

# THE VILLAGE AT GERMANTOWN

## Wood Delivers Affordable Design for Senior Living

### Project Summary

#### PROJECT

The Village at Germantown

#### LOCATION

Germantown, Tennessee

#### OWNER

CRSA

#### ARCHITECT

FreemanWhite, Inc.

#### ENGINEER

Laurene & Rickher, PC

#### CONTRACTOR

The Weitz Company

#### COMPLETED

2006

#### FACTS

- 430,000-square-foot project
- 900,000 square feet of plywood and OSB sheathing
- 200,000 lineal feet of 11-7/8-inch PRI I-joists
- 10,000 lineal feet of 11-1/8-inch LVL

Senior living facilities are one of the fastest growing segments in the construction industry. According to the National Association of Home Builders, the seniors market is “the biggest growth opportunity in the housing industry today.” U.S. Census Bureau statistics cite an expected 75 percent growth in the number of people age 55 to 64 by 2020, and a 54 percent jump in the 65-and-older group during that same period.

FreemanWhite has designed senior living projects since the early 1980s. With their architects more familiar with reinforced concrete and steel than with wood, it was only natural for them to consider reinforced concrete and structural steel frame alternatives at the Village at Germantown.

But when the budget for the 430,000-square-foot project was cut from \$60 million to approximately \$40 million, the project team found the concrete and steel systems too expensive. So they turned to wood. And in doing so, they found the answer to many other design challenges as well.

“The city of Germantown has verticality restrictions,” said FreemanWhite’s project architect, John Langdon, AIA. “Codes required that our mid-height mansards be less than 35 feet in height. Initially, we looked at steel with composite slabs, but the beams were too deep, and lateral bracing was a challenge. So we went through a number of value engineering exercises, which led us to wood. We considered wood last because it was the structural system



*By using 11-7/8-inch-deep I-joists, the designers were able to address height restrictions in the floor-ceiling assemblies. I-joists also eliminated the need for sprinklers in the concealed spaces.*



The Village at Germantown complex includes independent living apartments, a one-story healthcare facility and single-family residences.

with which we were least familiar. Yet it ended up being the only way we could make the project work from both a building height and a cost standpoint.”

The Village at Germantown consists of three primary residential areas:

- Independent living, with two- and three-story apartments (171 units, 320,000 square feet)
- One-story healthcare facility (40,000 square feet)
- 28 single-family residences (70,000 square feet)

Langdon said they first designed the apartment units using an open web truss for the 30-foot floor spans. But, because the members were 18 to 24 inches deep, the designers faced challenges with the height restrictions.

So they looked at I-joists. “Instead of framing the joists from the corridor wall to the exterior wall, which was a span of about 30 feet, we turned them the other way, so that the joists ran parallel with the corridor walls and exterior walls,” Langdon said. “Bearing points for the joists occur at interior walls within the apartment units and at demising walls between units. By making this change, we were able to reduce the joist depth to less than 12 inches; we used 11-7/8-inch PRIs from Georgia Pacific.”

Corridors are six-feet wide, so dimension lumber was used to frame the corridors. They added 23/32-inch OSB with ¾-inch gypcrete, which provided the needed sound attenuation.

Wood I-joists were also beneficial from a fire safety standpoint. “Since I-joists are considered solid members, sprinklers were not required in the concealed spaces,” Langdon explained. “The wood I-joists allowed us to limit the concealed compartments between joists to less than 160 cubic feet and stay within the limits allowed by the 2002 National Fire Protection Association’s NFPA 13, Section 8.14.1.2.6. If we’d used open-web joists, codes would have required that we sprinkle the entire structure, including the space between the open-web joists and the gypsum board ceiling. So I-joists saved money there also.”

Germantown is located in a high seismic zone, and wood helped the designers meet seismic and safety requirements. “We used UL Assembly 344, which combined 2x4 studs, 15/32-inch plywood and 5/8-inch gypsum on both sides of the wall. So, each wall between the apartment units created its own shear wall,” Langdon explained.

Wood frame construction was also new to Tim Smith, PE, from Laurene & Rickher. With help from APA – The Engineered Wood Association, he engineered plywood roof and floor diaphragms to meet seismic requirements. “We also used Georgia-Pacific’s typical I-joist details, so the contractor would know that we were doing things like offsetting I-joists to accommodate plumbing drops,” he said. “We used flush-mount LVL headers, which reduced interference problems with mechanicals as well.”

Nate Purdy, project engineer with The Weitz Company, said his workers appreciate wood’s versatility. “We can make in-field changes, which gives us flexibility in terms of how we build. That’s the biggest advantage to using wood, in my opinion.”

All agree that the project’s large size was a challenge. Langdon said FreemanWhite had used wood on smaller one-story projects, but were not accustomed to doing so on large, multi-story projects. “Budget restraints and zoning requirements drove us to wood for The Village at Germantown,” he said. “Once it became obvious that wood frame construction was so much cheaper, there was really no going back. We’re much more likely to use wood going forward, now that we know what it can do.”

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