

Reimagining the Timber Frame



Ohio builder salvages 1862 timber frame for reuse in high performance home

When Dan Troth stumbled across an abandoned timber frame farmhouse outside of Columbus, Ohio, he knew he had found a unique opportunity to create a fantastic home. Troth meticulously disassembled the hand-hewn timber frame before erecting it 15 miles from its original location as the centerpiece of a unique custom home. By enclosing the antique timber frame with structural insulated panels, Troth was able to create an energy-efficient and durable home that maintains its nineteenth century aesthetic.

PROJECT AT A GLANCE

LOCATION: **Delaware, OH**

SQUARE FOOTAGE: **6,000**

ARCHITECT: **F5 Design**

BUILDER: **GreenTech Construction**

SIP MANUFACTURER: **Insulspan**

Embracing the Past

Troth's fascination with antique timber frames goes back to his childhood. Growing up in rural Ohio, he was surrounded by century-old timber frame barns.

"I was always around barns as a kid," he said. "My dad, who was a lawyer, would load up the station wagon and take us kids out to his clients' farms to play. The seed was planted back then."

After successfully converting an antique barn into a custom home in upstate New York, Troth moved back to his home state in 1991 and started a company called Rebarn, specializing in converting barns into homes. He currently lives in a barn-home hybrid that was originally built in 1828.

"Finding an adaptive reuse for an antique timber frame is a recycling effort in one sense, but more importantly it is an effort to celebrate the timeless beauty and craftsmanship inherent in the frames built by America's pioneers," said Troth.

Salvaged hand-hewn timbers and reclaimed barn siding frame a sunroom overlooking the home's scenic lot in Delaware, OH.



Always on the lookout for unique projects, Troth found the abandoned farmhouse outside of Columbus in 2006. While disassembling the home, he discovered a newspaper clipping from 1862 that had been placed in the wall cavity. It chronicled the Confederate advance into Florence, Kentucky and their impending attack on Cincinnati, Ohio.

Old Meets New

It was not long before Troth met a customer interested in incorporating the timber frame into a new home for their family of six. The 6,000 sq. ft. home would be built in Delaware, Ohio, just 15 miles from the location of the original 1862 farmhouse.

While embracing the client's taste for timeless charm, the home was designed with energy efficiency in mind. Working with architecture firm F5 Design, Troth recommended structural insulated panels (SIPs) for the exterior walls and roof of the home. SIPs are a high performance panelized building system consisting of rigid insulating foam sandwiched between two structural facings, typically made of oriented strand board. Troth specified 6-inch SIP walls and an 8-inch SIP roof from Insulspan to reduce heat loss through the building envelope.

"Based on my experiences with SIPs and their own research, the homeowners were quickly convinced of the product's benefits, including strength, speed, and energy efficiency," said Troth.

Troth also explained to the homeowners that because of their large size and spanning capabilities, SIPs are ideal for enclosing timber frame structures—either new or salvaged. By using SIPs in place of conventional attic trusses, the homeowners gained additional third-floor living space, where they added a large guest room with a full bathroom.



(Above) A large section of SIP wall panels is preassembled on the ground and lifted into place. (Below) Eight-inch-thick SIP roof panels complete the energy-efficient building envelope.

Below grade, Troth specified prefabricated Superior Walls for the foundation, with additional fiberglass insulation on the interior, for an R-value of R-30. He installed a geothermal heat pump system that provides the home with much of its heating, cooling and hot water by circulating water through tubing in underground wells. Other green features include a metal roof that reduces solar heat gain and low VOC paints for a healthy indoor environment.

Troth's green building practices created a home that received a HERS Index of 40, using 60 percent less energy than a home built to today's building codes, while still maintaining the elegance of the century-old timber frame. The Energy Star home also easily surpassed the U.S. Department of Energy's Builders Challenge criteria, which requires a HERS Index of 70 or less.

"With thoughtful design and SIPs, we can easily build homes that consume less than half of the energy of stick frame houses," said Troth.

Troth framed the 1862 newspaper clipping for the homeowners to hang on their wall and left another symbol of the past—a section of honeycomb adhered to one of the timber posts where thousands of honeybees had taken up residence in the abandoned house.

"The honeycomb was stuck to the side of the post, so I left it there. The homeowner loves it. It's all part of the history," said Troth. "Knowing the old farmhouse housed several generations since the Civil War gives it a unique character and soul. It's gratifying for all of us to know that we have not only preserved the old house but given it new life and the opportunity to be enjoyed by generations to come."



(Above) The original 1862 farmhouse during disassembly. (Below) Crews enclose the salvaged timber frame with structural insulated panels.



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