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THE BUILDING ENVELOPE

Myths and Realities on Maintaining EIFS

By Martin Gerskup, OAA

MANY condominium buildings are clad with an attractive EIFS (exterior insulation and finish system) building cladding system that has the colour, appearance and texture of stucco. However, many corporations are now facing high-priced repairs that exceed the costs associated with traditional stucco wall systems.

EIFS are exterior wall cladding systems that are cost effective, energy efficient, attractive and easy to maintain.

One myth is that all buildings clad with EIFS are doomed to suffer the fate of the Vancouver leaky condos of the 1990s. The reality is that all buildings require major repair or maintenance work during the

course of their service lives, and EIFS-clad buildings are relatively simple to maintain.

As with most wall systems, EIFS performs well when properly designed and built, and the cladding system should last more than 30 years. However, there are many myths surrounding the performance of EIFS.

■ Myth 1 — System Performance

The first myth is that EIFS building cladding systems do not work and are not repairable. The reality is that most EIFS failures are the result of inadequate design, lack of understanding of the system or the failure of the installers to perform their

work properly.

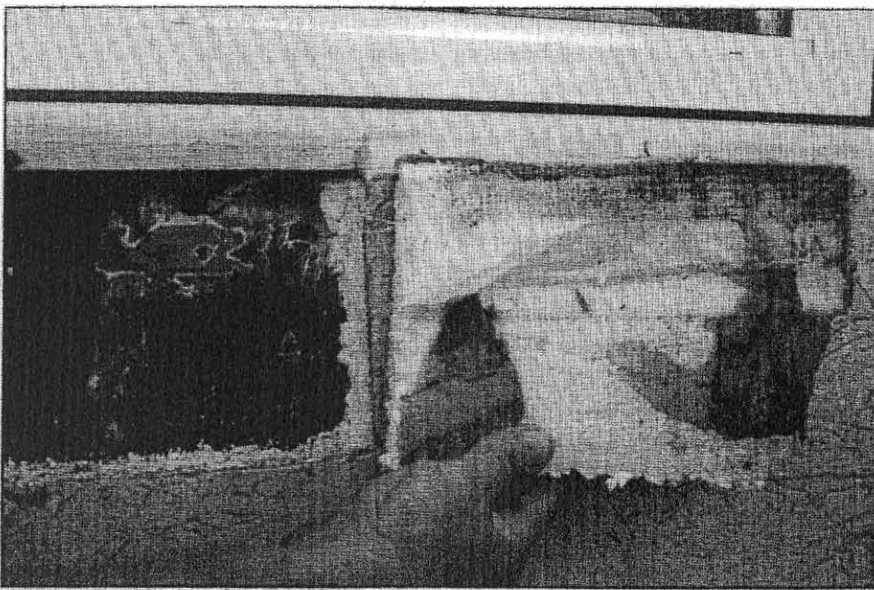
Performance failures are often attributed to deviations from contract documents, manufacturer's guidelines or acceptable application practices. This often results in the replacement of the EIFS cladding far in advance of the date indicated in the corporation's reserve fund study, creating economic harm to the corporation.

Many corporations do not even know that a problem exists with EIFS until long after extensive damage has occurred to the cladding and other exterior wall components.

The key to a successful maintenance program is in pinpointing the source of the problem. Many exterior wall failures are caused by a

Repairs should only be undertaken after all factors have been identified.

Face-sealed EIFS have resulted in a disproportionate number of EIFS failures over the years. Face-sealed EIFS are wall systems that are not drained or vented. The performance of face-sealed systems is questionable because there is no provision to allow water to escape from the system. What may appear as a seemingly minor defect in a face-sealed EIFS cladding, such as very minor cracking, often becomes the symptom of a serious mode of failure owing to the entrapment of moisture. EIFS cladding systems can retain an appreciable quantity of water, which will result in significant moisture damage to many of the components concealed within the exterior wall assembly.



EIFS conditions requiring repair or maintenance.

Some problems are so severe that a complete replacement of the EIFS system becomes a necessity. Defective EIFS can either be removed and replaced or clad over with a new EIFS system.

The reality is that a significant number of problems could have been avoided with the selection of a drained and vented EIFS. Most EIFS manufacturers now offer a plethora of both drained and vented systems that should be considered during the repair and maintenance of EIFS clad buildings.

Sometimes it is the performance of the existing building wall beneath the EIFS that creates the initial problem. The walls of many older masonry buildings were clad with EIFS as a cost-effective alternate to removing the existing deteriorated materials.

The application of EIFS over top of building materials exhibiting evidence of distress can have a potentially adverse consequence. The structural integrity and adequacy of the existing building must be carefully considered prior to proceeding with the application of EIFS.

Perhaps the biggest concern is over the continued use of plywood or paper-faced gypsum sheathing. Plywood and paper-faced sheathing

materials are subject to significant moisture damage and mould growth problems. The selection of a suitable substrate is of paramount importance during the repair and/or maintenance of EIFS.

For projects that will rely upon the adhesive attachment of the EIFS materials, adhesive bond strength tests should be performed to ensure that the substrate is capable of supporting an EIFS installation.

Removal and replacement of the existing EIFS permits the full inspection of the underlying wall structure to assess the adequacy of the substrate and structure.

However, the removal of existing EIFS carries the risk of incurring additional moisture damage if adequate

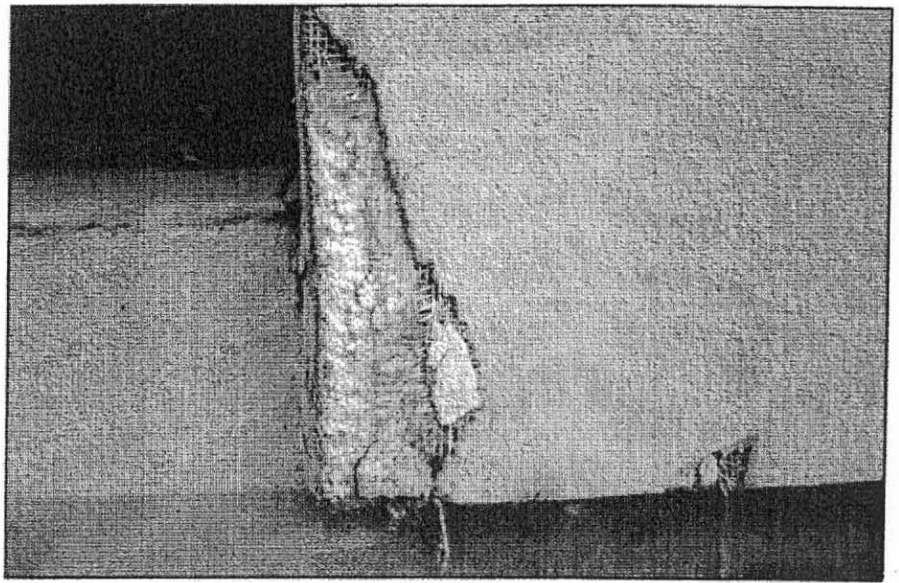
precautions aren't taken to protect the building walls from adverse weather during the repair work.

To avoid problems due to inexperience, the references of EIFS applicators should be obtained in advance of awarding any maintenance work.

■ Myth 2 — Durability

The second myth is that buildings finished with EIFS are not durable. The measure of the durability of a wall system is the cost of maintaining its performance level over time. It is therefore necessary to define the expected performance level of an EIFS wall system and its anticipated service life.

Performance issues are being considered in the development of per-



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formance-based standards for EIFS. These standards will provide criteria and standard test methods for assessing water penetration resistance, moisture absorption, puncture and impact resistance, and other performance properties.

All EIFS manufacturers prescribe a minimum application temperature of about 4°C to avoid weather-related problems. Scheduling of EIFS repair work is critical to avoid damage to the coating materials from freezing temperatures.

Cleaning procedures must take into consideration the unique nature of EIFS coatings, which tend to soften when exposed to moisture for extended periods of time. Consequentially, EIFS should be washed or cleaned in a careful fashion.

Surfaces showing evidence of cracks or deterioration should not be cleaned, but repaired.

Remedial coatings can be applied directly to EIFS when the original coating fades, but cannot be relied upon in addressing any performance-related problems that require remedial work.

Experience has demonstrated the relatively low cost associated with the maintenance of EIFS cladding systems.

■ Myth 3 — Cracking

Cracking of the coating is one of the most frustrating problems encountered with EIFS. Cracks are often found at the corners of windows and doors, and are often attributed to the failure of the installers to properly abut the insulation boards and/or install reinforcement mesh.

All EIFS have a reinforcement layer that provides both tensile strength and impact resistance. The most common reinforcement is fiberglass mesh embedded in the base coat of

the EIFS system. Fiberglass mesh is manufactured in various weights or densities. Strip mesh is available for use around window and door openings, and is often installed in a diagonal pattern at locations where high stresses are anticipated.

Any new mesh provided during EIFS repairs must be fully encapsulated in the wet base coat, and must overlap the old mesh to prevent the formation of new cracks.

The poor abutment of insulation boards may necessitate the localized

removal of the EIFS coating in order to repair the existing insulation, which can be “routed” and repaired in accordance with the manufacturer’s recommendations.

Some cracks are due to the absence of control and/or expansion joints. Control joints are intended to relieve stresses within the EIFS coating materials, whereas expansion joints relieve movement stresses between separate wall components.

The inadequate placement of control and/or expansion joints

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will result in the development of cracks at areas of unrelieved stresses. Repair and maintenance plans should anticipate the provision of joints at all locations of differential movement.

■ **Myth 4 - Impact and Puncture Resistance**

The fourth myth is that EIFS building cladding systems are prone to problems related to impact damage. Impact damage provides a potential path for water to enter the system.

The reality is that most systems are manufactured, designed and installed to resist normal impact-generated damage. High-performance mesh can be specified for maintaining building areas expected to be exposed to an increased risk of damage from maintenance and landscaping activities. However, areas subjected to frequent and repeated impact, such as loading docks, may require a more durable wall material.

With proper inspection most deficiencies can be discovered in time to be corrected.

■ **Myth 5 - Fire**

The final myth is that EIFS are combustible because of the foam plastic components of most EIFS wall systems. EIFS manufacturers have developed foam plastic insulation materials that have been treated with fire-retardant additives. Most building codes specify allowable flame spread ratings for foam plastics and the fire resistance ratings of EIFS wall assemblies.

The reality is that foam plastics are combustible materials, and there remains much controversy over the fire risk of EIFS.■

Martin Gerskup is the president of BEST Consultants, former president of the Ontario Building Envelope Council (OBEC) from 1993 to 1994, and currently a member of the ULC Thermal Insulation Committee. He has taught as an assistant adjunct professor and tutor at the University of Toronto Faculty of Architecture, Landscape and Design, and for the Faculty of Engineering and Applied Science at Ryerson University.