The Water Leak Problem

Many Efforts to Stem Water Leakage Represent Money Wasted, But The Challenge Is Not Unsurmountable

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Traditional, historical, inevitable. All these adjectives describe the perennial tendency of many to stop water entry problems by "sealing" surfaces of exterior finishes such as stucco, concrete, masonry.

And just as often untold thousands of dollars go down the drain with the excess water that causes the problem to begin with.

Most of these questionable expenditures derive from a view point that stucco, for instance, leaks. That is, it is porous and water goes right through it. Often stucco is compared to a big blotter. It "blots up" water until it gets "saturated" and when it can blot up no additional water, the excess goes right through into the building, breaching the weather-resistive barrier installed under the stucco.

(Editor's Note: This article is excerpted from the technical newsletter, Techniques and Comments, which is written by Bucholtz and published a minimum of 24 times a year. A top technical Professional Engineer consultant in the wall and ceiling industry, Bucholtz will soon be authoring a monthly technical feature series for Construction Dimensions Magazine. Details for subscribing to Techniques and Comments may be obtained by writing to AWCI, 25 K St., N.E., Washington, D.C. 20002

Adequate extensive testing proves this concept is without foundation. As stated in PCA's "Portland Cement Plaster (Stucco) Manual", *"The ability of plaster to withstand weathering includes resistance to rain penetration; freeze-thaw durability; resistance to extreme thermal and moisture changes; and resistance to aggressive chemicals in the atmosphere, such as acid rain. Plaster properly proportioned, mixed, applied, and cured will exhibit good durability and resistance to the natural environment.*

Water Repellents

Reinforcing my contention for years, Portland Cement Association's same manual noted above, has this to say about water repellents:

> Products are available that are said to reduce the water permeability of plaster. These formulations include water repellents, hydrophobic liquids, and inert fillers. Quality plaster that is properly cured does not need water-repellent admixtures. Laboratory tests that measure time of setting and water permeability of plaster actually retard cement hydration and increase permeability.

Finding Sources

Examination of a structure to determine sources of water entry should begin at the top of the building. In fact water can flow downward and laterally a long way in a wall before it shows within the building.

Specific items to be inspected include these . . .

- The roof of the structure. If the roof is sloped, the ridge should be carefully examined, as well as gable ends.
- Flat roofs—examine flashing against parapet walls and areas where water is standing. Examine drains.
- Installation of flashing cap on parapet walls, and proper installation of flashing under metal or wood caps.
- Locations where pipes or vents go through the roof itself to the interior of the building.
- Parapet caps are extremely important. When installed, the vertical flanges should receive a bead of quality sealant to prevent rainwater from being blown up under the flanges to the parapet top beneath the cap, where water may find its way into the building.
- Roof rakes and eaves are often vulnerable to rain water entry particularly when exposure is to the wind direction.
- Proper flashing of windows. Where flashing is not adequate, water can find its way into stud

cavities and appear on interior locations of the structure.

- Windows whose corners are fastened with screws permit water entry if corners are not watertight.

Windows, Doors

Areas around windows and sliding glass doors frequently show signs of water entry, often leading to a conclusion that doors or windows leak. This conclusion may be incorrect, and repair work will often be futile. Best procedure is to determine source of the water that can reach the window area.

Often this may be at a point above the window, on the upper floor or floors, with water running downward inside the wall assembly and finding egress at the window area, particularly if flashing is improper or inadequate.

In most cases examined, the sources of water entry often prove to be sources that were not considered at the outset of the problem. Hasty conclusions as to sources can lead to unjustified and fruitless expenditures of a lot of money. And there is always someone around to "seal" walls. When those walls are not at fault, obviously the expense is waste and the problem persists.

Codes Are Minimum Requirements

Building codes seek to establish minimum requirements for construction. Compliance with code requirements does not signal that a structure is superbly built. It merely says that the minimums have been met.

What brings this up? On a recent inspection of a very expensive custom home it was observed that the exterior framing was covered with asphalt coated insulating sheathing, followed by stucco netting and portland cement plaster (stucco).

Insulating sheathing was square (no T & G) and building paper was not used over the insulating sheathing. This situation establishes sources of water entry into the structure via the vertical and horizontal opening between sheets of sheathing. Water which reaches the area behind the stucco is going to be able to travel through the end and butt joints and will appear inside the structure.

Codes allow use of water-repellent sheathing without building paper, and omission of the paper complies with the code but makes no sense whatever when water-resistance is necessary.

Use of sheathing with tongue and groove at both horizontal and vertical joinings can obviate use of the water-resistant building paper, but square edge panels of any kind invite the kind of problems that affect the entire building.

Correction

There are occasions when water penetrates through the stucco membrane, these occasions being when a crack or hole exists in the membrane, or where the mix has been altered by addition of wetting agents or detergent-type materials calculated to increase yield.

Cracking has to be corrected and there are ways to handle this task. Where cracking is extensive, a best technique is to apply a glass fiber mesh to the entire elevation, followed by a bonding agent (or bonding agent may be applied to a clean surface first) and a new coat of portland cement base stucco. Where the cracking is the fine hairline type, a stucco fog spray can be applied to the surface. A bonding agent can be added to the wash or fog coating material for adhesion.

Where cracking is extensive, some manufacturers offer coatings which can be spray-applied, troweled on or even rolled on. These coatings should be carefully selected for performance.

Where a single large crack exists, an excellent technique has been to apply a tape of glass fiber over the crack followed by application of stucco which is then worked to match the adjacent areas.

It is important to use the same material for crack remedy as was used originally in the finish being corrected. At least this minimizes the probability of difference in light reflectance of dissimilar materials. At one time I suggested use of an acrylic in the repair material, but this should be avoided as most acrylics tend to induce a glossiness which has the same effect as different materials and their light reflectance. Use of a glass fiber mesh and stucco should be sufficient.

Sealers

Sealers have been previously discussed in Techniques and Comments. One thing to remember is that so-called “silicone” sealers may be subject to oxidation by ultra violet rays of the sun. Such sealers may break down over a period ranging from a few months to a couple of years, but exposed to the sun they will lose their effectiveness.