‘Green’ Currency: Retrofit, New-Building Projects Deliver High-ROI Upside

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The path to achieving “green” or “sustainable” objectives in design, construction and building renovations can be paved with different building blocks, and charted with varying approaches.

Exhibit A: The historic Lido Beach Towers in Long Island, N.Y., recently received an energy-efficient EIFS retrofit yielding a nearly 33% decrease in energy bills.

Photos courtesy Sto Corp.

Certainly, no two projects present the same challenges—or opportunities.

Cases in point: Two recent projects employing sophisticated, technologically advanced building-envelope and air-barrier systems.

Exhibit A: A hotel retrofit project employing an EIFS cladding system and integrated air/moisture barrier.
Exhibit B: A new high-rise, affordable-housing project that combines liquid- and sheet-applied air-barrier systems to deliver maximum efficiencies.

A toast to EIFS retrofit
“So long sad times,_Go along bad times_We are rid of you at last.”

For one historic hotel-turned-condominium community with an energy-efficient EIFS retrofit yielding a 33% decrease in energy bills, perhaps a reference to the “Happy Days” theme is in order.

Renovations under way at Lido Beach Towers

And Barbara Streisand might agree. She, Sammy Davis Jr. and Connie Francis were just a few of the stars who performed in the nightclub inside this once-glamorous retreat.

Built in 1929, the bright, bubble-gum-colored Lido Beach Towers in Long Island, New York, was nothing short of exclusive. In its heyday, “The Pink Lady,” as it was
nicknamed, was a 300-room seaside resort, complete with twin Moorish-style cupolas, indoor and outdoor pools, a golf course, beach cabanas and a restaurant with a retractable roof.

In time, the magic of the seaside destination faded and the hotel eventually succumbed to the fate afflicting so many other former resort hot spots: condominium conversion.

Following the 1981 conversion, the pink exterior was replaced by a drab-colored coating (applied over stucco on terra-cotta block walls). The facility, already showing its half-century age, spiraled into another 25-year slide.

Countless thermal issues, water leaks and various other nightmares haunted the once-great zinfandel beauty during this time. The building owners attempted various surface treatments to patch up the leaks, but the owners soon learned that these band-aids were no cure.

The condo’s ownership board quickly realized the futility of such stopgap measures when a budget established with the idea of fixing all the exterior stucco ran out after work was completed on just one wing.

The ultimate makeover solution came with a $15 million price tag and consisted of a new “green skin”—an Exterior Insulation and Finish System (EIFS) retrofit—new balconies, doors, windows, roof, and replacement of both cupolas.

The board enlisted the Huntington, N.Y.-based engineering firm P.E. Consulting Engineers, retaining its principal, Jordan Ruzz, to conduct a “peer review” of the various building-upgrade recommendations and draw up his own blueprint for the project.

More than 100 water leaks plagued the building, Ruzz noted in his initial report. The original heat-pump sleeves made of ordinary steel were rusted, and condensation produced by exterior air-conditioning units had leaked into the exterior walls, wreaking havoc in the units below.

Air leaks were just as pervasive, according to the report.

As a remedy, Ruzz recommended StoTherm Premier NExT® EIFS, a system that would essentially thermally “wrap” the building in 3 to 4 inches of insulation. The manufacturer is Sto Corp. (Atlanta, Ga.).

His decision turned on the building’s climatically exposed location, its age, Sto Corp.’s dew-point analysis, and the alternatives of doing nothing other than continual maintenance with no ROI (return on investment).

Ruzz also noted, “We were working on an occupied, operational building, so we needed to accomplish all this with minimal disruption to normal life.”

Knowing EIFS would address the hydrothermal leaks in the structure, Ruzz said he faced an immediate challenge—“how to best attach the EIFS, since much of the existing surface of the building was cracked, disbonded and loose.”

Ruzz and waterproofing contractor Anthony Colao of Flag Waterproofing & Restoration (Elmont, N.Y.) were concerned that while fasteners might hold, the existing surface
would loosen. Also, thanks to many surface treatments applied over the years, the walls were not square and “plumb,” which made it difficult to attach anything and make it come out straight, he said.

A different ‘angle’
Ruzz and Colao developed a solution to address the inherent unevenness of the surface: a Z-channel arrangement composed of two attached L-angles. The angles were 10-foot sections of 18-gauge galvanized steel placed vertically on the building at 16-inch intervals.

“We took the first angle and conformed it to the uneven surface by cutting the perpendicular leg of the angle where necessary, so the angle bent into the unevenness,” Ruzz explained.

Once the team had the first angle firmly affixed to the building, using ZEMAC nail-in fasteners or screws, they attached the second angle—fabricated to be straight—to be perpendicular to the first.

Sto, in its review of the project, said the beauty of the Z-channel arrangement was that, whether or not the perpendicular portion of the first angle needed to be “cut-and-gathered” (roughly two-thirds of the building’s wall required it), it offered a flat surface to which the second angle could be affixed.

The other half of the second angle, a surface now parallel to the plane of the wall, offered the requisite flat and plumb surface on which the gold Georgia-Pacific DensGlass® sheathing was mounted.

Supplemental insulation
As mentioned, Ruzz had taken into account Sto Corp.’s dew-point analysis of the system. The analysis concluded that the team needed to minimize airflow behind the sheathing (in the space created by the two angles), and recommended two insulating strategies.

First, the company prescribed affixing 15-inch-wide pieces of 1-inch expanded
polystyrene (EPS) insulation board directly to the building wall in the 16-inch interval between each set of angles.

Second, since the walls’ irregularities created varying gaps between the DensGlass and EPS, the company proposed spraying expandable foam between the two—every eight feet vertically—to fill the cavity and ensure a firm, plumb surface on which to affix the EIFS. The sheathing was coated with StoGuard waterproof air barrier as the final layer prior to EIFS installation.

**EIFS-with-drainage model**

The Lido project offered an opportunity to employ an innovative variation on the normal EIFS model. Because it is vapor-permeable, the EIFS can handle small amounts of incidental moisture, but if a poor-quality window leaks gallons of water into a wall assembly, a problem results if the water can’t get out.

Thus, Sto designed a process by which rough window openings are protected with flashing before the window goes in, in order to deflect water away from the wall. EIFS-with-drainage specifies that waterproof StoGuard (the last step before the EIFS) be installed with vertical ribbons of adhesive, so any incidental water that penetrates the EIFS can drain between those ribbons and exit the wall assembly.

**Standing guard…**

Unavoidable project delays meant that, in some areas, the StoGuard-coated DensGlass sheathing sat out exposed for nearly a year before EIFS was installed—the only protection the building had. In areas where the sheathing had been exposed for longer than six months, another coat of StoGuard was applied to ensure proper adhesion of the EIFS.

Throughout the construction process, Ruzz and Colao worked closely with Sto engineering, formulating details on windowsills, heat-pump sleeves, door penetrations, and balconies, to ensure drainage planes remained intact and construction complied with design principles of the “EIFS-with-drainage” model.

Colao noted, “This was a team effort from start to finish.”

**Energized about savings**

The Pink Lady’s insulating facelift has returned the glow of youth—and delivered something more tangible in “green” terms.

Before-and-after data from the power bills of five units has provided “empirical proof” of energy savings and insulation benefits of the EIFS retrofit. The data collected reflected an average savings of 32.5%.

Currently steps are being taken to obtain aggregate before/after power-usage statistics on the entire building, Sto said.

“So, let’s sing a song of cheer again,—Happy times, Happy nights,—Happy days are here again.”

**A high-five to air-barrier solutions**

Designed with “green” principles at the forefront, the Hobbs Court on East 102nd Street in New York, N.Y., offers another example of high-performance air-barrier and
Hobbs Court, designed by MHG Architects (New York), is a nine-story, two-tower, 259-unit affordable housing building comprising a variety of studio to three-bedroom apartments. The newly constructed facility replaced 12 deteriorated walk-up buildings on the site and is the work of Phipps House, a non-profit developer of housing for low- and moderate-income families, on land owned by the NYC Housing Authority.

Exhibit B: Hobbs Court, a new high-rise, affordable-housing project in New York City, was designed and built with liquid- and sheet-applied air barrier systems to deliver maximum energy efficiency. Photo courtesy of Lettire Construction Corp.

The Hobbs Court project operated on a “very tight budget,” thus presenting difficulties in financing of construction corrections, said Matthew Kelly, vice president of Phipps Houses.
“We have one shot at doing it right, so it’s especially important we build a quality, durable building,” Kelly said.

The building also includes community-facility space and a below-grade garage.

**The challenge**

With the building’s wall design well-insulated on both the outside and inside, the project required a permeable or “breathable” air barrier that would protect against the damaging effects of air and water ingress—impermeable to liquid water while allowing exit of water vapor from the wall assembly.

Improper air-barrier selection and installation can cause building moisture problems, wasted energy and potential efflorescence on the outside of buildings, issues that only add to the urgency of proper selection of high-performance products and ensuring the job gets done right the first time.

A key to this focus on the details was proper installation of the air barrier—particularly in areas prone to water ingress, such as the transition from below-grade waterproofing to the above-grade air barrier, detailing around the windows, and around electrical conduits.

Below grade, with the building being constructed in an area with a high water table and environmental concerns, waterproofing also assumed great significance.

**Devising the formula**

The project architect selected a Grace Construction Products (Cambridge, Mass.) Perm-A-Barrier® air-barrier system for the job. First, a self-adhered sheet barrier, Perm-A Barrier VPS, was applied on 120,000 square feet of above-grade exterior walls of the building.

Self-adhered air barriers do not require any special equipment, such as spray systems or rollers, and offer the advantage of uniform, factory-controlled thickness, said Jane Wu, Grace Construction product marketing manager, specialty building materials.
The project team also installed the company’s Perm-A-Barrier VP, a fluid-applied, vapor-permeable air barrier (applied with roller as an approved alternative application method) onto 30,000 square feet of CMU block construction.

Grace’s Wu noted that fluid-applied air barriers offer a seamless membrane that reduces the chances of voids or gaps at joints or other transition areas. Other attributes are faster installation and ease of detailing around brick ties and other penetrations.

The company says the sheet- and liquid-applied membrane systems permit the diffusion of water vapor that could otherwise condense in the wall structure, but keep liquid water out, which allows the products to act as a waterproofing drainage plane.

Both systems also protect against the effects of air and water ingress that can damage buildings, and prevent air infiltration to minimize energy loss, the company says.

As a measure against water penetration below grade—given the high water table and to protect against potential environmental issues—Grace’s Preprufe® 300R was used under the approximately 80,000 square feet of slab. Preprufe is a proprietary pre-applied waterproofing system that affixes to concrete with a reported 100% fully-adhered adhesive bond, according to product literature.

In addition, Grace’s Bituthene® 4000 was used on 25,000 square feet of the outer vertical walls at the foundation. Bituthene is a fully-adhered waterproofing membrane that is applied after the concrete is poured.
In its review of the project, Grace said the combination of waterproofing and air-barrier systems represent “an investment that they (the building owners) expect will pay dividends for years to come.”

The general contractor for the project was Lettire Construction Corp., based in New York.

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