

APA CASE STUDY

Lone Survivor House Provides Respite for Soldiers



The Lone Survivor House in Crystal Beach, Texas, was designed with accessibility, flexibility, and healing in mind. The living area is connected to conference space via an elevated boardwalk.

When the Lone Survivor Foundation set out to design a retreat that honors both the service and the needs of healing soldiers, a pentagon shape provided a fitting nod to the U.S. armed forces' most recognizable symbol. But the unique design of the two-story Soldier Bunk House also presented a number of challenges for the design and engineering team, hurdles that were further complicated by the home's location in Crystal Beach, Texas, where construction on piers is required.

Project Summary

TYPE:

Retreat house

LOCATION:

Crystal Beach, Texas

COMPLETION DATE:

February 2015

OWNER:

Lone Survivor Foundation

BUILDER:

Brint Construction

ENGINEER:

Aran and Franklin Engineering

Engineers Chandra Franklin Womack, PE, and Rachel Riley, both of Aran and Franklin Engineering, opted to move from traditional 2x dimension lumber to treated glulam beams from APA-member Anthony Forest Products Company because of the limited capacities of dimension lumber.

The treated glulam serves as the stringers around the perimeter, with a multitude of beams supporting the center of the house, left open to allow for parking below. The custom, thinner stringers were made with 5-1/2-inch glulam beams resawn in half to a finished width of 2-7/16 inches. All glulam beams in the structure were engineered and designed with Anthony's software.

The long-span capabilities of the glulam helped the engineer reduce the number of piles and design the piers in a simple grid pattern, thereby reducing point loading and opening up more room under the house. The obtuse interior angles dictated by the pentagon shape and limitations on notching of beams would have necessitated the use of more pilings had they chosen dimension lumber.



Womack also used the glulam beams in certain areas of the floor system, including end walls, and where a wall is supporting a beam to take load off of the floor system to the stringer and the piling. On the second level, the glulam beams span the width of the living room to support the trusses while ensuring an open, flexible layout below.

“With this shape, you can’t just straight frame the second floor,” Womack says. Trusses couldn’t span the whole length of the floor, so beams were required, but the pentagonal shape created point loads. Engineers used dimension lumber to frame the ceiling of the second floor even with the sharp angles and the unconventional floor plan.

Design for a Cause

Along with the overall design and the role of the wood framing, the home features a range of elements to better serve its visitors. The retreat house in Crystal Beach is part of the Lone Survivor Foundation’s mission to provide holistic healing for soldiers suffering from post-traumatic stress disorder (PTSD) and other illnesses associated with combat.

The Soldier Bunk House includes two family suites on the first floor along with a large common room and shared kitchen; on the second floor are two bunkrooms and bathrooms, plus a kitchenette and small sitting room. The facility also includes a Conference Center/Staff House connected by an elevated boardwalk. A nearby ranch, Crystal Corral, provides equine-assisted learning.

Thoughtful design elements ensure comfort and safety, including ADA compliance throughout, a robust elevator, expanded foam insulation to cut down on outside noise, fenced-in acreage to accommodate service animals and improve privacy, and a fire pit for nightly discussions. Special touches include military artwork throughout the house, a memorial brick walk around the fire pit, and flagpoles with the American flag, the Texas state flag, and the Lone Survivor flag.

While the retreat is technically zoned residential, the engineers designed the house to meet International Building Code specifications because of its unique uses: for example, the structure would need to accommodate additional loads from occasional parties and events.

“The glulam beams were instrumental in having the house come together really well,” says Womack. “The house would not be able to work in that configuration and those spans without using glulam. There is no way you could have the openness or the pilings as far apart as they are. You couldn’t do that with anything else.”



Glulam beams combined with trusses create an open, flexible floor plan.



Shown during construction, treated glulam beams are set on piers to support the floor system above.

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Form No. R115
Issued July 2015

