The Right Choice

Choosing Retrofit Options Will Enhance EIFS Share in Growing Renovation Market

by William F. Egan
Manager, Technical Services, Senergy, Inc.

The renovation of AstroMed, Inc.’s corporate headquarters included the addition of an exterior colonnade and stairwell on the east side of the building and exterior columns on the west side.

Recladding an existing building is sometimes a difficult task—even with versatile exterior insulation and finish systems (EIFS)—largely because of unknown or hidden conditions that often exist.

However, if you follow a few simple retrofit guidelines outlined here you can reduce your risk as well as become a leader in the EIFS industry.

The substantial EIFS potential in the renovation market depends on the same design versatility, quality installations, energy conservation value and cost-effectiveness that have contributed to the tremendous growth and acceptability of EIFS since their introduction to US markets over 20 years ago. However, until now, most EIFS use has been for new construction. The trend now is toward much greater use of EIFS for renovations.

This EIFS trend is concurrent with the general construction industry trend for renovations to outpace new construction. In 1986, for example, more than half the nonresidential construction expenditures in the United States were for renovations, maintenance and repairs with more than 60 percent of that amount going for improvement. Construction industry experts today predict that renovations, or improvements, will outpace new construction by 1995.

Since EIFS are particularly well suited to renovation, the EIFS business offers applicators a major opportunity for growth. In this period of slow economic recovery, the cost effectiveness of EIFS vis-a-vis other types of popular wall systems certainly is a major advantage. While each project and system must be evaluated on an individual basis to determine accurate costs, general construction cost data provided by such firms as R.S. Means Co.,
Kingston, MA, offers typical comparative cost data for numerous products and systems in new construction. (See Figure 1 for a sampling of installed construction costs for a variety of wall systems.)

Cost-effective for Retrofits

An EIF system often provides additional savings in retrofit situations and may be more competitive than shown in Figure 1 largely because its relatively light weight and easy adaptability to a wide range of building conditions enable it to be installed without the costly structural and substrate modifications often required by heavier and/or less easily worked materials. Relatively quick and easy application as well as inexpensive, decorative architectural shapes also contribute to cost-effective renovations.

Energy savings afforded by the insulation board add to the system’s economic attractiveness compared to wall systems that offer relatively low R-values. Projected payback periods based on energy savings may be calculated for particular projects.

Despite these very tangible cost benefits, possibly the most dramatic value of EIFS to a building owner maybe the total architectural transformation that can turn almost any building into a stunning structure. Such a building can attract new tenants or customers and even serve as an anchor in reviving an entire business community.

Substrate Analysis is a Key Difference

The well-executed retrofit application depends heavily on proper substrate analysis. This is a major area in which EIFS retrofits differ from EIFS new construction work.

The importance of judicious evaluation of the type and condition of the old substrate to which the EIFS will be attached as well as the right choice of application methods and system options cannot be overemphasized since it can affect the cost as well as the quality of the installation. The importance of attaining long-lasting reference quality projects in the retrofit market is one reason for the great emphasis on training new applicators and introducing new products and techniques to journeymen applicators.

Although the project requirements will be evaluated by the architect and/or engineer (see Figure 2) the EIFS applicator also should review the existing conditions prior to starting the application and advise the architect or engineer if there are any adverse conditions. In all cases, considerations such as the type of substrate, systems options and detailing are best reviewed by the manufacturer’s technical representatives to ensure they comply with recommended procedures.

The guidelines in Figure 3 cover most typical situations and considerations for retrofit projects. In practice, however, each retrofit presents a different set of challenges as illus-
In planning the expansion of AstroMed, Inc.’s corporate headquarters in West Warwick, RI, two major concerns of architect Richard Hunt were:

• To create an aesthetic statement while adding a second floor designed as a completely open clear-span structure on top of a structure originally built to accommodate a second floor expansion with interior columns.

• To solve a condensation problem that occurred with the existing masonry wall which had created problems with the exterior paint.

An exterior colonnade and stairwell on the east side of the building as well as exterior columns on the west side met the first challenge, and the relatively light weight of the EIFS helped minimize the additional structural support required.

Another type of treatment was used on the Largo Medical Complex, Largo, FL. The condition of the existing painted stucco finish was checked, and it was determined that the insulation board could be applied after the surface was cleaned with a pressure water system and treated with a Senergy surface stabilizer before applying standard adhesive base coat to attach the insulation board over the painted brick and painted block, with special attention paid to 6-in. and 8-in. thick decorative shapes. No fasteners were used over the glazed ceramic tile, which was treated with a special adhesive base coat. The exposed aggregate surface, which was embedded in an epoxy matrix, was covered with two-in. insulation board and a thicker than usual adhesive base coat to help level the surface, then secured with mechanical attachments.

These are just a few examples of different EIFS retrofit solutions for existing substrates in a variety of conditions. The point is that each retrofit candidate is a unique case...
and requires individualized attention. While this may at first seem onerous compared to standard procedure used for new construction, EIFS manufacturers who want to prosper in the growing retrofit market are making it easy for applicators to enter the renovation market.

System Options

Other retrofit system options follow guidelines that are generally standard for new construction. This includes determining whether a Class PB or Class PM system should be used. The typical adhesive-fastened Class PB system is used on most surfaces, and the more impact-resistant, mechanically fastened Class PM system is used in high traffic areas or on substrates that are not suitable for adhesive-fastened EIFS.

Most retrofit work still is done most economically with on-site application, and panelization is used more often on new construction projects than on retrofit projects. However, prefabricated panels may be ideal for retrofit where many duplicate windows or doors are to be removed and replaced with EIFS.

**EIFS. . . can turn almost any building into a stunning structure.**

**Such a building can attract new tenants or customers . . .**

![Figure 1](image1)

**Figure 1**

**Typical Retrofit Conditions**

- Determine if there are planar irregularities,
- Check the integrity and soundness of existing paints or coatings,
- Perform adhesion tests and/or fastener pullout (tensile load) tests if chalking or flaking paint or coatings, mildew or residue may require special surface conditioners or fasteners to supplement adhesive base coat.
- Assess possibility of condensation occurring within wall system, noting sealers and coatings on existing walls. If possibility exists, conduct water vapor transmission analysis to help determine appropriate solution.
- Note existing doors, windows and HVAC/utility penetrations where EIFS will require additional or new flashing and sealant.
- Check plans for any new placements of doors, windows or other penetrations.
- Determine if planned expansion joints are adequate (typically required where different materials abut and at manufacturer-recommended distances).
- Review details with EIFS manufacturer’s technical service department to ensure proper handling.
- Determine optimum insulation board thickness and/or R-value.
- Select system class and determine method of attachment.

![Figure 2](image2)

**Figure 2**

**Typical Exterior Wall System Costs**

<table>
<thead>
<tr>
<th>Description</th>
<th>Typical installed cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated siding, fabric-reinforced synthetic exterior finish on 1 in. (25.4 mm) polystyrene insulation board (EIFS). Add $0.78/ft² ($8.39/m²) for 2 in. (50.8 mm) polystyrene.</td>
<td>$5.40/ft² ($58.13/m²)</td>
</tr>
<tr>
<td>Simulated brick including mastic, cement base.</td>
<td>$8.05/ft² ($86.65/m²)</td>
</tr>
<tr>
<td>Simulated stone face including mastic.</td>
<td>$11.75/ft² ($126.48/m²)</td>
</tr>
<tr>
<td>Steel siding, colored, corrugated/ribbed on steel frame 24-gage.</td>
<td>$2.42/ft² ($26.05/m²)</td>
</tr>
<tr>
<td>Aluminum siding, 0.019 in. (0.48 mm) thick on steel construction, painted.</td>
<td>$2.21/ft² ($23.79/m²)</td>
</tr>
<tr>
<td>Metal facing panels field-assembled over 5,000 ft² (464.5 m²) 16-gage aluminum exterior, 1-1/2 in. (38.1 mm) fiberglass and 18-gage galvanized steel interior.</td>
<td>$11.05/ft² ($118.95/m²)</td>
</tr>
<tr>
<td>Wood siding, sheets, texture 1-11, cedar, 5/8 in. (15.86 mm) thick, two coats stain, sprayed.</td>
<td>$2.16/ft² ($23.25/m²)</td>
</tr>
<tr>
<td>Stucco, three coats 3/4 in. (19.05 mm) thick with mesh, masonry construction, colored, trowel-finished.</td>
<td>$3.08/ft² ($33.15/m²)</td>
</tr>
<tr>
<td>Steel siding, factory sandwich panel, 26-gage, 1 in. (25.4 mm) insulation, galvanized, colored one side.</td>
<td>$6.15/ft² ($66.20/m²)</td>
</tr>
</tbody>
</table>
Before the renovation at AstroMed, Inc., condensation within the existing masonry wall had created problems with the exterior paint.

**Renovation — cont’d from page 10**

Thicknes of insulation board may be affected by the different protrusions or fenestrations to be covered on existing buildings. Thermal resistance also may be of special concern to owners of buildings that experience high heating and air conditioning costs. Consequently, the optimum insulation board thickness should be determined and utilized.

By choosing the right system options and paying proper attention to quality installation tailored to specific retrofit situations, applicators can take full advantage of the great EIFS potential for substantial business growth.

---

**About the Author:**

William F. Egan is Manager of Technical Services for Senergy, Inc. where he supervises the research and development department as well as the technical services department. Bill joined Senergy in 1981 as a technical service representative and was promoted to manager of technical services in 1986. He holds a BS degree in civil engineering from Roger Williams College, Bristol, RI.

Bill has served on the Exterior Insulation Manufacturers Association Technical Committee since 1983 and is a member of the ASTM C11 Committee on Gypsum and Related Building Materials and Systems.

---

**Common Retrofit Application Options**

<table>
<thead>
<tr>
<th>Class of System</th>
<th>Substrate type/condition</th>
<th>Substrate preparation options</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB (Adhesively fastened)</td>
<td>A) Unpainted and uncoated stucco, unit masonry, concrete, and wood based sheathing.</td>
<td>1) Remove dirt, mildew, etc.</td>
</tr>
<tr>
<td></td>
<td>B) Painted or coated stucco, unit masonry, concrete and wood based sheathing.</td>
<td>1) Sandblast existing surface to remove paint, coatings, etc. 2) Attach metal lath or sheathing to the existing substrate. 3) Remove dirt, mildew, loose paint/coatings, etc. Apply manufacturer’s adhesion intermediary or primer. 4) Remove dirt, mildew, loose paint/coatings, etc. Install mechanical fasteners following adhesive application.</td>
</tr>
<tr>
<td></td>
<td>C) Unpainted and uncoated tile, glazed unit masonry and metal buildings.</td>
<td>1) Attach metal lath or sheathing to the existing substrate. 2) Remove dirt, mildew, etc. Apply manufacturer’s adhesion intermediary or primary.</td>
</tr>
<tr>
<td>PM (Mechanically fastened)</td>
<td>All of the above.</td>
<td>1) No special substrate preparation typically required.</td>
</tr>
</tbody>
</table>

---

Footnotes: