The Facelift is More Than Cosmetic

A Partial Exterior Renovation in Cleveland Provides Removable Walls Plus a 60% Savings in Heating Bills.

A partial facelift of the old Penn-Lillis Building—a six-story printers’ building in downtown Cleveland—slashed its heating costs a phenomenal 60 percent, added outside wall removability for the installation of new equipment, and aesthetically transformed a decaying exterior.

The renovation project, which cost less than $90,000, is expected to pay for itself with a few years of fuel savings. It was made possible through the use of lightweight steel framing as a curtain wall, incorporating a tight-sealing exterior insulation system.

The six-story (plus basement) Penn-Lillis Building, constructed in the early 1900’s, is located at East Second and High Streets. Occupying 35,000 square feet, it was built with structural steel framing and, before the remodeling, had an exterior of non-bearing, metal-clad bays over wood spandrels and windows, separated by masonry piers.

Says Cleveland architect Hugo L. Klopper, of Christian & Klopper: “The building’s exterior was in such poor shape that rotting wood windows were about ready to fall out. Besides the obvious danger, cracks and infiltrations were resulting in enormous heat losses and the owner requested a complete exterior repaneling from the second through the fifth floors.
“Our charge was to replace a total of 32 bays (eight vertical bays, each four stories high). This was to secure the exterior, increase insulation values, and modernize the facade.

“In addition, a method had to be devised for removal at any time of one outer wall section per floor, so that new printing machinery could be brought in whenever needed. And it all had to be accomplished without adding any weight to the building’s structure.”

**Steel Framing Selected**

According to Klopper, various alternatives were considered. The choice decided upon was a steel stud framing system that would completely cover each bay area and encompass insulation as well as a protective finish. By employing two thicknesses of insulation and recessing the windows, a “relief” facade effect would be created.

Since a busy city site was involved, and an already-erected and occupied building, there was no space for on-site fabrication work, a prime reason for selection of the steel framing system. With it, walls could be prefabricated and completely pre-panelized elsewhere, then shipped to the building for installation. Moreover, with little information available on the building’s structure, no chances could be taken with additional loads.

The light framing system, plus its covering, was designed to equal the original weight — approximately 1,200 pounds — of the building’s exterior panels.

Steel framing components were welded into 32 wall panels. Illustrating the system’s design flexibility was the fact that misalignments in the existing structure and a lack of dimensional consistency in the bays required each panel to be different. Panels thus ranged in size from 12’ x 12’ to 12’ x 16’.

Once prefabricated, the wall framing was shipped to Donley’s Inc., in Cleveland, for full panelizing. Applied first was the 1/2" gypsum sheathing, followed by set-in of all window frames and glazing. Adhesive-bonded to the sheathing were 1" and 3" thicknesses of expanded polystyrene insulation board, surmounted by a reinforcing fiberglass fabric, embedded in adhesive.

**Synthetic Plaster**

The exterior surface, Quarzputz, is a synthetic plaster material, used in beige and white, and troweled to the desired stucco-like texture to provide a weatherproof finish.

Just prior to shipment of the completed panels to the building, via flat-bed truck, the old, worn exterior was pried off and hauled away. Demolition and preparatory work, done bay by bay, took two days for each vertical, four-floor bay.

Temporary construction wills of wood stud partitions covered with plastic sheeting allowed the building occupants to pursue their normal business activities.

The bay openings were prepared...
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for installation of the new panels by welding angle clips to the existing steel floor beams. Hoisted by crane, each panel was positioned at its designated site, aligned in all directions and then bolted at top and bottom to the clip angles. The end studs of each panel were also bolted to the building’s masonry pilasters. Once each bay was completed, caulking was applied in all joints between panel and building. The contractor installed the panels at the rate of one four-floor bay per working day.

**Special Construction**

To attain the requested removability feature, each steel framing on all floors of one vertical bay was specially constructed as a “panel within a panel.” When serving its building enclosure role, the inner panel is bolted to the outer. When new equipment is to be delivered or old machines taken out, the bolts can be removed and the space opened up from the inside of the building. To close up the space, the panel is re-bolted.

According to Alex Kariotakis, of the Penn-Lillis Building Corp., the remodeling project and its vastly improved insulation qualities resulted in more than a 60 percent savings in steam heat costs. In fact, it is now so well insulated that several radiators per floor have been taken out of service. In addition, the new exterior is maintenance-free, with no need for periodic repainting.

The building plans a similar project for its top and bottom floors this year, using the lightweight steel framing and insulation/finish materials.