EIFS Restoration:

THE CHALLENGE OF WATERPROOFING

Exterior insulation and finish systems got their start in the United States more than 25 years ago, and they really began to catch on during the 1980s because they are attractive and cost-efficient. Now many installations from that construction boom are approaching 10 years old, and some of the challenges of age are becoming apparent. This has led to both improvements in design and materials, and to the development of long-lasting repair solutions. This article describes some typical waterproofing failures, specifically in sealant joints and coatings, and explains a variety of effective repair methods using long-lasting, flexible silicone materials.

EIFS JOINT FAILURES

Sealants may fail in EIFS joints in different ways. One is an adhesive failure—bond loss of the sealant to the substrate. The three reasons this is likely to occur are lack of primer, improper use of primer or improper surface preparation. Most sealants require the use of a primer. Furthermore, the substrate must always be clean, dry and frost-free at the time of sealant installation. If these requirements are not met, adhesive failure is the most common joint problem.

Sealant failure also may be due to deterioration. Commonly used multicomponent polyurethane sealants are organic materials that degrade in the presence of ultraviolet light. This deterioration manifests itself in loss of sealant flexibility and movement capability, or in some instances, reversion of the sealant from a cured to an uncured state. It is not uncommon for polyurethane-sealed joints to fail within five to 10 years.

Cohesive failure occurs when a sealant tears or splits within itself as the result of joint movement. This usually happens when the sealant is no longer able to accommodate the expansion and contraction of the joint. While original movement capabilities may meet specifications, many organic sealants stiffen and lose movement capability as they age. Joint size also plays a role, with narrower joints more prone to cause cohesive sealant failure. Also, while thicker sealant depth may help compensate for organic sealant weathering it reduces movement and increases the potential for cohesive failure.

Another mode of failure is delamination of the EIFS coating. This occurs when the sealant overstresses the coat-

ing. Prolonged exposure to moisture or water increases the risk of this type of failure. Use of open-cell polyurethane backer rods instead of the recommended closed-cell polyethylene or non-gassing polyolefin backer rods is often a culprit in this problem, as the open-cell backer rods hold water in constant contact with the coating. Acrylic finish coatings are particularly vulnerable to softening when wet. Even in joints where trapped moisture is not the problem, a sealant that has stiffened can cause delamination by putting too much stress on the coating during joint extension.

EIFS JOINT RESTORATION METHODS

Silicone sealants and coatings are recommended for EIFS restoration as well as original installations because they are UV stable and do not degrade in outdoor weathering. They have more stable modulus of elasticity and remain flexible in cold temperatures. Silicone sealants have a life expectancy of greater than 20 years. Following are four methods for using silicone materials to repair EIFS joints and one for repairing hairline cracks in walls.

Recessed Joint. Where the failed sealant was originally recessed into the joint 1/2 inch or more, it may be possible to install a new sealant over it. The original sealant is slit, a closed-cell backer rod or foam bond breaker tape is applied over it, and the sealant installed and tooled. (See Figure 1, page 27.) The sealant should have a minimum bond of 1/4 inch on the side of the joint and a depth of 1/8 inch to 3/8 inch at the center. This repair method has the advantage of avoiding costly sealant removal, but can only be used if there is

Figure 1. Recessed Joint Restoration

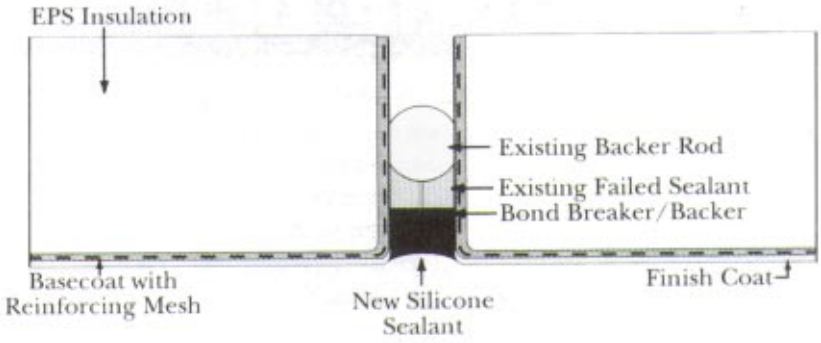


Figure 2. Joint Reconstruction—New Penetration

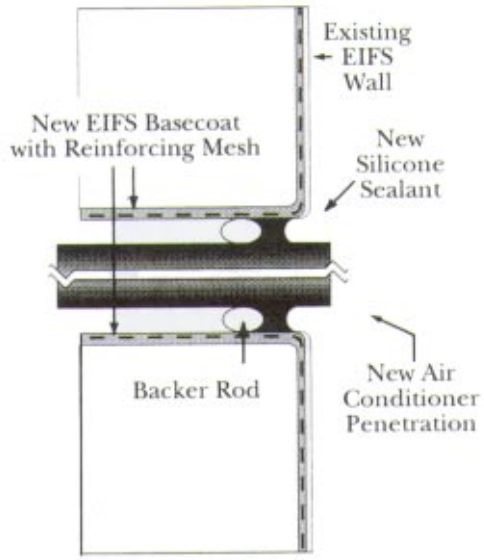
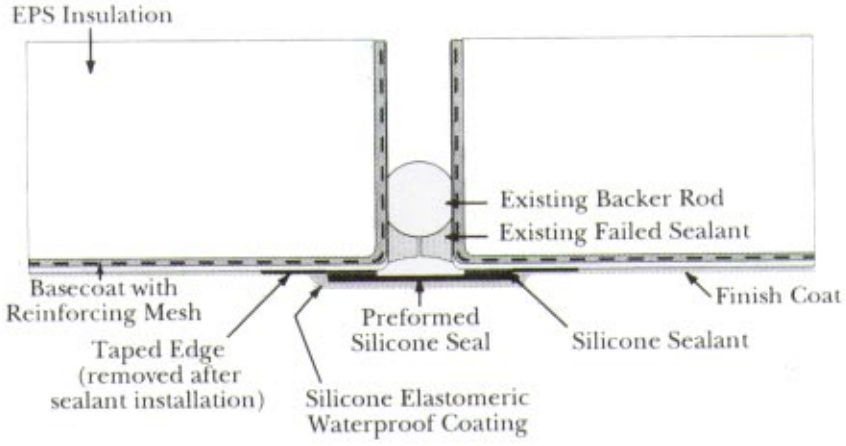


Figure 3. Joint Overlay Restoration Using Preformed Silicone Seal and Silicone Elastomeric Waterproof Coating



adequate recess. Also, if the original finish coat was applied to the inside of the joint, care must be taken to assure that the new sealant will adhere to this coating. Use of a low-modulus silicone, such as Dow Corning® 790 Silicone Building Sealant, will greatly reduce the risk of coating delamination.

Sealant Removal. The second repair method is to remove all the existing sealant and reseal the joint. This is usually accomplished by cutting out as much of the existing sealant as possible and removing the old backer rod. The next step is to abrade the surface to remove all traces of the old sealant from

EIFS CONSTRUCTION DELIVERS DESIGN FLEXIBILITY AND COST EFFECTIVENESS.

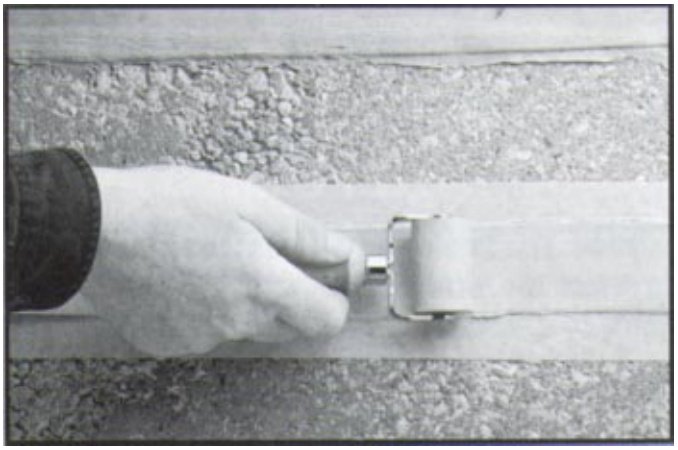
the EIFS and the adjacent metal surfaces. Any existing finish coat inside the joint should be removed as well. Abrading must be done with extreme care to avoid damaging the base coat and reinforcing mesh.

A polyurethane sealant that has reverted will have a gummy texture, making it extremely difficult to remove without solvents, which can damage the underlying foam insulation board. A different repair method may be more appropriate in this case. While normally labor-intensive and costly, sealant removal may be the most cost-effective methods of joint repair where the failure is due to finish coat delamination and the sealant has not reverted.

Joint Reconstruction. Reconstruction of an EIFS joint is the most costly and labor-intensive method of joint restoration. It involves cutting into the EIFS and reinstalling the base coat, mesh, color primer and finish coat. This method would be appropriate if the original joints were too small to accommodate joint movement or if a new penetration such as a window or air conditioner is being installed. (See Figure 2, page 27.) The EIFS manufacturer should be involved in supplying specific procedures and materials to match the original ones.

Joint Overlay. This repair method allows for cost-effective waterproofing without joint reconstruction or sealant removal. An overlay joint, also called a bridge joint, spans the existing sealant joint. Traditionally, these joints have been applied in the field with a wet sealant. Such field-applied silicone overlay joints have a proven track record of performance on EIFS. Now a new preformed silicone extrusion, Dow Corning® 123 Silicone Seal, makes this type of repair easier and more attractive. A bead of silicone sealant is applied on either side of the joint and the preformed extrusion is installed over it, bridging the failed sealant joint. (See Figure 3, page 27.) The finished joint has excellent movement capabilities and exerts little stress on the EIFS panels. When a building is resealed with the preformed silicone seal and coated with a silicone elastomeric waterproof coating, it is protected by a seamless skin of silicone that prevents leaks and resists degradation.

Wall Restoration. Restoration of the EIFS wall beyond the existing joints can be complex enough to warrant calling in a qualified EIFS consul-



Surfaces should be clean and dry before applying sealant on either side of the joint. Masking tape may be applied on the outside edges of the sealing area to ensure good aesthetics.

tant. If the wall is essentially sound, however, it can be waterproofed and restored with silicone sealant and elastomeric coating. A coating like Dow Corning® AllGuard Elastomeric Coating can bridge hairline cracks up to 1/16 inch. The coating accommodates movement, adheres to silicone sealant in the joints and "breathes" to allow moisture vapor to escape from the interior. Cracks larger than 1/16 inch may indicate the need for an expansion joint, and an EIFS expert should be consulted.

EIFS construction delivers design flexibility and cost effectiveness. Projects that are installed or restored with silicone sealants and coatings also deliver reliable waterproofing and weather protection. New materials like preformed silicone seals and silicone waterproof coatings make EIFS restoration more practical and successful now than ever. Detailed information about restoration techniques may be obtained from manufacturers of sealants and of EIFS systems.