



STEEL FRAMING INDUSTRY ASSOCIATION



CASE STUDY

LUXURY FOR LESS

METREAU APARTMENTS
GREEN BAY, WISCONSIN

Steel Framing Industry Association
513 W. Broad Street Suite 210
Falls Church, VA 22046-3257
P 703.538.1613
F 703.538.1733
CFSteel.org

OVERVIEW

PROJECT

Use

Mixed-use luxury apartments

Size

Eight stories, 107 units,
127,546 sq. ft.

Completion Date

Fall 2016

PEOPLE

Developer

Dermond Property Investments,
Inc., Milwaukee, WI

Project Architect

Eppstein Uhen Architects,
Milwaukee, WI

Project Engineer

Pierce Engineers, Inc.,
Milwaukee, WI

Specialty Engineer

Matsen Ford Design Associates, Inc.,
Waukesha, WI
(now part of raSmith, Brookfield, WI)

General Contractor

Catalyst Construction,
Milwaukee, WI

Cold-Formed Steel Panelizer

Wall-panel Prefab,
DeForest, WI

Cold-Formed Steel Erector

Wall-tech, Inc.,
DeForest, WI

STEEL

43 - 97 mil steel stud
and joist framing

Cover photo: C&N Photography



Metreau Apartments is seven stories of cold-formed steel framing over a pre-cast concrete podium. CFS saved the developer about \$250,000 versus post-tensioned concrete.

Cold-Formed Steel Saves \$250,000 in Building Mid-Rise Apartments

Using a design by Matsen Ford Design Associates of Waukesha, Wisconsin (recently acquired by raSmith, Brookfield, Wisconsin), eight men erected cold-formed steel walls and flooring systems in an eight-story apartment building in 14 weeks.

"We had a small screw that could focus," says Pat Hainault, Matsen Ford's head engineer and project manager. "The work was quick and efficient."

PANEL PREFABRICATION

Located on the Fox River in Green Bay, Wisconsin, Metreau Apartments is a luxury, 107-unit complex located at East Walnut and North Washington streets. It opened in the fall of 2016.

Pete Braun, President of Wall-tech Companies, DeForest, Wisconsin, says that panelization of the CFS framing saved the developer weeks over post-tensioned concrete construction. Metreau Apartments was en-

closed within 20 weeks.

"We were able to physically set more linear footage of walls by panelizing than stick building them," Braun says.

Prefabrication also improved work quality and enabled Wall-tech to maintain productivity during several windy and snowy days.

"We think of cold-formed steel as 'wood on steroids,'" says Braun. "I'm not the first to say that, but it sure was amazing to watch this structure appear to just grow out of the ground."

As an extra step, Wall-tech's Wall-panel Prefab division, welded the nearly 1,800 individual CFS-framed wall and floor panels together instead of using screws. This gave the panels extra stiffness, which enabled them to be set more precisely in place. Fabricating the sheathed wall panels took only about 5½ hours per 150 lineal feet.

"You don't see many cold-formed steel erectors who also fabricate flooring panels,"

Wall-panel prefabricated the wall and floor panels off site. Wall-tech erected the systems.



Wall-panel Prefab used building information models to eliminate conflicts with the MEP trades.



Metreau Apartments' framing design includes CFS attachment points for a variety of balcony types.



Pete Braun, President of Wall-tech Companies, says CFS prefabrication made efficient use of materials and boosted construction speed.

Braun says. "But we're set up for it. We were able to handle the process smoothly at Metreau."

Wall-tech's eight-man crew installed a total of 1,106 CFS wall panels and 670 floor panels at the rate of one floor every two weeks. Using cranes, the Wall-Tech crew erected wall panels as large as 28 ft. 4 in. by 10 ft. 6½ in., and weighing 1,654 pounds. Some floor panels weighed 1,642 pounds and were 26 ft. by 12 ft. in size.

In all, the eight-man crew installed 11,508 lineal feet of wall panels and 97,236 square feet of floor systems. By panelizing the entire job and providing an earlier delivery of the building, Braun estimates Metreau's developer, Dermond Property Investments, Inc., Milwaukee,

saved \$250,000 in construction and in carrying costs.

BALCONIES AND TERRACES

Unique elements give Metreau Apartments special character.

"Metreau features different kinds of balconies and inset terraces on the eighth-floor, penthouse level," Hainault says. "Since the terraces step back from the building, we had to support the upper story on built-up CFS transfer joists and posts buried in the load-bearing walls."

Another feature includes built-in fall arrest anchors in the the roof trusses and terrace floor joists. The anchors can support a maintenance crew and its scaffolding.

Lateral bracing was achieved by integrating CFS shear wall bracing with pre-cast concrete

shear walls at the elevator and stair shafts. The integration enabled the building to achieve bracing at less cost.

And finally, the wall panel frames were pre-compressed, which is recommended on all wall panel projects. Pre-compression enabled tight seating of the framing. Bearing walls could be installed precisely and accurately without fear that the CFS framing would compress and damage the finishes.

CONFLICTS CAUGHT BY BIM

Wall-tech used Building Information Modeling on the project. BIM enabled the firm to collaborate effectively with the MEP trades by spotting potential conflicts between the wall and flooring panels and the mechanical systems.

"We caught all conflicts before we got too far along," Braun says. BIM helped Wall-panel to be "lean on the materials," he says. Nothing had to be rebuilt in the field.

In the end, the CFS framing of the Metreau Apartments is a fine example of how to save money on construction materials and labor, improve quality and lower job site waste.

Since the terraces step back from the building, we had to support the upper story separately from the bearing lines of the rest of the structure.



Metreau Apartments' lateral-resisting system includes X-braced CFS shear walls and pre-cast concrete stairs and elevator shafts.



On February 1, 2016, erection of the CFS framing on the second floor of Metreau Apartments was nearly complete.



Eighty days later, on April 22, 2016, eight men had completed five additional floors.

DETAILS

METREAU APARTMENTS

DESIGN

Upper 7 stories: Cold-formed steel walls, C-joist floors and flat CFS roof trusses.

- 127,546 sq. ft. total; 114,000 sq. ft. CFS
- First floor and lower level pre-cast concrete post-and-beam framing with podium slabs
- X-braced CFS shear walls and pre-cast concrete stair and elevator shear walls transfer through the podium level diaphragm into pre-cast concrete shear walls

COLD-FORMED STEEL TRUSSES

Prefabricated off site.

- Spans up to 44 ft. 3 in.; supported by CFS stud walls at 16 in. o.c.
- Built-in fall-arrest anchors

COLD-FORMED STEEL FLOOR JOISTS

Prefabricated off site. Spans up to 26 ft.

- 12 in. by 54 mil to 97 mil C-joists (2 in. flange) at 16 in. o.c.; 8 in. by 54 mil used in corridors
- End track used frequently to eliminate load-bearing headers
- Fall-arrest anchors built into terrace joists
- 670 total panels, 111 per floor

COLD-FORMED STEEL WALLS

Prefabricated off site. All studs aligned from floor to floor.

- Bearing cases: 6 in. by 97 mil to 43 mil C-studs (1- $\frac{5}{8}$ in. to 3 in. flanges) at 16 in. o.c.
- Parapets designed for fall-arrest loading
- Stud panels compressed for tight seating in top and bottom track
- 1,106 total panels, 158 per floor

The information presented here is for illustrative purposes only. SFIA accepts no responsibility for the accuracy or completeness of the information or for loss or damage caused by any use thereof.
© 2018 Steel Framing Industry Association