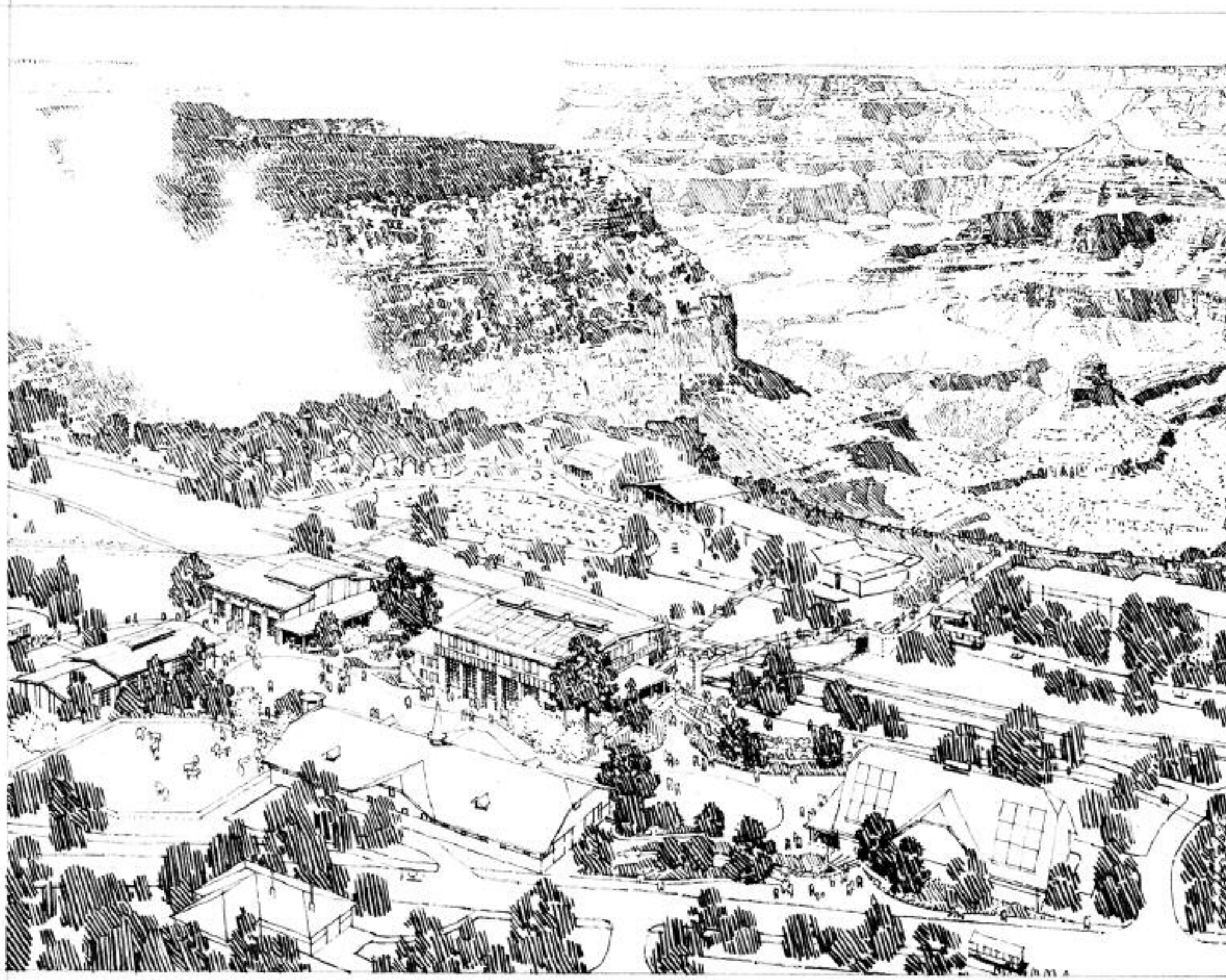


BUILDING CONCEPTS



THE VILLAGE INTERPRETIVE CENTER

HISTORY OF THE SITE

Introduction

Historically known as the Utility Zone, the site of the proposed Village Interpretive Center is comprised of utilitarian buildings including the Power House, Mule Barn, Paint/Maintenance Shop, Laundry, Livery Stable and Blacksmith/Saddle Shop. At the center of the Utility Zone is a paved area that has historically been utilized for circulation, parking and as a staging area for the utilitarian buildings that surround it. Historically this area was not paved and during the early part of the twentieth century it was partially shaded beneath juniper, piñon and ponderosa pines. Gradually over the past half-century the gravel roads were paved and most of the trees cut down. As part of Grand Canyon Village, the entire Utility Zone falls within the boundaries of World Heritage (listed 1979), National Register (listed 1975, boundaries increased 1995) and National Historic Landmark (1997) districts.

BUILDING CONCEPTS



VIEW OF THE VILLAGE INTERPRETIVE CENTER FROM THE NORTHWEST

DESIGN CONCEPTS

As part of the Grand Canyon Village Interpretive Center the paved area in the center of the Utility Zone will be restored. The proposed scheme calls for the removal of non-historic paving and restoration of landscape elements that are in keeping with natural and cultural landscape features of the South Rim. The main public space will be called the Main Plaza and it will serve as the fulcrum around which the Village Interpretive Center is organized, allowing informal connections between the public buildings and serving as the primary pedestrian circulation zone. Elsewhere paths will follow historic pedestrian circulation routes. Private automobiles and service vehicles will be removed from the Central Corridor.

The introduction of the new “Brown Bridge” from the South Rim to the Grand Canyon Village Interpretive Center will introduce a new visual feature to the historic Utility Zone. The proposed truss bridge will be made of cor-ten steel which will be allowed to weather naturally, complementing the historical industrial character of the Utility Zone. It will also be light in form to minimize its visual impact

on the Bright Angel Wash and adjacent areas. Shade structures consisting of peeled wood posts, lightweight cor-ten trusses and corrugated metal will provide much-needed shade in the Central Corridor. The shade structures have been designed to reference the existing rustic industrial structures in the vicinity and will be freestanding, minimizing physical impacts on historic buildings. At the north side of the Central Corridor, stone terraces and an amphitheater will replace parking lots and paved roadways. They will take advantage of existing contours and vegetation and are designed to reference the geologic strata of the Grand Canyon itself. Throughout the site native drought-resistant trees and shrubs will be planted in an effort to create more shade and greenery, recalling the historic appearance of the area.

BUILDING CONCEPTS



- 1 Perspective Sketch of the Powerhouse Entry Area
- 2 Powerhouse Entry (East Elevation)
- 3 East Facade of Powerhouse/Icehouse

POWERHOUSE

History

The Grand Canyon Power House was erected in 1926 by the Atchison, Topeka and Santa Fe Railroad (ATSF) to supply power and steam heat to Grand Canyon Village. The building was designed by ATSF engineers in Los Angeles in the Rustic Swiss Chalet style and constructed by James Morris of Flagstaff. Originally the Power House had a 160' high smokestack visible with the naked eye from the North Rim. In 1935 the Power House was upgraded with two new Fairbanks-Morse diesel engines, which remain within the building. In 1956 Arizona Public Service brought power lines to Grand Canyon, removing the need for an independent power generating facility at the South Rim. The stack was demolished and the boilers were removed prior to the Fred Harvey Company taking over the building for use as a warehouse.

In 1958 the Fred Harvey Company built out the interior, installing offices and refrigeration equipment. In subsequent years the loading docks were altered and additional openings punched in the walls to accommodate new entrances and ancillary functions. A large mezzanine level was

installed in the interior of the Power House to provide additional office and storage space in 1964. In 1998 an additional fire exit was constructed on the south wall of the building.

Building Design Concept

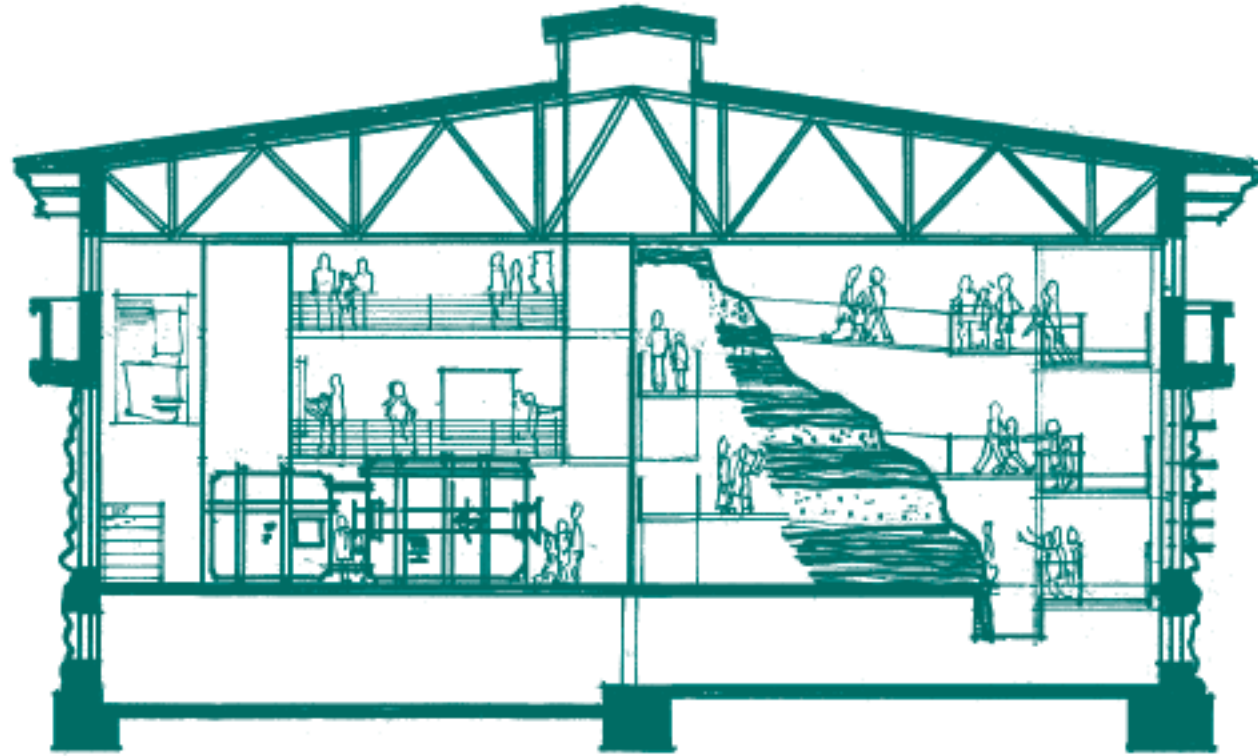
The Power House will be the centerpiece of the Grand Canyon Village Interpretive Center, housing exhibits, a bookstore and other functions. The Powerhouse is a contributor to the World Heritage, National Register and National Historic Landmark districts. The building was also individually listed as a National Historic Landmark in 1987.

Exterior Modifications

The new use of the building will require modification to the existing entry at the east facade that will include new doors, entry deck, shade structure, stairs to the Greenway to the north and connection to the pedestrian bridge.

Other exterior modifications include restoration of all existing windows and doors, re-pointing of damaged stone work, repair of wood detailing, implementation of roof ventilators, re-roofing (with insulation/structural upgrade), shading

BUILDING CONCEPTS



SECTION SKETCH LOOKING EAST

- 1 Existing Generators to be restored and displayed with Interpretive Information about Powerhouse History

devices at the south facade and re-grading where water damage has been an issue.

Interior Modifications

Within the powerhouse existing temporary wood mezzanines will be removed and new steel supported platforms will be introduced into the space describing the different levels of the new interpretive experience. Where possible the steel truss joists from the original floor plates will be reused.

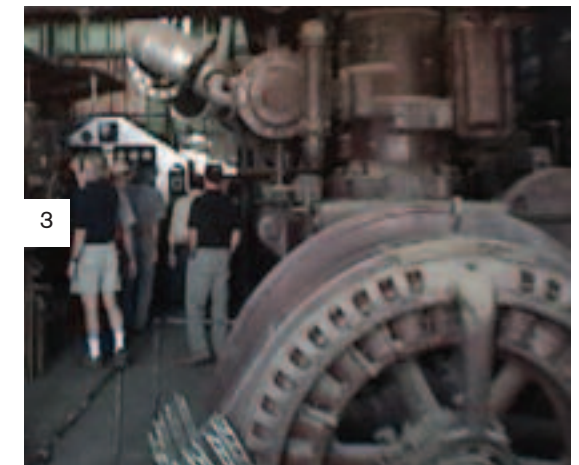
A system of steel supported ramps will be created to connect these different levels together. The overlook areas described in the Visitor Experience section of the book will be supported by steel columns that will form a brace for the south exterior wall.

A three-story atrium space will be preserved over the historic generators and at the south side of the building. The glass wall that divides the building will be retained and a new glass wall will be constructed adjacent to it to form a plenum at the center of the building. This plenum will be used for natural ventilation of the building via new clerestory roof vents that will be implemented as part of

the re-roofing strategy required for lateral stability. The primary exhibit space at the south side of the building will also remain and open three-story space.

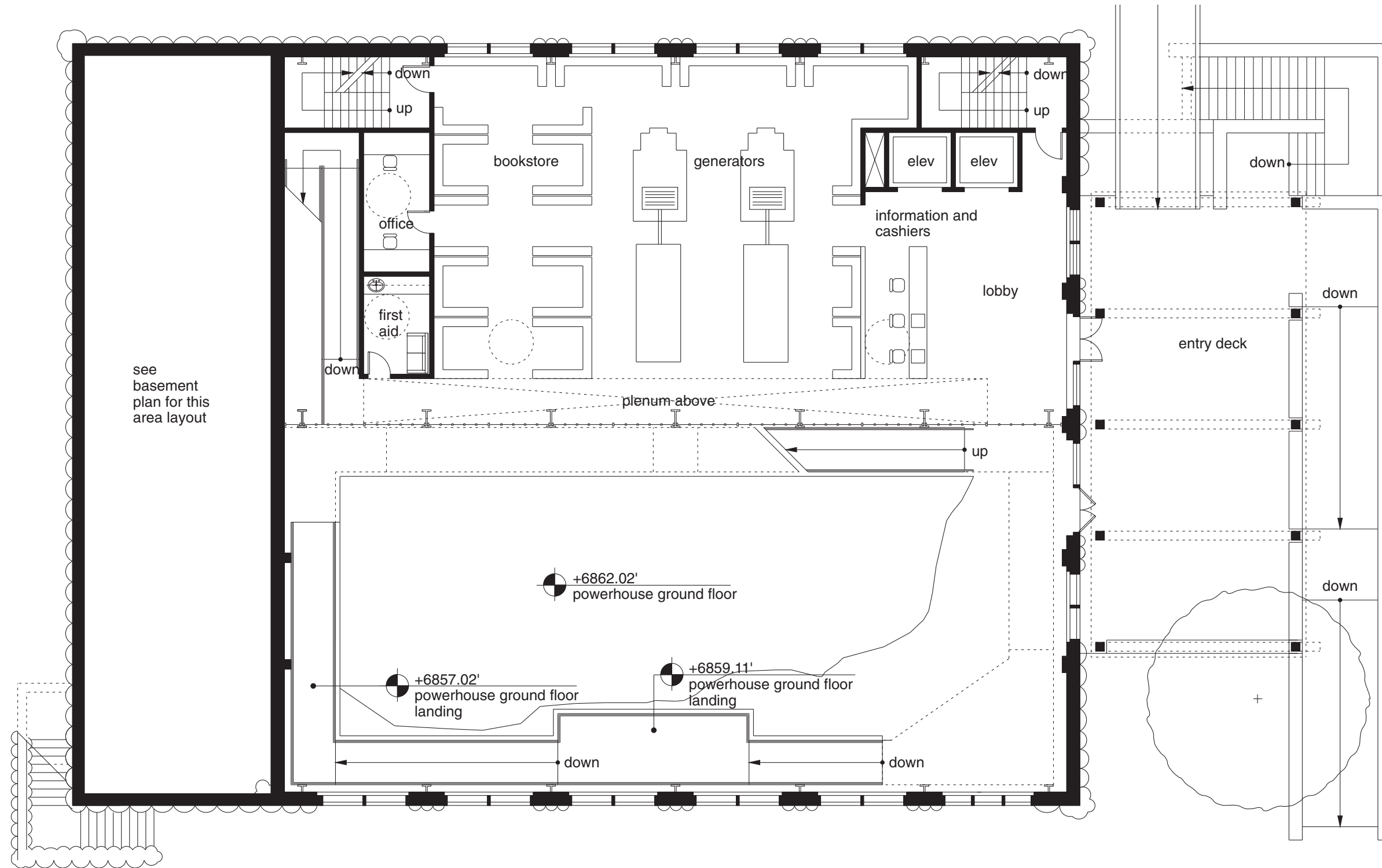
A new elevator, restroom facilities and exit stairs will be implemented along with related code requirements for the change in occupancy.

The basement of the building will receive modifications to receive mechanical/electrical rooms, a new bicycle rental facility and implementation of a rock storage system (see heating and cooling diagrams).



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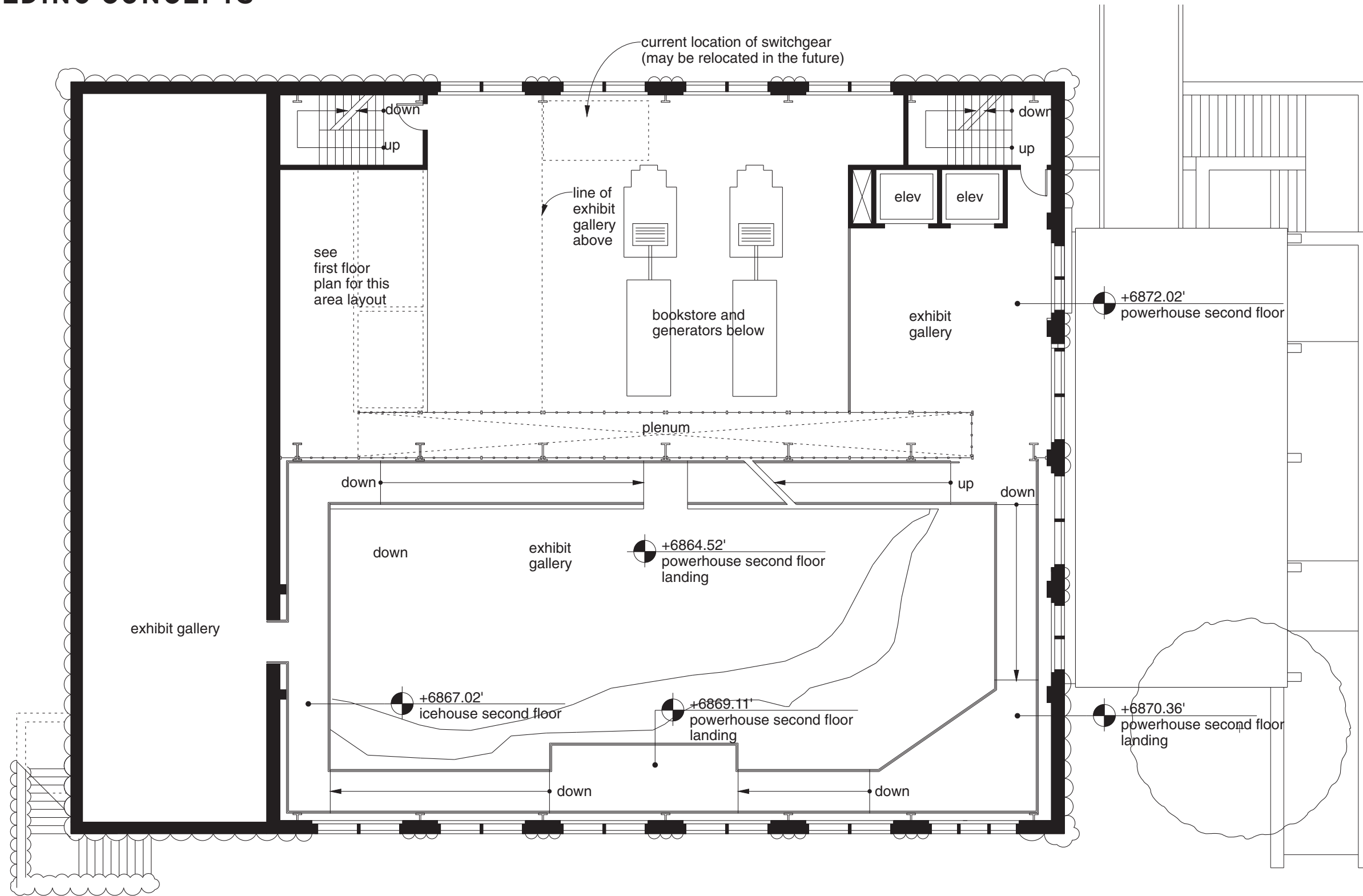
BUILDING CONCEPTS



POWERHOUSE GROUND FLOOR PLAN



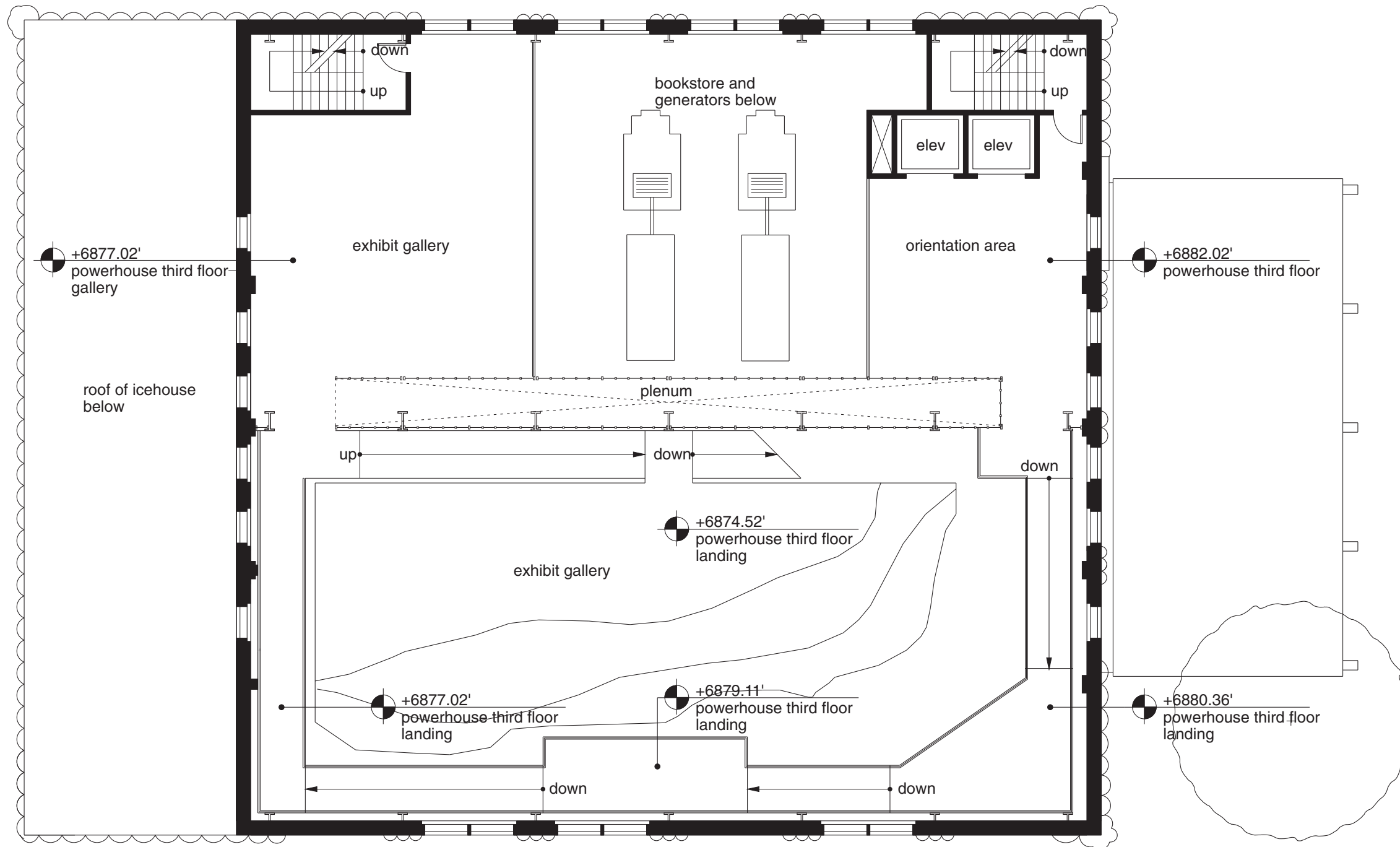
BUILDING CONCEPTS



ICEHOUSE & POWERHOUSE SECOND FLOOR PLAN



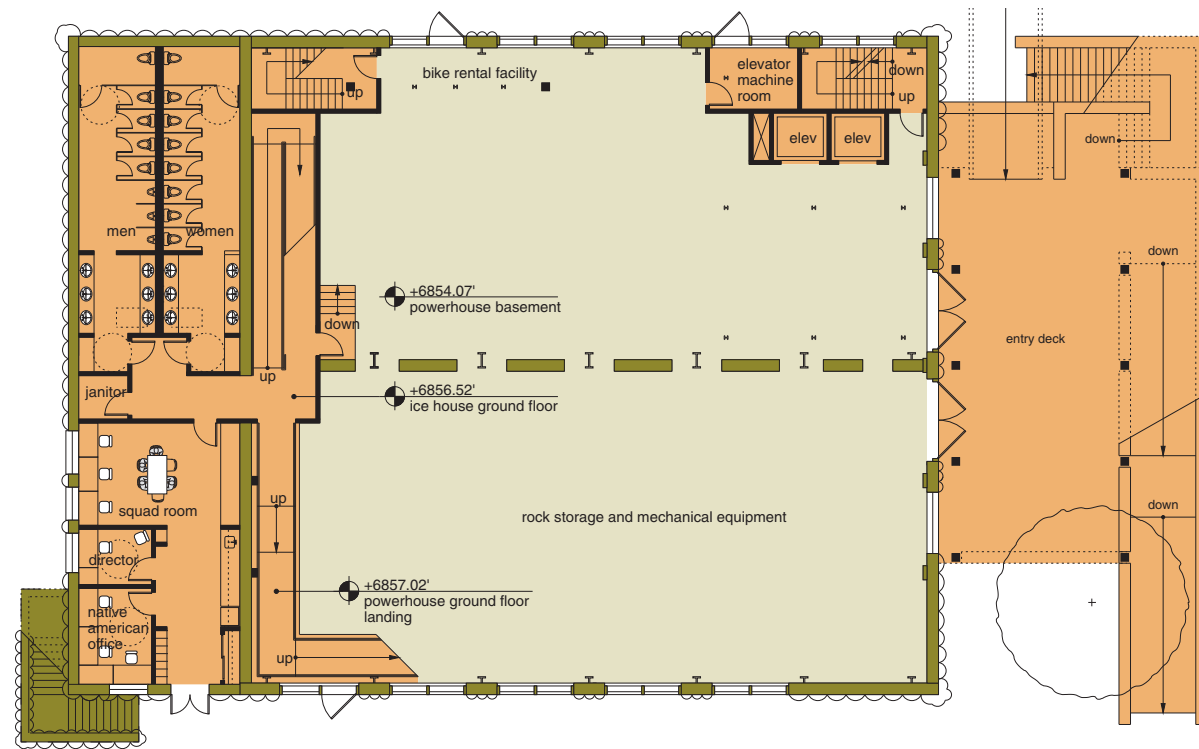
BUILDING CONCEPTS



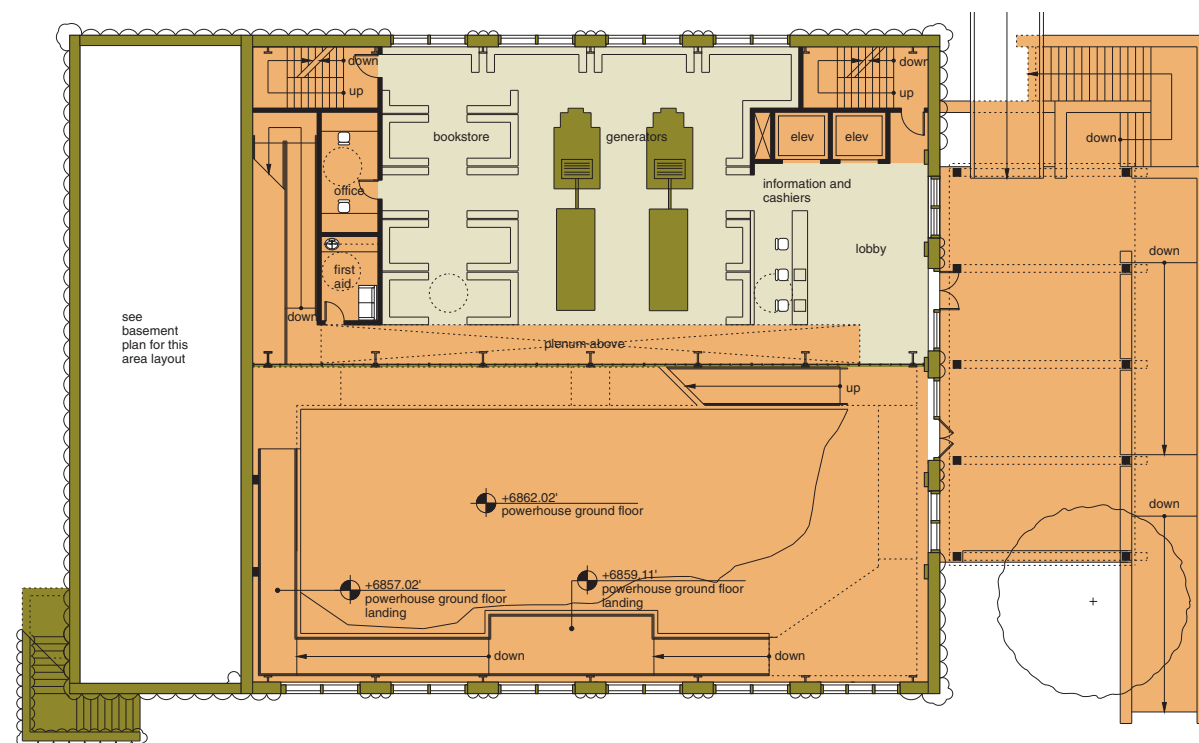
POWERHOUSE THIRD FLOOR PLAN



BUILDING CONCEPTS



POWERHOUSE BASEMENT/ICEHOUSE GROUND FLOOR HISTORIC PRESERVATION DIAGRAM



POWERHOUSE GROUND FLOOR HISTORIC PRESERVATION DIAGRAM

Historic Rehabilitation & Effects

Exterior

The proposed Grand Canyon Village Interpretive Center scheme seeks to rehabilitate the Power House for use as an exhibit and attraction space. Exterior changes will be minimal, respecting the distinctive cyclopean stone wall finishes and large vertical bands of fenestration. The most notable change to the exterior of the building occurs at the stair landing on the east facade. In the proposed scheme the heavily altered loading dock will be removed and replaced with a more substantial slab sheltered beneath a new wood post and steel truss shade structure. The shade structure will be made of peeled log columns, with cor-ten connectors and corrugated metal roof. The original concrete and stone walls and all door and window openings will be retained and/or restored. When the originals are missing or deteriorated the scheme will install compatible new windows and doors that employ similar materials and fenestration patterns. Some windows on the south wall will have their

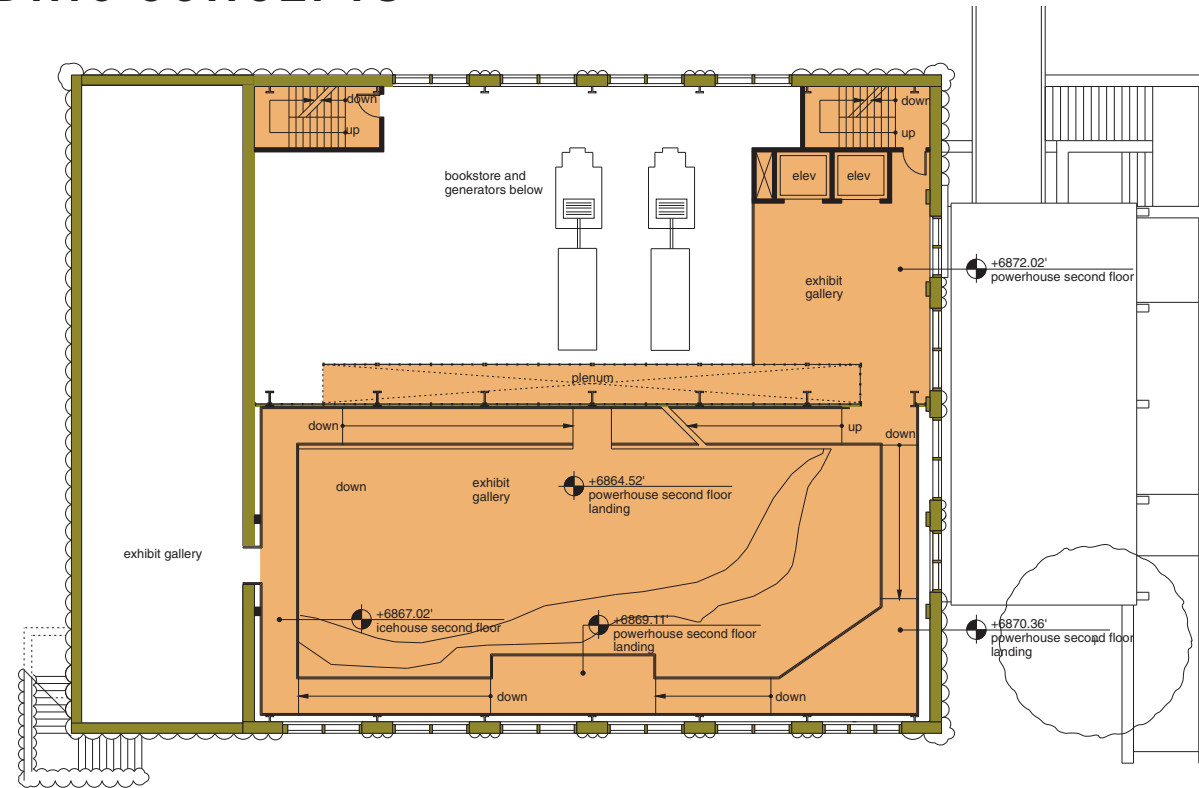
sashes replaced with louvers in order to proposed passive heating and cooling system work. The most significant proposed change to the exterior involves the construction of a plenum cap above the roofline. The plenum is part of a proposed passive heating and cooling system that will bring cool or warm air, depending on the season, from the basement through the upper floors, venting through the roof. The construction of this element above the roofline will require care as it will introduce a new element that will be visible from surrounding areas, particularly the Bright Angel Wash and South Rim areas.

Interior

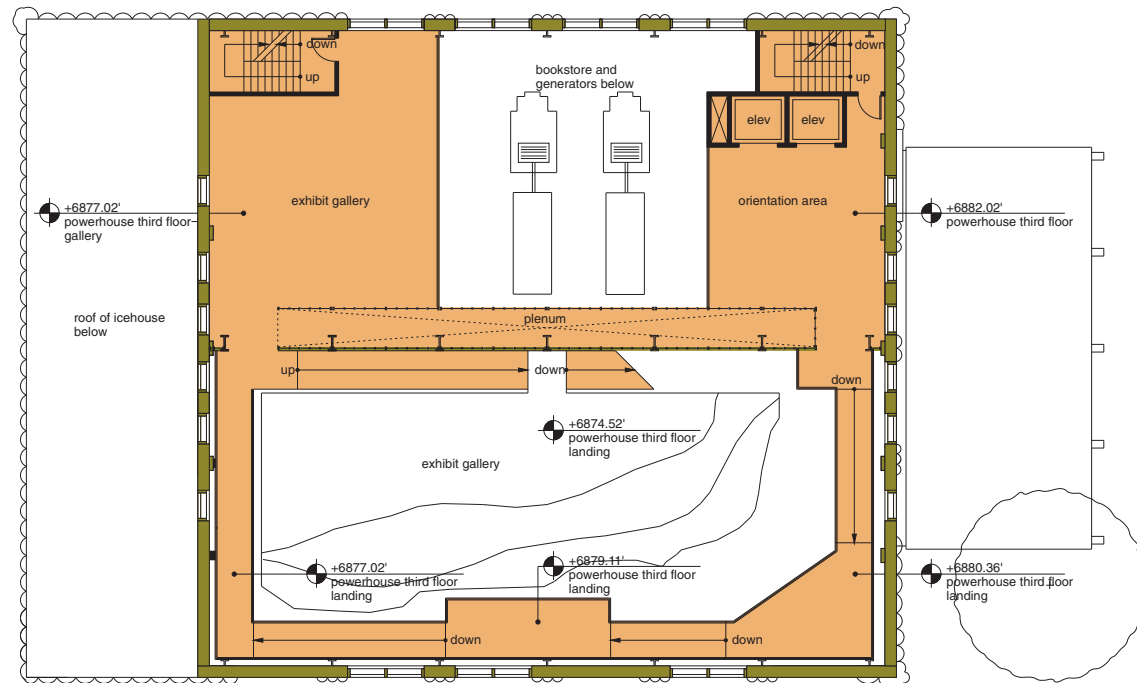
The interior of the Power House retains much historic machinery and switchgear, particularly in the engine room. Most of the rest of the interior has been compromised through the addition of non-contributing partitions, mezzanines, coolers and shelving installed after 1958. The steel and glass demising wall that separates the engine and boiler rooms is original and the most important character-defining feature inside the building. Also important are the two Fairbanks-Morse diesel engines, electrical panels, gantry crane and switchgear in the engine room.

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

BUILDING CONCEPTS



POWERHOUSE SECOND FLOOR HISTORIC PRESERVATION DIAGRAM



POWERHOUSE THIRD FLOOR HISTORIC PRESERVATION DIAGRAM

This machinery dates to circa 1935 and iconographically conveys the original use of the building. The current scheme has no provision for retaining the electrical switchgear at its current location although the engines are to be retained in situ for an interpretive exhibit within the bookstore. The switchgear may be relocated and displayed at a more suitable area.

The proposed scheme punches several new openings and infills several others in the steel and glass demising wall between the engine and boiler rooms. It will be critical to the character of both spaces that the new openings be detailed using compatible materials and proportions. Historic openings should be used as much as possible and if doors are removed in one area they should be reused in new openings. Another issue affecting the central wall is the construction of the plenum as part of the passive heating and cooling system. Constructed of glass and steel, the plenum could be confused with the demising wall and mistaken for a historical feature if not

designed appropriately. It is crucial that the plenum be distinguished from the historic demising wall to avoid the perception that the plenum is an original construction. Furthermore the plenum should be as transparent as possible in order to allow the demising wall to read as an independent feature.

Other major interior changes include the demolition of non-contributing mezzanines, coolers, storage areas and enclosures in the engine and boiler rooms. In addition, several new openings will be punched through the concrete slab on the first floor level in order to install a ramp, an elevator and two fire stairs. While these changes will entail the removal of historic fabric, the materials being removed are not highly significant and the end result will not impair the integrity of the building, especially considering that the project will remove floors and enclosures that currently detract from the historic character of the space. While the proposed scheme will construct new partial floors at the second and third floor levels, they will be constructed of light steel framing in keeping with the existing structural system and major sections of the floor plate will be left open to the ceiling.

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

BUILDING CONCEPTS



- 1 Ceiling Structure
- 2 Exterior Detail
- 3 Glass Wall
- 4 Existing Trusses

Structural Assessment

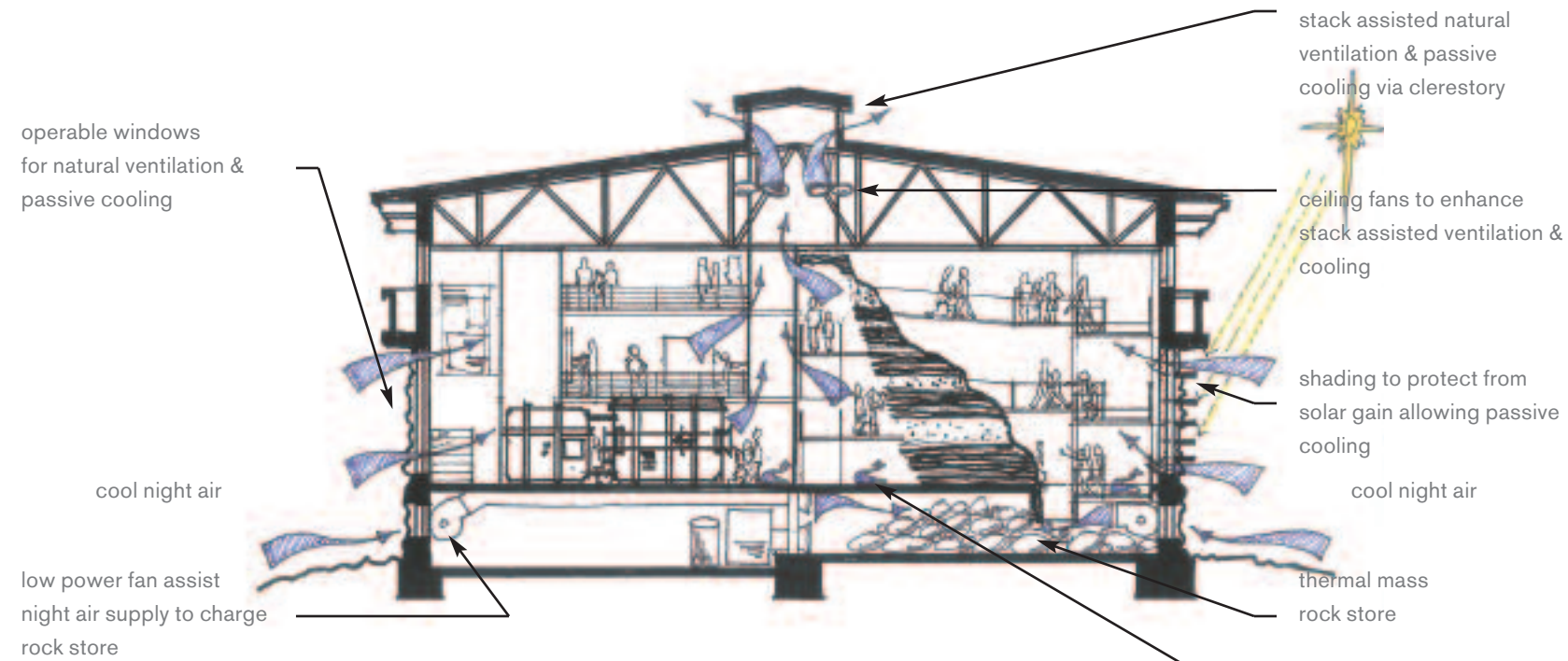
The following assessment is based on review of an existing seismic/structural report prepared by LZA Technology and observations from visiting the site.

The Powerhouse is a two-story structure of mixed construction with an addition (Icehouse) located on the west side of the building. The building and the addition contain mezzanines that are not tied to the building's structural system. The roof of the main building consists of steel trusses spanning to perimeter concrete bearing walls and interior steel columns. The roof of the addition consists of steel beams spanning to concrete bearing walls. In both sections of the building, the roof is sheathed with wood members that are laid on edge. The upper floor construction of the main building is a mixture of concrete and steel framing and in the addition it is a mixture of wood and steel framing. The foundation consists of concrete spread footings below the walls and columns. The lateral force resisting system is classified as concrete shear wall.

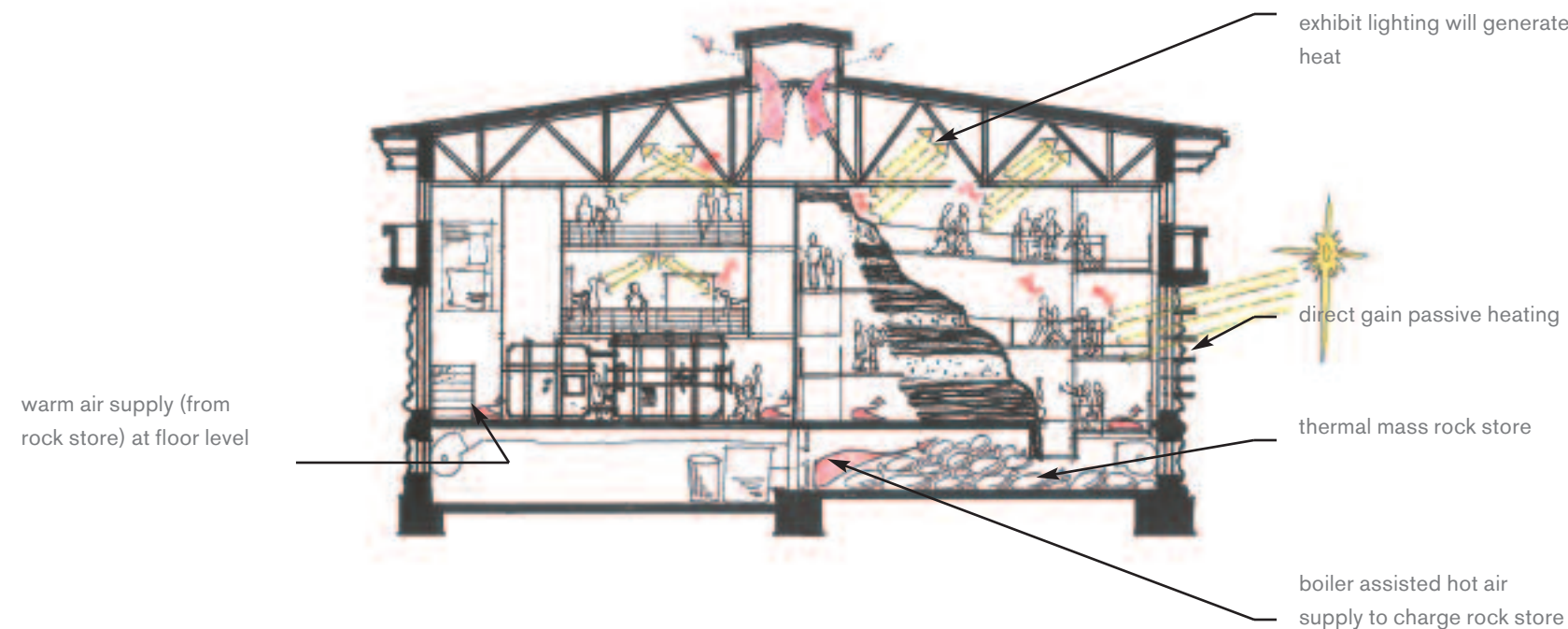
A certain amount of seismic upgrade will be required to provide a life-safety level of performance in a moderate earthquake. It would be expected that the following items would need to be completed in order for the building to be adapted for its new use:

- addition of new plywood sheathing on the roof
- addition of new roof clerestories for natural ventilation
- roof to wall anchors
- wall to foundation anchors
- concrete wall strengthening for out-of-plane loads

BUILDING CONCEPTS



POWERHOUSE SECTION SUMMER DIAGRAM



POWERHOUSE SECTION WINTER DIAGRAM

Heating & Cooling

In order to respect the historic character of the building minimum modification of the envelope of this structure is proposed. Some louvered shading devices (within existing window frames and in alignment with existing window lite divisions) may be required for solar control on the south facing windows.

Passive heating will be provided through direct heat gains to the space via the large areas of south facing, clear glazing and internal gains primarily from exhibit lighting. Passive cooling will be provided using natural ventilation through a combination of operable windows and stack effect through the new internal double glass wall 'shaft' and roof clerestory.

Supplemental heating will be provided through the use of a fan-assisted supply from a basement rock store system charged by a high efficiency, gas fired condensing boiler. Supplemental cooling/ventilation will be provided through cool night flushing of the basement rock store system. Daytime cooling/ventilation distribution may be supplemented using the required smoke evacuation fans as appropriate.