

Lakeport Plantation Restoration

Technical Report No. 1

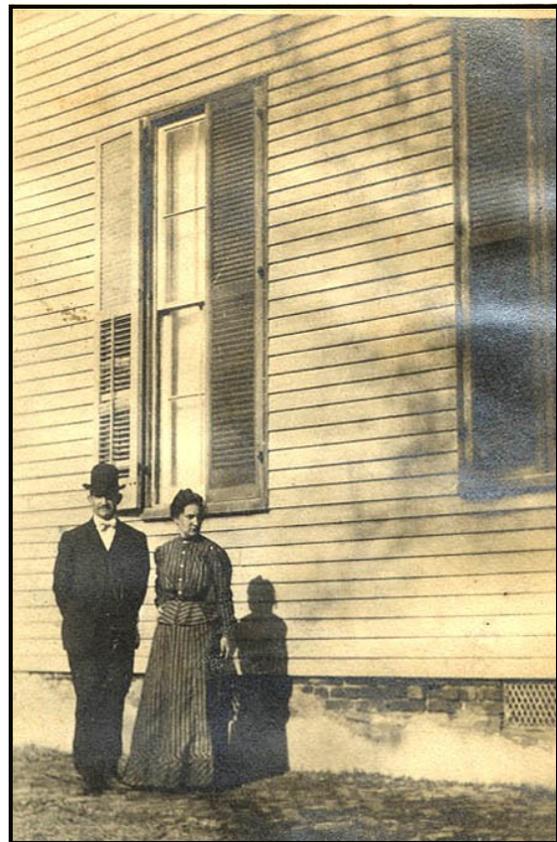
Parge Coating



At the time restoration began on Lakeport Plantation house, most of the original parge coating on the brick foundation wall was gone. What remained was a modern cement that had been applied in more recent years. Remains of the original parge coating were discovered by the archeologists during excavation, when the foundation of the house was exposed to examine the condition of the foundation. All of the exterior foundation walls had to be replaced, removing any remains of the original parge coating. The original parge coating can be seen in old photographs taken of the house during the early 1900's.

Historically, parge coating is the application of a lime-based plaster to exterior walls. Its purpose is twofold as it serves as a protective finish while also providing a decorative appearance. The lime-based plaster coating provides a protective finish to such materials as stone, brick, log and wood. The porous nature of the lime mortar composition allows the walls to breathe and moisture to evaporate at a high rate, keeping the building dry inside. It is also softer than brick and other hard materials and can withstand the movement caused by settling or temperature change, and will resist cracking.

Parge coating, or plastering, can also be made to give the look of a more expensive or desirable material. During the 18th century, when brick became unpopular, brickwork was covered with plaster and then scored to give the look of stone, which was a more desirable material at the time. Some other forms of decorative plaster are stucco, used to give an adobe look to a building, and pargeting, which is ornamental plasterwork found on the outside of a structure.



This photo of Lakeport Plantation house, taken during the early 1900's, shows the original parge coating on the foundation walls. This photo was provided by descendants of the Johnson family.

Before applying the parge coating, the brick wall foundation should be cleaned and readied for plaster. In a restoration where original plaster exists, the plaster should be examined and a determination made as to what should stay and what should be removed. Care should be taken to avoid damaging the brick during removal of the plaster. The new plaster should also be prepared to match the existing plaster. This may require the knowledge of an expert who can determine the composition of the original material. Samples of the original parge coating were taken from Lakeport Plantation house and sent to Wollenberg Building Conservation, LLC, in St. Louis, Missouri, to be analyzed. Results of the testing for this project can be found in the Historic Structures Report for Lakeport Plantation.

Historically, the plaster used for parge coating would consist of slaked lime, sand and water with a fiber such as straw or animal hair generally added as a binder. The plaster used for this project contained a fiberglass fiber rather than straw or animal hair and would have been a mixture that was compatible with the new brick that was used to rebuild the exterior foundation walls.

A common problem found today on historic homes is the use of new materials that are not compatible with original materials used at the time the house was built. When the second layer of parge coating was applied to Lakeport Plantation house, sometime after the early 1900's, a harder portland cement was used that was not compatible with the soft, handmade bricks used to build the foundation walls. This harder cement had a much stronger bond making its removal impossible without damaging the soft brick surface, resulting in the replacement of the exterior foundation walls of the house.

The first step in applying the parge coating is to apply the limewash. The limewash is a mixture of water and lime putty that is mixed to a thin, creamy consistency. The limewash will penetrate into the surface of the brick wall and assist in adhering the parge coating to the brick. Before the limewash can be applied, the brick should be thoroughly dampened. When applied, the limewash should not be allowed to dry too quickly, as this may cause cracking and flaking. Spraying the limewash with a fine mist should allow it to dry without problem. During application of the limewash to Lakeport Plantation house, restoration workers covered the limewash, once applied, with plywood sheets to protect it from the sun and help prevent quick drying. The limewash should be applied as thinly as possible and in several coats. It should be firmly brushed into the surface, allowing it to bond with the brick.



This photo shows the foundation walls of Lakeport Plantation house after the limewash was applied. Notice how the walls have been covered with sheets of plywood to protect the limewash from the sun to prevent quick drying.

Photos of the restoration crew preparing the lime-based mortar mix used for parge coating the exterior foundation walls of Lakeport Plantation house.



After the limewash is applied, thin strips of wood, called screeds, are applied to the brick foundation walls. The screed strips are used to provide a straight edge for applying the plaster smoothly and evenly. The screeds are applied vertically and should be cut to fit the height of the brick foundation walls as well as to match the thickness of the finished parge coating. If the limewash becomes too dry, it should be re-dampened before applying each coat of plaster to assure that the plaster bonds properly. The first coat of plaster, or scratch coat, should be applied to a thickness of about 1/4" to 3/8" with the use of a dashing trowel, and then roughly leveled. Once applied, the plaster should be raked or "scratched" with a plasterer's comb to assure a strong bond with the next coat of plaster.



The photo above shows a restoration crew member misting the coat of limewash which will allow it to dry without cracking or flaking. To his right another crew member is applying the thin strips of wood called screeds which will be used to apply the plaster evenly.



The photos at left and below show the scratch coat being applied to the foundation walls of Lakeport Plantation house.



The photo at right is a close-up of the scratch coat after being raked or "scratched".

The second coat, or brown coat, should be applied at about the same thickness as the scratch coat, with a combined thickness of about 5/8" for the two coats. Once again, it may be necessary to re-dampen the existing coat of plaster. The brown coat should be applied with a trowel and leveled using the screeds as a guide. Each coat of plaster should be allowed to cure for three days with continuous misting. Although it is not possible to control temperature or humidity, the ideal temperature for curing is 55 to 70 degrees. Plaster should never be applied in extreme weather conditions as this will affect the curing process.

The final coat, or the finish coat, should be about 1/4" thick. The plaster used for the finish coat should be of a finer consistency which will result in a smoother, harder finish. This can be achieved by using a finer grain of sand in the plaster mixture and eliminating any fibrous substance. The finish coat should be applied in very thin layers to assure a smooth, even finish. The finish coat can be worked to a glossy finish or a light sanded finish as desired. The finish coat for Lakeport Plantation house was applied in a circular pattern with a sanded finish look.



The photo at left shows a view of the scratch coat and brown coat applications side by side. The photo above shows an up-close view.



The photo at right shows the lime mortar ready to be used to fill voids left by the screed strips when removed after the brown coat was applied.



The photo at left shows the finished parge coating on the north side of Lakeport Plantation house. Notice the sheets of plastic attached to the siding of the house. The plastic was used to cover the plaster and protect it from the weather, allowing it to cure properly.

Finished parge coating should be given coats of limewash periodically as a maintenance procedure. The limewash will continue to protect the parge coating and fill any hairline cracks that may have developed, preventing the cracks from becoming larger and allowing moisture to enter.

The parge coating on the foundation walls of Lakeport Plantation house has failed in several areas. In some areas the plaster has cracked and buckled and in other areas it is pulling away from the foundation wall. Some of this is due to the brick and plaster not being dampened enough to assure a tight bond during application. The modern brick that was used to replace the foundation walls is a harder brick than the original and is not as porous, meaning that it does not absorb moisture as easily. The modern brick would have required prolonged irrigation to become damp enough for the plaster coating to bond tightly.

In some areas the plasterers did not protect the wood trim above the brick foundation walls when applying the plaster, allowing the plaster to bond to the wood rather than the brick. This has resulted in movement of the plaster with the wood, forcing the plaster to pull away from the brick. To prevent this the plasterers should have either removed the bottom row of siding or applied a barrier to protect the wood when applying the plaster. Another preventive measure is to score the plaster before it has cured to the wood, breaking the possibility of bonding.

Although the restoration crew were skilled plasterers, they did not have a background in restoration and did not fully understand historic plaster and its application. The knowledge and skills needed for modern construction are greatly different from those necessary for historic restoration and preservation. It is extremely difficult to find qualified restoration workers because of the lack of skilled craftsmen who are knowledgeable in this area. This will continue to be a problem for historic restoration projects in the future.



The photo above shows the parge coating on a corner of the foundation wall where it has cracked and buckled. This is largely due to the plaster not being dampened enough to assure a tight bond during application.

Resources:

U. S. Heritage Group, Preserving America's Historic Masonry, 2005. Bennett, Bob & Speweik, John. Limewash Returns. Dec. 13, 2006. <<http://www.usheritage.com/limewashes.htm>>.

Technical Preservation Services: National Park Service, U. S. Department of the Interior, 1990. Grimmer, Anne. Preservation Brief 22: The Preservation and Repair of Historic Stucco. Dec. 12, 2006. <<http://www.cr.nps.gov/hps/tps/briefs/brief22.htm>>.

Guendling, Randall L. Archeological Investigations at Lakeport Plantation, Summary Report. Arkansas Archeological Survey, 2003.

Historic Structures Report for the Lycurgus Johnson House at Lakeport Plantation ca. 1858-61, Vol. 1. WER Architects/Planners, 2003.

Technical Preservation Services: National Park Service, U. S. Department of the Interior, 1989. MacDonald, Mary Lee. Preservation Brief 21: Repairing Historic Flat Plaster-Walls and Ceilings. Dec. 12, 2006. <<http://www.cr.nps.gov/hps/tps/briefs/brief21.htm>>.

Building Conservation.com, Cathedral Communications Limited, 2006. Taylor, Jonathan. Lime: The Basics. Dec. 12, 2006. <<http://www.buildingconservation.com/articles/limebasic/limebasic.htm>>.

Virginia Lime Works, Makers of Traditional Lime Mortars. Practical Guide: Plasterwork & Rendering. Jan. 10, 2007. <<http://www.virginalimeworks.com/pdfs/plastering.pdf>>.

Welcome to Breckland Council, 2007. Conservation Advice Sheet: Lime Plaster. Jan. 10, 2007. <http://www.breckland.gov.uk/lime_plaster_advice_sheet.pdf>.

Welcome to Breckland Council, 2007. Conservation Advice Sheet: Limewash. Jan. 10, 2007. <http://www.breckland.gov.uk/limewash_advice_sheet.pdf>.

Historic Preservation Websites:

Building Conservation.com, Cathedral Communications Limited. <http://www.buildingconservation.com/>.

De Gruchy's Lime Works. <http://www.palimeworks.com/lwus/>.

National Park Service, U. S. Department of the Interior. Technical Preservation Services: Preservation Briefs. <http://www.cr.nps.gov/hps/tps/publications.htm>.

St. Astier Pure and Natural Hydraulic Limes and Lime Products Since 1851. <http://www.stastier.com/>.

U. S. Heritage Group, Preserving America's Historic Masonry. <http://www.usheritage.com/>.

Virginia Lime Works, Makers of Traditional Lime Mortars. <http://www.virginalimeworks.com>.

Reference Books:

Ashurst, John and Nicola. Mortars, Plasters and Renders, Practical Building Conservation, Volume 3. Gower Technical Press, 1988.

Millar, William. Plastering, Plain and Decorative. B. T. Batsford, 1897. Reprinted by Donhead Publishing Ltd., 1998.

Lakeport Plantation is an Arkansas State University Heritage Site located in Chicot County, Arkansas. The *Lakeport Plantation Restoration Technical Reports* were compiled by Ronnie and Sonya Walker to document the restoration of Lakeport Plantation.