

Renovating Goes Steel

The Growth of Lightweight Steel Framing May Signal the Biggest Material Change Trend in Rehabilitation and Remodeling Work

What may be the biggest materials trend in major rehabilitation/remodeling construction is the startling growth of lightweight steel framing for these purposes.

Current applications for the steel studs and joists are diverse, and cover virtually the full gamut of significant reconstruction work in residential, commercial and industrial fields.

- The No. 1 retrofit activity is the gutting and rehabilitation of the interiors of deteriorated tenements and small apartment buildings in older urban areas. These projects are growing in such metropolitan centers as Boston, Detroit, Newark, New York, Philadelphia and Washington. In the decay-famed South Bronx section of New York City, for example, numerous six-story brick buildings have had their badly damaged wood beams removed. They're being replaced either entirely with steel joists, or, depending on required fire resistance, with alternating floors of steel and wood joists.

- Everyone is familiar with the conversion of individual movie theaters into twin and even quadruple facilities, a trend that has become nationwide to accommodate varying audience tastes within the same building. More often than not, steel framing is employed in this divider work, which typically necessitates partitions 35 feet high from orchestra floor to balcony ceiling. The reason: the framing's fast and clear erection capability, minimizing theater downtime.

- Usually, layers of gypsum wall-board are attached to each vertical stud to achieve the required fire ratings; some contractors are actually specializing in this reconstruction market.

- Another conversion activity, spreading fast in former industrial



An electrician pulls wiring through pre-punched holes in steel joists. Some studs and joists have openings which reduce weight, improve heat transfer properties and help plumbers to install piping more easily.

areas, is the transformation of old loft buildings into multi-family housing. Large single manufacturing spaces with 16-to-20 foot ceilings are being divided into two floors to make duplex apartments, using steel studs and joists. In some cases, the lightweight members make it possible to construct additional apartments at roof level, adding another residential floor.

- In a variation of this approach, aimed at a market hungry for housing, garages and even theaters are undergoing conversion. In Brooklyn, N.Y., to cite an instance, a dozen two-level, cooperative apartments resulted from a garage remodeling. The switch

was accomplished by gutting the high-ceilinged interior, erecting steel stud partitions and walls, and giving each unit a loft.

- In another attack on the rising cost of housing, low-rise 40' x 40' apartment buildings sited on 40' x 60' lots have become infill projects. The dark and unused 20-foot back yards are being topped with apartments that are connected to the original buildings. Lightweight steel framing, noncombustible and with a load bearing capacity of up to four floors in height, made the work possible.

- What could well become the largest renovation market is the addition of solar heating equipment to existing buildings of all types. Steel stud and joist components provide the framework for solar collectors, and for passive solar add-ons such as greenhouses. Proposed legislation would provide loans to pay for such energy conservation features. Eligible would be owners of existing buildings, those who put up new ones, and purchasers of new or substantially-rehabbed buildings.

- In both commercial and industrial structures, lightweight steel framing is being employed to create additional storage space, frequently by erecting wide-span, mezzanine storage systems in high-ceiling areas. Photography studios have installed stud-supported walkways to position overhead cameras and lighting. Studs are often used as structural supports when mansard-type roofs are added to visually modernize existing buildings. And it's not unusual now for building owners to seal up unnecessary windows for fuel conservation, using the steel framing to hold enclosure panels and insulation.

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- Lightweight steel framing for remodeling is often proving more economical than masonry or wood construction. This can apply where a job favors steel framing’s relatively lightweight, wide stud spacings, long joist spans, and noncombustibility.

Further Advantages . . .

Builders are finding that steel studs and joists have further advantages

which are peculiar to remodeling. They’re easy, clean and fast to work with, so that a structure is back in use quickly. Entire wall sections and even their surfacing can be completed off-site, important in renovation where work space is at a premium. Weight for a typical wall can be up to 40 percent less than for the same wall framed in wood, minimizing the load added to a structure.

Exemplifying advantageous use of the framing components is the conversion that International Minerals and Chemicals Corp. (IMC) performed on an existing warehouse in Mundelein, Illinois, transforming it into a creative center complete with studios, control

room, auditorium, offices and a cafeteria with kitchen. IMC actually had 17,500 square feet of warehouse space to work with, but needed 21,000. The feat was accomplished by combining cafeteria and auditorium and adding a second floor within the 18-foot-high warehouse.

Steel framing was able to bear the loads of the second level as well as provide suitable fire and acoustical ratings. The strong stud supports under the cafeteria-auditorium stage permit a storage area for extra chairs and tables, which also serves as a return-air plenum for the room. In fact, the space-saving steel stud and joist construction provided enough

additional footage to include a utility room, maintenance shops, four bathrooms, a dishwashing room and a record center.

In New Britain, Connecticut, the Stanley Works has remodeled two seven-story concrete buildings that combine plants and offices, putting a completely new facade on the 1920's-vintage structures. The total area "facelifted" is 100,000 square feet, encompassing all four sides of each building. The job was performed in two stages by Genovese & Di Donno, framing contractors, of Berlin, Connecticut.

The first step was erection of a 15-foot-high brick base fully surrounding each building. From there to the roofs, a steel stud curtain wall system forms a single-plane, continuous elevation, reducing existing window area 80 percent to drastically slash excessive heat loss. Studs are attached to the building with steel joists. Gypsum sheathing that is surfaced with a synthetic plaster system which encompasses three inches of polystyrene insulation is then attached to the steel framing by screws. The result: the look of a new building, with an anticipated major savings in heating costs.

Varied Components . . .

Manufacturers produce the channel-shaped members of the steel framing system in an assortment of depths, lengths, flanges and thicknesses, with the components usually galvanized or primed with red oxide paint. With all figures approximate since exact measurements vary by producer, studs range in depth from 1 5/8" to 8" in length from 6' to 40' (about shipping maximum); in flange width from 1 3/4" to 2 1/2"; and steel thickness from .025" to .108". Studs are normally pre-punched for pass-through of plumbing lines, electricals and bridging.

Steel joists are pre-punched too, and range in depth from 5 1/2" to 12"; in length from 6' to 40'; with flanges from 1 5/8" to 2 1/2"; and thickness from .051" to .108". Both studs and joists can be pre-cut to exact sizes and are engineered to resist specific wind, snow, impact, live and dead loads.

The versatile framing—lighter and

thinner than structural steel, but just as durable—is usable for ceilings, floors, partitions, flat and pitched roofs, and all types of walls (interior, exterior, curtain, spandrel, fascia and fire). A cavity wall system, it will accommodate insulation for “U” values that can be as low as 0.05.

The system blends with any finishing material. Interiors can be drywall, plaster over metal or gypsum lath, ceramic tile, wood or steel paneling. For exteriors, it is compatible with textured stucco and exposed aggregate, and with such sheet materials as steel panels, textured plywood, and brick or stone veneer. By facing steel stud walls with Portland cement over metal lath, the look of precast concrete can be achieved at lower cost and at half to a quarter of the weight.

Whether the job be a comparatively simple remodeling or a massive rehabilitation project, lightweight steel framing has become a leading retrofit material. Information on sources of framing components is contained in

Sheet Steel for Building Construction—Directory of Manufacturers, obtainable from the Committee of

Sheet Steel Producers, American Iron and Steel Institute, 1000 16th Street, N.W., Washington, D.C. 20036.