

# Make it Stick:

By Russ Flynn

Concrete block makes a super base for Portland cement-based plaster (stucco). The two materials are made from the same basic ingredients and they are extremely compatible. Properly done, it's a great combination.

## The Block

The concrete block should have an open or coarse texture. This enables the stucco to interlock with the surface of the block, providing a mechanical key bond (Fig. 1).

In some parts of the country, stan-

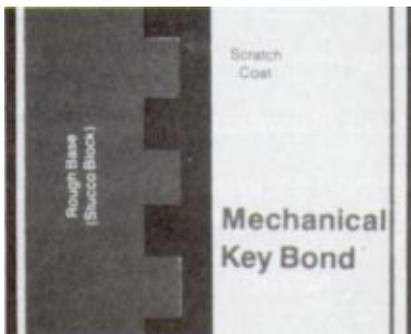


Figure 1

dard concrete block has a smooth texture. This block does not provide much of a mechanical bond for the stucco, but it may still be considered an excellent base if a suction bond can be developed.

Suction bond is the absorption of water and Portland cement from the mortar into the surface of the block. This creates a knitting effect at the interface of the stucco and block (Fig. 2).

An evaluation of a block wall to determine whether suction bond is feasible is a relatively simple opera-

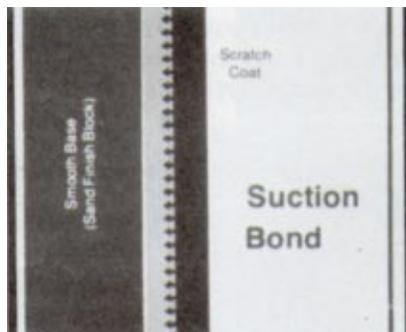


Figure 2

tion. Spray the block with water. If the water beads up as if on wax paper, you can forget suction bond. Your remaining options are the use of a bonding agent or metal reinforcement.

If the water is absorbed into the block, a suction bond is possible. However, there is one other consideration, the absorption rate of the block.

A block with a high absorption rate is capable of rapidly taking too much water from the stucco mix. This "dry out" could prevent the hydration of the cement and destroy the conditions necessary for establishing a good suction bond. It could also cause additional shrinkage and cracking.

This can be a serious problem, but there is a practical solution. By uniformly wetting the wall and waiting for the water to be absorbed prior to the application of the stucco, the rate of absorption can be controlled and the success of the suction bond can be ensured (Figs. 3 and 4).



Figure 3



Figure 4

## The Wall

A block wall that is ready for the application of stucco is one that is properly cured and carrying the majority of its intended load. The mortar joints of the wall are not struck; they are cut flush with the block. The wall should be properly aligned to eliminate large variations in stucco thickness and plane tolerance.

Inspection of the wall before plastering will determine the suitability of the wall. It should be clean and ready to stucco—no form oil, no loose block, no efflorescence, no mortar drippings, no roof tar, etc.

# A Common-Sense Way to Apply Stucco to Concrete Block

## The Bond

The question of bond must be answered before the scratch coat is applied. If a bond problem is suspected, don't proceed. Consider your options.

In some applications a bonding agent should be considered. There are several types and variations of these materials. Some are surface applied to the block prior to the application of the scratch coat, while others are integrally mixed into the stucco mortar. It is extremely important that the right bonding agent be used in the right situation, and that these materials should be used in strict accordance to the manufacturer's recommendations.

Where poor bond or no bond is anticipated, metal reinforcement, adequately anchored to the wall, is required. A paper backed, self-furring metal lath is recommended for this application. The purpose for this is to make sure that there is a uniform *unbonded* condition and that stucco isn't adhering to the block base in some spots and not in others.

From time to time the question of stucco to a painted block wall arises. Today's bonding agents are capable of producing a good bond to a painted surface; however, is the adhesion between the paint and the block good enough to carry a half inch of stucco?

In all these situations, common sense and good judgement provide better answers than wishful thinking.

## Control Joints

Because stucco and concrete block are similar in nature, properly applied and adequately bonded stucco need only be jointed over any control joints in the base wall. This is one of the greatest benefits of using block for a base.

If metal reinforcement is used over a block wall, the same recommendations must be followed as with frame construction. Proper spacing of control joints now becomes a consideration for the architect who should follow the guidelines established in ASTM C-1063, "Installation of Lathing and Furring for Portland Cement Based

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**Table 1**  
**Consideration for**  
**Control Joints**

Maximum Area of Panel..	144 sq. ft.
Maximum Distance Between	
Control Joints . . . . .	18 ft.
Maximum Length to Width	
Ratio . . . . .	2-1/2 to 1

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Plaster" (Table 1).

## Unlike Bases

In walls where block construction abuts another type of construction, the dissimilarity of the bases will cause

the stucco to crack. Additional precautions are taken in these situations. Where block and frame walls join, a control joint is recommended. This will predetermine and prealign the crack into a nice looking joint (Fig. 5).

In some parts of the country when concrete and block abut, strip lath is placed over the joint and secured to the concrete and the block. Local

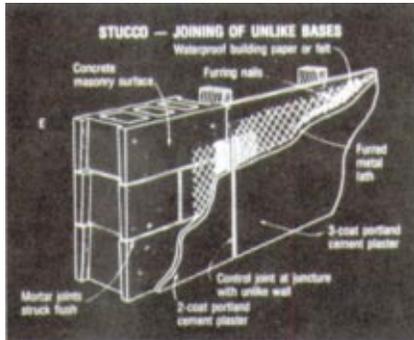


Figure 5

experience has shown that this method may be an adequate solution and will minimize or eliminate the cracking.

In other parts of the country a more

<b>Base</b>	<b>1st Coat</b>	<b>2nd Coat</b>	<b>3rd Coat</b>	<b>Total</b>
<b>Three-Coat Work</b>				
Metal Lath	3/8"	3/8"	1/8"	7/8"
Unit Masonry	1/4"	1/4"	1/8"	5/8"
<b>Two-Coat Work</b>				
Unit Masonry	3/8"	1/8"	--	1/2"

conservative approach is required, such as the installation of a control joint over the juncture.

#### The Mix

The stucco mix is characteristic of the aggregates and materials available in each location. An experienced plasterer should know which materials work best and how to proportion them.

The workability of the stucco mix is most important. It must be cohesive enough to stay on the trowel from the hawk to the wall. Plasticity is needed for ease of troweling and manipulations. At the same time, it must have enough body to resist sagging. And above all, it must bond the stucco to the block.

#### Coats and Thickness

For block wall construction, ASTM C-926, "Installation of Portland Cement Based Plaster" contains pro-

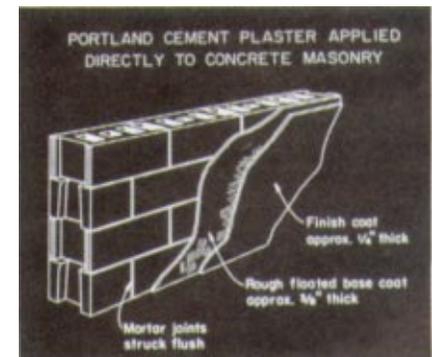


Figure 6

visions for either a two-coat or three-coat application (Table 2). Since a half inch of stucco thickness is sufficient for most block work, the two-coat, double-back application is recommended. With this method, the second coat is applied as soon as the scratch coat has stiffened sufficiently to support the second coat. Little or no delay between coats promotes complete curing, less shrinkage and improved bond (Fig. 6).

The three-coat system requires an

additional thickness and weight of the finish coat. It also has a greater potential for shrinkage and cracking. If a three-coat system is required and you are not sure about the bond, or if extra thickness is required, use metal reinforcement!

### **The Application**

The stucco should be applied with enough pressure to force the material into the surface of the block to ensure a mechanical key and suction bond. Just getting it on the wall may not be sufficient to ensure an adequate bond. Enough material must be put in place to obtain the specified thickness of the coat being applied.

It may take more than one pass to accomplish this. Adequate thickness is extremely important—especially with the scratch coat—since a thin scratch coat is more susceptible to “dry out” and bond failure.

### **Curing**

Proper curing is essential for the success of a good stucco job. The codes and standards are very vague about what constitutes adequate curing. Sufficient moisture and time between coats can mean many things to many people, depending among other things on their geographical location. If you are in Seattle during the rainy season, it's one thing. If you are in Phoenix in the summer, it's something else.

In most instances, moist curing several times a day for the first two or three days should be adequate. The stucco should not be allowed to dry out during this period.

### **A Winning Combination**

The outcome of a stucco job is dependent on the ability of the construction team to resolve potential problems. It is to everyone's benefit to discuss bond potential and location of control joints before the job begins.

The architect is responsible for designing a system which will perform. However, the probability of a successful job will be really improved if the stucco contractor is consulted prior to the application of the Portland cement plaster.

### **References**

1. ASTM C-926, “Standard Specification for Application of Portland Cement Based Plaster,” ASTM, 1916 Race St., Philadelphia, PA 19103.
2. ASTM C-1063, “Standard Specification for Installation of Lathing and Furring for Portland Cement Based Plaster.”
3. Portland Cement Plaster (Stucco) Manual, EB049 Portland Cement Association, 5420 Old Orchard R., Skokie, IL 60077

### **About the Author:**

Russ Flynn is Technical Services Manager of LaFarge Corporation. He is a member of ASTM's C-11 Committee, as well as AWCI's Technical Committees 2 and 7. He is also Chairman of ACI 524, Portland Cement Base Plaster Committee.