

Mass Timber Application of LP® SolidStart® LSL

Vertika Structural Engineers



LP® SolidStart® LSL Transforms Possibilities with Mass Timber Construction Application of Multi-Use Facility

SUMMARY

Over the past several years, wood has become a viable structural choice for taller buildings and projects that typically require the strength of steel or other similar materials. This trend—known as Mass Timber—is based around the use of large prefabricated wood members such as Laminated Strand Lumber (LSL), Laminated Veneer Lumber (LVL) or Cross Laminated Timber for wall, floor and roof construction.

Not only do these solutions support an accelerated construction process, they are also transforming possibilities with wood construction. The recent construction of a nearly 33,000 sq. ft., three-story multi-use facility near Houston incorporated one of the first uses of LP® SolidStart® LSL to create mass timber members.

OBJECTIVES

Thomas A. Bellace, P.E., Principal with Vertika Structural Engineers, worked with general contractor Bill Hughes Inc. to use wall panels and floor planks made of LP SolidStart LSL as the superstructure. Mr. Bellace served as the engineer of record for the project while employed at The Sterling Engineering Group, designing a structural system to meet the owner's multifaceted needs. He also provided construction administration services through VSE during the foundation construction erection phases of the project.

"The owner knew I had to create a unique design for a structural system for this one-of-a-kind building," said Mr. Bellace. "Because of the need to achieve a significant amount of strength while still being economical, I thought a hybrid combination of structural steel and mass timber would be the best solution. After working on a mid-rise residential prototype of mass timber construction using LP SolidStart LSL, I knew that was the product I needed—both because of its strength and the support I trusted my LP sales professional to provide."

"After working on previous projects with LP SolidStart LSL, I knew that was the product I needed."

Thomas A. Bellace, P.E., Principal for Vertika Structural Engineers



IN BRIEF

LOCATION

Houston, Texas

PROJECT SUMMARY

Vertika Structural Engineers and BIGenterprise's recent construction of a nearly 33,000 sq. ft., three-story multi-use facility near Houston incorporated one of the first uses of LP® SolidStart® LSL to create mass timber members. The use of LP SolidStart LSL supported an accelerated construction process and is also transforming possibilities with wood construction.

WEBSITE

vertika-se.com

PROJECT OBJECTIVES

Vertika Structural Engineers looked to LP SolidStart LSL because it offers:

- Fast and easy installation
- Long lengths and uniform dimensions
- Superior strength and durability
- Versatility in application

SOLUTION

Vertika Structural Engineers worked with general contractor Bill Hughes Inc. to use wall panels and floor panels made of LP SolidStart LSL. The builders continue to rely on LP SolidStart LSL for superior strength and durability.

IMPLEMENTATION

LP secured a prefabricator to create 7-inch-thick LSL panels, combining dowel screws and two 3.5-inch-thick LSL panels, which were then joined on-site using steel connections. The strength and thickness of the LSL panels helped with noise control as well as fire and thermal resistance and, combined with LSL reinforcing vibration stiffeners, provided a stiff floor with no perceptible bounce on the second story.

“We did our own unofficial test of the stiffness of the floor by having eight of the workers—all 250-pound men—jumping up and down,” Mr. Bellace said. “It felt like you were jumping on a concrete floor.”



That strength and stiffness was especially important on the second floor, where the owner intended to use part of the space to accommodate both a dance floor and a bowling alley.

“The walls, floors and roof were all SolidStart LSL panels from LP,” said Jim Boyd, owner of erection subcontractor BIGenterprise. “The product really provided superior results for what our engineer was trying to achieve with the stiffness. The product was fantastic.”



The building also included tall ceilings from

which the owner intends to hang a jet, creating an even greater need for strength. As a result, Mr. Bellace designed the main roof joists, beams and spandrels with LSL combined with two massive steel rigid frames.

In addition to the bowling alley and dance floor on the second floor, the structure also incorporates a garage, apartment, commercial kitchen, flight simulator and an elevator. Also, the building is wrapped by a veranda on three sides.

OUTCOME

Construction of the building took nearly two years to complete, as it was both a unique design incorporating extensive foundation work and intricate finishes while being Mr. Bellace’s first experience using LSL in mass timber construction, and he anticipates this won’t be his last time to use LSL.

“Since completing the building, I’ve been innovating more ways to use the technology in other residential projects here in Houston, including plans for some multi-story wood structures,” Mr. Bellace said. And from what he’s seen, he may not be too far off in designing a multi-story residential mass timber structure using LSL that is taller than the five stories currently allowed by code.

