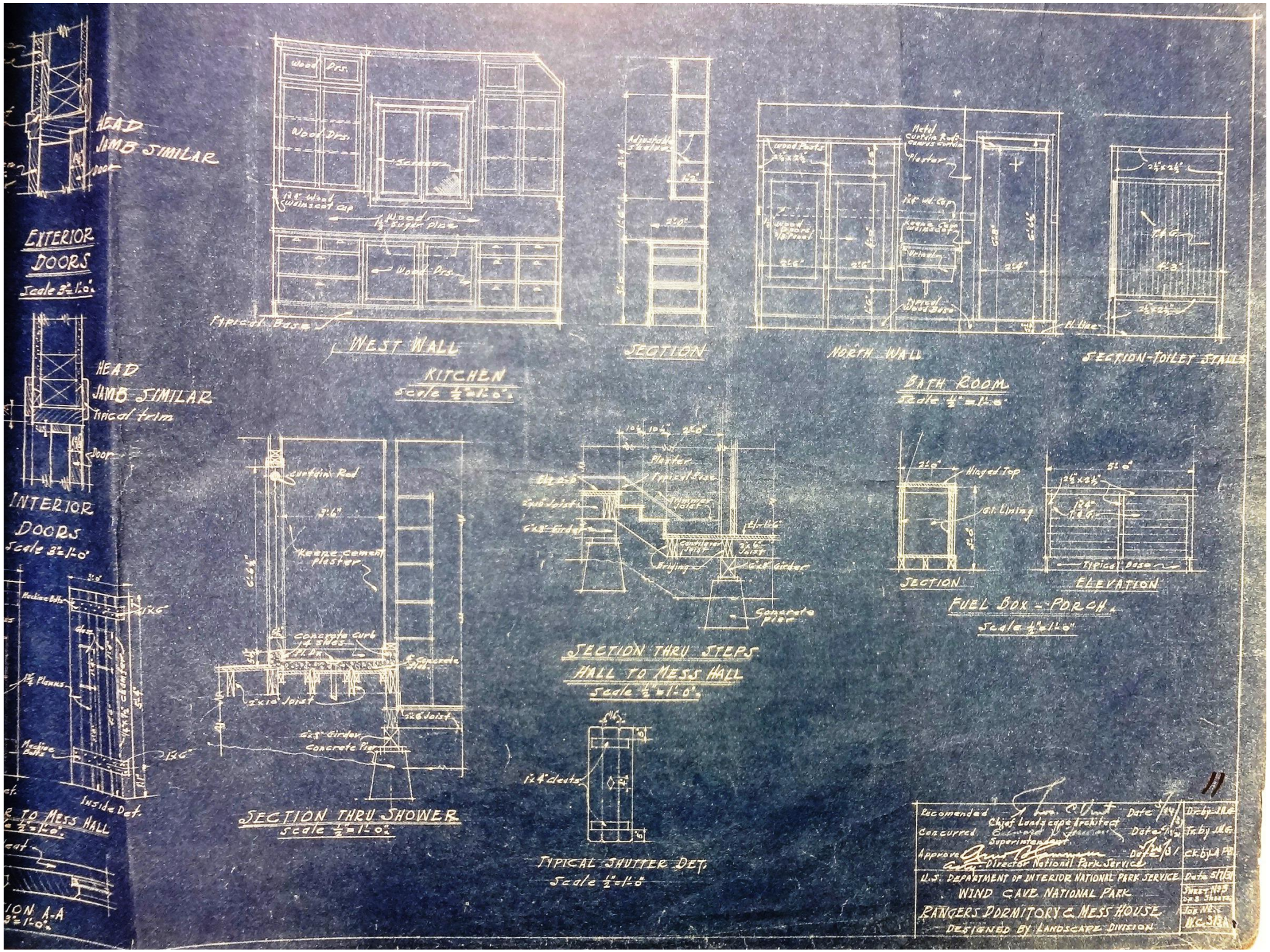
WICA_1931 Plans from Maintenance File_**HS 08**



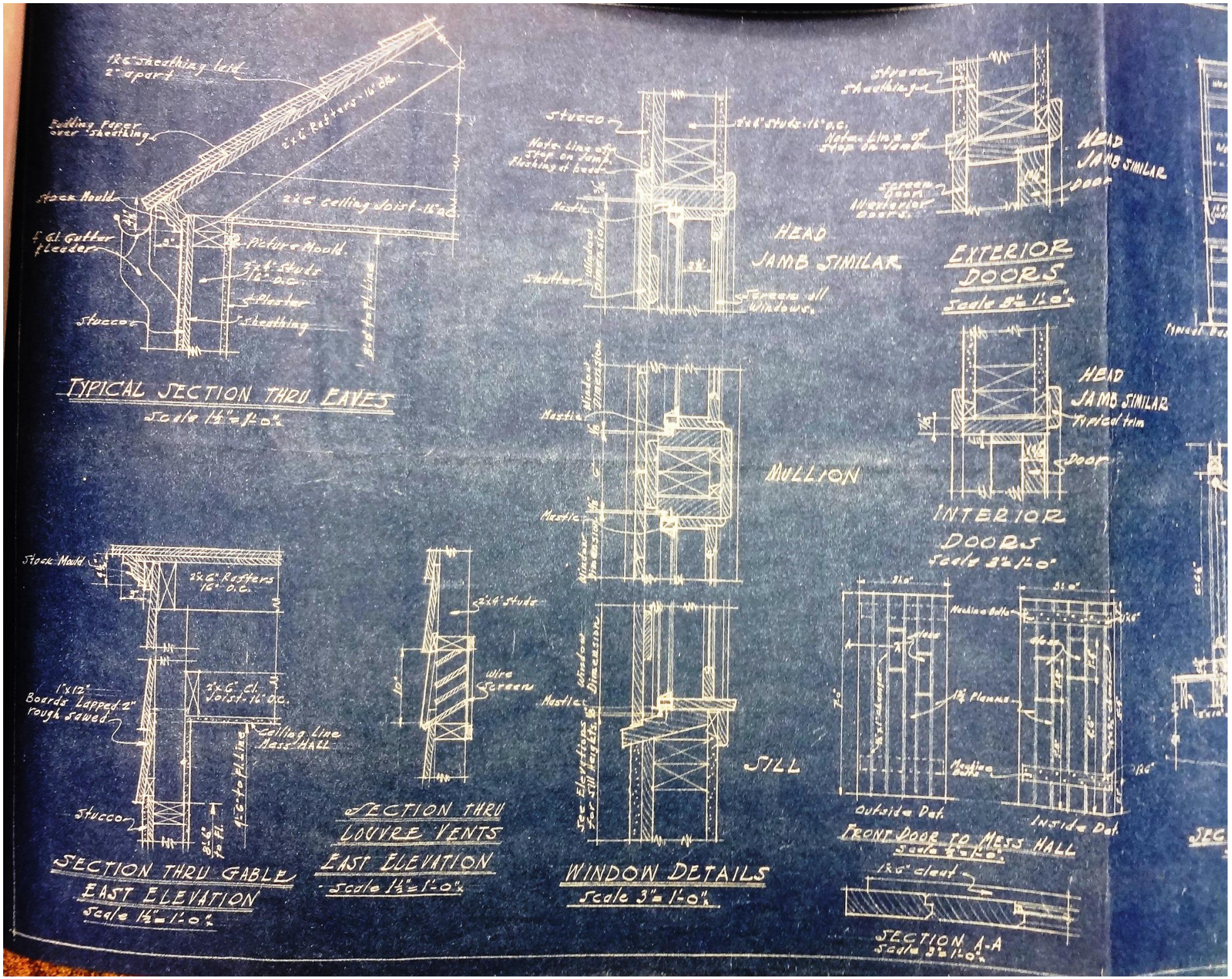
WICA_1931 Plans from Maintenance File_**HS 08**



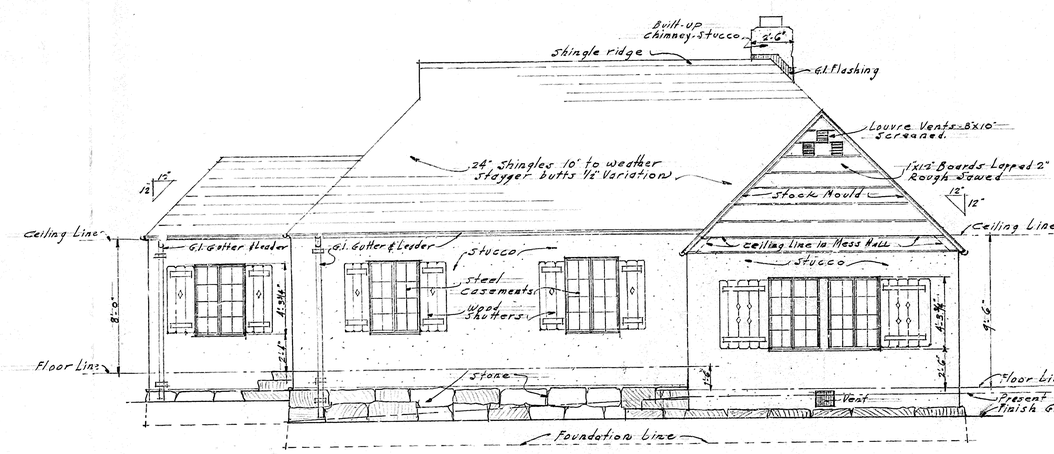
WICA_1931 Plans from Maintenance File_**HS 08**



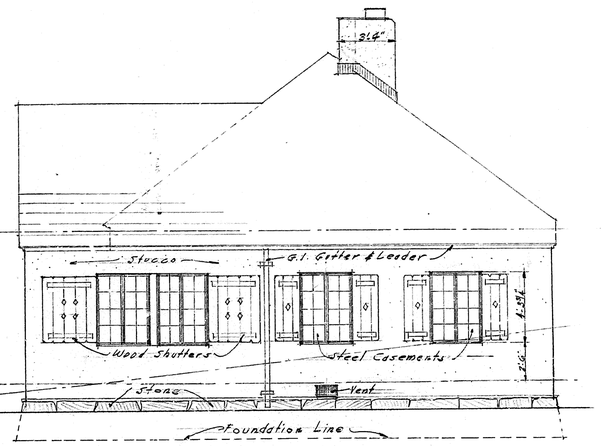
WICA_1931 Plans from Maintenance File_**HS 08**



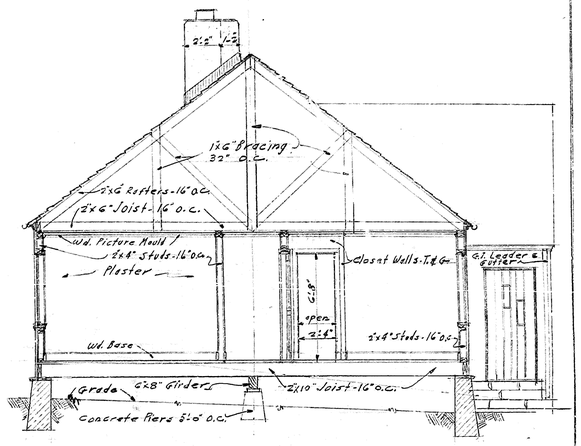
WICA_1931 Plans from Maintenance File_**HS 08**



* EAST ELEVATION *



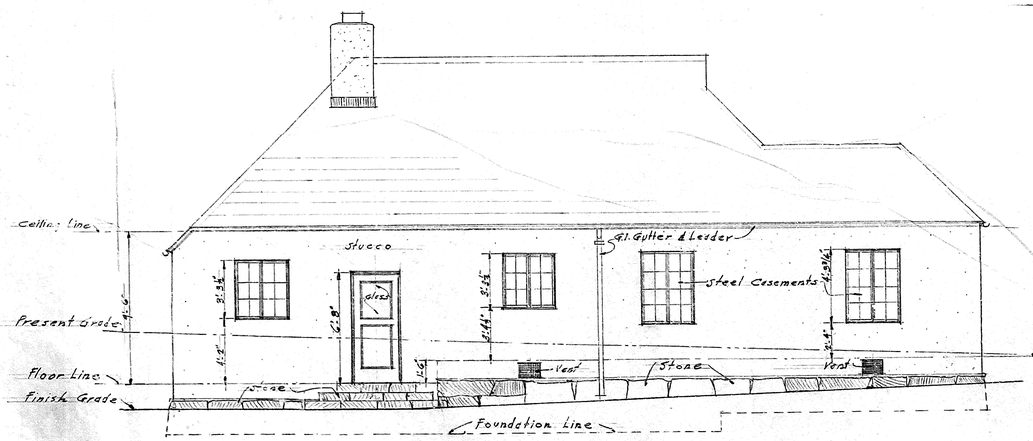
* NORTH ELEVATION *



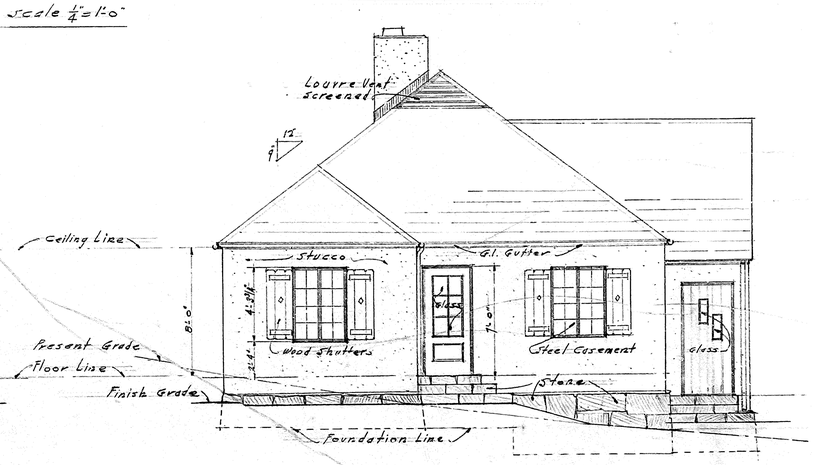
SECTION

Scale 1/4" = 1'-0"

Scale 1/4" = 1'-0"



WEST ELEVATION



* SOUTH ELEVATION *

Scale 1/4" = 1'-0"

STEEL CASEMENT SASH

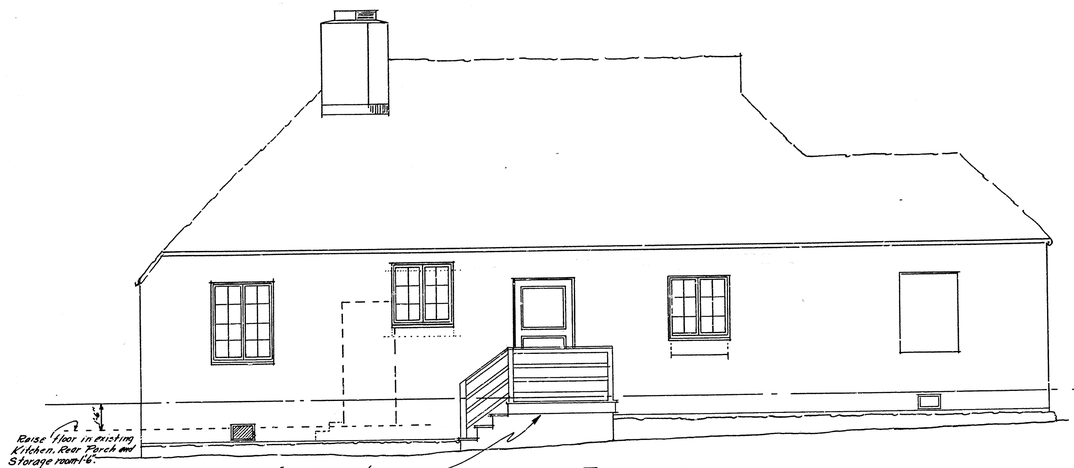
① "Ariston" - 4428 - 3'1 1/2" x 4'3 3/4" or equal.

② "Ariston" - 4326 - 3'1 1/2" x 3'3 1/2" or equal.

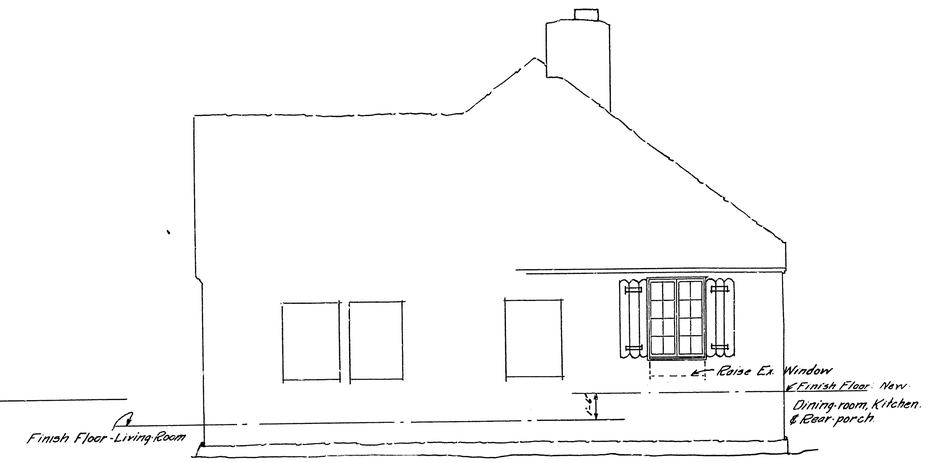
Recommended Chief Landscape Architect	Date 8/14/31	Dr. by J.H.G.
Concurred Superintendent	Date 8/21/31	Tr. by J.H.G.
Approved Director National Park Service	Date 9/24/31	Ck. by A.P.B.
U.S. DEPARTMENT OF INTERIOR - NATIONAL PARK SERVICE		Date 8/7/31
WIND CAVE NATIONAL PARK		Sheet No. 2 of 3 Sheets.
RANGERS DORMITORY & MESS HOUSE		Job No. 313-A
DESIGNED BY LANDSCAPE DIVISION		

Job completed 8-15-31

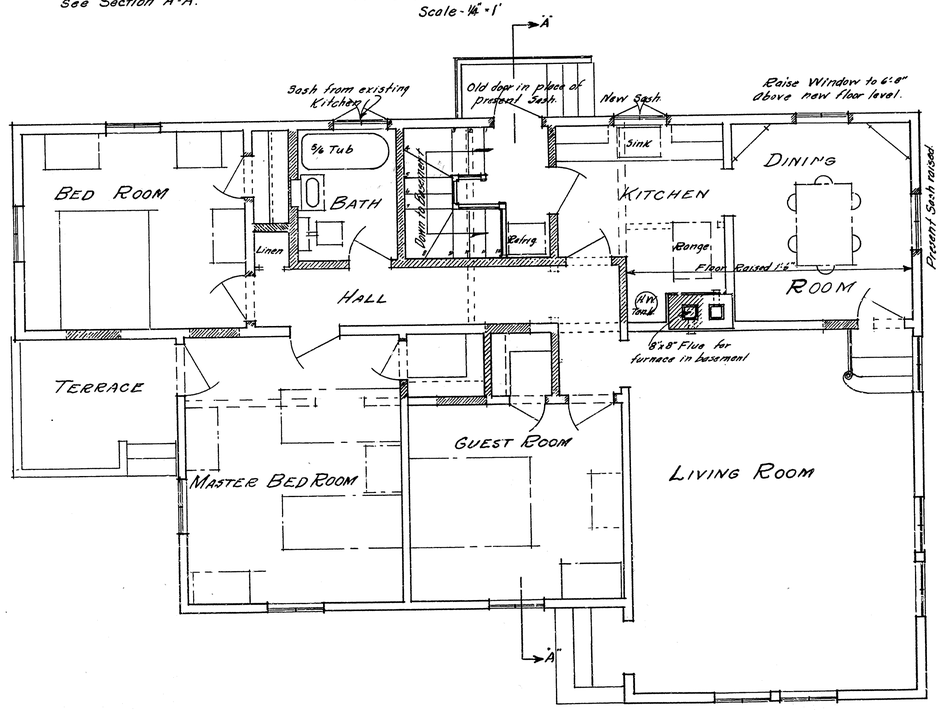
WICA_108_313A_[id278462] **HS-08**



WEST ELEVATION
Scale - 1/4" = 1'



NORTH ELEVATION
Scale 1/4" = 1'



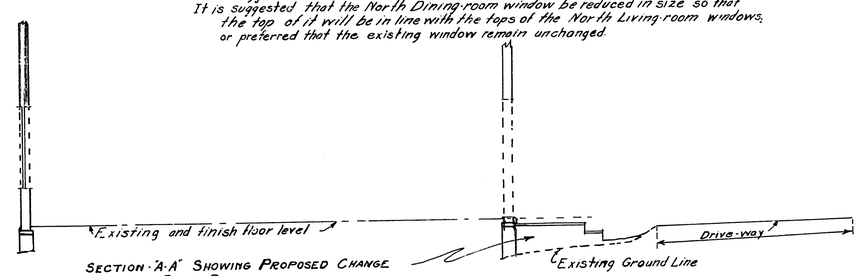
FLOOR PLAN
Scale - 1/4" = 1'

New work.
Existing work to be removed

HALF-SIZE REPRODUCTION

~ Notes ~

Basement shall contain a furnace.
There shall also be a single laundry tray with an electrical outlet adjacent in the basement and an ironing-board.
The floor-level in a portion of the existing building has been raised 1'-6". This is necessary because of the foundation.
It is suggested that kitchen window be lowered - 0'-6".
It is suggested that the North Dining-room window be reduced in size so that the top of it will be in line with the tops of the North Living-room windows, or preferred that the existing window remain unchanged.



SECTION "A-A" SHOWING PROPOSED CHANGE IN BACK PORCH.
Scale - 1/4" = 1'-0"

RECOMMENDED BY W. T. Carrier, Act. Chief Architect	Date 1/22/37
CLEARED FOR ENGINEERING, Chief Engineer	Date
CLEARED FOR E.C.W., E.C.W. Officer	Date
CONCURRED Superintendent	Date 1-10-37
APPROVED Acting Director	Date 1-22-37

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

WIND CAVE NATIONAL PARK

ALTERATING RANGER'S DORMITORY
INTO
A RESIDENCE
DECEMBER - 1936
Scale as Shown

Quarters No. 8

NP-WC
313-C

P

WICA_108_313C_[id278461] HS-08

HS-08 ca. 1969. (WICA Museum Collection #WICA 6709)

Appendix B
Historic Photographs

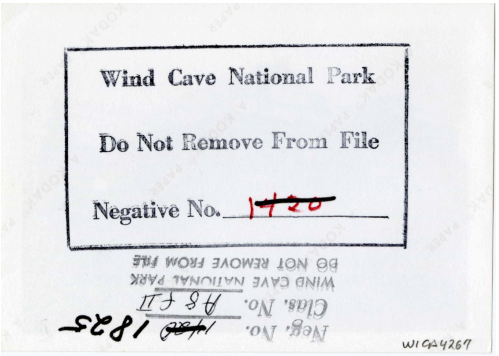
Primary Topic ***HS#*** *HS8*
HS-08

Catalog #
WICA
4267

Photo Date ca. *1931*
Date Source *Architetural Drawings*
Photographer

Manufact. Date 8/31/2014

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Plans say this was completed 9 -15-1931.

Park Database Description

Photographic Print and Negative of Buildings - Construction of Residence #8. See Also 3550, 3551. 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

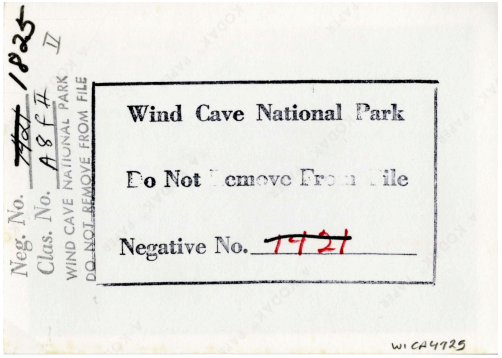
Primary Topic ***HS#*** *HS8*
HS-08

Photo Date ca. *1931*
Date Source *Architetural Drawings*
Photographer

Manufact. Date 8/31/2014

Catalog #
WICA
4725

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Buildings - Construction of Residence #8. See Also 1825, 3551. 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

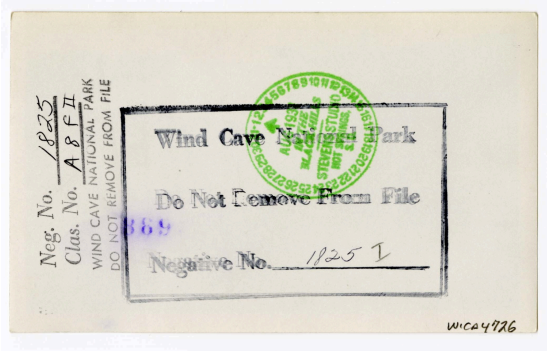
Primary Topic ***HS#*** *HS8*
HS-08

Catalog #
WICA
4726

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

Manufact. Date 8/31/2014

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Year not clear on date stamp, but plans are dated 1931.

Park Database Description

Photographic Print and Negative of Buildings - Construction of Residence #8. See Also 1825, 3550. 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

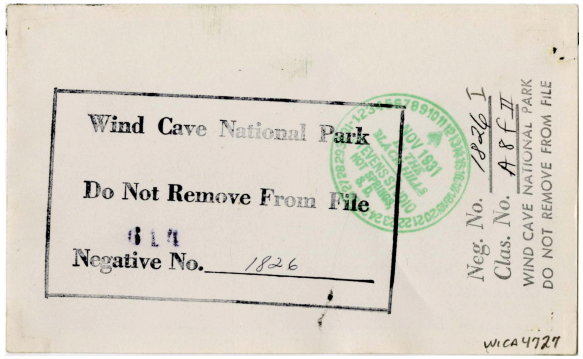
Primary Topic ***HS#*** *HS8*
HS-08

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

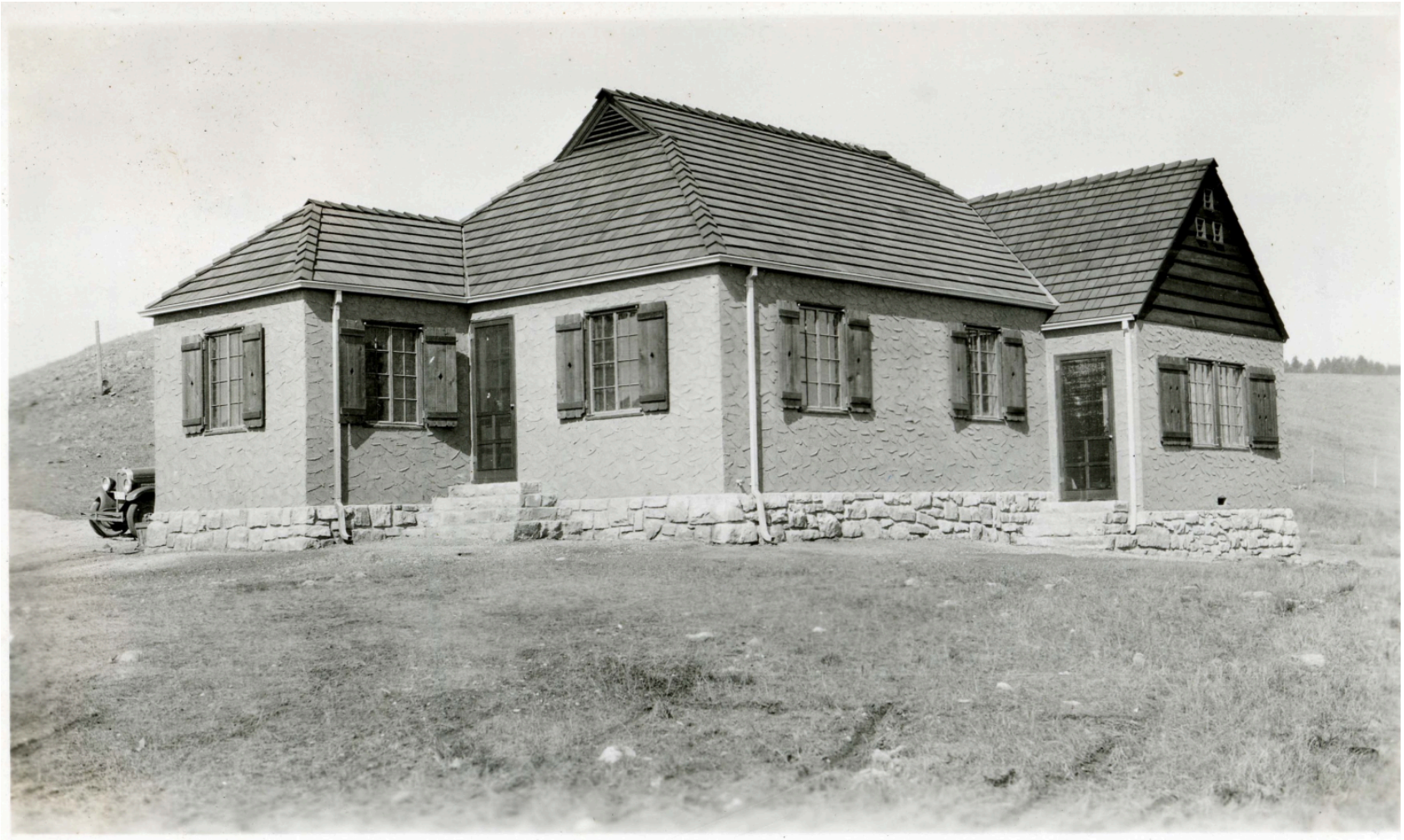
Manufact. Date 11/1/1933

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

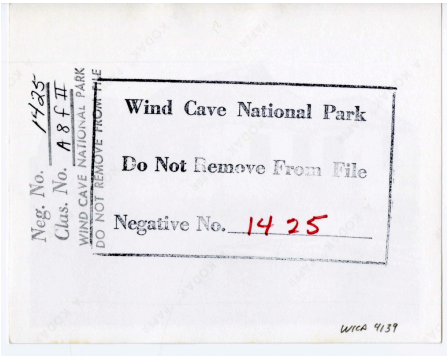
Primary Topic ***HS#*** *HS-08*
HS-08

Catalog #
WICA
4139

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

Manufact. Date

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

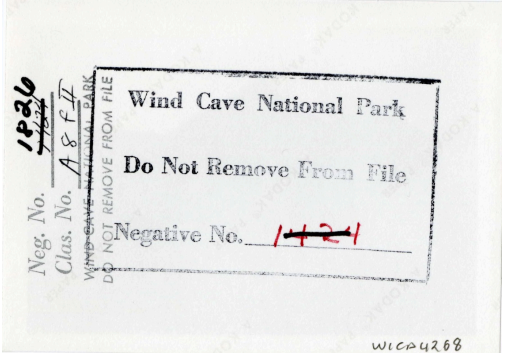
Primary Topic ***HS#*** *HS-08*
HS-08

Catalog #
WICA
4268

Photo Date ca. *1934*
Date Source *other, see HSR notes*
Photographer

Manufact. Date 11/1/1933

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

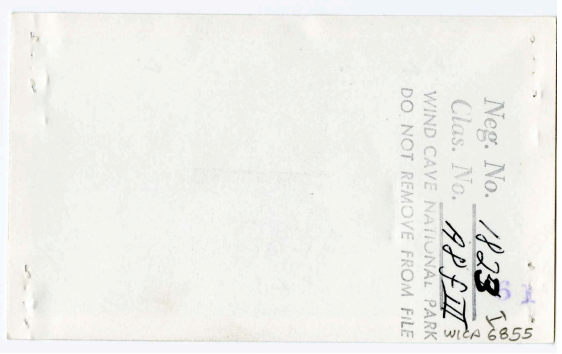
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1952*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date 1952

Catalog #
WICA
6855

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Dormer in place before windows were changed.

Park Database Description

Photographic Print and Negative of insulation of Residential Building - View of Windows in Residence #8 Prior To installation of New Check-Rail Sash Windows. See Also 3549

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

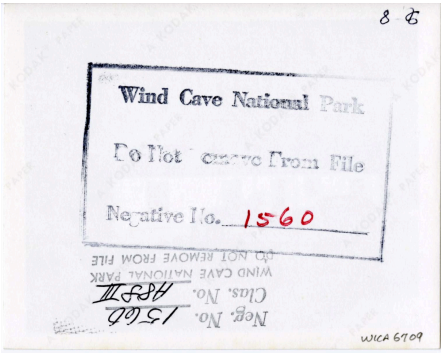
Primary Topic ***HS#*** *HS-08*
HS-08

Catalog #
WICA
6709

Photo Date ca. *1969*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date WINTER1969

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

After dormer was added to the back wall, and windows changed.

Park Database Description

Photographic Print and Negative of Building - Residence #8.

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

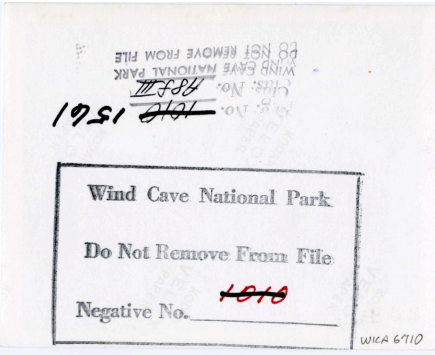
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1969*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date WINTER 1969

Catalog #
WICA
6710

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Windows have been replaced.

Park Database Description

Photographic Print and Negative of Building - Residence #8. See Also 3459, 3460

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

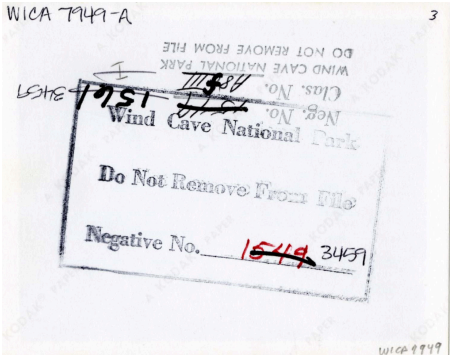
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1969*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date WINTER1969

Catalog #
WICA
7949

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Park Database Description

Building - Residence #8

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

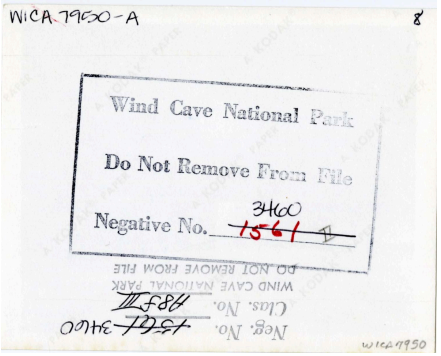
Primary Topic ***HS#*** *HS-08*
HS-08

Photo Date ca. *1969*
Date Source *"Manufactured Date"*
Photographer

Manufact. Date WINTER1969

Catalog #
WICA
7950

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Park Database Description

Building - Residence #8

HS-08 West Elevation. (SRJA 2014)

Appendix C
Cost Estimate

CONSTRUCTION MANAGEMENT RESOURCES, LLC
ESTIMATING • SCHEDULING • PROJECT MANAGEMENT • CONSULTING
5201 JOHNSON DRIVE, SUITE 330, MISSION, KANSAS 66205 (913) 262-6715 • FAX (913) 262-1380

Historic Structures Report - Historic Housing Area
Wind Cave National Park - Hot Springs South Dakota
Susan Richards's Johnson & Associates
Final Report Estimate 01/27/2016

DESCRIPTION		Immediate	Short Term	Long Term
HS-08 Quarters				
01 00 00 GENERAL CONDITIONS	15%	10,103	-	7,318
02 41 00 DEMOLITION		3,660	-	1,536
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	-
03 30 00 CAST-IN-PLACE CONCRETE		24,545	-	-
04 01 20 MASONRY RESTORATION AND CLEANING		3,142	-	2,319
04 20 00 MASONRY		-	-	-
05 12 00 STEEL		300	-	-
06 10 00 ROUGH CARPENTRY		2,689	-	6,500
06 13 00 EXTERIOR RESTORATION		960	-	5,400
06 40 16 INTERIOR ARCHITECTURAL WOODWORK RESTORATION		-	-	-
07 14 00 FLUID-APPLIED WATERPROOFING		-	-	-
07 20 00 STUCCO REPAIRS		4,482	-	-
07 21 00 THERMAL INSULATION		6,625	-	-
07 50 00 ROOFING		650	-	26,634
07 60 00 SHEET METAL FLASHING AND TRIM		1,100	-	5,688
07 92 00 JOINT SEALANTS		-	-	-
08 11 00 DOOR & FRAMES		200	-	-
08 32 13 STORM WINDOWS		-	-	-
08 52 00 WOOD WINDOWS		120	-	-
08 71 00 DOOR HARDWARE		-	-	-
08 80 00 GLAZING		-	-	-
09 20 00 PLASTER REPAIR		-	-	-
09 21 16 GYPSUM SYSTEMS		-	-	-
09 64 00 WOOD FLOORING		-	-	-
09 90 00 PAINTING		2,250	-	210
10 14 00 SIGNS		-	-	-
10 28 00 TOILET AND BATH ACCESSORIES		-	-	-
10 44 00 FIRE-PROTECTION SPECIALTIES		250	-	-
21 00 00 FIRE PROTECTION		-	-	-
22 00 00 PLUMBING		-	-	-
23 00 00 HVAC		450	-	500
26 00 00 ELECTRICAL		1,200	-	-
31 20 00 EARTH MOVING		1,977	-	-
31 48 13 UNDERPINNING PIERS		6,000	-	-
32 13 13 CEMENT CONCRETE PAVING		5,000	-	-
32 92 00 LAWN & GRASSES		179	-	-
33 10 00 WATER DISTRIBUTION		-	-	-
33 30 00 SANITARY SEWERAGE		-	-	-
33 40 00 STORM DRAINAGE		1,573	-	-
33 46 16 FOUNDATION DRAINAGE SYSTEMS		-	-	-
subtotal		77,455	-	56,105
Contractor's Fee	10%	7,746	-	5,610
subtotal		85,201	-	61,715
Design/Estimate Contingency	25%	21,300	-	15,429
subtotal		106,501	-	77,144
Escalation to Mid-Point - 04/15/2017	3.7%	3,912	-	2,834
TOTAL		**110,413**	**-**	**79,977**

***NOTE: Ground disturbance may require archeological monitoring. Costs for monitoring are not included in estimate.**

DESCRIPTION	QUANTITY	UNIT $	TOTAL	Immediate	Short Term	Long Term
HS-08 Quarters						
02 41 00 DEMOLITION						
Immediate						
Demo Concrete Cap in Basement	112 SF	3.00	336	336		
Demo Concrete Footing in Crawl Space	5 EA	100.00	500	500		
Temp Shoring @ Crawl Space	5 EA	200.00	1,000	1,000		
Demo West Concrete Landing	54 SF	5.00	269	269		
Remove Deck Posts and Temp Shore	14 EA	100.00	1,400	1,400		
Remove Plastic Sheeting from Basement Ceiling	1 LS	105.00	105	105		
Remove Straps @ Chimney	2 EA	25.00	50	50		
Long Term						
Demo Deck & Haul Off	473 SF	3.25	1,536			1,536
			5,196	3,660	0	1,536
02 50 00 HAZARDOUS MATERIAL ABATEMENT						
			0			0
Extent of hazardous materials needs to be determined before accurate estimate can be rendered						
			0	0	0	0
03 30 00 CAST-IN-PLACE CONCRETE						
Immediate						
Install Grade Beams And Underpin	31 LF	650.00	19,920	19,920		
New Concrete Cap @ Basement	112 SF	10.00	1,121	1,121		
New Concrete Footing in Crawl Space 2'x2'x10"	5 EA	200.00	1,000	1,000		
New West Concrete Landing	54 SF	7.50	403	403		
New Footing @ Deck Posts	14 EA	150.00	2,100	2,100		
			24,545	24,545	0	0
04 01 20 MASONRY RESTORATION AND CLEANING						
Immediate						
Repoint Window Well Walls	24 SF	8.00	192	192		
Repoint Foundation Walls	81 SF	8.00	651	651		
Clean Foundation Walls	326 SF	6.00	1,954	1,954		
Repoint Chimney	4 SF	8.00	29	29		
Clean Chimney	36 SF	6.00	216	216		
Restore Mortar Wash @ Top of Chimney	1 EA	100.00	100	100		
Long Term						
Repoint Foundation Walls After Deck Removal	166 SF	8.00	1,325			1,325
Clean Foundation Walls After Deck Removal	166 SF	6.00	994			994
			5,461	3,142	0	2,319
04 20 00 MASONRY						
			0	0	0	0
05 12 00 STEEL						
Immediate						
Fabricate New Steel Window Well Cover and Paint	1 EA	300.00	300	300		
			300	300	0	0
06 10 00 ROUGH CARPENTRY						
Immediate						
New 4x4 Posts @ Crawl Space	5 EA	200.00	1,000	1,000		
New Through Bolts @ Pickets	270 EA	5.00	1,350	1,350		
Add 2x8 Blocking @ Decking x 2'	19 EA	10.00	189	189		
4' Beam Splice (Detail F)	1 EA	150.00	150	150		
Long Term						
Build New Deck or Patio @ West Side ALLOWANCE	1 LS	6,500.00	6,500			6,500
			9,189	2,689	0	6,500
06 13 00 EXTERIOR RESTORATION						
Immediate						
Misc Wood trim Repair	24 LF	15.00	360	360		
Patch Misc Holes in Wood Trim	2 EA	150.00	300	300		
Exterior Window Sill @ Window 200	1 EA	300.00	300	300		
Long Term						
Replicate Rustic Shutters	9 PR	600.00	5,400			5,400
			6,360	960	0	5,400
06 40 16 INTERIOR ARCHITECTURAL WOODWORK RESTORATION						
			0			0
			0	0	0	0
07 14 00 FLUID-APPLIED WATERPROOFING						
			0			0
			0	0	0	0
07 20 00 STUCCO REPAIRS						
Immediate						
General STUCCO Wall Repair (allow 50%)	149 SF	30.00	4,482	4,482		
			4,482	4,482	0	0
07 21 00 THERMAL INSULATION						
Immediate						
Insulate Crawl Space @ NW Corner ALLOWANCE	194 SF	10.00	1,942	1,942		
Replace Insulation in East Half of Crawl Space 003 and 002 as needed	1 LS	500.00	500	500		
Insulate Crawl Space Foundation Walls	183 SF	3.00	548	548		
Remove Debris and Install Vapor Barrier in Crawl Space	654 SF	0.85	556	556		
Additional Insulation in Attic	1,079 SF	1.00	1,079	1,079		
Test Exterior Walls for Insul and Patch holes ALLOWANCE	1 LS	2,000.00	2,000	2,000		
			6,625	6,625	0	0

DESCRIPTION	QUANTITY	UNIT $	TOTAL	Immediate	Short Term	Long Term
HS-08 Quarters						
07 50 00 ROOFING						
Immediate						
Remove Stove Pipe and Patch Roofing	1 EA	500.00	500	500		
Misc Roof Repair @ North	1 LS	150.00	150	150		
Long Term						
Demo Roofing and Install New Decra Steel Roofing System	2,219 SF	12.00	26,634			26,634
			27,284	650	0	26,634
07 60 00 SHEET METAL FLASHING AND TRIM						
Immediate						
Install Crawl Space Vents	5 EA	200.00	1,000	1,000		
Install Downspout Extensions	2 EA	50.00	100	100		
Long Term						
New Custom Box Gutters	160 LF	25.00	4,008			4,008
Custom Downspouts	112 LF	15.00	1,680			1,680
			6,788	1,100	0	5,688
07 92 00 JOINT SEALANTS						
			0	0		
			0	0	0	0
08 11 00 DOOR & FRAMES						
Immediate						
Weather Strip Doors 200-A	1 EA	200.00	200	200		
			200	200	0	0
08 32 13 STORM WINDOWS						
			0			0
			0	0	0	0
08 52 00 WOOD WINDOWS						
Immediate						
Install Caulk Rope Weather-stripping @ Basement Windows	3 EA	40.00	120	120		
			120	120	0	0
08 71 00 DOOR HARDWARE						
			0			
			0	0	0	0
08 80 00 GLAZING						
			0			0
			0	0	0	0
09 20 00 PLASTER REPAIR						
			0			
			0	0	0	0
09 21 16 GYPSUM SYSTEMS						
			0			
			0	0	0	0
09 64 00 WOOD FLOORING						
			0			
			0	0	0	0
09 90 00 PAINTING						
Immediate						
Misc Stucco Painting	1,494 SF	1.00	1,494	1,494		
Paint/Stain Wood Trim/Siding/Windows	151 SF	5.00	756	756		
Long Term						
Staining Interior Windows	7 EA	30.00	210			210
			2,460	2,250	0	210
10 14 00 SIGNS						
			0			0
			0	0	0	0
10 28 00 TOILET AND BATH ACCESSORIES						
			0			0
			0	0	0	0
10 44 00 FIRE-PROTECTION SPECIALTIES						
Immediate						
Fire Escape Ladders for Bedrooms	1 EA	250.00	250	250		
			250	250	0	0
21 00 00 FIRE PROTECTION						
not applicable			0	0		
			0	0	0	0
22 00 00 PLUMBING						
not applicable			0	0		
			0	0	0	0

DESCRIPTION	QUANTITY	UNIT $	TOTAL	Immediate	Short Term	Long Term
HS-08 Quarters						
23 00 00 HVAC						
Immediate						
Extend Exhaust Fan Vents Through Roof	1 EA	300.00	300	300		
Install Heat Trace on Sump Pit Piping	1 EA	150.00	150	150		
Long Term						
Move Dryer Vent to West Elevation	1 EA	500.00	500			500
			950	450	0	500
26 00 00 ELECTRICAL						
Immediate						
Install GFCI Outlets @ Existing Locations in Basement & Kitchen	8 EA	150.00	1,200	1,200		
			1,200	1,200	0	0
31 20 00 EARTH MOVING						
Immediate						
Excavate at perimeter of Building	14 CY	30.00	409	409		
Backfill at perimeter of Building	14 CY	25.00	341	341		
Excavate column Footings 2 Crawl Space	5 EA	150.00	750	750		
Regrade at West and South Side of House	60 SY	8.00	478	478		
			1,977	1,977	0	0
31 48 13 UNDERPINNING PIERS						
Immediate						
New Steel Underpinning	6 EA	1,000.00	6,000	6,000		
			6,000	6,000	0	0
32 13 13 CEMENT CONCRETE PAVING						
Immediate						
New Asphalt Paving ALLOWANCE	1 LS	5,000.00	5,000	5,000		
			5,000	5,000	0	0
32 92 00 LAWN & GRASSES						
Immediate						
Seed	60 SY	3.00	179	179		
			179	179	0	0
33 10 00 WATER DISTRIBUTION						
			0			0
			0	0	0	0
33 30 00 SANITARY SEWERAGE						
			0			0
			0	0	0	0
33 40 00 STORM DRAINAGE						
Immediate						
Install New French Drain	31 LF	35.00	1,073	1,073		
Install Drain in Window Well and connect to new French Drain ALLOWANCE	1 EA	500.00	500	500		
			1,573	1,573	0	0
33 46 16 FOUNDATION DRAINAGE SYSTEMS						
			0			0
			0	0	0	0