Getting the Most From Steel

There's Little That Steel Can't Do in Modern Construction—And Steel and Brick Make a Fine Combination

By Bill Leach
Bostwick Steel Framing Company

When the Erie Insurance Group outgrew its existing office space in Erie, PA, anticipating continued growth, it set up a long-range development plan. The first phase, implemented in May, 1981, began with construction of a 200,000 square foot addition to the company's downtown headquarters buildings.

Because it would provide an expansive backdrop for, Perry Square, a downtown revitalization project, the new building was limited to four stories, with the third and fourth floors cantilevered seven feet beyond the second story wall. This provided a sidewalk green belt at the property line while conserving energy by dramatically reducing the amount of sunlight falling on first and second-floor glass surfaces.

To invite entry, the building's main entrance is recessed in an open angle at the southwest corner, and upper floors are set back above it.

The ground floor includes a lobby, office space, a 250-seat auditorium, and a 400-seat cafeteria. The other floors accommodate office space surrounding a four-story atrium. Topped by a glass panel roof that allows natural light to reach the inside offices through the full-height glazing, the atrium provides solar heating as well.

Special Capabilities Needed

The interior finishing package for the Erie Insurance building was a joint venture of the Gellin Company of Cleveland, Ohio, and AWCI member, Erie Acoustical Corporation of Erie, PA. The nature and size of the package required a sub-contractor with special and diverse capabilities, so the Gellin/Erie Acoustical combination's experience with light-gage steel framing made it a natural to furnish the interior finishing package.

Light gage steel framing consisted of 14 and 16 page galvanized Cee Studs and Track in 4" and 6" sizes, featuring use of Gee Studs in several different applications. These included inverted "J" framing sections below the window lines on the third and fourth floors. Gellin/Erie Acoustical prefabricated more than 1,000 "J" sections in a jig in their Erie plant and shipped them to the construction site as needed.

At the site, power fasteners were used to attach 6" track approximately 24 inches from the edges of the third

Steel Studs and Brick Veneer Test Advances Technology

The unfortunate controversy over whether or not a deflection limit of L/360 on metal studs alone, under full design wind load, will result in wall assemblies with deflections that will not cause cracking of the brick wall has been resolved.

The recent test conducted by Clemson University's Dr. Russell Brown had put the controversy to rest, under the test parameters: backup steel stud alone to L/360 of stud span is acceptable for brick facing.

With the strong encouragement—and $5,000 financing—provided by AWCI, along with a number of other associations, the Brick Institute of America and the Metal Lath/Steel Framing Association were able to go ahead with the tests and show that this system of construction was viable. The results are now being heavily promoted among design professionals—and more jobs such as the Erie insurance job described here will be made possible.

and fourth floor concrete slabs. A "J" section would be inverted and a shorter Cee Stud placed in the track and welded. Then the longer Cee Stud was welded to a clip fastened to an angle along the edge of the slab.

After the "J" section placement (16' O.C.), a track was welded to the lower ends of the Cee Studs. At 4 ft. intervals, kickers were welded between the "J" sections and either the steel decking or spandrel beams. Then a structural angle was welded to the lower track to provide a bearing member for the brick veneer.

Half-inch gypsum sheathing was screw attached to the Cee Studs after which DW-10 adjustable brick ties were fastened through the sheathing to the studs.

Adjustable ties allow thermal movement between masonry and steel, but in this building there was another benefit.

"Installing the ties along with the framing saved time. Because they were adjustable, the ties allowed masonry workers to make positive attachments with the steel framing later. It didn't matter where the brick courses were located vertically," Ebner said.

Bricks were laid for the wall, and then on the angle sill. The two-foot recess reduces the amount of sunlight falling on the windows. Additional light reduction is achieved from two-foot-wide limestone panels set vertically in the recessed window areas on the west and south walls.

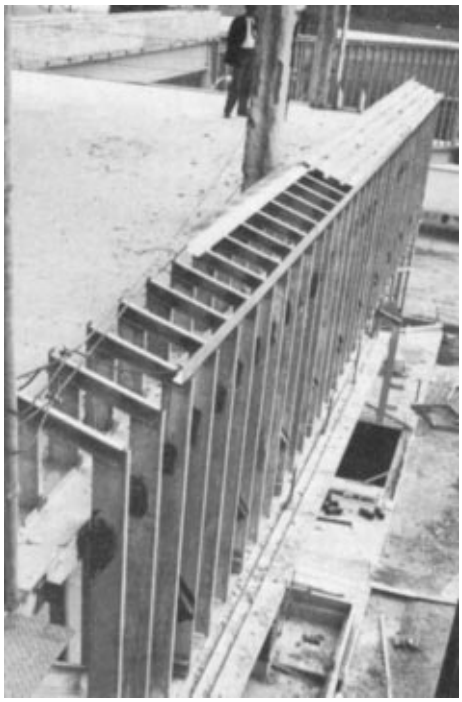
For curtainwalls that bear on the slabs, workers assembled 6" (16 gage) Cee Studs and Track into frames of various sizes up to 20 ft. wide.

Frames for curtainwalls above the third- and fourth-floor windows and beneath the second-floor windows were also fabricated from Cee Studs. These frames were welded to clip angles on the edges of the concrete slabs. Structural angles for brick bearing were attached, before the sheathing and adjustable brick ties for subsequent masonry work.

Because of varying wall dimensions and angles, steel framing members around the main entrance were pre-cut and assembled piece-by-piece. Six-inch batts of R-19 fiberglass insulation were placed between Cee Studs in all exterior walls.

The steel supplier, Bostwick, worked closely with Gellin/Erie Acoustical,

A close-up of the inverted "J" framing sections on the fourth floor of the Erie Insurance Group building. Light gage steel track was power-fastened to the slab, and then the short end of the "J" section was placed in it. Erie Acoustical fabricated "J" sections from 4" and 6" Cee Studs.



An exterior view of some of the inverted "J" framing sections. The sloping framing members in the background have had steel angles and deck material attached. This surface will support a sloping brick sill for the recessed windows.

Exterior walls around the entrance to the Erie Insurance Group building were framed with precut Cee Studs. A brick bearing angle is visible above the sheathing on the first floor frame.

Brick veneer over steel stud framing is a practical, working system and the recent Clemson University tests show that—within the test parameters—steel studs function without causing brick breakdown.

coordinating shipments of steel framing members as needed for construction over a period of several months, This eliminated the need to warehouse material not immediately needed resulting in more efficient handling and fabrication.

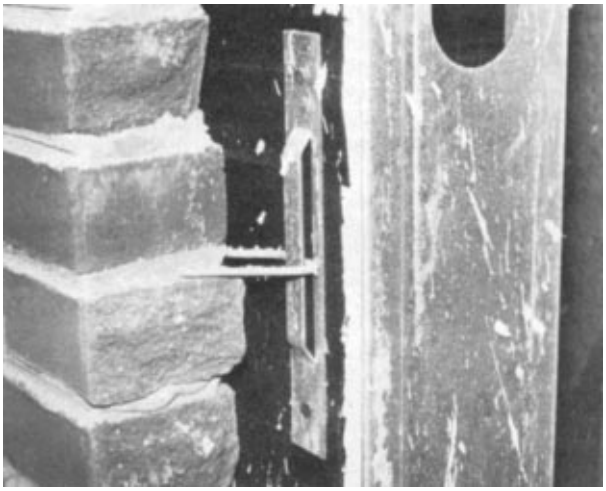
Plaster Soffits

Soffits above the first- and second-floor windows are 7 ft. wide, while soffits above the recessed third and fourth floor windows are 2 ft. wide. The contractor used 3.4 diamond mesh galvanized lath for plastering the soffits, and 3.4 diamond mesh painted lath for the walls and ceiling of the 250-seat auditorium.

Because most of the space in the new building will be open office, drywall applications were limited. But the inside surfaces of exterior walls saw drywall attached directly to the Cee Studs.

Gellin/Erie Acoustical installed acoustical tile throughout the office area of the new building. This involved 1' x 1' tiles suspended in a concealed, accessible spline system.

Other interests features of the building's interior include the passenger elevator doors known as the "Erie Doors." Vera Ronnen-Wall, an internationally known artist, designed and enameled the twelve doors.



Masonry workers used screws to attach DW-10 adjustable brick ties to the 14 gage Cee Studs through the ½" gypsum sheathing.

Of a contemporary design, the new addition complements the design and materials of Erie Insurance Group's original structure—a two-story red brick building constructed in 1956 and patterend after Philadelphia's Independence Hall. The new building is attached to existing structures by a two-story connecting link, and a landscaped courtyard extends to the original structure.

Besides the four-story addition, the first phase of this project includes a 163-car parking structure/storage facility, and extensive sitework and landscaping.