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STATE OF NEVADA



RONALD M. JAMES
State Historic Preservation Officer

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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE
June 13, 2012

Leon Thomas
Field Manager
Sierra Front Field Office
Bureau of Land Management
5665 Morgan Mill Road
Carson City NV 89701-1448

RE: Review of the Proposed Treatment of the Remains of the American Flat Mill
(United Comstock Merger Mill) by Frederick L. Walters and Melvyn Green,
Storey County (Undertaking #2010-0290).

Dear Mr. Thomas:

With this letter, the SHPO submits the promised peer review provided by Fred Walters and Mel Green, nationally recognized experts in concrete and historic structure preservation and rehabilitation.

The SHPO believes the suggested fifth alternative described in this summary document provides the greatest preservation of this valuable and appreciated resource while also ensuring the abatement of the public health and safety hazard present and providing a cost-effective use of scarce public taxpayer dollars.

In accord with the executed Programmatic Agreement between the Bureau of Land Management, SHPO, and the ACHP, the SHPO is providing this document with the understanding that the Bureau of Land Management will incorporate it into the information the Bureau of Land Management will use to select an alternative.

If you have any questions concerning this correspondence, please feel free to contact me at (775) 684-3443 or by e-mail at rlpalmer@shpo.nv.gov.

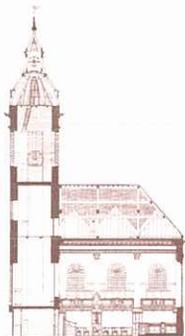
Sincerely,

A handwritten signature in blue ink that reads "Rebecca Lynn Palmer".

Rebecca Lynn Palmer, Deputy
State Historic Preservation Officer

7/11

2010-0209



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STATE HISTORIC
PRESERVATION OFFICE

Friday, June 8, 2012

Ron James
State Historic Preservation Officer
901 South Stewart Street, Suite 5004
Carson City, Nevada 89701

Dear Mr. James:

This report was initiated by the Nevada State Historic Preservation Office to review the proposed treatment of the remains of the American Flat Mill (United Comstock Merger Mill) in Storey County, Nevada, as outlined in the March 2012 Programmatic Agreement between the Bureau of Land Management, the Advisory Council on Historic Preservation, and the Nevada State Historic Preservation Officer. The Mill is located on public lands within the boundaries of the Virginia City National Historic Landmark District. This report is a collaborative assessment by Mr. Melvyn Green, Structural Engineer and myself.

Of the four treatment options proposed in the above referenced agreement, i.e.

1. No action
2. Demolition
3. Institutional Controls
4. Selected Building Controls

it is believed that a more comprehensive and integrated treatment option could be developed to conserve the cultural and historic values of the site and reduce safety risks through a broader program of ruins stabilization and visitor management.

The recommendations presented herein are general in nature. Planning and implementing a ruins conservation program will require additional study and refinement. The purpose of the report is to present another viewpoint for discussion and consideration.

Building Construction

Overview

The buildings are all of reinforced concrete frame or bearing wall construction.

In the era of construction of these buildings, reinforced concrete design and construction were standardized relative to design methods, reinforcement layout and placement, as well as concrete placement, rodding and/or vibration.

Limits of Observations

Structural observation was limited to a visual observation. Neither physical tests nor removal of materials for future testing was done. Typically access was limited to the lower levels of the tall buildings

General Construction Notes

Foundation construction is reinforced concrete. Foundations varied in size for columns based on their specific loads. Wall foundations were observed to be wider than the wall thickness.

Wall construction is all reinforced concrete. Wall thickness varied by the wall height. The minimum wall thickness observed was 6 inches. In the multi-story structures the walls usually had a 2 inch or more lip to support the structural floor or roof slab. Wall reinforcing was typically a pattern of bars spaced about 12 inches on center. Reinforcing, when exceeding 3/8 inch diameter, was slightly deformed bars. Smaller bars were generally smooth.

Column size varied depending on the load and height. Often columns were 12 inch minimum and are some cases greater than 24 inches in one or the other direction. Typically the designers tried for approximately square columns in working and mill areas. Reinforcing steel in the columns were square bars lightly deformed. Bar size varied with the maximum size bare being 1 inch square. Column ties were 3/8 inch diameter smooth bars. Ties typically had a 90 degree bend to close the loop.

Second floors are reinforced concrete. Reinforcing varied but was usually small diameter bars, 1/4 inch diameter maximum, smooth bars.

Roof construction varied by building function. Most of the steel roof trusses and framing were removed for the war effort in WW II. Only small amounts of roof structural material were found on the site.

Many roofs, both long and short span, consisted of steel trusses spaced at varying distance. Where observable or remaining, metal purlins spanned between the trusses.

A number of structures had concrete roofs. These roofs spanned between concrete beams. Typically the slabs were less than 4 inches thick and use ¼ to 3/8 smooth reinforcing steel bars.

Why did these structures deteriorate?

The deterioration of these structures occurred for two principal reasons.

The first is the loss of structural integrity when the bracing provided by the roof system was removed. This loss of support and bracing resulting in columns being permitted to move slightly in winds and even small earthquakes as well as self-weight. Because the structures no longer had the supports, columns and walls acted as cantilevers rather than simply supported elements. Continued, unanticipated, movements resulted in overstress of the steel and degradation of the concrete by the constant rocking.

The second reason for the structural problems with these buildings was the field construction. The concrete cover from the bottom of the slab to the reinforcing steel was typically about ¼ to ½ inch. This is less than standard and does not provide sufficient cover of the steel to control rusting and loss of material. In observing the construction the material under the reinforcing appears to be a cement paste possibly indicating inadequate vibration of the concrete.

Conservation of a Ruin

The American Flat Mill is a created ruin. Unlike some abandoned mining operations that lingered with periodic salvage or reuse of materials and equipment, the owners of the Mill, following suspension of operations in December 1926 and the unsuccessful search for a buyer, sold the salvageable machinery and building elements to the Morse Brothers of Denver. Founded in 1898, the Morse Brothers were a major supplier of scrap metal and reconditioned mining machinery for western mining operations up until the 1980s.

The nature of salvage is to take what is of market value and leave the remains. In the case of the American Flat Mill, this was the damaged concrete skeletons of the mill buildings. As of 1927, these were considered of no value monetarily.

Conservation of cultural heritage is increasingly being seen as complimentary to economic growth as part of the emerging values embodied in the concept of human sustainable development. . From an economic viewpoint, the concrete building frames are still of no market value. What has changed in regards to the mill ruins are the development of cultural values associated with the site. The ruins over time have come to be viewed by local residents and outside visitors as reminders of the last major period of mining revival prior to the transition to a tourist economy. Since the demise of the American Flat Mill short term periodic mining revivals have occurred, but the tourist-based economy has come to instill value on the past. People visit Virginia City to understand its history, not the present. It is the rise in the cultural appreciation for the history of Western mining development that has given value to the ruins of the American

Flat Mill. For the past 23 years, since the Hardesty report of 1989 through the Zeier & Associates Report of 2010, the ruins have been recognized as having the qualities of meeting both the significance and integrity standards associated with eligibility for listing in the National Register for Historic Places.

These cultural values manifest themselves in the visitor's experience of the mass and scale of extant concrete frames of this immense mill complex. While understanding the rationale to reduce all the building walls down to a ten (10) foot height for safety concerns, the appeals of the structures is what is above the 10-foot height. If the historic significance of the site is to be retained, then at least a major portion of the concrete frames need to be preserved.

The main issue that arises with a conservation program for the buildings and site is visitor management and safety. The 2010 Findings Report for American Flat Mill acknowledges that the buildings have unsafe conditions and are undergoing material deterioration. But the report also recognizes that even at the current rate of deterioration, the buildings will "...probably stand for many more years, ." The deterioration of the concrete frames occurs from the loss of the bracing, not necessarily the quality of the concrete, as in the horizontal slabs. The challenge therefore lies in devising ways of overcoming risks and reducing the rate of material deterioration that do not erode the understanding and enjoyment of the site that visitors have come to experience.

For visitor management, the issue is determining where visitors will be allowed access and still have an experience of the ruins. In general, this would be grade level for the buildings and site. Access to above or below grade areas/levels should be removed. An improved trail system should be developed to provide guidance through the site. Some challenges may be encountered providing complete ADA access, but can be mitigated through interpretation. If an integrated conservation program is to be developed to retain the historic values of the site, a visitor management program and strategy will be mandatory.

In reducing the risks associated with safety and visitor welfare, some buildings or portions thereof will have to be removed, or in the case of voids or underground tunnels, filled in or permanently closed. Those portions remaining may need additional structural support to maintain stability. These new structural elements can often be designed to "ghost" missing elements of the original building, providing an interpretive understanding of the structure in addition to reducing risk. The ghost elements will generally be in the same location as the removed steel trusses and beams. In such a conservation program, the overriding goal will be to preserve the experience of size and scale of the site and buildings through the reflection of the ruins.

The question becomes whether a ruins conservation program and hazard reduction program are compatible, can be integrated with a visitor management strategy, and be implemented within a reasonable budget.

In addressing the first part of this question, the following recommendations are cursory by nature and estimated in only the broadest terms.

Recommendations for the eight (8) buildings ruins of American Flat Mill

Building No.1: Ore Bin

1. Retain concrete frame (columns and beams) and stabilize.
2. Fill ore pit to reasonable depth for safety
3. Remove horizontal concrete slabs; add struts if required
4. Encapsulated cut ends of rebar

Building No.2: Course Crushing Plant

1. Retain most of concrete frame (columns and beams) and stabilize.
2. Provide some new structural bracing for stability.
3. Remove frame of former blacksmith wing (NW) to foundation; leave foundation footprint.
4. Remove upper floor columns and beams (above runway beam) on remains of south wing
5. Fill below grade floors
6. At west end grade floor fill floor voids with concrete
7. Floor voids of upper floors cover with expanded metal grates.
8. Clean site of debris.
9. Install concrete cap over column footings of between Buildings #2 and #3 to encapsulate exposed rebar and provide interpretive understanding of former building scale.
10. Remove all loose and exposed rebar

Building No.3: Fine Crushing Plant

Trestle

1. Photo document and remove all broken debris
2. Design and Install modern “ghost” structure for stability and interpretation
3. Block off/close access to Bldg No. 2

Crushing Plant

1. Retain concrete frame (columns and beams) and stabilize.
2. Option A: remove all horizontal elements and install struts
Option B: Remove all horizontal elements but retain roof and repair
3. Remove all access to upper floors
4. Fill lower levels
5. Fill floor voids with concrete
6. Encapsulated cut ends of rebar)

Building No.4: Cyanide Plant

Preservation of the cyanide plant is complex. The size of the facility shows the magnitude of the refining activities. It was huge but with the roof gone it loses a lot.

The filter unit with its 16 concrete tanks is a key visual element of the plant and should be retained. The top needs to be covered for safety. Below grade voids should be filled (even if it entails removing some of the exposed foundations). The site should be re-landscape to reflect the terraced character of the site, including preservation of the retaining walls.

Building No.5: Warehouse

1. Retain concrete frame (columns and beams) and stabilize.
2. Remove roof of "office"
3. Clean up site and remove vegetation
4. Encapsulated cut ends of rebar

Building No.6: Precipitation and Refining Building

1. Retain concrete walls and stabilize.
2. Close off access to rear lower level
3. Provide steps to first floor
4. Clean up interior of deteriorated roof material
5. Reinstall security bars on window openings (only building on site with security)
6. Encapsulated cut ends of rebar

Building No.7: Assay Office

1. Demolish building to ground floor
2. Leave as footprint and interpret

Building No.8: Electrical Sub-Station

1. Remove all debris
2. Leave foundation/grade slab
3. Cap any exposed column footings
4. Leave as footprint and interpret

"Order of Magnitude " Cost Estimate:

The following cost estimate is based on the general listed recommendation as noted above. These costs only apply only to building conservation treatments and do not include design fees, construction administration, general landscape work, general site cleanup, or any interpretation program.

Building No. 1	\$100,000
Building No. 2	\$300,000
Building No. 3	\$500,000
Building No. 4	\$860,000

(Similar to Findings Report Option B with partial demolition of foundations and filling underground voids, but with more retention of retaining walls and a varied landscape plan for visitor access)

Building No. 5	\$30,000
Building No. 6	\$150,000
Building No. 7	\$50,000
Building No. 8	\$10,000

Total: \$2,000,000

Mr. Green and I hope this report will assist you in discussing potential future treatment of the site and conservation of its historic ruins. Thank you for the opportunity to work on this challenging project.

Respectfully,



Frederick L. Walters
Historical Architect



Melvyn Green, Structural Engineer
Melvyn Green & Associates, Inc.

Cc: Michael Bert Bedeau, Comstock Historic District Commission