National Park Service • U.S. Department of the Interior

Rocky Mountain National Park

FALL RIVER PASS HISTORIC DISTRICT

Historic Structures Reports for Fall River Pass Ranger Station, Pump House, and Generator House

APRIL 2023





Cover Illustration: The Fall River Pass Ranger Station (Brian Rich, 2021)

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Rocky Mountain National Park
Fall River Pass Historic District

Historic Structures Reports for Fall River Pass Ranger Station, Pump House, and Generator House

April 2023

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National Park Service

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TABLE OF CONTENTS

Historic Structures Reports for Fall River Pass Ranger Station, Pump House, and Generator House

Executive Summary ix

Chapter 1: Introduction 1-1

Chapter 2: Ranger Station 2-1

- Overview 2-3
- Physical Description 2-8
- Condition Assessment 2-15
- Treatment Recommendations 2-21

Chapter 3: Pump House & Catchment Basin 3-1

- Overview 3-3
- Physical Description 3-7
- Condition Assessment 3-14
- Treatment Recommendations 3-22

Chapter 4: Generator House 4-1

- Overview 4-3
- Physical Description 4-7
- Condition Assessment 4-13
- Treatment Recommendations 4-18

Appendices

- A. Bibliography A-1
- B. Methodology B-1
- C. Treatment Terminology C-1
- D. Ranger Station - Detailed Condition Assessment D-1
- E. Pump House & Catchment Basin - Detailed Condition Assessment E-1
- F. Generator House - Detailed Condition Assessment F-1

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

PROJECT DATA

The Fall River Pass is located on Trail Ridge Road, Estes Park, CO 80517. The Ranger Station is located west of the Alpine Visitor Center while the Generator House is located adjacent to the Trail Ridge Store. The Pump House and Catchment Basin are located in the cirque approximately 600 feet below the Alpine Visitor Center.

Colorado's State Historic Preservation Office (SHPO) and the Keeper of the National Register of Historic Places recognizes the Fall River Pass as a historic district (Site identification number: 5LR.14866) under criteria A (broad patterns of development of the National Park System) and C (for architectural design). The Ranger Station (1922, building 0058, 5LR.1204), Pump House[1], and Catchment Basin (1938, building 0171, 5LR.10936) are contributing structures to the historic district. The Generator House[2] is not a contributing structure.

KEY CONTRIBUTING FEATURES

Key contributing features on the auxiliary building exteriors include the stone, wood-framed windows and doors, and mineral-surfaced, built-up, or cedar shake roofing. Key interior contributing features include the interior finishes, equipment and furnishings.

STUDY SUMMARY

The Fall River Pass Historic Structures Reports focus on existing auxiliary structures in the Fall

0.1. The 2006 NRHP nomination name for this building below the cirque is the Fall River Pump House and Catchment Basin. More recent documents spell the name of this building as "Pumphouse." For this report, the building will be referred to as the "Pump House and Catchment Basin." Where historical documents are referenced, this report will refer to it as "Pumphouse" to be consistent with the historical document.

0.2. Some historical documents, including the original drawings, refer to this building as "Generator Building." The 2021 Fall River Pass Historic District Nomination refers to this building as the "Generator House." For this report, the building will be referred to as "Generator House." Where historical documents are referenced, the report will refer to it as "Generator Building" to be consistent with the historical document.



Figure ix: The Pump House and Catchment Basin are located in the cirque below the Alpine Visitor Center. (source: Brian Rich, 2021)

River Pass Historic District, including the Ranger Station, Pump House, Catchment Basin, and Generator House. Evaluation of contributing features and character-defining features of the structures, physical description, treatment recommendations and brief summaries of information located in companion reports, appendices, and other documents are included in this report. The unique features of this site are discussed in detail in the Fall River Pass Preservation Plan. The Alpine Visitor Center is discussed in detail in the Alpine Visitor Center Preservation Plan.

The project team completed on-site observations of the site and structures in October 2021.

SUMMARY OF DEFICIENCIES

Overall, the buildings and structures in the Fall River Pass Historic District vary significantly in age, level of maintenance, materials, and construction methods. In general, roof failures, wood window and doors, and mortar materials exhibit the most significant deterioration.

Table 1 (below) summarizes the average finding of the condition assessment. The following list indicates major deficiencies for each.

SUMMARY OF RECOMMENDATIONS

The recommended treatment options for the buildings and structures in the Fall River Pass Historic District include multiple approaches depending upon the nature of the structure and its anticipated future use. Table 2 below summarizes recommended treatment options for each building.

Table 1. Building Condition Assessment Summary

Resource Name	Date of Construction	Average Condition	Notes
Ranger Station	1922, 1932, 1937.	Poor	Shelter converted to museum to ranger station; abandoned in 1965
Pump House	1938.	Poor	Abandoned in 1984
Catchment Basin	1938	Poor	Abandoned in 1984
Generator House	1962	Fair	Currently in use

Table 2. Recommended Treatment Approaches

Resource Name	Date of Construction	Average Condition	Treatment Approach
Ranger Station	1922, 1932, 1937	Poor	Preservation
Pump House	1938	Poor	Preservation
Catchment Basin	1938	Poor	Preservation
Generator House	1962	Fair	Rehabilitation (with Preservation for parts of the building)

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1

INTRODUCTION

THE RANGER STATION

The Ranger Station was originally constructed in 1922 as a shelter cabin and underwent several changes of use since then. The bearing stone structure is nestled into the hillside. It has a flat roof framed with log rounds and features a roof hatch and a short chimney for the wood stove. The stones on the roof act as counterweight against the high winds. The south elevation of the building features 4 windows and the only door while the east elevation has two windows. The interior of the building is framed out with a wood floor and wood clad walls and includes a bench seat, wood stove and casework all painted white. See Chapter 2 for additional information about the Ranger Station.



Figure 1.2. The interior of the Ranger Station is clad in wood and features a bench, long shelf, and casework along the north wall. The interior is all white except where the roof structure was replaced. (source: Brian Rich, 2021)



Figure 1.1. The 1922 Ranger Station has served multiple functions, including as a shelter cabin, ranger accommodations, and museum. Currently the building is not used for park functions. (source: Brian Rich, 2021)



Figure 1.3. The Pump House condition assessment found that there were significant deficiencies in the roof assembly, cracked stone units, severely deteriorated mortar, and broken windows. The building is at risk of accelerated deterioration due to the severe deterioration. (source: Brian Rich, 2021)



Figure 1.4. The main floor of the Pump House the pump equipment and electrical controls for the water system. (source: Brian Rich, 2021)



Figure 1.5. The Catchment Basin is positioned across the valley and supplies water to the Pump House via gravity fed pipes. (source : Jorgenson Engineering, 2021)

PUMP HOUSE & CATCHMENT BASIN

The 1938 Pump House and Catchment Basin are located in the cirque below the Alpine Visitor Center. The Catchment Basin captures water runoff and uses the slightly lower elevation of the Pump House to gravity feed water to the main collection cistern. The Pump House is recessed into the slope and used diesel pumps and electric pumps to move the water to storage vaults at a nearly 600 feet higher elevation adjacent to the Alpine Visitor Center. Both structures are constructed with reinforced concrete foundations, roofs, and walls and clad in stone. The parapeted roof area has a single roof hatch and severely deteriorated built-up roofing. The Pump House features a single door on the south elevation and windows on the east and west elevations. Minimal alterations to the structures focused on replacement of pumping equipment and the main door. See Chapter 3 for more information on the Pump House and Catchment Basin.

THE GENERATOR HOUSE

The Generator House is recessed into the side of the hill and houses the two generators and water filtration system for the visitor center. Constructed in 1963, the Generator House is the only source of electrical power for the historic district. The exterior of the building is stone cladding of concrete masonry unit walls with a wood truss roof and cedar shingle roofing. The interior is one large open space with a concrete floor and plywood walls and ceiling. The generators have been replaced multiple times and electrical equipment has been installed to update the power system. The chimney has also been extended to control sound and separate air intake from exhaust. Water purification systems have also been installed in the building. See Chapter 4 for additional information about the Generator House and the adjacent structures.



Figure 1.7. The interior of the Generator House features a concrete floor and bare concrete masonry unit or plywood walls and a plywood ceiling. It houses the two generators and electrical equipment to power the historic district as well as the water purification system. (source: Brian Rich, 2021)



Figure 1.6. The Generator House exhibits several deficiencies with stone and mortar cladding as well as the roof and stone chimney. The related accessory structures also show severe deterioration of the roof structures and aluminum access hatches. (source: Brian Rich, 2021)

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RANGER STATION

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CHAPTER 2 — RANGER STATION

OVERVIEW

Embedded in the side of the cirque at the Alpine Visitor Center is a hallmark of the earliest exploration of the Rocky Mountains. The rustic Ranger Station has withstood the ravages of time and nature for over 100 years. As a shelter for intrepid explorers and adventurists, a home to rugged Park Rangers, and even a natural history museum, the Ranger Station enhanced and safeguarded visitor experiences at Rocky Mountain National Park. Sweeping vistas, granite rock outcroppings and tender alpine tundra have made this area an irresistible combination of attractions that has lured thousands of visitors to the Park. Originally constructed in 1922 by the National Park Service, the evolution of the building explains aspects of the abandoned building that are at the center of the story of the development of the National Parks and Rocky Mountain Park, in particular.

PROJECT DATA

- Constructed in 1922
- Designed by David P. Hull, Assistant Landscape Engineer, NPS Yosemite Valley
- Constructed by Carl Pultz
- NPS Building #0058
- Contributing building to the Rocky Mountain National Park Multiple Resource Area; Listed January 9, 1988; NRIS.87001140; Site Number 5LR.1204; Designation Criteria C[2.1]
- Contributing building to the Fall River Pass Historic District; Listed December 10, 2021; NRIS #100007216; Site Number: 5LR.14866; Designation Criteria A & C[2.2]

BUILDING DEVELOPMENT

Park management sought to ensure that, if motorists found themselves stranded, a shelter was available until rescue services arrived. Thus, the initial iteration of the Ranger Station was made manifest.

The original shelter cabin was opened on August 22, 1922. The 320-square-foot structure was designed by Park Architect and Landscape Engineer Daniel P. Hull and built by Carl Pultz. The one-room rectangular structure's significance belies its diminutive size. Hull's plan of incorporating the building slightly below the prow of the adjacent ridge line and borrowing in situ building materials evidences an early desire by park management to make as small of an impression upon the park's vistas as possible. The shelter came to be used immediately by stranded motorists.[2.3]

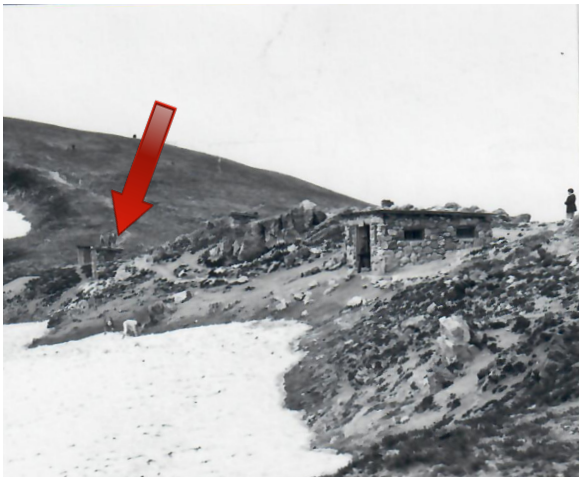


Figure 2.8. Two stone privies were located west of the Ranger Station. (source: NPS Visual Inventory Cards, photo by Dunn, September 10, 1929, Album #1, Negative #1239)

2.1 Carl and Karen McWilliams. National Register of Historic Places, Registration Form: Fall River Pass Ranger Station. Estes Park, CO: National Park Service, 1988. Reference Number 87001140.
2.2 National Park Service, National Register Database and Research. https://www.nps.gov/subjects/nationalregister/database-research.htm#table. Accessed 2022.
2.3 Atkins, *Fall River Historic District*, 1975.

The 20 foot by 16 foot room included a wood-burning stove, a cache of seasoned firewood, a free-standing locker, a table, and chairs. Later, rangers allocated premium space for the installation of an icebox. The masons also installed a matched set of stone outhouses nearby which are no longer extant.

The shelter was converted to a Ranger Station in 1931 to accommodate a park ranger posted at Fall River Pass during the visitation season. Trail Ridge Road formed a junction with Fall River Road near the Ranger Station. With increased visitation after the opening of Trail Ridge Road in 1933, park rangers at Fall River Pass installed a natural history exhibit within the Ranger Station. It remained a natural history museum until 1937 when the museum moved to the Trail Ridge Store.

The Ranger Station was used as a park ranger bunk house until the opening of the Alpine Visitor Center in 1965 when two apartments were made available to park rangers in the new building. Since 1965, the former Ranger Station has been underutilized and subsequently abandoned in place.

CHRONOLOGY OF DEVELOPMENT AND USE

1922
Shelter cabin constructed at Fall River Pass.[2.4]

1922
Fall River Pass Shelter Cabin construction was completed along with two adjacent stone outhouses on August 22, 1922.[2.5]

1931
First year that a ranger is stationed 'on-duty' at Fall River Pass. The Shelter Cabin is now referred to as the Ranger Station.[2.6]

1932
Permission was granted to convert the Fall River Pass Ranger Station into a museum.[2.7]

1936
Construction began on a concessionaire and museum structure at Fall River Pass, which became known as the Trail Ridge Store.[2.8] [2.9]

1937
A permanent concessionaire and museum structure [Trail Ridge Store] was constructed at Fall River Pass.[2.10] The Ranger Station reverts to accommodations for park rangers.

1986
Building stabilized with a new transom log, miscellaneous rock work, and rebuilt roofing and joists.[2.11]

2.4 Roger W. Toll, *1922 Superintendent's Annual Report*, (Estes Park, CO: National Park Service, 1922.)
2.5 D. Ferrel Atkins, *Historic Structures, Vol. II*, (Estes Park, CO: National Park Service, 1981.)
2.6 Atkins, *Historic Structures.*
2.7 Edmund B. Rogers, *1932 Superintendent's Annual Report*, (Estes Park, CO: National Park Service, 1932.) 5.
2.8 Yost. *NRHP: Fall River Road Pump House and Catchment Basin.*
2.9 Atkins, *Fall River Historic District*, 1975, 9.
2.10 Thomas J. Allen, and David H. Canfield, *1937 Superintendent's Annual Report*, (Estes Park, CO: National Park Service, 1937.)
2.11 National Park Service. Completion Report: 1986 Work Order 1520-1027-290.



Figure 2.1. This undated photo of the Shelter Cabin illustrates the original wide opening and flanking windows present from 1922 to 1932 when it was converted to the museum. (source: Roger W. Toll, 1927.)



Figure 2-1. "Fall River Hist. D. #5. Looking NW to F. R. Pass Range Station" (source: 1975 Fall River Pass Historic District Nomination by Ferrell Atkins. Collection 1572 Series 2.2 folder 002 - Ranger Station 1975.jpg)

1988
Fall River Pass Ranger Station listed on the National Register of Historic Places on 1/29/1988.[2.12]

1998 & 2004
The Ranger Station is called out as "storage" on Alpine Visitor Center remodel drawing site plans. No work indicated on the Ranger Station.

2008
The Ranger Station is called out as a "shed" on the Alpine Visitor Center Reroof Project Site Plan. Window and door shutters were restored by NPS.

2012
Log rafter repairs and window repairs completed. Roof replaced.[2.13]

CHARACTER-DEFINING FEATURES

The Ranger Station's character defining feature is the recessed volume of the building, minimizing its visual impact, clad with natural stone making the building disappear in the landscape. The stone is varied in color and uses projecting three dimensional units creating a rough exterior wall plane. The resulting building is difficult to distinguish from the rocky alpine terrain setting.

ADDITIONAL KEY FEATURES

Additional key features of the Ranger Station include:

- The flat, thin, forest green colored rolled roofing
- Hand-tooled mortar with native stone aggregate
- Wood-framed and sash windows
- V-groove wood plank shutters
- Projecting round log beams and purlins
- Short stone chimney
- Embedded log beams and columns
- Wood windows and sashes
- Low profile roof hatch

On the interior, key features include:

- The single room space
- Unfinished wood tongue-and-groove flooring
- White-washed plank-covered stone walls, shelves, and benches
- White-washed round log beams and purlins
- Exposed plank roof deck

2.12 McWilliams, Carl and Karen McWilliams. National Register of Historic Places, Registration Form: Fall River Pass Ranger Station. Estes Park, CO: National Park Service, 1988. Reference Number 87001140.

2.13 Johnston, Mary. Structure - Single Entry Report: Fall River Pass Ranger Station. 2015.

STATEMENT OF SIGNIFICANCE

The Ranger Station is significant because it demonstrates the changing use of buildings and structures in response to the changing requirements of visitor experience throughout the history of the park.

It is also significant for its architectural design which is an excellent example of the Park Service Rustic design style, embodying rustic attributes, simple and employing handcrafted workmanship with natural stone and log materials blending with largely undeveloped surrounding landscapes.

ASSESSMENT OF INTEGRITY

The buildings in the Fall River Pass Historic District were assessed for their integrity and their ability to convey their historic significance. The Ranger Station retains a high degree of integrity of location, setting, design, materials, workmanship, feeling and association. The seven aspects of integrity are discussed in more detail in the Fall River Pass Preservation Plan.

While the building, as a whole, retains a high level of integrity, minor changes have eroded some aspects of integrity. The aspects of materials and workmanship are most significantly impacted by prior projects. Some of the inappropriate interventions include:

- Application of the weather barrier membrane under the rolled roofing (though it would not normally be exposed to view and serves to better protect the rest of the building below)
- Installation of modern glass in the replacement windows
- Application of non-matching mortars in the exterior stone cladding



Figure 2.3. The southeast corner of the Ranger Station illustrates the character defining feature of the building volume recessed into the slope of the cirque. Additional key features are illustrated, including the rubble stone walls, shutters, round log beams and purlins, and flat roof system. (source: Brian Rich, 2021)

Restoration of the integrity of the Ranger Station is recommended wherever possible for all potential treatments but must also balance the need to accommodate new uses, functions, and technologies to future-proof the building against obsolescence.



Figure 2.4. The 1922 Fall River Pass Ranger Station was originally constructed as a shelter and also served as a museum from 1932 to 1937. (source: Brian Rich, 2021).

PHYSICAL DESCRIPTION

The Fall River Pass Ranger Station was constructed upon a foundation of fieldstone and has a rectangular plan configuration measuring 16 feet by 20 feet. It is oriented northwest-southeast but for this report, the primary facade with the entry door will be referred to as the south elevation.

EXTERIOR ELEVATIONS

The walls consist of load bearing rounded rubble boulders and are partially buried in the slope of the top edge of the alpine cirque. The stone appears to have been sourced from nearby the construction site and is characteristic of NPS Rustic style buildings. Thus, the south elevation is a full-height wall while the east and west sides are trapezoidal shaped and tapering to the north.

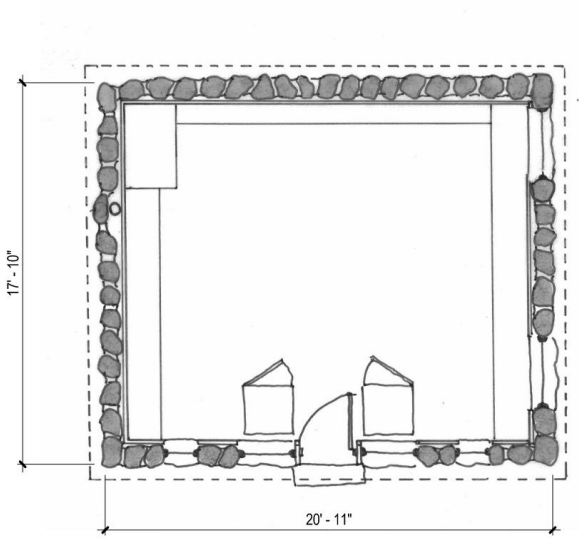


Figure 2.5. The floor plan of the 1922 Ranger Station showing the simple configuration of the building. (source: Otak, 2022)

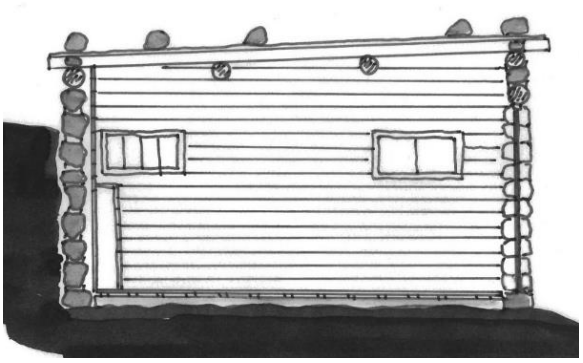


Figure 2.6. The simple floor plan of the 1922 Ranger Station belies the complex construction of the building which is revealed in this section. (source: Otak, 2022)

In 2008, park staff made wood shutters for all the windows to protect them from weather and damage and to secure the building from vandals. The shutters are constructed of bevel-edged 3/4" tongue and groove boards attached to 1 x wood frame and painted black. The shutter at the door is held in place with wood screws into the frame of the opening, whereas the window covers are held in place with “Gray Clip” rotating turn buttons screwed into the wood frame.

The north elevation is a very short wall above grade, varying from thirty to forty-eight inches tall. The stone cladding is uncoursed fieldstone appearing similar to stone found locally in Rocky Mountain National Park used on the Alpine Visitor Center, Generator House, Catchment Basin, and other buildings at this site, harmonizing with the surrounding alpine environment. The joints between the stone units are all filled with mortar. The aggregate in the mortar reflects the color and texture of locally sourced stone materials. The uncoursed fieldstone wall does not have any penetrations. Along the bottom edge of the wall is a cement mortar wash to conduct water around the building.

The east elevation is a solid stone wall recessed into the sloping terrain of the cirque. The east wall features two horizontally oriented window openings. The openings are spanned with a sedimentary stone lintel but no apparent steel lintel support. The window frame is constructed of 2x dimensional lumber painted a pale green color. The east windows, covered in a shutter on the exterior, are visible from the interior of the building. The north window is constructed of 4 window panes in a single row, whereas the south window is constructed with two side-by-side window panes. Both sashes were restored in 2008 with single pane glass in each light and are held in place with finish nails. The window openings are lined with plywood paneling. The entire window opening is painted with glossy white paint.

The south elevation of the building originally had a wide opening with two narrow windows flanking it. The opening is spanned by a pair of large wood logs bearing on the stone wall, which are only visible on the interior of the building. The two extant windows are original windows, restored in 2008, based on anecdotal information provided by park staff. The windows are multi-paned wood sashes held in place with sawn timber quarter



Figure 2.7. The east elevation of the Ranger Station features two windows (with shutters) and illustrates how the building is sunk into the slope at the edge of the cirque. (source: Brian Rich, 2021)

round boles having a two-to-three-inch radius. Extra pieces of the quarter-round boles have been stored on the bench along the west side of the building.

The wide opening on the south elevation was infilled, likely when the building was converted into the museum because the exhibits could not be exposed to the weather. The edge of a concrete slab is visible across the entire width of the wider opening, though it is unclear if this is the original floor of the shelter.

The infilled portion of the south wall consists of a central door and two additional flanking windows in a “T” shaped configuration. This smaller opening is spanned by a large wood log, in keeping with the original construction, but bears on two planed vertical log posts and the stone wall infill below the windows. The log header beam is not painted, but the vertical logs and the dimensional lumber door and window frames are painted light green. The windows in the infill section of the south elevation are single pane exterior glazed wood sashes. They consist of three rows of two panes for a total of 6 panes of glass and are painted white. They are installed in a hopper configuration with brass hinges and transom window latches typical of the period. The entry door is a stile and rail-type door with a single glazed window in the top third and three raised panels in the bottom section of the door. The door hardware consists of five-knuckle steel hinges with round ball-headed hinge pins, traditional round handled steel doorknob and back plate with a keyhole for a mortise lock, steel slide bolt lock on the interior, and a steel lock hasp on the exterior.

The west elevation is a solid stone wall recessed into the sloping terrain. The west elevation does not have any openings.

ROOF

The roof structure of the Ranger Station is a low sloping shed roof with the lower edge at the north elevation and extends approximately 8 inches.



Figure 2.8. The mortar and stone appearance indicates that the original opening of the Ranger Station was infilled with the door, two windows, and the infill walls below the windows. (source: Brian Rich, 2021)



Figure 2.9. This detail view of a window on the west elevation shows the dimensional lumber window frame. The bead board shutter is held in place with rotating turn buttons. (source: Brian Rich, 2021)



Figure 2.10. The roof of the Ranger Station is constructed of wood planks, ice and water shield and rolled roofing. Wood planks and stone serve to counterbalance the high winds. (source: Brian Rich, 2021)



Figure 2.11. The roofing is directly flashed into the mortar joint of the stone chimney at the west edge of the roof. Original mortar is visible at the top; repair mortar at the bottom. (source: Russell Holter, 2021)

It is constructed of a cross grid of main and secondary 4-inch to 8-inch diameter log beams and purlins, which are exposed at their ends. Four primary wood pole beams, typically 6 to 8 inches in diameter, span across the long dimension of the building from east to west and bearing on the stone walls. Fifteen wood poles, ranging from four to 6 inches in diameter, serve as purlins spanning north-south and bearing on the stone walls. They are arranged on top of the beams in a grid pattern and only occasionally fastened to the beams. In many locations, the beams are deformed and sagged such that the purlins are not in direct contact with the beams, though wood blocks have been inserted in some locations to provide a bearing point.

Several of the log purlins were replaced between 2005 and 2010. Two of the original purlins and all four log beams spanning east-west are original materials. They are differentiated from the replacement material by the faded white paint and numerous initials and words carved into them. In addition, the original beams and purlins are de-barked, whereas the replacement materials are not, except for the header beams in the south wall. The gaps between logs and the stone walls are chinked with stone and mortar.

The roof sheathing is 1x12 dimensional lumber fastened to the wood purlins with nails installed between 2005 and 2010 by park staff. Layered on top of the sheathing is a WR Grace self-adhered ice and water shield membrane and forest green colored mineral surface rolled roofing, lapped four inches at the edges, also installed between 2005 and 2010. The roofing materials are fastened at all edges with four rows of 1¼ inch long galvanized roofing nails. The roofing materials are flashed directly into the mortar joint at the base of the stone chimney. No sheet metal or gutters are installed on the building. The hatch, located adjacent to the north wall of the building, allows access to the cabin from the roof when snowdrifts prevent access through the entry door. The roof hatch consists of a custom-made 2x4 frame with a plywood top clad in ice and water shield, and green mineral surface rolled roofing. It is held in place with two steel barn door hinges and a lock hasp.

Over the top of the roofing, 1x6 dimensional lumber planks have been placed in a pattern running downslope and around the edges of the roof. On top of the wood planks are dozens of large locally sourced stones acting as counterweights against the wind.

The roof has a small fieldstone chimney approximately thirty inches square which once accommodated a wood stove. The stone chimney was lined with a 6-inch diameter galvanized sheet metal flue, which has been removed and stored inside the building. The bottom section of the flue is visible inside the building, where it was connected to a wood-fired stove.



Figure 2.12. Most of the interior of the Ranger Station is whitewashed. The unpainted logs and planks on the roof are replacement materials. This photo, looking west, shows the wood flooring, wood plank walls, bench, counter and shelves. The ice box (left) is one of the few furnishings remaining. The chimney for the metal stove is on the floor. Pieces of the quarter-round used to trim the windows were observed on the bench. (source: Brian Rich, 2021)

INTERIOR

Inside the Ranger Station, the floor consists of clear vertical grain tongue and groove floorboards running north-south. The floorboards have been coped around the stone along the south wall. The framing below the floor is unknown.

The north, east, and west walls of the shelter have been lined with wood framing, and horizontal wood planks coped around the roof beams and purlins on the interior face of the wall. The wood plank interior face of the wall is also coped around the contours of the stones on the south wall.

The north wall has a full-width narrow shelf at the same height as the counter. The planks at the top of the wall were replaced at the same time as the purlins in 2005-2010 and are unpainted.



Figure 2.13. The window sashes on the 1922 openings on the south elevation have been restored and set in place using large quarter-round material. (source: Brian Rich, 2021)

The east wall features two windows (see discussion above) and a narrow bench for seating. All of the planks on the interior are painted white. Few interior furnishings remain: an icebox and a tall plywood freestanding closet/storage locker.

The interior of the south wall is exposed stone, windows, door, and log headers that are painted white. Below the two windows flanking the door, the wall appears to consist of stone cladding over wood-framed walls with dimensional lumber and infilled with a wood fiberboard panel over horizontal wood planks on the interior. In the southeast corner of the building is a single-strand copper telephone wiring.

The west wall of the building features a bench, counter, and shelves. Fastened to the side of the counter is a piece of wood with slots cut into it, perhaps as a knife rack. The sheet metal chimney for the wood stove also enters the building on the west wall.

The ceiling of the Ranger Station is exposed to the roof structure, including the wood log pole beams and purlins and the plank roof sheathing. Of the original whitewashed structure, two of the beams and two purlins remain. They have lettering and initials carved into them. The unfinished replacement wood poles and sheathing are also visible.



Figure 2.14. Most of the interior of the Ranger Station is whitewashed. The unpainted logs and planks on the roof are replacement materials. This photo, looking north, shows the wood flooring, wood plank walls, bench, counter and shelves. The chimney for the metal stove is on the floor. Pieces of the quarter-round used to trim the windows were observed on the bench at the left edge of this image. (source: Brian Rich, 2021)



Figure 2.15. Prior to serving as the Ranger Station, the first structure at Fall River Pass served as a shelter cabin from 1922 until 1932. Entirely constructed of stone, the shelter cabin served as protection for visitors during inclement weather. (source: P.F. Shope, No Date.)

CONDITION ASSESSMENT

During the October 2021 site visit and assessment of the buildings and structures within the Fall River Pass Historic District, the team observed numerous deficiencies at the Ranger Station. While more detailed information is included in the condition assessments in the Appendix, several key items include the following:

- The mortar at the stone cladding is significantly deteriorated. Mortar is missing in some cases, loss of bond to the stone and gaps between the stone and mortar were observed in other locations. In many places, the mortar was cracking as well.
- Several metamorphic type stone units are cracking and splitting due to weather exposure.
- On the interior, the stone support points for the header beam are severely cracked and have lost significant structural stability and capacity.
- In the northeast corner of the building, a portion of the stone wall is collapsing.
- The roof beams and purlins have permanently deflected over time under excessive snow loads and show signs of early rotting and splitting further compromising their structural capabilities.
- The roof is almost entirely missing allowing for water and snow infiltration and accelerated deterioration of the structure.

FOUNDATIONS – CONSTRUCTION ASSEMBLY & CONDITION

The foundations of the Ranger Station are stone, though the details of their construction are not clear. While not readily visible , the foundations do not appear to have significant deficiencies requiring repairs based upon observations of the above-grade structure.

WALLS – CONSTRUCTION ASSEMBLY

The walls of the Ranger Station are constructed of uncoursed fieldstone rubble mortared in



Figure 2.16. A detail photo at the southeast corner of the Ranger Station roof shows the integration of the roof log poles with the stone. (source: Brian Rich, 2021)



Figure 2.17. The windows at the far left and right are original whereas the windows, door, and infill walls below the log header were added when the shelter was converted into a museum. (source: Brian Rich, 2021)

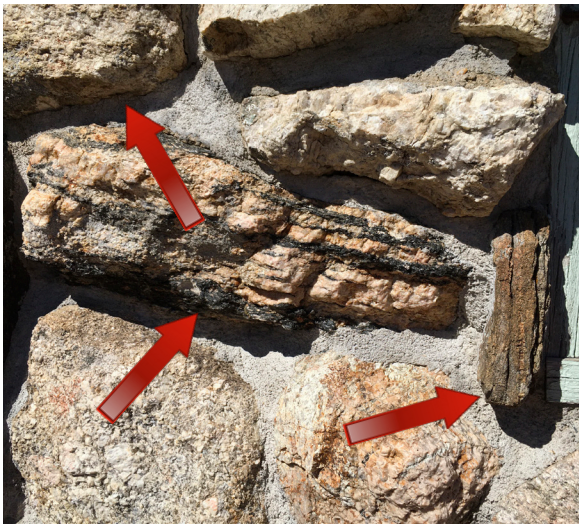


Figure 2.18. Cracks between the mortar and stone and improperly bedded metamorphic stone allow water infiltration, accelerating deterioration at the Ranger Station. (source: Brian Rich, 2021)

place. The stone is a combination of igneous and metamorphic types of stone with a variety of colors ranging from translucent white to pink, yellow, orange, and other darker colors. The stone is sometimes bedded vertically or facing the exterior, contrary to the nature of the stone materials. All of the stone is irregularly shaped fieldstone and has not been manipulated during construction.

There are several iterations of mortar on the building due to repairs over the history of the building based on observations of layering and appearance of the mortar. The mortar typically appears to include locally sourced sand and aggregate, based on the color. The nature of the binder is unclear: it may be lime-based or Portland cement-based mortar. Further analysis is recommended. The interior of the west, north, and east walls are lined with wood framing and wood plank surfaces. The wood planks obstruct views of the inside face of the stone walls.

On the south side of the building, the wall was originally constructed with two large logs



Figure 2.19. The header log over the south openings at the Ranger Station is severely cracked due to significant overloading of the roof structure. (source: Brian Rich, 2021)

spanning the full width of the building. The logs bear directly on the stone return walls on either side of the opening. Built into the stone return walls are two narrow windows, reducing the



Figure 2.20. The interior of the east window at the Ranger Station has been wrapped with plywood and painted indicating a recent repair that is not historically accurate. (source: Brian Rich, 2021)

bearing area of the stone return walls. When the building was converted to the museum and the Ranger Station, this large opening was infilled with a secondary log beam on log posts at either end, two windows, the door, and stone cladding over a wood stud framed wall. The stone and the windows on the south wall are painted white, though the logs spanning the openings are not painted and only partially debarked.

WALLS – CONDITION

The visible portions of the stone walls exhibit long-term exposure to the weather conditions at this location and signs that both stone and mortar will eventually fail. Because of the metamorphic origin and the bedding, some stone units are splitting and may become structurally unreliable. Gaps were observed between the mortar and stones. Very little of the mortar is bonded to the stone any longer. Multiple efforts to repair the mortar have been undertaken as evidenced by the different mortar compositions and the layering of the mortar repairs. It is unclear whether the mortar repairs are physically compatible with the historic mortar, but they are not a good aesthetic match. The mortar and stone chinking between the roof beams and purlins are cracked and failing and do not appear to fully enclose the building.

The north, west, and east wall planks on the interior are in good condition exhibiting paint failure (wear, peeling, and fading) but minimal warping or other deformations. The walls do exhibit some water staining, but no rot. At the top of the north wall, replacement wood planks are tightly coped planks around the purlins. Immediately below, at the east end of the north wall, the stone wall behind the planks appears to be deteriorating and dislodging the planks.

The south wall of the Ranger Station exhibits significant structural failures at the stone on either side of the 1922 wide opening. The stone has borne excessive load, leading to displacement of the stone, opening of the mortar joints, and breaking of stone units. This deterioration is only visible from the inside of the building.



Figure 2.21. The inside of the southeast window illustrates the unusual glazing configuration and quarter round trim suggesting that this window sash may not be original. (source: Brian Rich, 2021)



Figure 2.22. Looking south toward the entry, the log pole beams run east-west and the purlins run north-south. The whitewashed materials are original whereas new material is uncoated. (source: Brian Rich, 2021)

WINDOWS AND DOORS

WINDOWS AND DOORS – CONSTRUCTION ASSEMBLY

The windows on the building are all wood-framed, wood sash, single glazed windows and all appear to have been restored. The 1922 windows are all fixed windows ranging from two to five panes. The trim around the 1922 windows on the south wall is quarter round wood with a 2” radius. Extra pieces of this quarter-round trim were observed on the east bench inside the building. The two windows on the east side of the building have deep penetrations constructed of plywood and no visible trim. The two windows added when the south wall was enclosed are hopper-type windows with six panes. The trim around the windows consists of light green painted dimensional lumber. There are several indications that the windows were restored, including the stripped paint and bare wood, the good condition of the sashes and new glazing putty, the spare pieces of quarter round observed on the west bench, and the paint, which was in good condition as well.

The door into the building is a stile and rail door with a square single pane of glass at the top and three raised panels at the bottom portion of the door. It is painted light green and features older hardware.

WINDOWS AND DOORS – CONDITION

The windows appear to be in good condition with no rot, glazing putty deterioration, or paint failure. The main concern with the windows is that they are not weather-tight and blown snow intrudes into the building. The windows had shutters installed and the exterior sides of the windows were not observed.

The door is in fair condition. No rot or failing paint was observed on the wood frame and door panel. However, the hardware consists of steel components that are corroding since the coatings have failed.

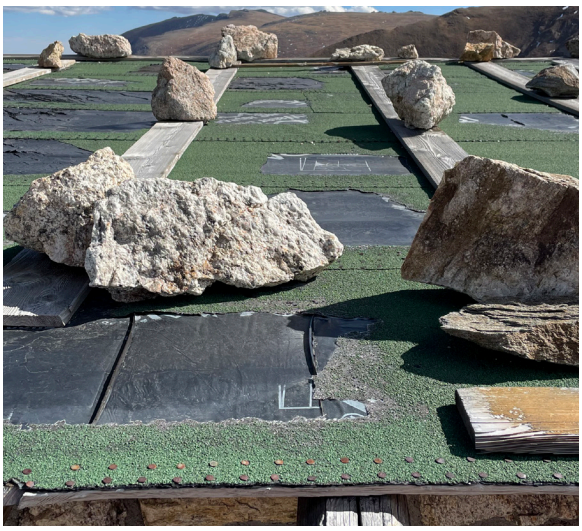


Figure 2.23. The modern ice and water shield roofing underlayment is split and weathered after being revealed due to the failed rolled roofing. (source: Brian Rich, 2021)

ROOF

Roof – Construction Assembly

The roof assembly consists of 6” to 8” diameter log beams spanning the long direction (east-west) of the building and 4” to 6” diameter log purlins spanning the short direction of the building. Original beams and purlins are white-washed whereas replacement purlins are not. At some of the intersections of the beams and purlins, wood blocks have been installed to establish structural contact. Very few of the beams and purlins are attached. On top of the purlins, unpainted nominal 1x12 roof deck planks run east-west. Some dimensional lumber materials are used to secure the roof deck planks. All fasteners appear to be nails, both in the historic construction and repairs. On top of the roof deck, an ice and water shield rolled material is covered by forest green colored mineral surfaced rolled roofing. The roofing is fastened at the edges with four rows of roofing nails. No perimeter metal flashing is used on the building. In addition, 1x6 wood planks are placed on top of the roofing with fieldstones used as counterweights against the wind.



Figure 2.24. Two different mortars were observed at the chimney indicating that repointing has been completed on multiple occasions. (source: Russell Holter, 2021)



Figure 2.25. The weathered log pole roof structure, cracked roof planks, failed roofing nails, forest green mineral surface roofing, and the plank and stones seen at the Ranger Station roof. (source: Brian Rich, 2021)

Roof – Condition

The roof structure has deformed and significantly deflected over time such that the beams and purlins are not in contact, suggesting it is inadequate to support the loads. The roof itself has completely failed. Several sections of the mineral surface roofing are missing and the ice and water shield underlayment is split, cracked, and has several sections missing. Samples of the roofing and underlayment suggest that part of the deterioration may be due to wind. However, severe ultraviolet light exposure and material quality may also be factors in the roofing deterioration.

INTERIORS

Interiors – Construction Assembly

The interior floors of the Ranger Station are unfinished clear vertical grain tongue-and-groove wood flooring. Framing beneath the flooring was not readily observed. Rough wood planks are used to line the interior of the stone walls of the structure as well as construct benches, a counter, and shelves within the building. Where the flooring and the wall planks meet the uneven stone of the south wall, the wood is carefully coped to meet the stone. The ceiling of the building consists of a combination of original, white-washed logs and purlins and unpainted replacement purlins, and 1x roof decking. The original beams and purlins have lettering carved into their surfaces – graffiti from the past use of the building.

Interiors - Condition

The interior finishes are generally in good to fair condition. The floor is water-stained and the floor boards are cupped in many places. There is a low level of snow and moisture that infiltrates through the gaps in the exterior envelope collecting inside the building. Where whitewashed, the planks on the walls are peeling and fading, but no significant deterioration of the wood is observed.



Figure 2.27. The wood plank wall surface is damaged revealing a partial collapse of the stone wall in the north east corner of the Ranger Station. (source: Brian Rich, 2021)



Figure 2.26. When the roof of the Ranger Station was rebuilt, a new roof hatch was installed. The missing plank on the wall reveals the stone and mortar, wood framing, and fiber board. (source: Brian Rich, 2021)



Figure 2.28. The interior side of the south wall of the Ranger Station showing the storage cabinet and icebox as well as the windows and door. (source: Brian Rich, 2021)

TREATMENT RECOMMENDATIONS

The recommended treatment approach for the Ranger Station is Preservation. The proposed scope of work is prioritized in three levels of effort, each building upon the lower level of effort with the goal of proposing different scopes of work depending on the funding available. The three levels of effort are Stabilization, Partial Restoration, and Full Restoration.

Due to the difficulty of access, it is not anticipated that the Ranger Station will serve a public use in the future, but is an important aspect of the cultural interpretation of the Fall River Pass.

Preservation Treatment Approach
Stabilization Level of Effort

The goal of Stabilization is to prevent catastrophic failure and loss of a building.

Structure

The most critical aspects of the Ranger Station focus around the structure of the roof, header beam over the door, and bearing stone wall construction. The following scope is recommended:

- Replace log beam over doorway, including removal and replacement in-kind of stone bearing points. New log beam preferred but may require combination with a steel beam.
- Excavate and reconstruct exterior wall and interior wood framing/planks at the northeast corner of the building.
- Install temporary intermediate columns to support roof beams and purlins.
- Provide cross structure support at the floor to spread structural loads.

Enclosure

The next most important aspect of the Ranger Station to stabilize for long term preservation of the structure is the building enclosure, especially the roof, mortar, and openings. The following scope is recommended:

- Replace entire roofing system (rolled roofing and underlayment) and 1x12 roof planks in-kind (cracked at ends). Beams appear in fair to poor condition but can be stabilized as noted above.
- Repoint missing mortar at joints between stones and fill openings at the top 12" to 18" of the stone parapet (above the roof to the top of stone wall).
- Seal all gaps around windows and doors to minimize moisture and snow infiltration.

Interior

No work is recommended on the interior of the Ranger Station for a Stabilization level of effort. There are no critical aspects of the interior that require urgent repair.

Preservation Treatment Approach Partial Restoration Level of Effort
In addition to the Stabilization recommendations noted in this section, the following additional scope is recommended to achieve a level of Partial Restoration.
Structure
Alternatives for making the roof structure more robust include: • Reinforcing the existing roof beams to withstand greater loads using steel flitch plates or other additional steel members. • Additional beams concealed within the building to maintain the exterior appearance. • Salvaging and displaying the existing beams to preserve them and replace in-kind with larger log pole beams.
Enclosure
• Repoint an additional 30% of stone mortar joints that are in the worst condition such as missing mortar or gaps between mortar and stones with in-kind mortar and installation techniques. • Replace critical stone units that are deteriorating and place the structure at risk. • Paint all existing exterior wood components (windows, doors, roof beams, and infill panels), in-kind. • Replace any broken glass and glazing putty that is weathered.
Interior
• No work is recommended on the interior of the Ranger Station for a Stabilization level of effort. There are no critical aspects of the interior that require urgent repair.
MEP Systems
• There are no active mechanical, electrical, plumbing or other building systems at the Ranger Station. Therefore no action is required for a Stabilization level of effort.

Preservation Treatment Approach Full Restoration Level of Effort
In addition to the Stabilization and Partial Restoration recommendations noted in this section, the following additional scope is recommended to achieve a level of Full Restoration.
Structure
• In addition to the Stabilization and Partial Restoration recommendations noted above, the following additional scope is recommended to achieve a level of Full Restoration: • Consider installation of helical rods in the mortar joints of the stone walls or connecting stone elements from inside (where ties would be concealed by interior wood planking) to provide long term stabilization of the stone walls. • Consider attachment of plain wood or flitch-reinforced beams to the stone walls.
Enclosure
• Repoint 100% of the mortar joints at the stone cladding, in-kind with compatible mortar. • Replace all failing stone units, in-kind. • Reconstruct the water drainage channel at north (uphill) side of the building. • As an alternate to reconstructing the drainage channel, consider french drains and/or concealed waterproofing (such as Xypex) around the below-grade walls of the building. • Accurately reconstruct all wood windows and sashes. Recommendation to use wavy glass is based on modern glass production creating float glass which is super flat compared to pre-WWII glass that would have been more wavy. Until there is evidence suggesting one way or the other, we recommend replacement in kind. • Reconstruct (new) winter shutters for windows and doors with in-kind materials and workmanship.
Interior
• Reconstruct wood stove and chimney in-kind. • Repair and/or replacement of all damaged wood planks on the interior of walls in-kind. • Prep and repaint all interior surfaces, in-kind. • Remove and replace warped flooring, in-kind.
MEP Systems
• Provide minimal power for maintenance and lighting of the Ranger Station.

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PUMP HOUSE & CATCHMENT BASIN

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CHAPTER 3 — PUMP HOUSE & CATCHMENT BASIN

OVERVIEW

The Pump House and Catchment Basin are a building and landscape feature set in an alpine cirque, nearly 600 feet below Fall River Pass. The National Park Service built the Pump House and Catchment Basin to treat water for the Trail Ridge Store and, after 1965, for the Alpine Visitor Center. The Pump House is a one-story NPS Rustic style building built into the hillside with the pump room above grade and a one-story water collection vault below grade. The vault protrudes from the south side of the building and forms a concrete stoop at the main entry door. The gull wing shaped catchment basin is across the valley and collects snow melt from the cirque.

BUILDING DATA

- Constructed in 1938
- Period of Significance: 1938 to 1966
- Designed by: L. Fletcher and G. W. Hill, NPS Landscape Architects
- NPS Building 0171 and 0171A
- Individually designated building; listed August 30, 2006, NRIS #06000735; Site Number 5LR.10936; Designation Criteria: C.[3.1]
- Contributing building to the Fall River Pass Historic District; Listed December 10, 2021; NRIS #100007216; Site Number: 5LR.14866; Designation Criteria A & C.[3.2]

3.1. Cheria Yost. National Register of Historic Places, Registration Form: Fall River Pump House and Catchment Basin. Estes Park, CO: National Park Service, 2006. NPS Reference Number 6000735.

3.2 National Park Service, National Register Database and Research. https://www.nps.gov/subjects/nationalregister/database-research.htm#table. Accessed 2022.



Figure 3.1. The Pump House and Catchment Basin were constructed in 1938 to supply water to the Alpine Visitor Center and Trail Ridge Store. (source: Russell Holter, 2021).

BUILDING DEVELOPMENT

The purpose of the Catchment Basin and Pump House was to provide a more reliable and less expensive water delivery system than trucking water up to the newly constructed Trail Ridge Store.[3.3] Their construction and subsequent alterations are representative of the NPS Rustic style. They are also indicative of the evolution of the Alpine Visitor Center from a viewpoint into a fully developed visitor experience that included education about, and the opportunity to experience, unique natural sites while respecting and preserving the natural environment. Improvements to the Pump House and Catchment Basin provided water for fire protection, safety and medical care as well as other visitor amenities such as flush toilets and a restaurant.

The catchment dam is 28' long and up to four feet deep and is located across a ravine from the Pump House at an elevation of 11,200'. The floor of the water vault in the Pump House is at an elevation of 11,157'.[3.4] The gravity-fed water supply system used the elevation difference to fill the water vault in the lower level of the Pump House. The diesel powered and electric pumps inside the Pump House supplied the stored water to the Trail Ridge Store.

With construction of the Alpine Visitor Center and Generator House, the diesel motor was replaced in 1963 with electric pumps. A new four-inch diameter feed line from the Pump House brought the water up to a 60,000-gallon below-ground tank adjacent to the Generator House and at an elevation of approximately 11,786 feet. Further, to provide adequate head pressure, water from the 60,000-gallon tank was again pumped to a 20,000-gallon auxiliary tank located at an elevation of 11,880 feet, along the Alpine Ridge Trail. Both tanks are tied directly into a system of three fire hydrants via a six-inch main.[3.5] The Alpine Visitor Center and Trail Ridge Store are supplied with 2 1/2 -inch mains.[3.6]

In 1963 and again in 1984, the pumps were replaced to provide improved water service capacity and update the existing equipment. In addition, water purification systems were installed to ensure visitor health in 1984. Water pumps were operated at night due to the excessive load on the generators. The pump system and tanks are drained every winter to prevent freeze damage.[3.7] Documentary evidence suggests the Pump House and its catchment were still operational in 2006.

In 2007, the water supply from the Pump House was replaced with a 660 foot deep public well located several hundred feet east on uphill side of the Fall River Road. It is recorded as capable of delivering up to 15 gallons per minute and a maximum of 977,554 gallons per year. NPS has since abandoned the Pump House and Catchment Basin structures in-situ.

CHRONOLOGY OF DEVELOPMENT AND USE

1938

Plans for the Pump House and Catchment are approved in March 1938.[3.8]

3.3 National Park Service. Internal Memo from the Coordinating Project Supervisor, Oct. 2, 1961, Historic and Central Files Collection—Administration, box 44.
3.4 J. F. Sato, Report on Two Water Systems. (Littleton, CO: JF Sato & Associates, 1983), 6.
3.5 J. F. Sato, Report on Two Water Systems, 2.
3.6 J. F. Sato, Report on Two Water Systems, 23.
3.7 J. F. Sato, Report on Two Water Systems, 24.
3.8 Yost, *NRHP: Fall River Road Pump House and Catchment Basin*.

1938
Construction of the Pump House and Catchment begins in Aug 1938.[3.9]

1963
Original diesel engine powered pump replaced with two 5 horsepower electrical pumps and one engine driven 20 horsepower pump.

1984
Engine driven and 5 horsepower pumps removed and replaced with 7.5 horsepower electric pumps and controls at Pump House, new water treatment equipment, fire pump, and generator silencers installed at the Generator House.

2006
Pump House and Catchment Basin listed on National Register of Historic Places.[3.10]

2011
The water pipe from the 20,000 gallon storage tank to the Alpine Visitor Center is replaced.

CHARACTER-DEFINING FEATURES

The character-defining features of the Pump House is the small volume recessed into the landscape clad in natural stone rubble blending into the surrounding alpine tundra landscape and rocky terrain.

3.9 Yost, Cheria. National Register of Historic Places, Registration Form: Fall River Pump House and Catchment Basin. Estes Park, CO: National Park Service, 2006. NPS Reference Number 6000735.

3.10 Yost, Cheria. National Register of Historic Places, Registration Form: Fall River Pump House and Catchment Basin. Estes Park, CO: National Park Service, 2006. NPS Reference Number 6000735.



Figure 3.2. The character defining feature of the Pump House is the recessed volume clad in natural stone as illustrated in this image. This photo also shows key features such as the wood door and windows, the corrugated metal valve shaft, the flat parapets and the concrete water vault below the structure. This image also shows the gull-wing retaining wall west of the Pump House where an exhaust port for the diesel generator was located. (source: Brian Rich, 2021).

ADDITIONAL KEY FEATURES:

Additional key features of the Pump House include:

- Its location in the lower part of the slope of the cirque
- The small volume recessed into the landscape
- Weather-worn wood windows and door
- Low slope built-up roof with parapets
- The metal sheet-clad roof hatch
- Battered (sloped) native uncoursed rubble fieldstone walls. The stone is rounded and varied in color and uses projecting three dimensional units creating a rough exterior wall plane.
- Hand-tooled mortar with native stone aggregate
- Wood window frames and sashes
- Wood plank door and frame

On the interior, key features include:

- White-washed concrete walls and ceiling, the pumps and panel controls, piping and valve system, and the raised circular manhole to the water collection vault.

The Catchment Basin's character-defining features include the native uncoursed rubble fieldstone walls built into the slope of the cirque. Additional key features of the Catchment Basin include:

- The gull-wing configuration
- Mortar with native stone aggregate
- Cement wash lining
- Water collection piping

STATEMENT OF SIGNIFICANCE

The Pump House and Catchment Basin are significant for their role in providing water to the Visitor Center, enabling provision of amenities that improved the experience for park visitors and functioning of the Alpine Visitor Center building. They are also excellent examples of the Park Service Rustic design style, embodying rustic attributes, simple forms, and employing handcrafted workmanship with natural stone and log materials that blend with their largely undeveloped surrounding landscapes.

ASSESSMENT OF INTEGRITY

The buildings in the Fall River Pass Historic District were assessed for their integrity and their ability to convey their historic significance. The Pump House and Catchment Basin retain significant integrity of location, setting, design, materials, workmanship, feeling, and association. The seven aspects of integrity are discussed in more detail in the Fall River Pass Preservation Plan.

While the structures, as a whole, retain a very high level of integrity, prior renovations have eroded some aspects of integrity. The aspects of materials and workmanship are most significantly impacted. Some of the inappropriate interventions include:

- Temporary covering of the windows with modern oriented strand board materials.
- Installation of the modern "hammered" glazing in the existing window opening.

Restoration of the integrity of the Pump House and Catchment Basin is recommended wherever possible for all potential treatments but must also balance the need to accommodate new uses, functions, and technologies to future-proof the building against obsolescence.

PHYSICAL DESCRIPTION - PUMP HOUSE

PLAN CONFIGURATION

The rectangular building is 13'-8" (north to south) by 15'-8" (east to west) at the parapet. The Pump House is constructed of steel-reinforced concrete foundations, walls, floors, roof, and parapets. The building was powered via an electric line buried in the slope of the cirque. The power line was disconnected when the Pump House was decommissioned and new well drilled closer to the Alpine Visitor Center in 2007.

EXTERIOR ELEVATIONS

The structure's walls feature battered uncoursed rubble fieldstone cladding with larger fieldstones at the bottom and tapering upwards with smaller stones near the parapet. The stone cladding is local rubble and appears similar to stone found in Rocky Mountain National Park used on the Ranger Station and Catchment Basin, harmonizing with the surrounding alpine environment. The mixture of metamorphic and igneous stone has rounded edges and tight mortar joints characteristic of NPS Rustic style buildings.

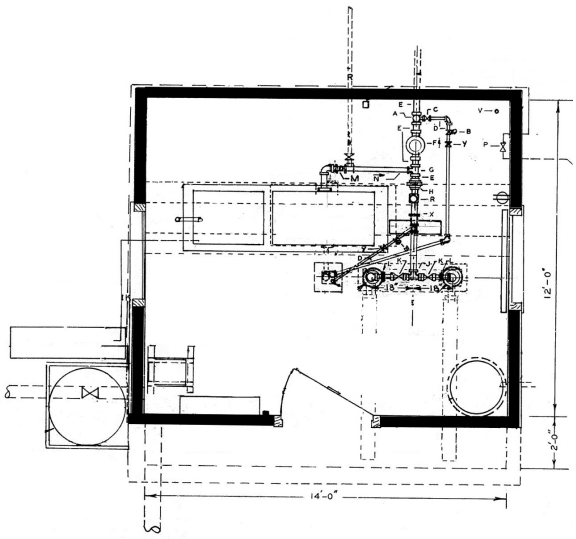


Figure 3.3. The Pump House floor plan illustrates the simple form of the structure in contrast to the complex network of piping and controls for the water pumps. (source: DP, 2010).

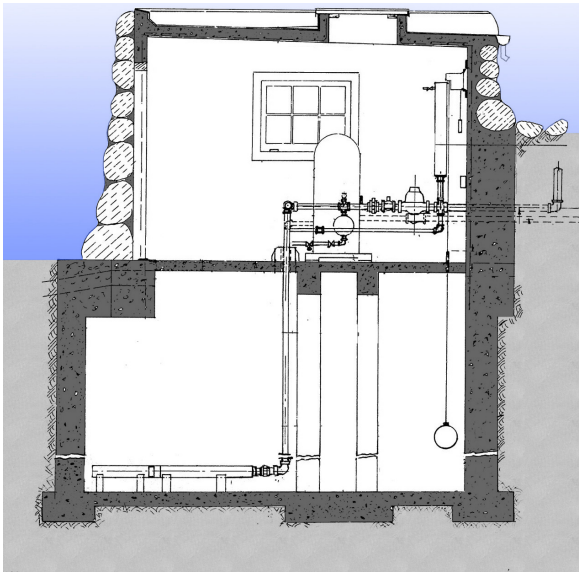


Figure 3.4. The section of the Pump House illustrates the lower catchment water vault and the upper level pump room. (source: DP, 2010)

The north elevation is a very short wall of reinforced concrete clad with uncoursed fieldstone rubble. There are no openings in the wall. The other notable feature is the painted steel gutter on the edge of the roof.

The east elevation is partially buried in the slope of the cirque. There is one window opening which is completely boarded over. This east window appears to be a wood frame and 6 paned, true-divided light, exterior-glazed wood sash but is covered in oriented strand board, concealing the original appearance. The head of the window opening is supported with galvanized steel lintels embedded in the masonry walls and are not visible on the interior of the building.

The south (primary) facade faces down the valley in the direction of Estes Park and is exposed to the weather for the full height of the wall. The south facade features a single solid wood entry door with steel barn door hinges and a lock hasp. The entry door is constructed of



Figure 3.6. The short north elevation illustrates how deeply the Pump House is sunk into the ground. This view also shows the poor condition of the roof. (source: Brian Rich, 2021)

two built-up layers of wood planks, vertical and diagonal, fastened with steel nails for added strength against the elements. The exterior layer of planks consists of vertical 1x6 wood planks, while the interior layer consists of diagonal 2x10 wood planks. The door opening is spanned with a 3/8” thick galvanized steel lintel, similar to the windows. The door frame is a rabbeted 2x8 wood framing member anchored directly into the structural concrete wall and thus recessed from the stone face of the building.



Figure 3.5. The west elevation of the Pump House shows the Rustic style construction and infilled window. In the foreground is a crankshaft and coil of cable from earlier pump equipment. (source: Brian Rich, 2021)

The west elevation is also partially buried in the slope of the cirque. The western window is largely missing and has been replaced with a single “hammered” glass pane fastened to the inside of the remaining deteriorated frame. The National Register Nomination indicates that the “south” window of the Pump House has been replaced (date unknown).[3.11] The head of the window opening is supported with galvanized steel lintels embedded in the masonry walls and are not visible on the interior of the building

3.11 Anstey, *NRHP, Registration Form: Fall River Pass Historic District*, 6.

ROOFING

The low-slope roof is sloped to the north, where a galvanized steel sheet metal gutter catches water and routes it to galvanized sheet metal downspouts at the corners of the buildings. The roof is composed of board-formed reinforced concrete and is surrounded by a low stone parapet on three sides. Built-up asphalt roofing was installed over cement rendering, providing curved contours at the inside corners. The cement rendering runs up and over the top of the parapet, forming a sloped parapet cap to protect the stone cladding, and a more gentle back slope. The roof supports a centrally located access hatch. The hatch is constructed of a wood frame and clad in painted sheet metal, and features steel hinges and a lock hasp.



Figure 3.7. The Pump House condition assessment found that there were significant deficiencies in the roof assembly, cracked stone units, severely deteriorated mortar, and broken windows. The building is at risk of accelerated deterioration due to the poor condition of the exterior enclosure. (source: Brian Rich, 2021)

MISCELLANEOUS FEATURES

On the west side of the building is a corrugated steel pipe connecting into the upper level of the Pump House. The pipe is not identified or indicated on the 1984 repair drawings by JF Sato, so its purpose is unclear, though it may have served as an exhaust location for the original pumps. The pipe is covered on the interior with a plywood panel and the exterior with a loosely placed steel plate held in place with stones. Where the pipe protrudes on the west side of the Pump House, a small bat-wing rubble stone retention wall has been constructed to allow access to the pipe. Unlike the parapet and the Catchment Basin walls, this retaining wall is not capped with a cement render wash, but it features a vertical galvanized pipe protruding out the top.

Similarly, a corrugated steel pipe, oriented vertically and covered at the top, is located on the southwest corner of the building. This 3'-0" diameter x 12-foot-deep corrugated pipe is a valve pit for the six-inch water supply pipe from the catchment basin. The water supply pipe enters at the southwest corner of the building, and the valve pit allows access to the shutoff valve. Extending from the southwest corner of the building to the south is a six-inch overflow pipe from the sump. This is exposed above grade near the valve pit.[3.12]

On the east side of the Pump House, a two-inch diameter galvanized steel pipe extends up the slope towards Fall River Road and, presumably, up to the water storage tanks. The power cable was similarly run from the Generator House down to the Pump House, though the exact route is unclear. Also, on the east side of the building is a buried pipe valve accessible via a clay tile pipe section buried vertically in the ground.



Figure 3.8. The corrugated pipe at the southwest corner of the Pump House is a 12 foot deep valve access hatch to control water flow into the Pump House. The six inch overflow pipe is visible at the bottom right of this image. (source: Brian Rich, 2021)



Figure 3.9. A short stone retaining wall west of the Pump House allows a corrugated metal pipe to be accessed. The use of the pipe is unknown. (source: Brian Rich, 2021)

3.12 N. W. Adams, *Improve Water and Sewer Systems, Fall River Pass Area.* (Larimer County, CO: National Park Service, 1966), 1-13.

INTERIOR

The interior of the upper level of the Pump House is bare concrete painted white. Mounted to the walls are several circuit breaker panels for power and control panels for the pumps. Embedded anchors for the original diesel-powered pumps remain in the floor. The floor also features a 20-inch diameter manhole access to the water collection chamber below with bent steel rod ladder rungs embedded in the concrete wall. The lower level of the Pump House contains the two electric pumps installed in 1984 but is otherwise empty. The entire collection vault is cast-in-place reinforced concrete.



Figure 3.11. The water collection vault is a reinforced concrete structure. This view, looking northwest, shows the water pumps. Embedded ladder rungs are visible at the bottom right. (source: Brian Rich, 2021)



Figure 3.10. Piping for the water pump system and several electrical panels remain in the Pump House. This view of the east wall also shows the access hole down to the collection tank. (source: Brian Rich, 2021)



Figure 3.12. Collected water flowed from the Catchment Basin to the Pump House water collection vault. From the Pump House water was pumped up to the Alpine Visitor Center and Trail Ridge Store. The original 1938 pump may have been a diesel powered pump as indicated by the crankshaft and notes on the drawings indicating a "fuel tank." Later replacement pumps were electrically powered. (source: Jorgenson, 2021)

PHYSICAL DESCRIPTION - CATCHMENT BASIN

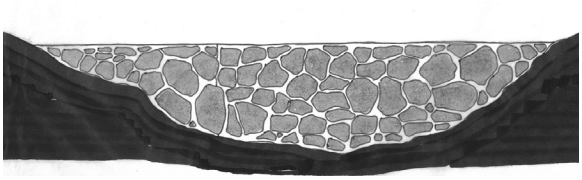


Figure 3.13. The elevation of the catchment basin illustrates how it is integrated into the sides of the ravine. (source: Otak, 2022)

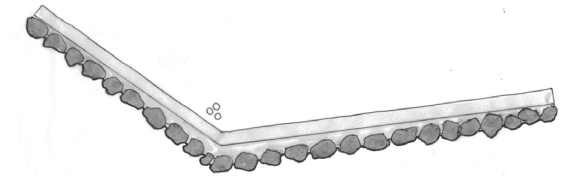


Figure 3.14. The catchment basin is built in a gull-wing configuration, collecting water inside the V shaped wall. (source: Otak, 2022)

The catchment is located across a draw near the confluence of two alpine streams. It is located at a slightly higher elevation (11,200 feet above sea level) than the Pump House (elevation 11,157 feet above sea level) on the stream on the south side of the cirque below the Alpine Visitor Center.[3.13] The water retention system is constructed of concrete clad in uncoursed rubble fieldstone. The fieldstone appears similar to stone found locally in Rocky Mountain National Park used on the Ranger Station and Pump House, harmonizing with the

3.13 J. F. Sato, *AVC. Generator Building Base Plan.* (Littleton, CO: JF Sato & Associates, 1984), Drawing 121.

surrounding alpine environment. The concrete structural wall of the catchment straddles a perennial stream. The catchment is a low-slung, gull-winged structure approximately five feet tall at the center. The top of the catchment is parged in concrete, which protects the concrete and stone structure by acting as an over-topping spillway. The two wings of the catchment are uneven, with one side measuring 15 feet 9 inches and the other 10 feet 5 inches in length at the up-slope edge. Each end of the respective wings is anchored into its corresponding hillside for stability. Embedded in the top of the wall are three galvanized steel pipes for unknown use.

Behind the catchment are four PVC pipes and a covered yellow plastic barrel used to collect water from the stream. The water flows via gravity from the Catchment Basin to the Pump House collection vault. Water is pumped from the Pump House to the water storage tanks adjacent to the Generator House and partway up the Alpine Ridge Trail. Connecting the Catchment Basin with the Pump House is a six-inch diameter steel pipe with flanged connections combined with flexible sections to accommodate the turns and different slopes of the terrain. The pipe and connections are exposed in some locations. Steel overflow pipes drain excess water to the streams below at the confluence. The catchment basin has filled with sand and stone from upstream and retains a minimal quantity of water.



Figure 3.15. Inside the Catchment Basin, the piping appears to have been replaced and a large quantity of sediment has collected, displacing the water in the basin. (source: Russell Holter, 2021)



Figure 3.16. The Catchment Basin and the Pump House water collection vault were equipped with overflow drain pipes that carried excess water to the streams at the bottom of the cirque (source: Russell Holter, 2021)

CONDITION ASSESSMENT

Numerous deficiencies were observed at the Pump House. The Condition Assessment in the Appendix has further detail. Several key deficiencies include:

- The mortar at the stone cladding is significantly deteriorated. Mortar is missing in some cases, loss of bond to the stone and gaps between the stone and mortar were observed in other locations. In many places, the mortar was cracking as well.
- Several metamorphic type stone units are cracking and splitting due to weather exposure.
- The windows are significantly deteriorated and/or missing.
- The roof is largely missing from the building and 100% failed.
- The parge coat roofing underlayment and mortar parapet cap are severely deteriorated and must be replaced prior to installation of new roofing.



Figure 3.17. The southeast corner of the parapet at the Pump House is severely deteriorated due to the roofing failure and water intrusion. (source: Brian Rich, 2021)

FOUNDATIONS

Foundations – Construction Assembly

The foundations and substructure of the Pump House are constructed of reinforced concrete footings and foundation walls. Given the structure extends approximately 10 to 18 feet below grade to the bottom of the footings (depending on which side of the building), it likely was excavated down into the stone of the mountains. The bottom slab of the water catchment vault and the foundation walls appear to be approximately 12” thick. The main floor slab over the vault is 4 1/2" thick reinforced concrete.

Foundations – Condition

The condition of the footings and foundation walls of the Pump House is not visible on the exterior. From the interior, at the lower level, no major cracks or damage were observed. The vault walls were iron-stained. The upper retaining walls showed signs of water infiltration through cracks, but structural deficiencies were not observed.



Figure 3.18. The west side of the west parapet at the northwest corner of the Pump House illustrates the severe deterioration of the parapets due to the roofing failure and water intrusion. (source: Brian Rich, 2021)

WALLS

Walls – Construction Assembly

The upper walls appear to be 5-inch thick reinforced concrete clad with tightly fitted battered local uncoursed rubble fieldstone and held in place with mortar. The interior faces of the walls are whitewashed but feature no adornment except the concrete wall texture. Given that board-formed concrete is used elsewhere on the structure, the smooth walls are likely coated in cement render. The exterior walls extend above the roof slab as parapet walls. The parapets are capped with a cement wash sloped in two directions. Embedded in the walls at the door and windows are steel lintel angles.

Walls – Condition

Similar to the Ranger Station, the exterior walls of the Pump House show signs of both stone and mortar deterioration. There are gaps between the stone and mortar in most parts of the exterior and the stone itself is also exhibiting cracking and failure. Multiple efforts to repair the mortar have been undertaken, though it is unclear whether the mortar repairs are physically compatible with the historic mortar. Many of the mortar repairs are not a good aesthetic match to the historic mortar. The steel lintel angles do not appear to have significant deterioration on their exposed surfaces nor does there appear to be damage from exfoliating steel corrosion. The cement wash at the top of the parapet walls has severely deteriorated and neither supports the roofing nor the deterrence of water from entering the wall system.



Figure 3.19. The Pump House and other structures are made of a mix of igneous and metamorphic rock. The metamorphic rock is often splitting and cracking, leading to eventual failure. (source: Brian Rich, 2021)



Figure 3.20. The west window of the Pump House is severely weathered, the sash is missing, but the steel lintel angle appears to be in fair condition with minimal visible corrosion. (source: Brian Rich, 2021)

WINDOWS AND DOORS

Windows and Doors – Construction Assembly

There are two windows and one door on the Pump House. The entry door is constructed of two built-up layers of wood planks, vertical and diagonal, fastened with steel nails for added strength against the elements. The exterior layer of planks consists of vertical 1x6 wood planks while the interior layer consists of diagonal 2x10 wood planks.

The eastern window appears to be a wood frame and a fixed six pane, true-divided light, exterior-glazed wood sash, but is covered in oriented strand board (OSB), concealing the original appearance. The western window also has a wood frame, but the sash and glazing are missing. Paint coatings on the wood components of the windows and doors were a dark brown.



Figure 3.21. The door of the Pump House is severely weathered with replacement wood and hardware. Brown paint is visible on some parts of the door and frame. (source: Brian Rich, 2021)

Windows and Doors – Condition

All wood components on the Pump House are severely worn by wind and weather exposure. Paint, where it was applied, has failed and is nearly totally gone. The hardware on the door is significantly corroded but functional.

The eastern window is covered with OSB over most of the window, so only some parts were visible. Glass is broken out in most of the panes and the wood sash and muntins have severely deteriorated where they are exposed to the weather.

The frame of the western window is severely worn away due to the weather and wind exposure. The sash and glazing are completely missing. A “hammered” texture piece of translucent plastic fastened to the frame from the inside does not provide weather protection for the opening.



Figure 3.22. Installed over the concrete slab roof, the cement underlayment is visible where the roofing has completely failed and is no longer adhered to the substrate. (source: Brian Rich, 2021)

ROOF

Roof – Construction Assembly

The roof structure, as mentioned above, is a low-slope reinforced concrete slab. Parapets surround the east, south, and west sides of the building. The low edge of the roof at the north edge has a full-width painted galvanized steel sheet metal gutter. On top of the concrete roof slab, a cement parge coat was installed. The parge coat runs up the walls of the parapet and becomes the dual-sloped parapet wash cap. In addition, it forms gently curved transitions from the roof to the parapets and the roof hatch opening. On top of the roof, there is a roof hatch framed with dimensional lumber and clad in painted galvanized steel sheet metal. Two rocks are on the roof but do not appear to serve any purpose. The roofing itself is a built-up roof of asphaltic mastic and reinforcing scrim several layers thick.

Roof – Condition

The roof of the Pump House is completely failed with several areas of roofing missing and the remaining roofing no longer adhered to the cementitious underlayment. In addition, the cementitious parge coating and parapet wash cap are severely deteriorated, cracked, and broken down. No significant cracks or other deterioration are observed from the interior or exterior of the roof. Some small shrinkage cracks are visible on the interior and water has been infiltrating through the unprotected slab but has not led to major deterioration of the concrete slab.



Figure 3.23. The built-up asphalt roof of the Pump House has completely failed and remaining portions are not adhered to the cementitious underlayment. (source: Brian Rich, 2021)



Figure 3.24. The parapet at the northeast corner of the Pump House reveals severe damage to the cementitious underlayment and roofing failure. (source: Brian Rich, 2021)

INTERIORS

Interiors – Construction Assembly

The vault level of the Pump House has a formed concrete floor, walls, and board-formed ceiling slab with no coatings. The floor of the upper level of the Pump House is bare concrete and shows signs of water intrusion and ponding. The interior walls of the upper level of the Pump House are bare concrete with a parge coat layer smoothing over the board-formed concrete and painted white. Mounted to the walls are several circuit breaker panels for power and control panels for the pumps. The ceiling of the upper floor level is board-formed white-washed concrete with no parge coat.

Interiors – Condition

The vault level of the Pump House is coated in a thin layer of sediment and corrosion product but otherwise is bare and dry. No cracks or deterioration of the concrete structure was observed. The cast-in-place rungs for the ladder are severely corroded and minor efflorescence was observed on the underside of the floor/ceiling slab.

The floor of the upper level of the Pump House shows signs of water intrusion and ponding (algae) with minor cracking of the concrete slab. The white-washed wall coating is failing (peeling, algal growth). Minor cracks have allowed some water infiltration, but no spalling



Figure 3.25. The spartan interior of the Pump House has multiple electrical power and control panels installed on the reinforced concrete walls. Some of the pump piping (right) is still extant. (source: Brian Rich, 2021)

or major deterioration of the walls was observed. Similarly, the ceiling of the upper level shows minor cracking and paint failure but no major deterioration or structural deficiencies. The roof hatch appears to have minor water infiltration (as indicated by the algae on the sides of the opening) but does not exhibit major deterioration.

There is also a significant quantity of electrical control panels for the pumps and piping for the pumps. The pumps have been removed and a few parts are on the ground adjacent to the building. The pipes and panels are in fair condition with minor peeling paint and minimal corrosion. Mechanical and electrical systems in the building were not inspected.



Figure 3.26. The interior of the west wall of the Pump House has some panels and shows the temporary view-obscuring glass installed over the window. (source: Brian Rich, 2021)



Figure 3.27. The interior of the south wall of the Pump House has a single plank door. The manhole to the catchment water vaults on the bottom left. (source: Brian Rich, 2021)

CATCHMENT BASIN

Numerous deficiencies were also observed at the Catchment Basin. Similarly, the condition assessment in the Appendix has further detail. Several key deficiencies include:

- The mortar at the stone cladding is significantly deteriorated. Mortar is missing in some cases, loss of bond to the stone and gaps between the stone and mortar were observed in other locations. In many places, the mortar was cracking as well.
- The cement lining and wall cap of the catchment basin has several critical cracks allowing water penetration and accelerating deterioration or the catchment basin wall.
- There is a significant build-up of rock debris on the uphill side of the catchment basin wall which is placing further stress on the wall as well.



Figure 3.28. The concrete wall and wash at the top of the Catchment Basin are severely weathered and cracked, allowing water to penetrate the wall and lead to further deterioration. (source: Russell Holter, 2021)

WALLS

Walls – Construction Assembly

Drawings were not available for review. However, the 2006 National Register Nomination, including some photographs of the Catchment Basin, were available for review. Per the nomination, the Catchment Basin is constructed of a concrete wall clad in local rubble fieldstone, similar to the Pump House. Three galvanized steel pipes extend out of the top of the wall.

Walls – Condition

The walls of the catchment basin are severely cracked. Mortar between the stones is completely missing. Heavy organic growth covers much of the stone wall. Water collecting inside the catchment basin is exiting through the wall rather than through the drainpipes leading to further erosion of the basin. The protruding galvanized steel pipes are partially corroded but do not appear to be causing further damage to the concrete wash or stone.



Figure 3.29. Due to the shaded location and significant quantity of water, there is extensive organic growth on the Catchment Basin wall. (source: Russell Holter, 2021)

LINING

Lining – Construction Assembly

The lining of the Catchment basin appears to be a concrete lining that includes the bottom and backside of the stone wall. The concrete lining extends over the top edge of the stone wall.

Lining – Condition

The concrete lining is severely cracked in several locations at the top and within the catchment basin.

PIPING

Piping – Construction Assembly

Within the catchment basin, there are four PVC plastic pipes and a yellow barrel with a lid. Piping extends from the bottom of the catchment basin down the valley to join with the primary stream in the valley. The galvanized steel piping is partially exposed, and some connections are visible revealing perforated sheet metal and mesh screens, flange connections, and reinforcing.

Piping – Condition

The PVC piping appears to be in fair condition, though perhaps brittle due to UV light exposure. The galvanized steel piping is corroding but remains connected.



Figure 3.30. Major cracks are visible in the concrete structure of the Catchment Basin wall allowing water to flow through and eroding the mortar in the stone cladding. (source: Russell Holter, 2021)



Figure 3.31. A cement wash is installed over the top of the stone and concrete wall. Pipes embedded in the wall may have been used to help form the concrete wall during construction. (source: Russell Holter, 2021)

PUMP HOUSE TREATMENT RECOMMENDATIONS

The recommended treatment approach for the Pump House is Preservation. The proposed scope of work is prioritized in three levels of effort, each building upon the lower level of effort with the goal of proposing different scopes of work depending on the funding available. The three levels of effort are Stabilization, Partial Restoration, and Full Restoration.

Due to the difficulty of access, it is not anticipated that the Pump House will serve a public use in the future. However, it is an important aspect of the cultural interpretation of the Fall River Pass.

Pump House
Preservation Treatment Approach
Stabilization Level of Effort

The goal of Stabilization is to prevent catastrophic failure and loss of a building.

Structure

Because the concrete walls and slabs of the Pump House structure do not exhibit major deficiencies, no major structural work is recommended for Stabilization.

Enclosure

For the Pump House, recommended stabilization scope includes:

- Removing and reconstructing the existing roof and roof hatch with in-kind materials and painting to match current finishes, including reconstruction of the parge coat substrate, parapet caps, gutter and downspouts.
- This also includes repointing the stone mortar joints at top 2'-0" of the wall for the entire perimeter of the building, in-kind.

Interior

- No work is recommended on the interior of the Pump House for a Stabilization level of effort. There are no critical aspects of the interior that require urgent repair.

MEP Systems

- There are no active mechanical, electrical, plumbing or other building systems at the Pumphouse, therefore no action is required for a Stabilization level of effort.

Pump House **Preservation Treatment Approach** **Partial Restoration Level of Effort**
In addition to the Stabilization recommendations noted above, the following additional scope is recommended to achieve a level of Partial Restoration.
Structure
• Clean, prep and epoxy inject cracks in all upper-level concrete walls and ceiling at the Pump House to reduce or stop water flow and prevent deterioration of the concrete through water infiltration and freeze-thaw damage. Epoxy injection may not be a permanent solution and could be difficult to install and make it aesthetically acceptable.
Enclosure
• Repoint an additional 30% of stone mortar joints that are in the worst condition such as missing mortar or gaps between mortar and stones with in-kind mortar and installation techniques. • Replace critical stone units that are deteriorating and place the structure at risk. • Reconstruct the two windows and door with in-kind wood, glass, and hardware materials and finish with compatible coating. • Paint all existing exterior wood components (windows, doors, roof beams, and infill panels), in-kind.
Interior
• No work is recommended on the interior of the Pump House for a Partial Restoration level of effort. There are no critical aspects of the interior that require urgent repair.
MEP Systems
• There are no active mechanical, electrical, plumbing or other building systems at the Pump House, therefore no action is recommended.

Pump House **Preservation Treatment Approach** **Full Restoration Level of Effort**
In addition to the Stabilization and Partial Restoration recommendations noted above, the following additional scope is recommended to achieve a level of Full Restoration.
Structure
• Design and install permanent structural repairs for the concrete walls of the Pump House.
Enclosure
• Repoint 100% of stone mortar joints at the Pump House, in-kind. • Replace all failing stone units, in-kind. • Consider methods of preventing water intrusion and consequent deterioration of the concrete structure such as excavating and installing exterior crystalline waterproofing for the upper level of the Pump House.
Interior
• Repaint the interior walls, ceiling, and wood components (windows, doors, roof beams, and infill panels) of the Pump House, in-kind.
MEP Systems
• Prep and paint all MEP systems piping and conduit on interior. Provide minimal power for maintenance and lighting within the structure. • Note: No work is recommended for the lower (cistern) level of the Pump House. The team did not observe structural issues, ground water was not collecting in the cistern, and the water pumps are not in use.

CATCHMENT BASIN TREATMENT RECOMMENDATIONS

The recommended treatment approach for the Catchment Basin is Preservation. The proposed scope of work is prioritized in three levels of effort, each building upon the lower level of effort with the goal of proposing different scopes of work depending on the funding available. The three levels of effort are Stabilization, Partial Restoration, and Full Restoration.

Due to the difficulty of access, it is not anticipated that the Catchment Basin will serve a public use in the future. However, it is an important aspect of the cultural interpretation of the Fall River Pass.

Catchment Basin
Preservation Treatment Approach
Stabilization Level of Effort

The goal of Stabilization is to prevent catastrophic failure and loss of the structure.

Structure

Because the concrete walls and slabs of the Catchment Basin exhibit major deficiencies, repairs of major structural cracks in the concrete wall and cement parging are recommended.

Enclosure

Recommended work at the Catchment Basin includes:

- Removing and replacing the cement parging and wall cap, in-kind.
- Repointing 100% of stone mortar joints, in-kind. The catchment basin is particularly subject to severe damage due to the built-up debris and water upstream of the basin wall.

Interior

- Not applicable. There is no interior to the Catchment Basin

MEP Systems

- There are no active mechanical, electrical, plumbing or other building systems at the Catchment Basin and no current plans to reactivate the Catchment Basin, therefore no action is recommended.

Catchment Basin
Preservation Treatment Approach
Partial Restoration Level of Effort

In addition to the Stabilization recommendations noted above, the following additional scope is recommended to achieve a level of Partial Restoration.

Structure

- Excavate and remove built-up sediment and rock inside/ upstream of the Catchment Basin.

Enclosure

- Repoint an additional 30% of stone mortar joints that are in the worst condition such as missing mortar or gaps between mortar and stones with in-kind mortar and installation techniques.
- Replace critical stone units that are deteriorating and place the structure at risk.

Interior

- No interior spaces at the Catchment Basin.

MEP Systems

- There are no active mechanical, electrical, plumbing or other building systems at the Catchment Basin and no current plans to reactivate the Catchment Basin, therefore no action is recommended.

Catchment Basin
Preservation Treatment Approach
Full Restoration Level of Effort

In addition to the Stabilization and Partial Restoration recommendations noted above, the following additional scope is recommended to achieve a level of Full Restoration.

Structure

- Design and install permanent structural repairs for the concrete wall of the Catchment Basin.

Enclosure

- Repoint 100% of stone mortar joints, in-kind.
- Replace all failing stone units, in-kind.
- Consider methods of preventing water intrusion and consequent deterioration of the concrete structure such as installing crystalline waterproofing on the upstream side of the Catchment Basin.
- Restore parge coating over crystalline waterproofing.

Interior

- No interior spaces at the Catchment Basin.

MEP Systems

- There are no active mechanical, electrical, plumbing or other building systems at the Catchment Basin and no current plans to reactivate the Catchment Basin, therefore no action is recommended.

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GENERATOR HOUSE

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CHAPTER 4 — GENERATOR HOUSE

OVERVIEW

The Generator House fulfills critical needs for the Alpine Visitor Center by housing the generators and water purification equipment. The stone-clad building is recessed into the slope of the cirque similar to the Ranger Station and Pump House, but is a distinctly Mission 66 design building with modern structure and features required for its functional role supporting the visitor experience.

PROJECT DATA

- Constructed in 1963
- Designed by P.A. Kay of the NPS Division of Architecture
- Constructed by: Unknown
- NPS Building #692
- Non-Contributing building (too recent) to the Rocky Mountain National Park Multiple Resource Area; Listed January 9, 1988; NRIS.87001140; Site Number 5LR.14267; Designation Criteria C[4.1]
- Contributing building to the Fall River Pass Historic District; Listed December 10, 2021; NRIS #100007216; Site Number; 5LR.14866; Designation Criteria A & C[4.2]



Figure 4.1. The Generator House was completed in 1963 to supply power to the Trail Ridge Store and the forthcoming Alpine Visitor Center. (source: Brian Rich, 2021).

4.1. Carl and Karen McWilliams. *Classified Structure Field Inventory Report: Generator Building.* Estes Park, CO: National Park Service, 1985.

4.2 National Park Service, *National Register Database and Research.* https://www.nps.gov/subjects/nationalregister/database-research.htm#table. Accessed 2022.

BUILDING DEVELOPMENT

The Generator House houses many of the mechanical and electrical functions necessary to maintain the day-to-day operations of the facilities at Fall River Pass. Completion of its construction in 1963 was essential prior to opening the Alpine Visitor Center. Architect P. A. Kay designed the Generator House in the Mission 66 style, using elements of the Park Service Rustic style and naturalistic materials, to blend into the natural environment and present as small a visual impact upon the surrounding landscape as possible.

The building underwent some mechanical and operational renovations in 2000. Prior to this time, some operational changes were necessary and minor modifications were made in 1986. However, these changes did not alter the appearance of the Generator House.

CHRONOLOGY OF DEVELOPMENT AND USE

1963
Generator House is designed by architect P. A. Kay and constructed.[4.3]

1966
Water and sewer systems construction project completed at a cost of $114,910. Power Plant and Shelter construction project completed at a cost of $69,229.[4.4]

1983
JF Sato report notes two existing 50 kW generators in the Generator House. Generators being overhauled due to overheating.[4.5]

1986
Generator House modifications completed. The 1987 Superintendent's report indicates that the Generator House was insulated and soundproofed and that the generators were replaced.[4.6]

1997
Roybal Corporation report notes that there are two 200 kW generators in the Generator House.[4.7]

1998
Emergency replacement of electrical cable powering the water pumps.[4.8] Electrical controls updated and catalytic converters installed on generators.[4.9]

2000
Generator House undergoes mechanical and operational changes designed by the Roybal Corporation as part of broader improvements to the site.

2019
Two 100 kW generators were removed and replaced, including electrical system.[4.10]

CHARACTER-DEFINING FEATURES

The character-defining feature of the Generator House include the modest volume recessed into the sloping terrain and natural materials that belie the essential functions the building houses.

4.3 Kay, P.A. *Generator House, Fall River Pass. Drawing 3600-B*. Larimer County, CO: National Park Service, 1963.
4.4 Novak, Fred J., *1966 Superintendent's Annual Report*, Estes Park, CO: National Park Service, 1966.
4.5 J. F. Sato. *Report on Two Water Systems*. Littleton, CO: JF Sato & Associates, 1983.
4.6 James B. Thompson, *1987 Superintendent's Annual Report*, Estes Park, CO: National Park Service, 1987.
4.7 Roybal Corporation (The). *Alpine Visitor Center and Trail Ridge Store Facilities Improvement Report*. Denver, CO: National Park Service, 1997.
4.8 Barry Alford and Roger Dilford. *Project Proposal/Clearance Form: Emergency Electrical Repair / AVC Water Sys. 1998.*
4.9 Roybal Corporation. *NPS - Alpine Visitor's Center & Trail Ridge Store Improvements.* 1998.
4.10 Rocky Mountain Region Center for Design & Interpretation. *Generator Replacement, Alpine Visitor Center.* 2019.

ADDITIONAL KEY FEATURES:

Additional key features of the Generator House include:

- Local uncoursed rubble fieldstone for the veneer which is more angular and set with wider mortar joints than the Ranger Station or Pump House. The stone veneer is more consistently igneous (granite type) stone, and almost no metamorphic stone. In addition, the stone color is less varied (a consistent golden brown or warm grey), and less three dimensional than the stone on the Ranger Station or Pump House. 1963 design drawings call out "Note: Rubble stone veneer is similar and texture to masonry of existing concessions building."
- The natural stone clad concrete masonry unit walls
- Flanking stone-clad concrete masonry unit retaining walls
- The projecting stone-clad chimney volume
- Functional hollow metal openings and metal louvers (contrasting with the refined wood frame openings on the Alpine Visitor Center)
- The modestly sloped cedar shake roof
- Hand-tooled mortar with native stone aggregate,
- Side-gabled roof with cedar shingles, and
- The stone chimney, including the steel plate and tube frame addition

Interior key features of the Generator House include:

- The unfinished concrete floor
- Concrete masonry unit walls
- Electrical panels and controls for the



Figure 4.2. The west elevation of the Generator House (shown above) illustrates the consistent warm brown toned stone and the more angular flat faced shapes of Mission 66 buildings at the Alpine Visitor Center as compared with the NPS Rustic style Ranger Station and Pump House buildings. (source: Brian Rich, 2021).

generators and pumped water systems
- The water filtration system
- The fire pump system

The features of the structures adjacent to the Generator House include the concrete, steel manhole cover, native uncoursed fieldstone walls, mortar with native stone aggregate, and the wood-framed roof with cedar shake roofing.

STATEMENT OF SIGNIFICANCE

As indicated in the Fall River Pass Historic District nomination, the Generator House is a contributing building to the Fall River Pass Historic District. It has important character-defining features that should be retained. Similar to other contributing buildings, the Generator House is a Mission 66 Park Service style building with modern building systems that also uses rustic building materials to blend into the landscape. The design of the building is driven by the functional requirements.

ASSESSMENT OF INTEGRITY

The buildings in the Fall River Pass Historic District were assessed for their integrity and their ability to convey their historic significance. The Generator House retains significant integrity of location, setting, design, materials, workmanship, and association. The seven aspects of integrity are discussed in more detail in the Fall River Pass Preservation Plan.

While the building, as a whole, retains a high level of integrity, several incompatible renovations have eroded some aspects of integrity. The aspects of materials and workmanship are most significantly impacted by prior projects. Some of the incompatible interventions include:

- Structural steel support along the south wall at the edge of the roof.
- Stainless steel plates over the window openings.
- Installation of electrical disconnect switches on the exterior of the building.

While the extension of the chimney using a steel frame and plates appears incompatible and is deteriorating, it is part of the upgrades to the generator system over time and has gained historic significance. When considering rehabilitation of the building, consider whether alterations to the chimney would further impact the integrity of the building.

Restoration of the integrity of the Generator House is recommended wherever possible for all potential treatments but must also balance the need to accommodate new uses, functions, and technologies to future-proof the building against obsolescence.



Figure 4.3. The Generator House was completed in 1963 to supply power to the Trail Ridge Store and the forthcoming Alpine Visitor Center. (source: Brian Rich, 2021).

PHYSICAL DESCRIPTION

Fall River Pass Generator House (1963) – Building 0692, 5LR.14267

Constructed along the eastern edge of Old Fall River Road across from the Trail Ridge Store, the Generator House contains two power generators, fuel piping, fuel filters, secondary water pumps, water piping, and fire pump controls.

PLAN CONFIGURATION

The Generator House is a rectangular, one-story building resting on a reinforced concrete foundation recessed into the terrain on the north side. It is approximately 28'-0" by 19'-4". The inside of the building is one ample open space. Two large generators, water pumps, and other mechanical, electrical, and plumbing fixtures occupy it.

EXTERIOR ELEVATIONS

All exterior walls are constructed of fully grouted 6" and 12" thick concrete masonry units (CMU). Below grade, the CMU is waterproofed, and above grade, the CMU is clad with native uncoursed fieldstone.

The north elevation features the chimney for the generator combustion air intake and exhaust which is offset to the west end of the building. The 6'-0" chimney follows the typical construction of this building, including uncoursed fieldstone clad CMU, and is capped with a tapered reinforced concrete slab. The chimney extends approximately 2'-6" higher with a painted steel frame and plate assembly on top of the concrete slab cap. The remainder of the north elevation extends only 1'-0" to 1'-6" above grade, revealing the asphaltic waterproofing over the CMU wall and wood trim tucked up under the roofing. Two galvanized iron pipe vents penetrate this wall close to the ground.

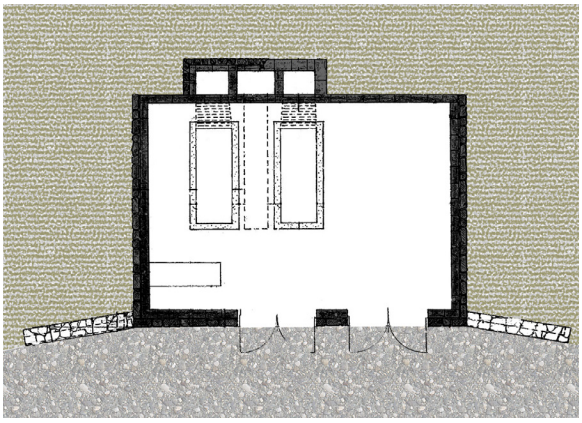


Figure 4.4. The plan of the Generator House reveals the simple configuration and the wing walls used to retain the alpine tundra since the building is recessed into the sloping terrain. (source: Kay, P.A., 1963).

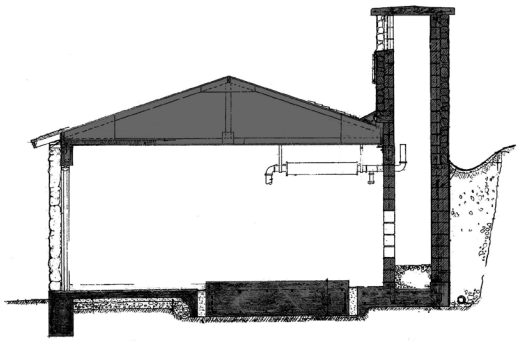


Figure 4.5. The section through the Generator House shows the chimney for the generator exhaust and the high terrain on the north (right) side of the building. This section does not show the later steel plate and tube frame chimney extension. (source: Kay, P.A., 1963).

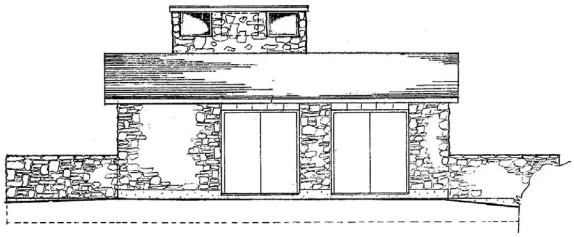


Figure 4.6. The south elevation of the Generator House shows the two original door openings. The right (east) opening has been changed to a hollow metal frame with two metal panels and two louvers covered by stainless steel plates. (source: Kay, P.A., 1963).

An asphalt wash surrounds the north (uphill) side of the building to control stormwater.

The east elevation is clad with uncoursed fieldstone cladding and has a small triangular louver vent at the top of the gable. Protruding out of the ground at the east elevation is a pipe vent. The 2-piece fascia board on the roof rake has a larger board covering the majority of the fascia and a smaller board intended to cover the edge of the plywood roof sheathing. On top of the stone is a mortar wash sloped to the exterior of the building.

The south elevation is the primary elevation and is constructed of CMU and uncoursed fieldstone cladding. It has a concrete stoop and trench drain flush with the adjacent Old Fall River Road. This elevation is the only full-height exposed wall of the building. It features a central painted hollow metal door and frame assembly equipped with weather seals, pull hardware, and a deadbolt lock with US26D bushed chrome or US32D brushed stainless steel hardware. A second opening is located between the main door and the east corner of the elevation. This second hollow metal frame is divided into four smaller panels. The bottom two openings are infilled with painted steel panels held in place with screw-in hollow metal stops. The upper two louvered openings are covered by stainless steel checker plate panels with hinges at the bottom edge and wing nuts at the top to hold the panels closed. Above both openings, the exposed CMU bond beam header is painted dark brown to match the wood trim on the building. The south elevation also has two large painted electrical disconnect switches for the generators, including gray sheet metal raceways and rigid metal conduits for electrical connections. Adjacent to the panels is a red strobe light. The south elevation also features a simple steel frame structure with four 3”x3” square hollow steel columns supporting a steel channel. The channel supports the rafter tails of



Figure 4.7. The west, north, and east sides of the Generator House are embedded in the slope of the hill to minimize its visual impact to the Alpine Visitor Center complex. (source: Brian Rich, 2021)

the roof trusses, though it is not fastened to any of them. This exposed steel structure is not painted.

The west elevation is very similar to the east elevation. Both have uncoursed fieldstone cladding and a small triangular louver vent at the top of the gable. There are several conduit and pipe penetrations at the west elevation. The fascia board and cement wash at the top of the stone cladding are the same as the east elevation.



Figure 4.8. The generator intake and exhaust chimney is the primary feature on the north elevation. Metal panel and frame structures extended the height of the chimney. (source: Brian Rich, 2021)

ROOF

The roof is a side-gabled 4:12 slope roof covered in wood shakes over heavyweight asphalt-impregnated building paper over plywood roof sheathing.[4.11] There is no sheet metal at the rake edges (east and west ends) nor at the north and south eaves of the roof. Besides the service doors facing Fall River Road, the Generator House's most prominent feature is the extensive air handling and exhaust system on the chimney. The chimney is flashed with galvanized steel flashing inserted into the masonry joints of the stone and sealant adhered lap joints.

The unpainted roof soffits are not enclosed, revealing roof sheathing, truss tails supporting the north and south roof overhangs, and outriggers at the east and west overhangs. The roof structure consists of two sets of roof trusses. The first set includes custom-built king-post trusses spaced at 2'-0" on center with 2x4

4.11 P.A. Kay, *Generator House, Fall River Pass. Drawing 3600-B.* (Larimer County, CO: National Park Service, 1963), 1-2.



Figure 4.9. The west exterior wall of the Generator House (left) has several electrical panels. One of the generators is seen at the right in this image. (source: Brian Rich, 2021)

members and plywood gussets.[4.12] The second set are Fink trusses spaced at 1'-4" on center with 2x4 members and galvanized steel nail plate connections.



Figure 4.10. The east end of the Generator House is where the piping, pumps, and filtration systems are located for the Alpine Visitor Center and the Trail Ridge Store. (source: Brian Rich, 2021)

INTERIOR

The interior of the Generator House is utilitarian in nature, consisting of concrete floors, painted CMU walls, and a painted plywood ceiling. The attic space has 3" of batt insulation but is open to the interior of the building through a large access opening.[4.13] The two generators are shifted to the western half of the building with electrical panels and disconnect switches mounted to the west and south walls. The east part of the building contains the water filtration systems and related control panels.

4.12 Kay, *Generator House, Fall River Pass. Drawing 3600-B*, 1-2.
4.13 Kay, *Generator House, Fall River Pass. Drawing 3600-B*, 1-2.

ACCESSORY STRUCTURES

There are three structures adjacent to the Generator House on the east side. They include the Fire Water Pump House, Valve and Float Switch Enclosure, and the Fire Tank Manhole.[4.14] [4.15]

The Fire Water Pump House is the largest of the accessory structures. Measuring nearly 9'-0" in the east-west direction and 6'-0" in the north-south direction, the structure stands approximately 5'-0" tall. It is a reinforced concrete structure on top of the underground 60,000-gallon water tank and houses the fire pump.[4.16] It is clad with native uncoursed fieldstone and covered with a low slope wood-framed roof. There is one pipe protruding from the east side of the building, a "Y" fire department connection on the south side of the building, and a 2'-0" diameter pipe opening on the west side of the structure that is covered by a plywood panel.



Figure 4.12. The Fire Water Pump House (housing the fire pump and valves) is located over the northwest corner of the 60,000 gallon water tank immediately east of the Generator House. (source: Brian Rich, 2021)



Figure 4.11. The Fire Water Pump House and Fire Tank Valve and Float vault are immediately east of the Generator House. The Fire Tank Manhole is further east. (source: Brian Rich, 2021)

The roof framing consists of 2x10 joists at 1'-0" on center spanning the short dimension of the structure. The roof sheathing is plywood covered by asphalt roofing underlayment and split cedar shakes. On top of the roof is a 4'-0" square aluminum plate access hatch.

The Valve and Float Switch Enclosure is a reinforced concrete structure 4'-6" square and 3'-0" tall located on the west edge of the 60,000-gallon water storage tank.[4.17] It is clad in native uncoursed fieldstone. The cover of this structure is an aluminum frame and panel hatch flush with the top of the stone cladding. There is also a narrow mortar wash on top of the stone.

The Fire Tank Manhole is a reinforced concrete structure approximately 3'-0" square and 1'-0" tall. It is capped with an unpainted steel angle and plate frame secured with steel hinges and lock hasp.[4.18]

4.14 DP. Alpine Visitor Center, Water Line Replacement Utility Plan. (Denver, CO: National Park Service, 2010). Drawing 121.
4.15 Sato, AVC. Generator Building Base Plan, Drawing 121.
4.16 DP, AVC, Water Line Replacement Utility Plan , Drawing 121.
4.17 Adams, *Improve Water and Sewer Systems, Fall River Pass Area*, 1-13.
4.18 Adams, *Improve Water and Sewer Systems, Fall River Pass Area*, 1-13.



Figure 4.13. The Fire Tank Valve and Float Chamber is located on top of the 60,000 gallon water tank immediately east of the Generator House. (source: Brian Rich, 2021)



Figure 4.14. The Fire Tank Manhole is located at the southeast corner of the 60,000 gallon water tank and is composed of a steel angle frame and steel plate cover. (source: Brian Rich, 2021)

RECORD OF PAST TREATMENT

This section will begin to document work performed on the property by providing a summary of the interim management activities at the property and initial stabilization plans for the buildings. After this planning effort is complete, it will be important to document future projects and maintenance activities at the Fall River Pass Historic District. The following information should be supplied when documenting work performed: (a) the intent of the work, (b) how the work was approached and accomplished, (c) the time required to do the work, (d) the cost of the work, (e) project plans or report, and (f) photographs of the work. This section should also be used to compile copies of the field reports, technical studies, condition assessments, and contract summaries.

Interim Management Recommendations

Until the execution of the stabilization of the buildings or structures in the Fall River Pass Historic District, recommendations include

- Maintaining the security of the buildings and related structures, including securing the site areas around the buildings.
- Minimizing human traffic in and around the buildings and structures to minimize impact to the buildings and alpine tundra landscape around the buildings and structures.
- Take precautions to prevent intrusion by flora and fauna that could damage the historic fabric of the buildings and structures.

Previous interventions at the Fall River Pass Historic District complex will be documented in future revisions of this report.

CONDITION ASSESSMENT

Numerous deficiencies were observed at the Generator House. The condition assessment in the Appendix has further detail. Several key deficiencies include:

- The mortar at the stone cladding is significantly deteriorated. Mortar is missing in some cases, loss of bond to the stone and gaps between the stone and mortar were observed in other locations. In many places, the mortar was cracking as well.
- Several metamorphic type stone units are cracking and splitting due to weather exposure.
- The steel roof support structure on the south side of the building is heavily corroded and not attached to roof members (though it is braced back to the wall of the building).
- The paint is failing on the steel chimney extension and the concrete cap is broken in multiple places compromising its structural integrity.
- There is severe deterioration of the cedar shingle roofing with broken and missing shakes and exposed and damaged underlayment.

FOUNDATIONS

Foundations – Construction Assembly

The Generator House is constructed on a 5” wire mesh reinforced concrete slab on grade with thickened edge beams and a 12” thick slab under the chimney. Additional reinforcing connects the thickened footings and exterior soil bearing walls. Block outs and 2’-0” thick slabs on grade are located at both generators with a sand-filled moat around each. The foundation walls are constructed of 12” thick CMU blocks, fully grouted and reinforced. Over the CMU, a waterproof membrane has been installed along with a 4” open joint field tile footing drain surrounded by gravel.



Figure 4.15. This stone, at the southeast corner of the Generator House, is failing and likely not well anchored to the building. The open mortar joint is a source of water intrusion. (source: Brian Rich, 2021)



Figure 4.16. The roof overhang at the north side of the Generator House conceals the incomplete building enclosure which is a likely source of water infiltration and damage inside. (source: Brian Rich, 2021)

Foundations – Condition

Observations from the interior of the slab on grade and foundation walls do not reveal significant cracking or water penetration. The east end of the floor slab is painted and observations reveal anchors for earlier equipment. Water penetration appears to be occurring at the chimney, roof, and other locations, except on the west wall. Efflorescence on the west wall indicates some moisture penetration. However, as no cracks or openings appear in this area, water may have originated elsewhere.

WALLS

Walls – Construction Assembly

The walls of the Generator House are all constructed of reinforced fully-grouted CMU clad with 6” or 8” stone veneer. In some areas, the interior face appears to have a thin parge coating concealing the texture of the CMU and mortar joints. The CMU walls are painted on the interior. The north wall of the building is very short and has waterproofing extending a short distance up the CMU foundation wall and capped by the exposed unfinished wood soffit.

Walls – Condition

As discussed above, the foundation walls of the Generator House are in fair condition, other than the minor efflorescence on the west wall. The walls have a significant amount of soiling from combustion byproducts from the generators. On the exterior, numerous penetrations are unsealed and the waterproofing on the short north wall is incomplete. Above the CMU north wall, the roof soffit extends out over the ground. Infill blocking between the framing has several gaps and is not watertight though it would be buried under a significant amount of snow during the winter.

The stone cladding is in poor condition with gaps between mortar and stone units and failing (cracking, splitting) stone units in some locations. The most significant stone cladding failure is at the southeast corner where a 1” crack has formed between the stone and the rest of the wall. Some



Figure 4.17. There is minor efflorescence on the interior side of the west foundation wall of the Generator House indicating water infiltration has occurred. (source: Brian Rich, 2021)



Figure 4.18. The doors of the Generator House are damaged and corroding. A louver is located above the door to allow fresh combustion air in for the generators. (source: Brian Rich, 2021)

repairs of the mortar joints on the stone have been completed. Physical property compatibility is unknown but some mortar joint patches do not aesthetically match the original mortar materials.

WINDOWS AND DOORS

Windows and Doors – Construction Assembly

There are no windows on the Generator House. There are two openings: a door and a vent. Both are made of hollow metal frames. The double door opening includes a pair of hollow metal doors with weather stripping and hardware. At the vent opening, a pair of four paneled hollow metal doors replace the original door. The bottom panels are filled with a painted metal plate while the top panels are louvers covered by stainless steel checker plate panels on hinges. The checker plate panels swing down to reveal the louvers during generator operation.



Figure 4.19. The roof of the Generator House includes plywood sheathing, heavy asphalt impregnated roofing paper, and cedar shakes which all show evidence of significant damage. (source: Brian Rich, 2021)

Windows and Doors – Condition

The hollow metal frames are slightly dented and paint has failed (scratches, corrosion, peeling). The perimeter sealant around the hollow metal openings has also failed (as it has elsewhere on the building). The metal panels on the infilled frame are also scratched, corroded, and have minor dents.

ROOF

Roof – Construction Assembly

The roof is a side-gabled 4:12 slope roof covered in wood shakes over heavyweight asphalt-impregnated building paper over plywood roof sheathing.[4.19] The roof structure consists of two sets of roof trusses. The first set includes custom-built king-post trusses spaced at 2'-0" on center with 2x4 members and plywood gussets.[4.20] The second set of trusses are Fink trusses spaced at 1'-4" on center with 2x4 members and galvanized



Figure 4.20. Missing trim allows severe weathering and damage to the edge of the Generator House roofing. Sealant has failed on all parts of the building. (source: Brian Rich, 2021)

4.19 Kay, *Generator Building, Fall River Pass. Drawing 3600-B*, 1-2.
4.20 Kay, *Generator Building, Fall River Pass. Drawing 3600-B*, 1-2.

steel nail plate connections. There is no sheet metal at the rake edges (east and west ends) nor at the north and south eaves of the roof. The chimney is flashed with galvanized steel flashing inserted into the masonry joints of the stone and sealant adhered lap joints. The unpainted roof soffits are not enclosed revealing roof sheathing, truss tails supporting the north and south roof overhangs, and outriggers at the east and west overhangs.

The chimney projects several feet above the roof and is constructed of CMU with 6" thick uncoursed fieldstone cladding. The CMU is reinforced and fully grouted. On top of the chimney originally was a thin reinforced concrete slab. Later additions to the chimney include a painted steel plate and frame extension to better control intake and exhaust from the generators.

Roof – Condition

The flashing at the roof-to-chimney connection has multiple failed joints and failed sealant and is no longer weather tight. The cedar roofing shingles have cracked and broken in several locations. The absence of sheet metal at the edges has resulted in the deterioration of the plywood roof sheathing. Significant water damage is observed at the interior plywood ceiling panels indicating that water is infiltrating through the roof and/or flashing.

Similarly, the top of the chimney is no longer weather-tight. Cracks, failed sealant, and failed grout were observed at the top of the chimney. The concrete slab cap on the chimney is cracked in several locations and exhibit exposed



Figure 4.21. The roof of the Generator House is cedar shake over asphalt felt building paper over plywood sheathing. The roof has broken shingles in several locations and the edges are deteriorating from mechanical and impact damage. (source: Brian Rich, 2021).

reinforcing. The mortar and stone on the chimney have failed, similar to other Fall River Pass Historic District buildings. There are gaps between the mortar and stone. The stone itself is failing in some locations (cracking and splitting). The stone on the chimney is also heavily soiled with generator exhaust byproduct. The paint on the steel chimney extension has failed.

INTERIORS

Interiors – Construction Assembly

The concrete slab floors are painted at the east end of the building and unfinished at the west end of the building. The interior face of the CMU walls have a thin parge coat in some areas and are painted at the east end of the building, but not the west. The ceiling consists of 3/8" plywood across the entire ceiling except for the opening to access the attic space. Above the ceiling is fiberglass insulation that has been partially moved aside for access. Attached to the plywood ceiling are a multitude of conduits and pipes.

Interiors – Condition

The painted concrete slab floors are in fair condition with no major cracks or other deterioration. The interior faces of the CMU walls have a significant amount of generator exhaust byproducts and minor efflorescence due to water infiltration. The painted plywood ceiling panels have severely deteriorated in areas where water infiltration has led to delamination and rot of the plywood. Fiberglass batt ceiling insulation should be considered severely damaged due to the apparent water intrusion into the roof/ceiling system.



Figure 4.22. The walls and ceiling at the west end of the building are severely smoke damaged, and there is significant water infiltration at the chimney and water damage at the ceiling. (source: Brian Rich, 2021)



Figure 4.23. The interior of the south wall of the Generator House illustrates the partially complete painting and smoke damage at the west part of the building. (source: Brian Rich, 2021)

TREATMENT RECOMMENDATIONS

The recommended treatment approach for the Generator House is Preservation. The proposed scope of work is prioritized in three levels of effort, each building upon the lower level of effort with the goal of proposing different scopes of work depending on the funding available. The three levels of effort are Stabilization, Partial Restoration, and Full Restoration.

However, because the building is a contributing building in the historic district and more accessible than the Ranger Station or Pump House, the building could be rehabilitated for a new use with more flexibility than the Ranger Stations or Pump House. Rehabilitation of the Generator House would require a more extensive scope of work than is included in this recommendation and would require further consideration.

Preservation Treatment Approach **Stabilization Level of Effort**
The goal of Stabilization is to prevent catastrophic failure and loss of a building.
Structure
• Attach the steel frame supporting the south roof eave to the building structure. Consult with structural engineer for recommended attachment.
Enclosure
• Remove and replace cedar shake roofing system, in-kind, including cedar shakes, ice and water shield and underlayment, plywood, perimeter trim wood, metal gutters and downspouts, flashing, and painting all wood trim). • Prep and recoat metal air intake/exhaust structures, doors and frames, and the steel frame supporting the south roof eave. • Repoint deteriorated mortar joints in-kind and attach stone at stone cladding where stone cladding is in imminent danger of failing. • Check, replace, and/or provide blocking and flashings at uphill side of the building to prevent water intrusion. • Repoint missing mortar at two accessory structures, the Fire Tank Pump House and the Fire Tank Valve and Float Enclosure, in-kind. • Remove and reconstruct roof at the Fire Tank Pump House accessory structure, in-kind, with wood framing, wood plank decking, rolled roofing and underlayment.
Interior
• No work is recommended on the interior of the Generator House for a Stabilization level of effort. There are no critical aspects of the interior that require urgent repair.
MEP Systems
• There are active mechanical, electrical, plumbing or other building systems at the Generator House, but stabilization of the systems is not required.

Preservation Treatment Approach Partial Restoration Level of Effort
In addition to the Stabilization recommendations noted above, the following additional scope is recommended to achieve a level of Partial Restoration.
Structure
• Reconfigure and permanently attach steel beam and columns on the south side of the building. • Consider replacing the roof structure with a stronger roof trusses.
Enclosure
• Repoint 30% of stone mortar joints, in-kind, and grade soil to slope around the uphill side of the building. • Consider reconstructing the on-grade asphalt swale on the north (uphill) side of the building. • Replace the aluminum plate access hatches at both accessory structures, in-kind.
Interior
• Remove ceiling panels and install new mineral wool insulation. Reinstall or replace existing ceiling panels, in-kind.
MEP Systems
• There are active mechanical, electrical, plumbing or other building systems at the Generator House, but stabilization of the systems is not required.

Preservation Treatment Approach Full Restoration Level of Effort
In addition to the Stabilization and Partial Restoration recommendations noted above, the following additional scope is recommended to achieve a level of Full Restoration and re-purposing of the building for a new use.
Structure
• Consider stronger roof trusses to withstand loads. This would allow the south steel frame to be removed. • Reconstruct chimney-top air intake and exhaust structures, in-kind.
Enclosure
• Repoint 100% of stone mortar joints and replace failing stone units in-kind. • Remove and patch all wall penetrations where they are not used with materials matching the adjacent construction. • Reconstruct the louver vent above the entry doors, in-kind. • Remove the steel panels at east doors and reconstruct historic door opening if possible, given outside air intake requirements for the generators. • Remove and replace the existing steel doors, in-kind. • Cap and close off vents and air intakes (if the building is rehabilitated for a new use that does not require them).
Interior
• Prep and paint all interior walls and ceiling, in-kind. Remove sandpits and infill with new flush concrete floor slab. Patch and repair anchor bolts in the floor slab and other minor defects.
MEP Systems
• See MEP pre-design scope for re-purposed building.

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APPENDICES

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METHODOLOGY

ON-SITE ASSESSMENT METHODOLOGY

The objective of the walk-through survey is to observe, visually, the property to obtain information on material systems and components to provide a brief description, identifying physical deficiencies to the extent that they are easily visible and readily accessible. The buildings were visually examined and photographed, accessing as many spaces as possible, including exterior and interior observations, without destructive investigation. Crawl spaces were not accessible in the three buildings. The Pump House features a water cistern below the main floor which was photographed from above but not accessed. Only the Generator House has an attic and it was accessed in a limited manner due to confined spaces, limited access, and dangerous conditions. Photos were taken with a digital SLR camera and/or smartphones. Other agencies, persons, or authorities having jurisdiction were not interviewed for this assessment. Detailed investigation of existing documentation of the existing building was conducted to support our observations and confirm information about the buildings. Testing of materials and diagnostic non-destructive testing techniques were not performed. However, samples of mortar, wood, and stone were collected from all buildings at the site and are available for testing and analysis at a future date.

DOCUMENTATION METHODOLOGY

The methods used to complete and document on-site observations for the Fall River Pass Historic District are discussed in the following sections. The Condition Assessment Drawings locate deficiencies with a keynote system and correlate to itemized spreadsheets of the deficiencies. The condition assessment drawings include embedded hyperlinked detail photos and more detailed information about each deficiency. In-person observations and digital images were used to identify deficiencies, evaluate the severity of the observed deficiencies, and identify areas where further investigation is recommended.

OBSERVATIONS

The assessment included observations of exterior building assemblies such as foundations, support structures, walls, openings, roofs, etc. Building exteriors were investigated from the ground through close-up observations telescopes and telephoto camera lenses. The assessment of interior spaces of the subject buildings included observations of the water cistern at the Pump House, limited observation of the attic at the Generator House, and other accessible spaces within the buildings. Team members from other disciplines conducted the assessment of other portions of the building, including the structure and active building systems (mechanical, electrical, and plumbing). No investigation from drones, man lifts, swing stages, or roped access was performed therefore close-range observations of the upper wall areas were limited. All roof areas of the auxiliary buildings were able to be accessed for detailed observations.

BUILDING CONDITION SUMMARY GRAPHICS

The Building Condition Assessment summary graphics provide an overall average summary of the building's condition and the condition of specific building components. Critical life

safety issues were observed in some areas of the building. The summary graphics list exterior building components and systems that were observed for each building along with an average rating. Deficiencies are assigned two ratings: Feature Condition and Feature Significance which are evaluated on a scale from 1 to 5. The Feature Condition is a relative measure of an item's condition. Feature Priority is an evaluation of the importance relative to character defining features and evaluates a feature's importance in conveying historic character. Building features in worse physical condition and/or higher importance in conveying historic character receive higher scores. See the condition assessment data in the Appendix.

The Feature Condition Rating and the Feature Significance Rating are multiplied, and the resulting product is the Treatment Priority. The Treatment Priority is a relative scale of the recommended priority for the repair of deficiencies. The higher the Treatment Priority, the more urgent the recommendation is to complete the repair of the deficiency.

BUILDING CONDITION ASSESSMENT DRAWINGS

The condition assessment drawings also incorporate a combination of photos taken during the site visit and historic construction drawings. Keynotes for each deficiency are called out on the drawings with a sequential notation. Keynotes indicate a specific location for a deficiency. Organized by keynote number, the condition assessment spreadsheets provide additional information about the deficiencies. The keynotes follow a naming convention with the first two characters representing the building name (RS = Ranger Station; PH = Pump House, CB = Catchment Basin, and GH = Generator House, etc.), the middle character(s) indicating the compass direction side or interior of the building (N = North, E = East, S = South, W = West, I = Interior), and a sequential number for each deficiency. In addition, the condition assessment drawings include a lens icon below each keynote, which hyperlinks to an embedded document containing detailed photos and information about the deficiency.

DETAILED BUILDING DEFICIENCY SPREADSHEETS

Detailed Deficiency Spreadsheets supplement the drawings by providing the same information about each deficiency in a convenient spreadsheet format if the hyperlinks in the drawings do not work. The spreadsheets contain tables with the keynote numbers, a narrative description of the deficiency, an estimated quantity of materials to be repaired, and clarifying notes. A separate cost estimate was completed for stabilization of the buildings and structures – see the pre-design cost estimate. The pre-design cost estimate does not include repair of all deficiencies observed and included in this condition assessment.

DETAILED DEFICIENCY PHOTOS

Detailed photos of the selected exterior and/or interior deficiencies were taken to document building deficiencies. The detailed photos (embedded within the elevation drawings as discussed above) are representative of the deficiencies observed. Due to file size limitations, not all detail photos are hyperlinked in the drawings. However, an electronic copy of all photos and videos is provided for the record.

LIMITATIONS

The following statements outline our observations and opinions concerning the condition of the property as reasonably accessed. This report relates only to that which was readily viewable. No opinion or warranty of opinion is made on that which was not readily and fully observed. The observers did not enter or inspect areas where safe, unobstructed, and legal access was not available. The extent of accessible areas, as defined by the presence of what is safe and reasonable as determined by the observers, is based on the conditions encountered at the time of the site visit. This report is limited to a visual observation which only covered the readily accessible areas of the exterior of each building and site that safe and reasonable access was permitted at the time of site visits. Observation included the architectural interior of the buildings. Building systems, including but not limited to structural, mechanical, electrical systems, were not reviewed.

The observations and opinions contained in this report are meant to assist the user of the report in developing a general understanding of the physical condition of the subject buildings. It is not the intent of this assessment to prepare or provide exact costs, exact quantities, or identify the exact locations of items or systems as a basis for preparing cost estimates.

This condition assessment was designed to reduce, not eliminate the uncertainty regarding the potential for component or system failure, within reasonable limits of time and cost, and no warranty is implied. This assessment does not constitute a regulatory or code compliance audit of the building systems that may be present at the subject buildings. This condition assessment of work does not include testing, measuring, or preparing calculations for any system or component to determine adequacy, capacity, or compliance with any standard.

Otak, Inc. has no ongoing obligation to obtain and include information that was not reasonably ascertainable, practically reviewable, or provided to Otak, Inc. in a reasonable time frame to formulate an opinion and complete the assessment by the agreed upon due date.

Any fungi or mold reference included in this report does not constitute a professional mold inspection and is not based upon any sampling, testing, and/or abatement. Otak, Inc. merely notes the visual presence or absence of fungi or mold observed during the preparation of this report.

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Rocky Mountain National Park
Fall River Pass Historic District

Historic Structures Reports for Fall River Pass Ranger Station, Pump House, and Generator House

April 2023