SOFFIT/WEEP SCREEDS IN CEMENT PLASTER (STUCCO) CONSTRUCTION

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Characteristics of Stucco

Some background on stucco is useful in understanding why soffit weep/drip screeds are important.

Conventional stucco, also called cement plaster, is a mixture of Portland cement, sand and water, to which plasticizers, traditionally lime, are often added to increase workability. In wood frame construction, stucco is usually applied in three coats over metal reinforcement (lath), with or without solid backing. Properly used, stucco is a desirable cladding material that is hard, strong, fire-resistant, rot and fungus resistant and durable. It adapts to any shape, is low in first cost and has minimal requirements for maintenance. It remains one of the most popular cladding materials in the west and southwest United States.

In spite of its many advantages, stucco has, when misused or abused, distinct undesirable characteristics that can cause or contribute to serious problems or construction failures. The undesirable result most often seen is water intrusion resulting in damage to structure or building contents.

A building system utilizing stucco as a wall cladding is generically known as a *drainage wall,* a wall system in which the outermost material provides a substantial barrier to water and a secondary material, typically a *weather resistive barrier* (WRB), provides a backup barrier to water that may penetrate the cladding. Penetrating water is intended to flow by gravity to the exterior outside of the WRB and is prevented from reaching water-sensitive materials. There are two types of drainage walls: membrane drainage walls and cavity drainage walls. A system utilizing stucco is an example of a membrane drainage wall, whereas a system using masonry veneer is usually designed as a cavity drainage wall. In drainage walls, evaporation may also play a role in moisture dissipation, but is a comparatively slower process subject to weather conditions.

As a material, stucco can provide a high resistance to passage of liquid water if properly formulated and cured, but it is not waterproof. Neither is it, as thought by many, porous. In fact, when liquid water penetrates stucco cladding on a building, it almost always does so not through the field of the stucco but through breaches at cracks, control joints (actually controlled cracks), perimeters of openings such as doors and windows and joints with abutting materials. In a properly designed stucco clad wall, water from these breaches is expected to penetrate no further than the WRB and exit the wall base at a weep screed or dissipate through evaporation.

There are limits, however, to the volume of water a stucco clad wall system can successfully handle. When these limits are exceeded, the WRB and related flashing materials, which are often made of asphalt saturated paper or felt, can disintegrate and become useless. Limiting the volume of water penetrating stucco cladding is typically accomplished by one or more of the following design and construction strategies:

- Limiting cracking by using appropriately low water-cement ratios and proper curing.
- Flashing penetrations and terminations successfully.
- Providing weeps at wall bases and soffits.

Soffit Weep Screeds

Although the *California Building Code* requires a weep screed at the base of stucco walls, it does not specifically require one at the bottom of a wall that terminates at a soffit. The functional need for a wall to weep at a soffit, however, is no different than the need to weep at a wall base.

Without a soffit weep, water can become trapped on the inside of the stucco soffit and easily find its way through breaches in the WRB to the framing and sheathing, typically at laps, terminations and fastener holes.

We recommend that all soffits, even those only a few inches wide, have weeps, preferably combined with a drip function.

Soffit without a weep screed resulted in massive decay of framing and sheathing. Water entering at cracks and control joints becomes trapped on top of the soffit stucco and moves through breaches in the weather resistive barrier.

Over 20 years ago, the *Plaster, Metal Framing Systems, Lath Manual*, published in 1981 by the California Lathing and Plastering Contractors **Association**, Inc. recommended soffit weeps, as does the Annex to ASTM C 926, *Specification for Application of Portland Cement-Based Plaster* (A.2.2.3):

> *Where vertical and horizontal exterior plaster surfaces meet, both surfaces shall be terminated with casing beads with the vertical surface extending at least ¼ in (6 mm) below the intersecting horizontal plastered surface, thus providing a drip edge. The casing bead for the horizontal surface shall be terminated not less than ¼ inch from the back of the vertical surface to provide drainage.*

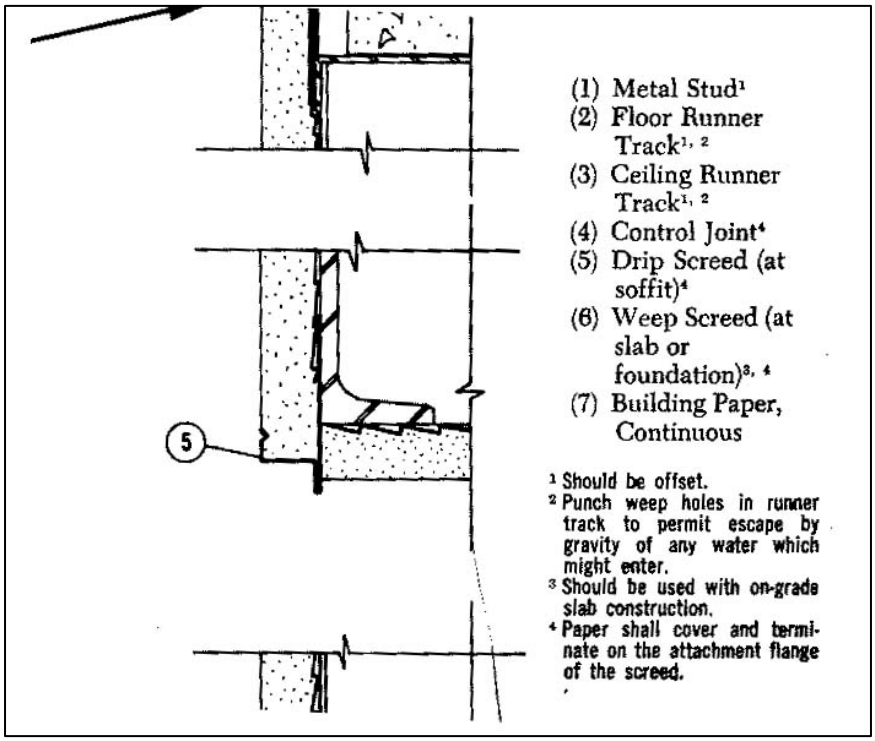
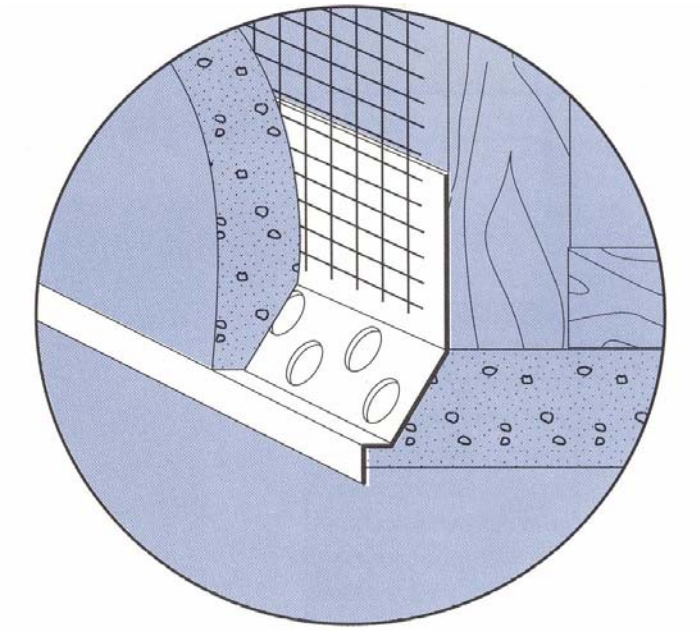
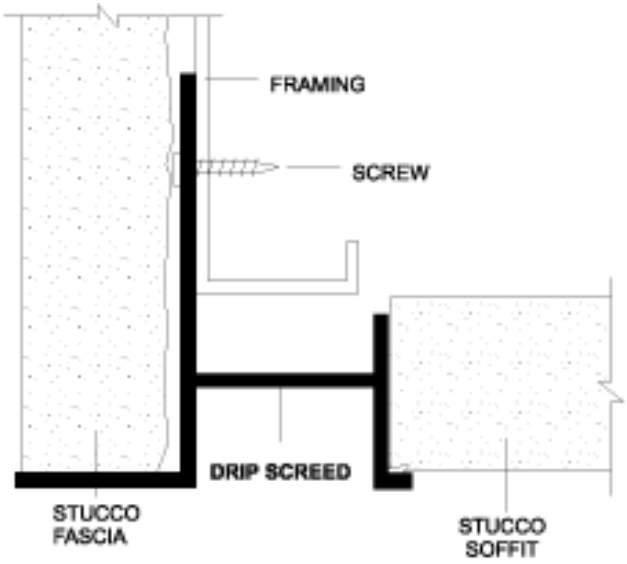


Diagram from *Plaster, Metal Framing Systems, Lath Manual*, published in 1981 by the California Lathing and Plastering Contractors Association, Inc. showing a soffit weep/drip screed (Note 5)

Deeply recessed window without weep at soffit suffered water penetration and damage at head



The Superior *SSC Superior Soffit Corner* is made of 24 gauge galvanized steel and seems to be popular with plaster contractors. Although it is intended to have a drip functionality, it is usually installed with stucco screeded to the tip, thus eliminating the drip. It also has perforations that act as plaster keys and actually inhibit weepage



Fry *DS 875 875* is made of extruded aluminum and combines a weep with a drip function.