



United States Department of the Interior

NATIONAL PARK SERVICE
SOUTHWEST REGION
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IN REPLY REFER TO:

H30(SWR-PCC)

MAY 22 1989

Memorandum

To: Superintendent, Bandelier National Monument

From: Chief, Division of Conservation, SWR

Subject: Mortar Specifications

John
After your review - 3
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Jr

A mortar and plaster sampling program of CCC buildings was conducted by the Division of Conservation in October 1988. Bill Sweetland recently requested mortar specifications based on the results of the analysis of the samples. The following recommendations are the result of the review of the mortar analysis data sheets from this sampling program. The mortar sampling was accomplished by the Region under the direction of Supervisory Exhibit Specialist, Jake Barrow.

Mortar samples were extracted from the following buildings:

1. Cement Mortar: Buildings 11,25,29,32, and wall between 27 and 28.
2. Mud Mortar: Buildings 1,3,6 and 8

The cement mortar sample from Building 29 was described as historic mortar. This mortar contains 73% sand, 11 % fines, and 16% binder. The fines were grey colored indicating the presence of cement as a binder. As a result, we are recommending testing the following mixes:

1. 6 parts sand, one part cement, one part lime.
2. 6 parts sand, one part cement, two parts lime.

Although the second mix will be softer and more porous, it may be undesirably lighter in color. Microscopic examination of the sand identifies the sand as Poi Plateau Sand. The color of the sand selected for new mortar will affect the color of the mortar.

The mud mortar samples analyzed contained an average of 68% sand, 26% silt and 5% clay. In order to recommend a specification for the mortar, samples of the proposed clay and

sand sources for new mud mortar should be provided for further analysis.

Notes taken during the sampling program indicate that installing a mortar and pointing mortar with acceptable results is very difficult. Each building has its own character; struck joints, unstrucked joints, slurry over the surface of the joint, recessed joints, darker mortar, etc. There is no one single solution which can be applied universally. Therefore, testing and analysis of the recommended mortar mixes on a building by building basis, is critical to achieving the appropriate result.

When test areas are complete, please advise this office and we will be pleased to consult on the final mix for each building during an on-site meeting to review the test areas.

Please feel free to contact Barbara Zook, Division of Conservation at FTS 476-1796, should you have any questions or comments regarding these recommendations.

A handwritten signature in cursive script, appearing to read "Barry J. Law". The signature is written in dark ink and is positioned below the typed text.