



GUIDELINES FOR EXTERIOR STUCCO RESTORATION

Old stucco in Charleston usually consisted of a thin coating (one-eighth to one-quarter inch thick) of lime-base mortar. Andrew Jackson Downing, a nineteenth century architect, promoted the use of properly prepared stucco and recommended a mixture of clean, sharp-grained sand, mixed with two parts sand to one part lime.

Various natural or patented cements were in use for stucco by the 1830's. Beth Elohim Synagogue (1839) was brick covered with "roman cement...the joints of the bricks to be well clean'd from loose mortar and the walls made sufficient wet before the plastering is put on." Portland Cements, similar to modern products, were commonly available with lime and sand after the 1880's.

RESTORATION OR REPLICATION OF CHARLESTON STUCCO

The key to successful restoration work is using your eyes to examine the old work and to match the new repair to the old. Texture, color and joint techniques are the qualities that make up the overall appearance of stucco or any masonry surface.

TEXTURE

Historical Stucco in Charleston was usually finished with a smooth steel trowel finish, not a wooden or textured float or sponge finish. Most current restoration work is too rough. Patented stucco mixes such as United States Gypsum's Oriental Exterior Stucco are not recommended for trowel finishing as their aggregate is too coarse. Never use machine sprayed stucco for restoration work.

COLOR

New stucco should be colored by the sand used in the mix, or if necessary, the addition of inorganic masonry pigments or tints. Common Gray Portland Cement should never be used for the restoration of Charleston stucco. The blue-gray color does not match the buff or tan colors of historic stucco and it cannot be altered by tints. Even when gray portland is used to repair cracks in buildings that are to be painted, it shows through as dark stains because the gray portion is darker, denser and harder than the old stucco, often causing re-cracking because of different rates of expansion and contraction. When using Portland cement stucco mixes, always use white, non-staining cement.

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In order to identify the historical sand color, immerse one cup of crushed original stucco in muriatic acid, using acid resistant containers such as a glass jar. When all the lime is in solution, wash away the acid and dry the sand over low heat. Then match sand color and texture using clean masonry sand. Sometimes it is necessary to buy and mix several batches of sand to get a proper color.

JOINT TECHNIQUE

Study the historical stucco that you are repairing or look at examples of old Charleston buildings. Most stuccoed buildings had scored joints to simulate coursed stonework. These false joints were always guided with a straight edge and must be laid out with great precision. The joints should be tooled when the stucco is thumb-print hard. The joint tool used should match the early work. Most early joint tools were rounded, not square, and varied in width from 1/8" to 3/8". Do not use a thin trowel edge as this gives a torn, ragged look to the false joint. The surface of the stucco wall should match the original work in texture. Experiment with unobtrusive test panels before proceeding with major repairs.

MODERN STUCCO FORMULAS

Sand - Masonry sand, color and texture matched to the old work.

Lime - ASTM C207, Type S pressured hydrated for immediate use, such as U. S. Gypsum Co. Bondcrete Mason's Lime.

Cement - White Portland, ASTM C-150, Type II (white non-staining) not to exceed 0.60 alkali.

SUGGESTED PROPORTIONS: (Proportion of sand varies with texture)

	<u>LIME</u>	<u>WHITE PORTLAND CEMENT</u>	<u>SAND</u>
	1 part by volume	2 parts by volume	6 parts by volume
Scratch Coat	—	—	—
	1 bag - 50 lbs.	1 bag - 94 lbs.	5 - 6 cubic feet
	1 part by volume	2 parts by volume	6 parts by volume
Brown Coat	—	—	—
	1 bag - 50 lbs.	1 bag - 94 lbs.	5 - 6 cubic feet
	2 parts by volume	2 parts by volume	8-10 parts by volume
Final Coat	—	—	—
	2 bags or 100 lbs.	1 bag or 94 lbs.	7-10 cubic feet

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Before applying stucco to old masonry walls, brush clean and rinse well with clean water. Scratch, brown and final plaster require curing with water after set.

Mix your new formula in test size batches and put plaster in styrofoam cups to cure. For quick results heat-cure your samples in low heat oven or over hot plate. Break samples in half and match against samples of old stucco taken from unweathered section of building wall. Do not match new stucco to soiled surface color of old work.

If you need help in analyzing and matching old stucco, call Historic Charleston Foundation at 723-1623 or the Center for Historic Preservation at 723-3646.