HERMIT’S REST
GRAND CANYON NATIONAL PARK
BUILDING CODE REVIEW

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prepared by:

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prepared for:

Historic Structure Report, Hermit’s Rest
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Summary
As an existing building and an historic property, Hermit’s Rest is generally not required to meet current Code standards (The exception to this is the accessibility requirements defined in the Americans with Disabilities Act). Codes for existing structures are generally applied in cases of change of occupancy, or when alterations are made to the facility. Separate code requirements have been created to provide flexibility for protection of existing historic structures, while at the same time addressing issues of life safety. So a status review of code compliance for an existing building (not facing a change of use or alteration) primarily focuses on issues of life safety and accessibility.

Hermit’s Rest is also a National Historic Landmark, and therefore consideration of the exceptional significance of the property must be taken into account when making specific recommendations.

The National Park Service and the Grand Canyon National Park have not adopted specific building codes for the Park’s facilities, nor have they adopted a specific code for historic structures. Based on review of various codes, NPS directives, and discussions with Robert Powell, Historical Architect for the Grand Canyon, the following codes have been adopted for the analysis of Hermit’s Rest.

- International Building Code 2006
- International Existing Building Code 2006
- Uniform Federal Accessibility Standards (UFAS) 1984
- ADA-ABA Guidelines 2004
- ADA Accessibility Guidelines (ADAAG) 2002
- NFPA 101 Life Safety 2006
The International Building Code and International Existing Building Code were selected in part because they are part of the International Code Council, which has been widely adopted across the country in recent years and is intended to bring uniformity to the broad range of codes and jurisdictions.

UFAS, ADA-ABA, and ADAAG codes have been adopted per NPS Director’s Order 28: Cultural Resource Management Guideline. NFPA codes have been adopted per NPS Director’s Order 58: Structural Fire Management.

Building Code Review
IBC 2006 (assumes new construction)

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>M—mercantile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Type</td>
<td>V-B</td>
</tr>
<tr>
<td>Fire Rating</td>
<td>0 hours (&lt;30 feet to nearest structure)</td>
</tr>
<tr>
<td>Area Limitation</td>
<td>6000 s.f. maximum (existing OK)</td>
</tr>
<tr>
<td>Height Limitation</td>
<td>1 story</td>
</tr>
<tr>
<td>Occupancy Load</td>
<td>30 s.f. per person, 200 s.f. per person in kitchen; total load 44 (per 1003.2.2)</td>
</tr>
<tr>
<td># of Exits required</td>
<td>1 (when occupant load is less than 50)</td>
</tr>
<tr>
<td>Sprinklers required?</td>
<td>no (per Chapter 9)</td>
</tr>
<tr>
<td>Exit signs required?</td>
<td>no (per Chapter 10)</td>
</tr>
<tr>
<td>Fire alarm required?</td>
<td>no (per Chapter 9)</td>
</tr>
</tbody>
</table>

Accessibility
Section 4.1.7(1) of the ADA Accessibility Guidelines (ADAAG) requires alterations to historic structures to comply with the requirements for other existing buildings unless it is determined that compliance with the requirements would threaten or destroy the historic significance of the building. Section 4.1.7(3) of the ADA Accessibility Guidelines (ADAAG) establishes the following minimum requirements for historic structures (significant issues for Hermit’s Rest in **bold**):

(a) At least one accessible route complying with 4.3 from a site access point to an accessible entrance shall be provided.

EXCEPTION: A ramp with a slope no greater than 1:6 for a run not to exceed 2 ft (610 mm) may be used as part of an accessible route to an entrance.

(b) At least one accessible entrance complying with 4.14 which is used by the public shall be provided.

EXCEPTION: If it is determined that no entrance used by the public can comply with 4.14, then access at any entrance not used by the general public but open (unlocked) with directional signage at the primary entrance may be used. The accessible entrance shall also have a notification system. Where security is a problem, remote monitoring may be used.

(c) If toilets are provided, then at least one toilet facility complying with 4.22 and 4.1.6 shall be provided along an accessible route that complies with 4.3. Such toilet facility may be unisex in design.
(d) Accessible routes from an accessible entrance to all publicly used spaces on at least the level of the accessible entrance shall be provided. Access shall be provided to all levels of a building or facility in compliance with 4.1 whenever practical.

(e) Displays and written information, documents, etc., should be located where they can be seen by a seated person. Exhibits and signage displayed horizontally (e.g., open books), should be no higher than 44 in (1120 mm) above the floor surface.

The Department of Justice’s guidelines for the implementation of the ADA require alternative methods of access where compliance with the special access provisions in 4.1.7(3) would threaten or destroy the historic significance of a qualified facility. However, this “does not require a public entity to take any action that would threaten or destroy the historic significance of an historic property.” (ADA.gov/regs2.html; DOJ implementation guidelines, Section 35.150)

Accessibility at Hermit’s Rest is limited by the building’s unique character, location and environment. However, minor modifications can be made to meet these minimum requirements for the public. Full accessibility for staff areas is more difficult to achieve, especially in the Kitchen, where space is limited.

<table>
<thead>
<tr>
<th>Deficiency</th>
<th>Recommended Treatment</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>A portion of the path from the parking lot to the building exceeds the minimum slope requirements for accessibility</td>
<td>The path should be modified to conform to the required minimum slope of 1:12, and 1:6 for a maximum length of 2 feet</td>
<td></td>
</tr>
<tr>
<td>The first step down into the Front Patio from the entry path is irregular and does not have a consistent surface for adequate footing</td>
<td>Concrete and asphalt surfaces should be repaired, and stone should be replaced and re-grouted to provide smoother walking surface (3 ft. width, min.)</td>
<td>Irregular surfaces are a character-defining feature of Hermit’s Rest; final surface should not be perfectly smooth</td>
</tr>
<tr>
<td>There is no accessible entrance into the building</td>
<td>The entry to the Secondary Room should be utilized for accessibility to the building; this will require modification of door hardware, including threshold; facility management may consider controlling access at this location and limiting entrance only to those requiring an accessible route</td>
<td>Access into and out of the Secondary Room may pose a security problem for facility management</td>
</tr>
</tbody>
</table>

Figure 1: First step down into Front Patio
Figure 2: Exterior door into Secondary Room
The wood threshold between the Great Room and the Secondary Room is greater than ½” tall and 1:2 slope. The threshold should be replaced or removed to reduce the height and angle to meet code requirements.

Retail displays reduce accessible width to less than 36” between shelving in 2 locations near northwest column in Great Room. Modify existing store fixture layout to obtain 36” min. path of travel in all locations; future fixture arrangements should maintain 36” width.

Main entry door hardware does not meet accessibility requirements. Knob handle should be replaced with hardware that meets accessibility code. Change of hardware is not necessary if exterior door into Secondary Room is utilized to provide accessible entrance; appropriate hardware selection is crucial to retain historic character.

Office door wood handle does not meet accessibility requirements. None. Wood handle is a character-defining feature; Office is not a public space and not fully accessible otherwise.

Double doors between Great Room and Kitchen are only 27” wide and do not meet accessibility requirement of 32” clear width; Kitchen layout is not accessible. None. Modification to the Kitchen to meet accessibility requirements would impose significant limits on services that could be provided from the existing space.

Door into Office is not fully accessible from Hallway side; clear space on hardware side of door is not provided. None. Modification of hallway or door to meet requirements would significantly impact character-defining features of the building.

### Egress

The building can be exited at three locations: the main entry in the Great Room, the Kitchen door and the Secondary Room door. Only two of these—the main entry and Kitchen door—are in use currently, and only the main entry can be accessed by the public. Primary issues of egress include door sizes and the irregular stone walking surfaces that pose potential trip hazards. Another issue is the hardware configuration that requires two separate actions to unlock and then open the doors.

The exterior door into the Secondary Room is currently blocked by store fixtures and not used as part of the egress system. As noted previously, use of this door would provide an accessible entrance; but it would also increase the safety of the building’s egress system by providing a second method of egress for the public. It should be noted, however, that the current configuration of a single exit for the public does meet code.

A fire protection assessment by a contractor for the Regional Structural Fire Management Office identified the following deficiency:

“Main entrance has double doors that swing inward; but doors are propped open during business hours. If doors are closed during colder months, existing doors would be required to swing out.”

However, IBC section 1003.1.2 (and NFPA 101, section 7.2.1.4.2) requires doors to swing in the direction of travel (outward) only if the occupant load is greater than 50. As currently utilized, the building occupant load is less than 50 (44) and would therefore not require modification to the doors.
Deficiency | Recommended Treatment | Impact
--- | --- | ---
Main Entry and Kitchen door hardware do not meet egress code requirements; knob and deadbolt require 2 separate actions to open door | Install sign that says “Door to remain unlocked while building is occupied” on or adjacent to door | Sign should be removable, and installation should not adversely affect substrate materials

Erosion of concrete and 10” width of step outside main entry doors poses a trip hazard and does not meet code requirement for landing width | Repair erosion on existing concrete step | This does not meet code; the modifications necessary to meet the code requirement would have a significant adverse impact on the character of the exterior patio; an alternative solution (that would also not meet code) would be to repair and expand the step to 12” wide

Stair between Great Room and fireplace area: irregular surface poses a trip hazard in one location (see figure 5) | Replace stone and regroute to provide smoother walking surface | Irregular surfaces are a character-defining feature of Hermit’s Rest; final surface should not be perfectly smooth

Office door is 6’-6” tall and does not meet the minimum code requirement of 6’-8” | None | Modification to the existing doors would have adverse impact on the door frame and surrounding trim; 6’-6” height provides adequate headroom for safety
Main entry doors are 6'-7" tall and do not meet the minimum requirement for egress doors  
None  
Modification to the existing doors would have adverse impact on the door frame and surrounding trim; 6'-7" height provides adequate headroom for safety

Door between Kitchen and Great Room is 6'-5" tall and does not meet the minimum code requirement of 6'-8"  
None  
Modification to the existing doors would have adverse impact on the door frame and surrounding trim; door is not a primary egress door

Kitchen door width of 30" does not meet required width for egress door  
None  
Modifying door width would require extensive modification of door and adjacent window or wall

Stone wall along canyon edge of exterior patio is 12-28" tall and does not provide adequate height as a safety guard  
None  
NPS waiver in place for alternate methods of protection of open walking surfaces; 18-24" width of wall provides additional protection

Figure 5: Stair into fireplace area

Figure 6 and Figure 7: Stone wall along canyon edge of Front Patio
Building Systems
Electrical, mechanical and plumbing systems generally appear to be in good working order and code compliant. This review was a visual inspection only and did not include an exhaustive investigation into the current condition of existing equipment, wiring or pipes. Chuck Easton from Xanterra Facilities Management indicated that the entire electrical system was upgraded in the late 1990’s; it appears to be in good condition, with wiring located in conduit in most locations. The holding tank and pump for the sink drains in the kitchen may or may not meet health code requirements; that is outside the scope of this investigation. A propane fueled heater is located in the Great Room; propane is piped in over the roof and through the window trim.

<table>
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<tr>
<td>Wiring inside kitchen for oven appears to have a splice connection using electrical tape; and interferes with access to fire extinguisher</td>
<td>Modify installation to provide proper, waterproof installation per code; re-route in an unobtrusive manner</td>
<td></td>
</tr>
<tr>
<td>Light above fireplace is not working</td>
<td>Check and repair as necessary</td>
<td></td>
</tr>
<tr>
<td>Exterior outlet adjacent to greywater holding tank poses fire hazard; outlet services 3 plugs that appear to serve permanent installations, and does not have adequate moisture protection</td>
<td>Hard wire systems as appropriate; provide exterior grade, waterproof outlet to meet code</td>
<td></td>
</tr>
<tr>
<td>Propane gas line on roof not properly installed</td>
<td>Provide permanent support and installation of pipe, per code; re-route in an unobtrusive manner</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8: View of Kitchen showing wiring and fire extinguisher
Figure 9: Propane gas line on roof, lower right hand corner of photo
Fire Protection

The current fire protection system consists of fire extinguishers in four locations. There are no smoke detectors, fire alarms or sprinklers.

A fire protection assessment by a contractor for the Regional Structural Fire Management Office identified the following deficiency:

"Interior walls appear to be covered with combustible surfacing which does not meet Class A, B or C interior finish requirements. Remove and/or cover with Class A, B or C rated surfacing material such as gypsum wall board or treat surface with an approved fire retardant."

It is unclear which building materials this refers to; it is likely a reference to the board and batten wall coverings in the Secondary Room, Office and Hallway. Our research indicates that most solid wood materials, at a minimum, do meet Class C requirements. However, the rough-sawn character of the surface in some locations may further reduce the flame spread rating of the wood panels to below Class C. Without actual analysis of the species, cut, density and finish of the boards, however, an actual fire spread rating can only be estimated. These wall surfaces contribute to the overall character of the building, and therefore removal or covering of these boards is not recommended. One solution would be the application of an approved fire retardant. However, care must be taken to avoid finishes that would alter the appearance of the wood surface.

<table>
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<tr>
<td>No smoke detectors present</td>
<td>Install smoke detectors; if it is determined that normal functioning of the detector will be adversely impacted by the presence of the fireplace, heat detectors should be installed</td>
<td>Install in locations to minimize visual impact; select color and finishes that closely match underlying substrate</td>
</tr>
</tbody>
</table>
Although a sprinkler system and fire alarm are not required at Hermit's Rest, Director's Order 58 includes the following policy statement regarding the protection of cultural resources:

“In the preservation of historic structures…, every attempt will be made to comply with national building and fire codes. When these cannot be met without significantly impairing a structure's integrity and character, the management and use of the structure will be modified to minimize potential hazards, rather than modifying the structure itself.

Subject to the previous paragraph, when warranted by the significance of a historic structure…, adequate fire detection, warning and suppression systems will be installed. ‘Pre-fire plans’ will be developed for historic structures…designed to identify the floor plan, utilities, hazards, and areas and objects requiring special protection. This information will be kept current and made available to local and park fire personnel.”

The remote location of Hermit's Rest, its unique character and designation as a national historic landmark may warrant the installation of additional fire protection measures beyond code requirements. However, care must be taken to minimize the impact on the existing structure.

### Miscellaneous Code Issues

<table>
<thead>
<tr>
<th>Deficiency</th>
<th>Recommended Treatment</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glazing in doors and adjacent panels at 1) Main Entry, 2) Secondary Room, and 3) Kitchen do not appear to have appropriate safety glazing installed</td>
<td>When glazing requires replacement, install approved glass to meet safety code requirements; glass should have stamp indicating that it meets safety requirements</td>
<td>Glazing should match existing in color and appearance</td>
</tr>
</tbody>
</table>

### Hazardous Materials

Painted surfaces on the interior and exterior of the building were tested for lead. Samples were tested at the following locations:

<table>
<thead>
<tr>
<th>Location</th>
<th>Result</th>
<th>Recommended Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>West-facing clerestory window frame on roof, exterior (green)</td>
<td>no lead detected</td>
<td></td>
</tr>
<tr>
<td>Secondary Room entry door jamb, exterior (green)</td>
<td>no lead detected</td>
<td></td>
</tr>
<tr>
<td>Lintel over west-facing clerestory window on roof, exterior (brown)</td>
<td>no lead detected</td>
<td></td>
</tr>
<tr>
<td>Beam near main entry, interior (brown)</td>
<td>no lead detected</td>
<td></td>
</tr>
<tr>
<td>Beam in Office closet, interior (yellow wash)</td>
<td>lead detected</td>
<td>Additional testing; abatement if necessary</td>
</tr>
</tbody>
</table>

From visual inspection, no other suspected hazardous materials were identified.