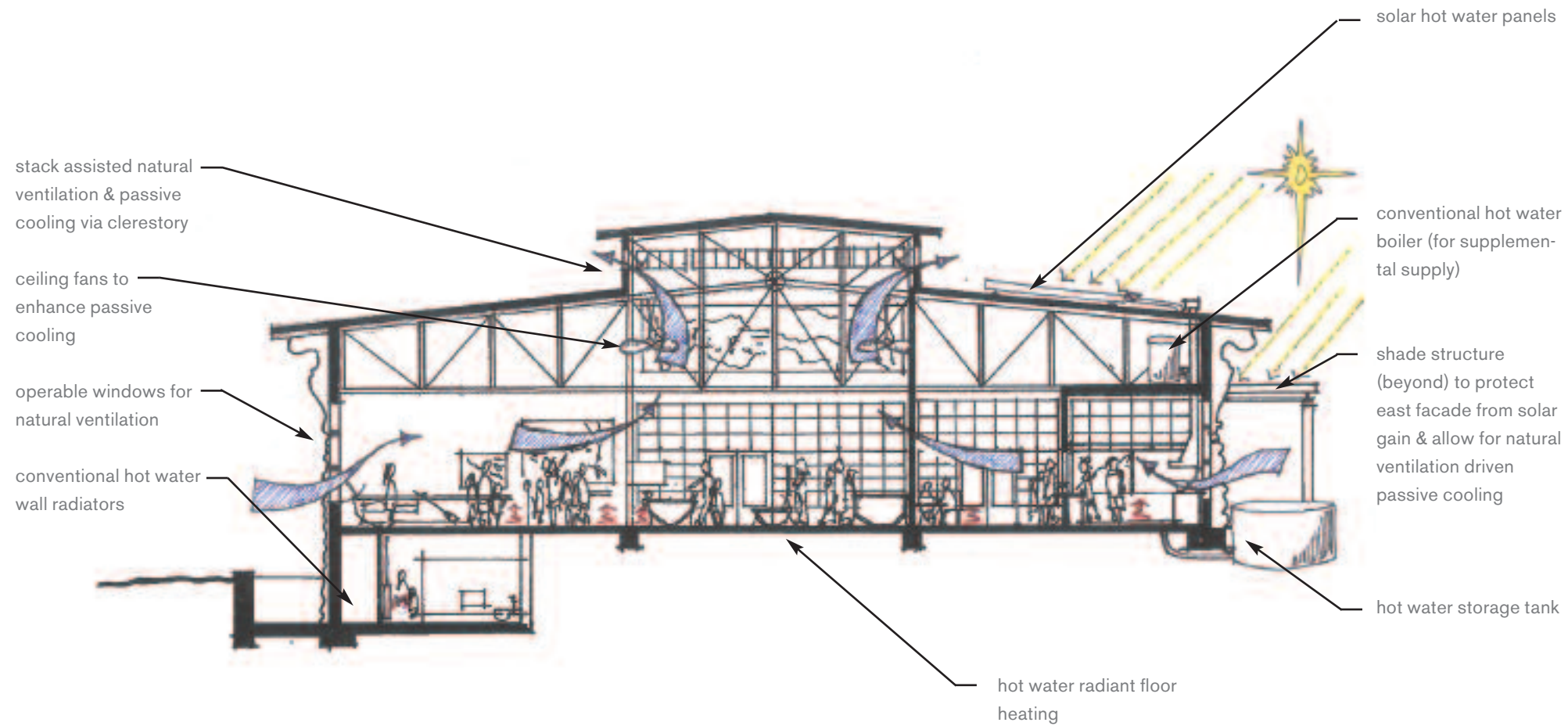


BUILDING CONCEPTS



LAUNDRY SECTION HEATING & COOLING DIAGRAM

Heating & Cooling

To preserve the historic character of the building, once the non-historic additions are removed, minimum modification of the envelope of this structure is currently proposed. (note: if a higher degree of conditioning and control is later deemed required for preservation of displays, more extensive refurbishment of the building envelope may be required.)

Passive cooling will be provided via natural ventilation through a combination of operable windows and stack effect using the existing roof clerestory. Passive heating is proposed to be provided using solar hot water heating panels located on the south facing portion of the roof coupled with a hot water storage tank and radiant floor slab distribution.

Supplemental cooling will be provided by appropriately located ceiling fans (to enhance the natural stack system). Supplemental heating will be provided by coupling a high efficiency, gas fired condensing boiler for any required 'top-up' to the solar hot water storage and distribution loop.

Note that potential provision of higher level temperature and humidity control for the historic boat display would require further investigation (with input from the Boat Preservation Consultant on required internal design conditions) and likely further intervention to resolve.

BUILDING CONCEPTS



- 1 Maintenance Building Exterior
- 2 Maintenance Building Exterior
- 3 Entrance
- 4 Ceiling Structure

CANYON ARTS & INSPIRATION (MAINTENANCE BUILDING)

History

The Paint/Maintenance Shop was constructed in 1931 by the Fred Harvey Company to provide an enclosed space to paint company vehicles and equipment. Built five years after the Power House and the Laundry, the Paint/Maintenance Shop is designed in a complimentary Rustic Swiss Chalet style. It was later converted to a maintenance shop. Presently it serves as an engineering office for Xanterra, a park concessionaire descended from the Fred Harvey Company. A non-contributing addition was built along the south façade of the Paint/Maintenance Shop at some point.

Building Concept Design

The Village Interpretive Center scheme will rehabilitate the Paint/Maintenance Shop for use as an art gallery showcasing Grand Canyon art. The building is a contributor to the World Heritage, National Register and National Historic Landmark Districts.

Exterior Modifications

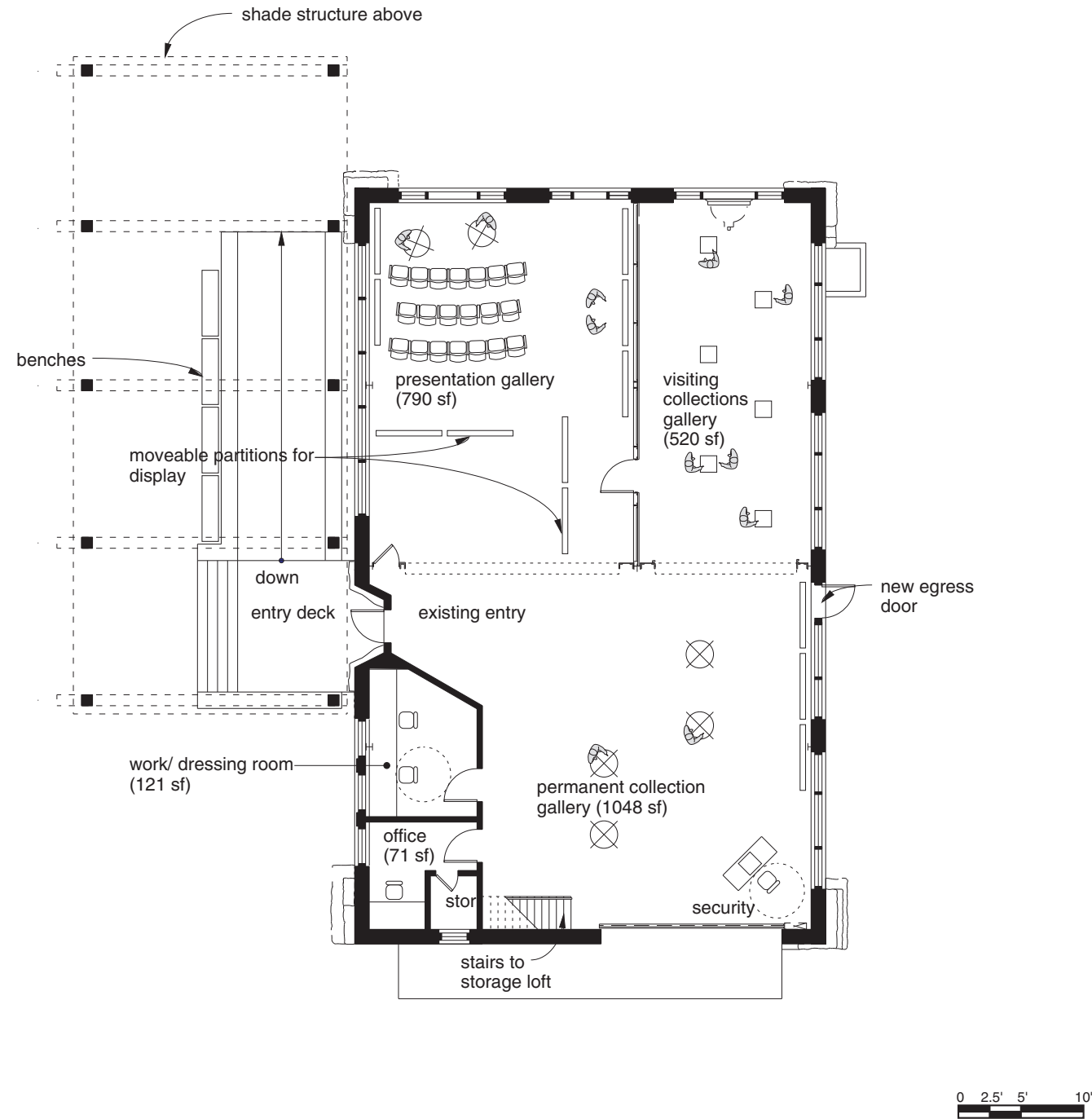
The exterior of the building will receive only minor modifications that may include re-pointing of existing stonework, repair of wood detailing, restoration of existing windows and doors, implementation of a new clerestory for ventilation at the roof, re-roofing and insulation and new egress doors as required. The west entry area will also receive a new deck and related stairs and ramps for accessibility and a new shade structure.

Interior Modifications

While the outside of the building remains almost completely unaltered the inside will be transformed into an open and light filled arts and inspiration space. The non-historic interior partitions will be removed leaving only the original office space to the right of the current entry and the glass partitions that define the old spray booth area. The paint will be removed from these partitions in order to visually connect this space with the rest of the new gallery space.

The resulting open floor plate facilitates curatorial flexibility for the Arts and Inspiration program, which will be enhanced by a system of movable parti-

BUILDING CONCEPTS



CANYON ARTS & INSPIRATION GROUND FLOOR PLAN

tions for displaying art. It is intended that gallery elements will be integrated into this building as the art produced in relationship to Grand Canyon is an important part of its history.

Entry to the primary gallery space will be through the existing entry doors. Access to these doors will be enhanced by the introduction of the new shade structure that will extend over towards the laundry building, to the North. Natural light and ventilation to the building are enhanced by the addition to the roof of a small clerestory element, similar to that which already exists on the laundry building.

Art storage will be provided on the top of the existing office with the intent of consolidating the permanent collection of Grand Canyon Art, which currently exists in numerous places around the park.

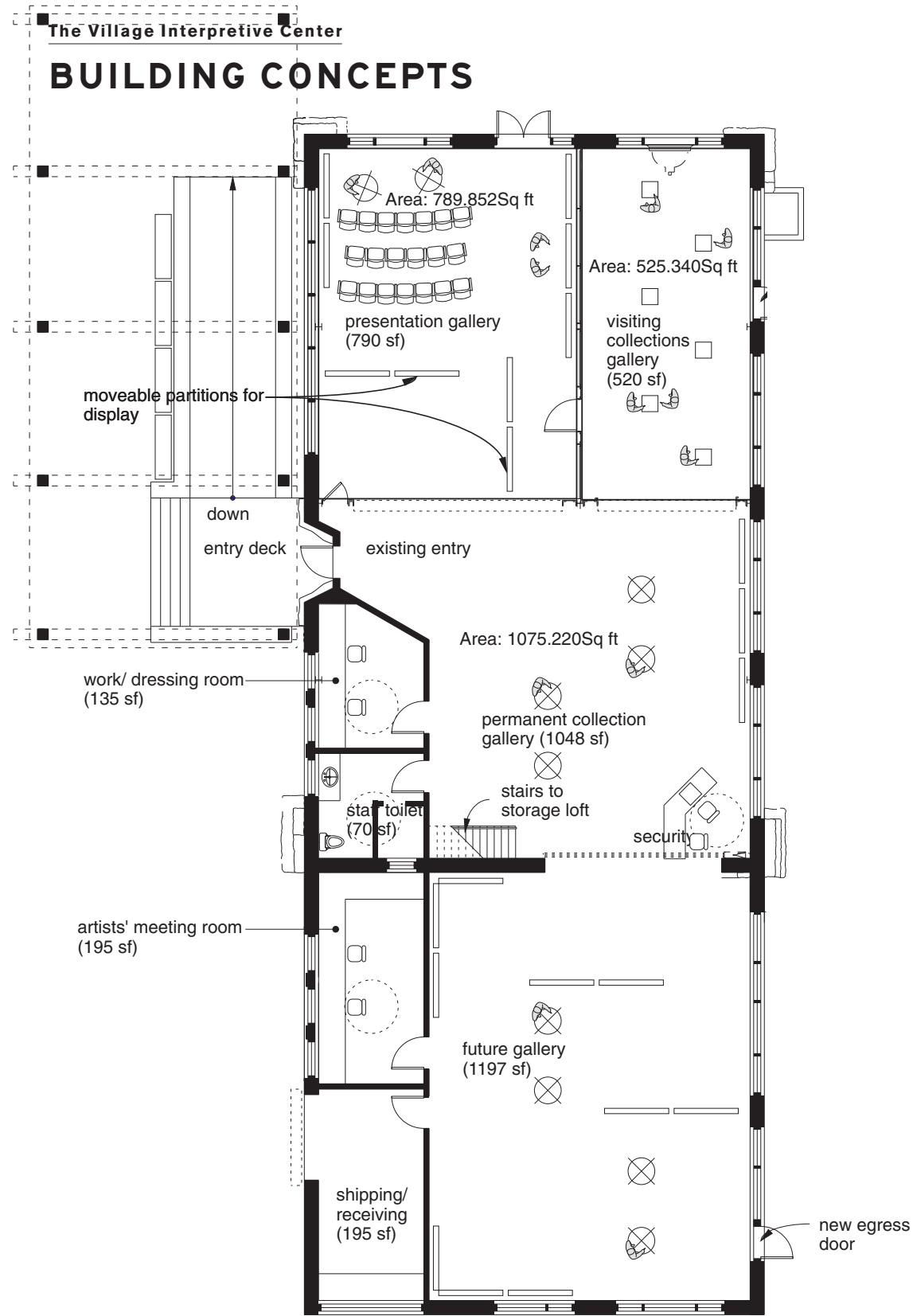
Fundraising permitting, a second phase addition is proposed to this structure that will almost double the available gallery space. Along the edge of the space a series of enclosed service spaces are created. These include a shipping/receiving area, a work room, additional art storage and a room for use by the current artist in residence. This room would allow artists in residence to meet with visitors

during arranged times. As these artists may be writers, musicians, sculptors, painters or perhaps even dancers, the layout of this room must be very flexible to accommodate needs of different disciplines.

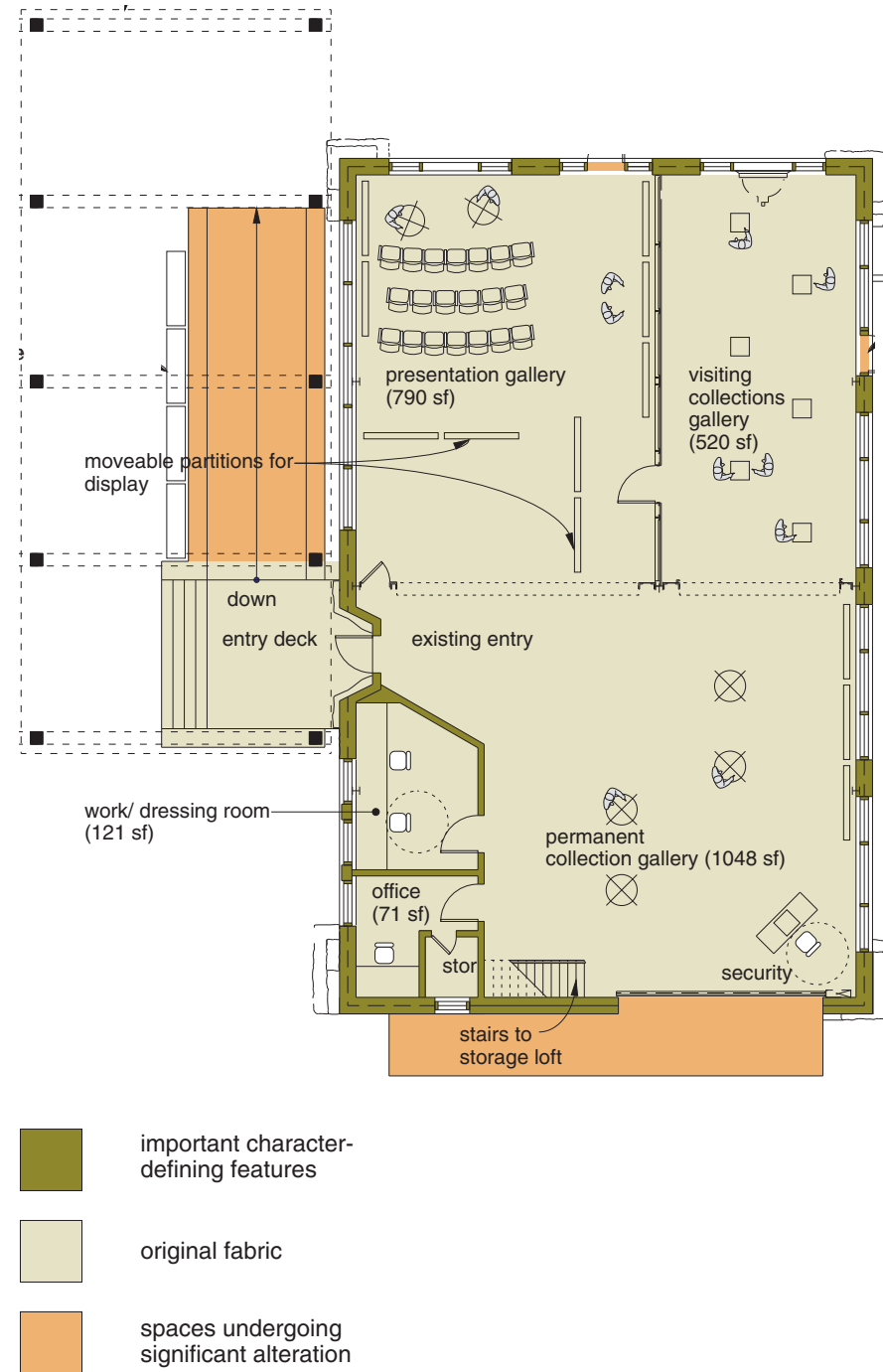
Historic Rehabilitation & Effects

Exterior

Based on the current rehabilitation scheme, exterior changes to the Paint/Maintenance Shop will be minimal. Beneficial to the reading of the historic building, the exterior rehabilitation will remove the non-contributing concrete block addition on the south facade and replace it with a new deck. A future gallery addition encompassing 1,600 square feet of exhibit space may be constructed along the south facade. An existing metal garage door on the south facade of the Paint/Maintenance Shop would serve as the linkage between both buildings if this addition is built. The only other exterior alterations will consist of a new egress door on the east facade and the construction of a new ADA compliant wheelchair ramp and a shade structure on the west facade. The placement of the ramp at the historic main entry will allow it to continue to serve as the primary



MAINTENANCE GROUND FLOOR PLAN WITH PHASE 2 ADDITION TO THE ORIGINAL STRUCTURE



MAINTENANCE GROUND FLOOR HISTORIC PRESERVATION DIAGRAM

entrance to the building. The shade structure will be freestanding so that it will not physically impact the building. In addition a monitor roof may be built on the roof to provide more natural light. If this feature is built care should be taken to make sure that it does not read as a historical feature like a similar monitor on the roof of the nearby Laundry.

Interior

The scheme for the interior of the Paint/Maintenance Shop will remove all non-contributing partition walls while retaining the original hollow clay tile interior partitions demarcating the paint store room, wash room and toilet. These three rooms are retained in the schematic design and will be converted into a work room, office and storage room, respectively. In addition, the glass and steel demising wall between the former spray room and workroom will be retained and preserved and used to demarcate galleries. Non-contributing details, such as box unit air conditioners, will be removed.

BUILDING CONCEPTS



- 1 Eave Detail
- 2 Ceiling Construction
- 3 Exterior Facade
- 4 Ceiling Structure
- 5 Existing Entry

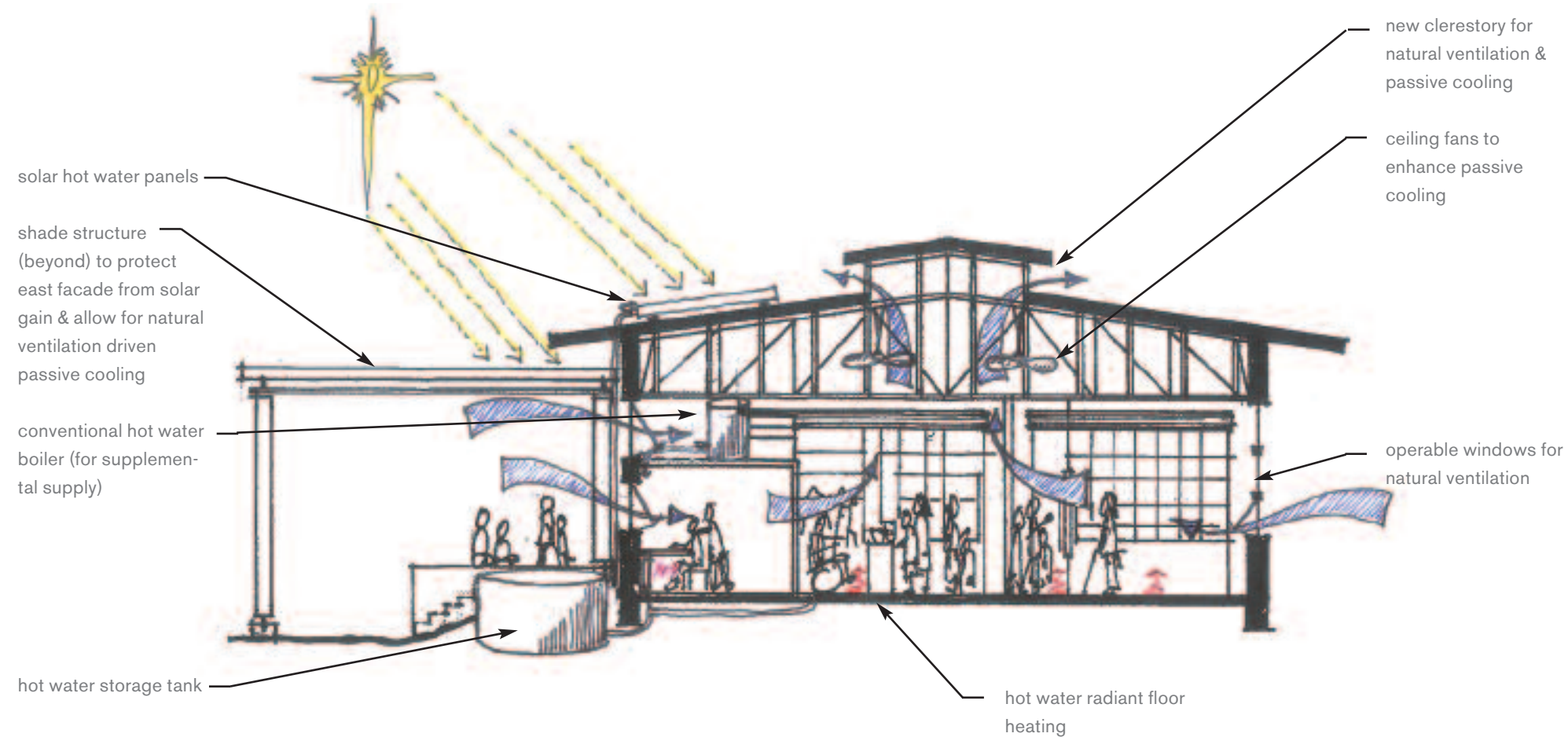
Structural Assessment

The Maintenance Building (Canyon Arts & Inspiration) is a one-story structure of mixed construction. The roof consists of steel trusses spanning to perimeter concrete bearing walls and is sheathed with metal deck. The foundation appears to be concrete spread footings around the perimeter. The lateral force resisting system is classified as concrete shear wall. A concrete block addition is located on the south side of the building.

We would expect the building to perform well in a moderate earthquake, providing a life-safety level of performance with some seismic upgrade. The roof diaphragm has an aspect ratio of about one to one and a half and there appears to be an adequate amount of shear wall in each principle direction. The existing connection between the concrete walls and the roof will likely require strengthening by the addition of new anchors. The connection between the concrete walls and the foundation should be verified, we do however expect that reinforcing dowels are present. The new use of the building includes the demolition of the building addition. If the addition remains, strengthening may be required.

The future reuse plan of the Maintenance Building includes gallery area. Other than the seismic strengthening described above, no major structural modifications are required for the intended purpose.

BUILDING CONCEPTS



MAINTENANCE BUILDING (CANYON ARTS & INSPIRATION) SECTION HEATING & COOLING DIAGRAM

Heating & Cooling

Again, to minimize the impact to the historic building character, modification to the envelope of this structure is limited to the addition of a roof ventilation clerestory. This clerestory would be similar in form to the one on the laundry building, and would be accomplished as a part of the required re-roofing of the structure. This would allow for a similar naturally ventilated cooling strategy as proposed for a number of the other buildings.

Passive cooling will be provided using natural ventilation through a combination of operable windows and stack effect using the proposed roof clerestory. Passive heating is proposed to be provided using solar hot water heating panels located on the south facing portion of the roof coupled with a hot water storage tank and radiant floor slab distribution where appropriate, and wall mounted radiator panels in areas (such as toilets) where radiant slab distribution is less appropriate or cost effective.

Supplemental cooling will be provided by appropriately located ceiling fans (to enhance the natural stack system). Supplemental heating will be provided by coupling a high efficiency, gas fired condensing boiler for any required 'top-up' to the solar hot water storage and distribution loop.

BUILDING CONCEPTS



- 1 East Entry
- 2 North Facade
- 3 View from Northwest
- 4 Structural System
- 5 Interior View
- 5 Mule Stalls

LIVERY BUILDING

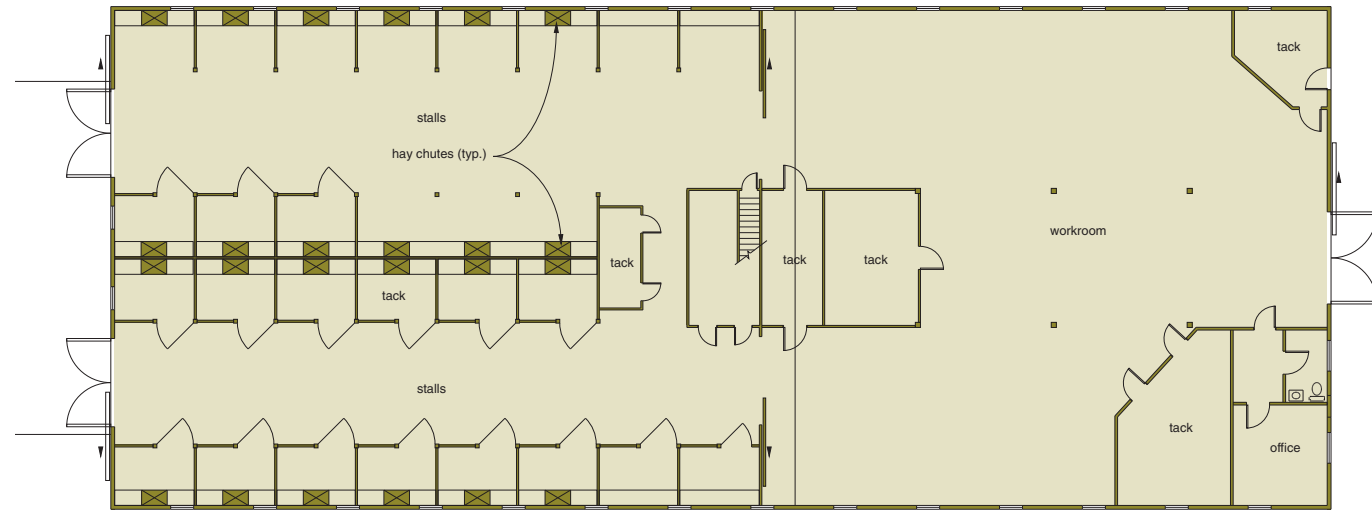
History

The Livery Stable was built in 1906 along with the Mule Barn and the Blacksmith/Saddle Shop to serve the El Tovar Hotel. Collectively known as El Tovar Stables, these three buildings were designed by staff of the Fred Harvey Company in the Craftsman style. The Livery Stable was built to house carriages and horses used to give visitors tours of the South Rim. These tours were eventually discontinued following the growing popularity of automobile tourism. In the 1940s the pack mules used to carry tourists into the Canyon were moved from the Mule Barn into the Livery Stable.

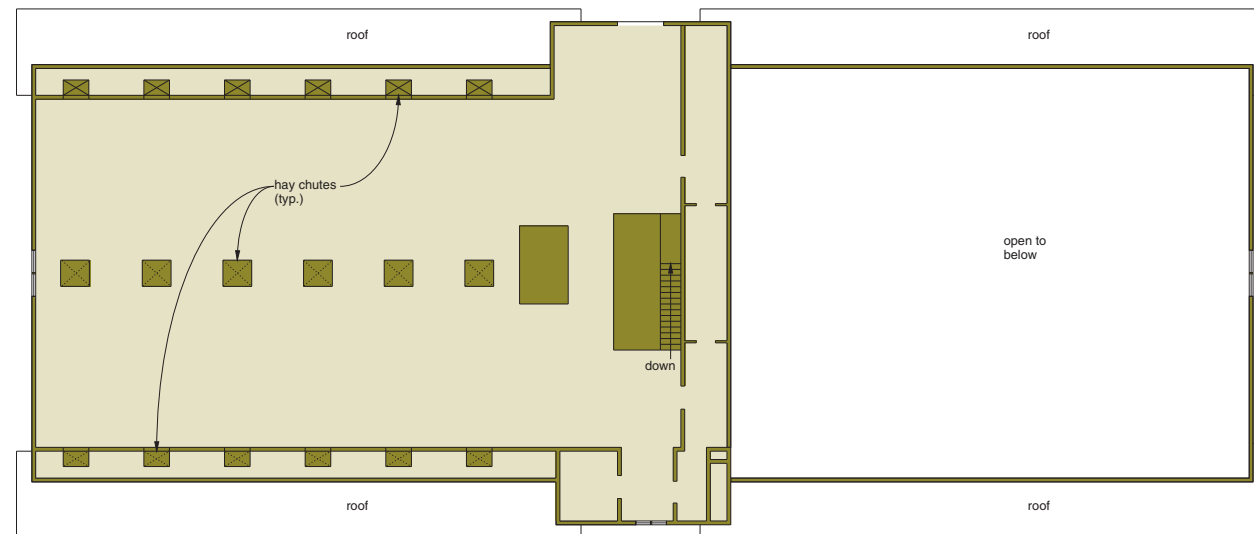
Building Design Concept

The Village Interpretive Center scheme will leave the mules in the Livery Stable, allowing this historical usage to remain visible to visitors. The Livery Stable is a contributor to the World Heritage, National Register and National Historic Landmark Districts.

BUILDING CONCEPTS



LIVERY STABLE GROUND FLOOR HISTORIC PRESERVATION DIAGRAM



LIVERY STABLE HAY LOFT HISTORIC PRESERVATION DIAGRAM

Historic Rehabilitation & Effects

As part of the “Working Zone” of the proposed Grand Canyon Village Interpretive Center, the Livery Stable will continue to fulfill its historic function. Aside from resolving structural and aesthetic issues brought on by deferred maintenance, very few changes are proposed for the building, which will continue to house the mules that take visitors into the Grand Canyon. As part of the Grand Canyon Village Interpretive Center, the Livery Stable will be given a more prominent role in the visitor experience. The outdoor corral will be reduced in size slightly and natural landscape and rock terracing placed between the visitors and the mules in order to prevent errant mule bites and inappropriate food being slipped into the corral.

Structural Assessment

The Livery Stable is a one-story structure, with attic loft, of wood frame construction. The roof consists of wood trusses spanning to perimeter wood stud bearing walls and interior post and beam frames. Both the roof and walls are sheathed with straight sheathing. The foundation appears to be concrete spread footings at the perimeter and isolated spread

footings at interior posts. The lateral force resisting system is classified as wood shear wall. In our site visit we were unable to verify the connection between the wood shear wall system and supporting spread footing foundation due to 1x straight sheathing applied to the inside face of studs.

We would expect the building to perform well in a moderate earthquake, providing a life-safety level of performance with only a minor amount of upgrade. The roof diaphragm has an aspect ratio of about two to one and there is a generous amount of shear wall in each principle direction. A connection between the roof and the walls does not appear to exist and the addition of new 2x blocking tied into the roof diaphragm and wall double top plates is recommended. In addition, the connection between the walls and foundation should be verified, however, we would expect that additional anchor bolts will be required.

- important character-defining features
- original fabric
- spaces undergoing significant alteration

BUILDING CONCEPTS



BLACKSMITH BUILDING

History

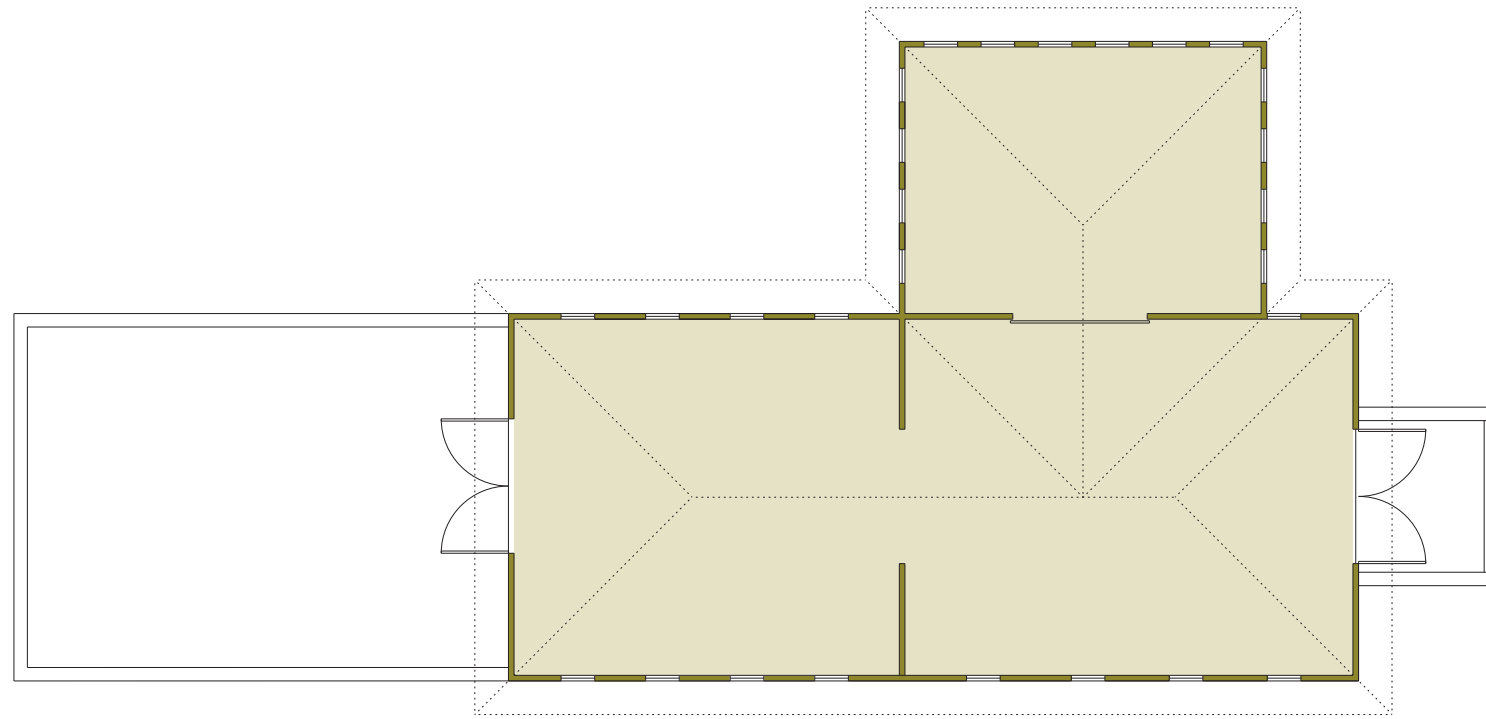
The Blacksmith/Saddle Shop was built in 1906 along with the Mule Barn and Livery Stable to serve the El Tovar Hotel. Collectively known as El Tovar Stables, these three buildings were designed by staff of the Fred Harvey Company in the Craftsman style. The Blacksmith/Saddle Shop was constructed to house farrier and saddlemaking operations for the mule operations that continue to take visitors to the Canyon floor. The Blacksmith/Saddle Shop is a contributor to the World Heritage, National Register and National Historic Landmark Districts.

Building Design Concepts

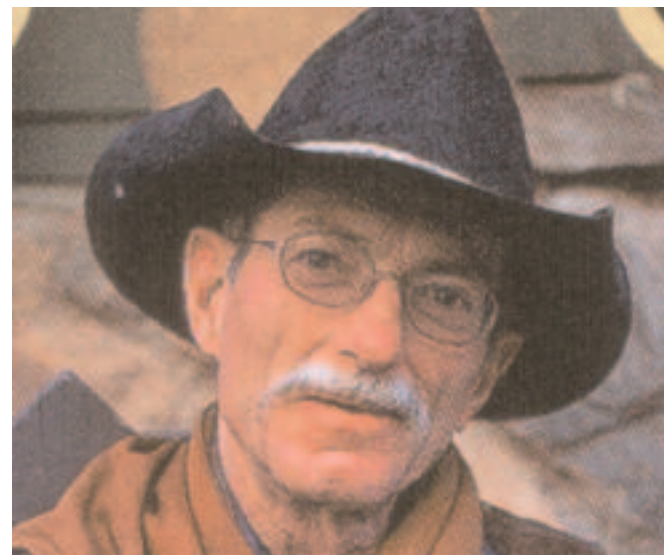
In the scheme for the Village Interpretive Center the Blacksmith/Saddle Shop will retain its historic use. Located in the Working Zone, the building will be accessible to visitors during periodic tours. The building will continue to be used as a workplace for blacksmiths to make shoes and saddlemakers to make saddles.

- 1 Exterior View of Blacksmith Shop
- 2 Rear of Building
- 3 Forge
- 4 Roof Framing
- 5 Detail

BUILDING CONCEPTS



BLACKSMITH GROUND FLOOR HISTORIC PRESERVATION DIAGRAM



Historic Rehabilitation & Effects

This use of the building will trigger ADA and life-safety code issues relating to public occupancy, necessitating the repair of all exterior doors to make them operable and the creation of an unobstructed path of travel from the parking lot into the building. In addition, any structural or material-related issues will need to be resolved.

Structural Assessment

The Blacksmith Shop is a one-story structure of wood frame construction. A portion of the building appears to be an addition. The roof consists of wood trusses spanning to perimeter wood stud bearing walls. Both the roof and walls are sheathed with straight wood sheathing. The foundation appears to be concrete spread footings at the perimeter. The lateral force resisting system is classified as wood shear wall. In our site visit we were unable to verify the connection between the wood shear wall system and supporting spread footing foundation due to the straight sheathing applied to the inside face of studs.

We would expect the building to perform well in a moderate earthquake, providing

a life-safety level of performance with only a minor amount of upgrade. The roof diaphragm segments have aspect ratios of about one to one and there is a generous amount of shear wall in each principle direction. A connection between the roof and the walls does not appear to exist and the addition of new wood blocking tied into the roof diaphragm and wall double top plates is recommended. In addition, the connection between the walls and foundation should be verified, however, we would expect that additional anchor bolts will be required. The connection between the original building will most likely require upgrade to tie the structures together.

