

“Keeping Room” Showcases Unique Truss Design

Trusses took center stage
in this large custom home.

at a glance

- ❑ A custom home in a suburb of Denver was originally designed with a stick-framed Keeping Room.
- ❑ The builder and framer were skeptical about trussing the roof until the designer provided a full-size sample truss.
- ❑ The prototype convinced them that the Keeping Room should be trussed.

by Libby Maurer & Stephen J. Scherneck, Jr., P.E.

Customer service, a can-do attitude and an affinity for tricky truss design resulted in one of the most complex truss design project of Steve Scherneck's career. Having designed numerous circular roofs in 15 years of designing trusses—some with arched top chords in a dome-shape, some with vaulted ceilings, but most with a uniform pitch for the top and bottom chords—Scherneck was prepared to take on the challenge presented by Bond General Contractors, Inc. on a custom single-family residence in a Denver suburb.

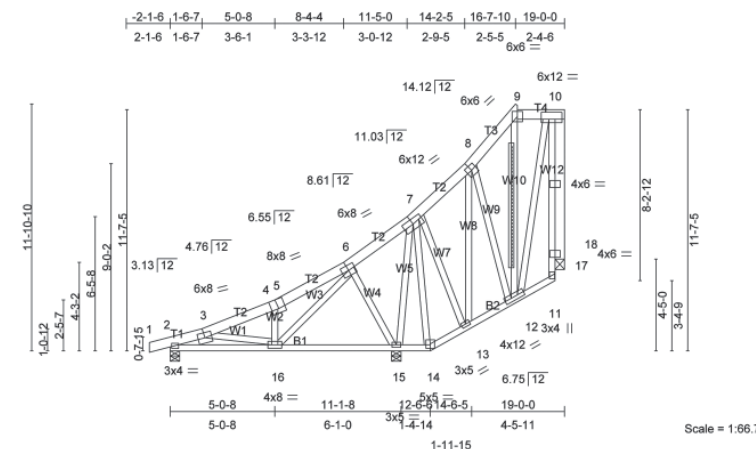
The owners of this 20,000 sq. ft. home in Cherry Hills Village, CO specified many complicated features, which meant a complicated roof line to match. Scherneck, a residential structural engineer with John Arthur Consulting, Inc., met with a team of building professionals early in 2006 to discuss the project. The original plans called for the majority of the home to be stick-framed—about 80 percent. During the routine meeting, Scherneck convinced the group that it would be economical to truss more than half of the roof structure. “I’ve had dealings with the contractor and framer for several years, so I felt comfortable suggesting that it would be a lot more economical to truss than stick-frame,” he said.

Among the unique truss profiles, the home contains tail-bearing room-in-attic trusses, parallel chord trusses with two room-in-attic spaces for mechanical units, and in the kitchen.

Of the home's intricacies, a Keeping Room, proved to be the most complex. This 315 sq. ft. traditional room in the rear of the home had an inner vaulted radius in a cone shape and the top chord with a radius slope. (See inset box.) Scherneck noted that John Bondarewicz (Bond General Contractors) and framer Gordon May were quite

What Is a Keeping Room?

Early Colonial houses had few rooms. The most versatile room was called a Keeping Room, where daily household activities were conducted. Since they held the fireplace—often the only source of heat—the family cooked and bathed in these rooms. Modern Keeping Rooms are less functional than their predecessors, serving as decorative sitting spaces. Keeping Rooms still house working fireplaces.



skeptical about being able to truss the roof above the Keeping Room. “That is, until I offered to design and build a full-size sample truss,” Scherneck says. (See sample truss design drawing above.)

The prototype was enough to convince Bond that the Keeping Room should be trussed. May said when the group saw the sample, they had the idea for Scherneck to make the top chords out of 2x6s (instead of 2x4s) to achieve a true radius.

Allowing the general and framing contractors to physically see and touch the proposed design solution prior to committing to the project gave them the confidence that trusses were the right solution to their problem, Scherneck said. “Within 30 minutes of the contractor receiving the sample truss,” he says, “we had the green light to proceed with the project.”

It's All in the Details

Scherneck got to work designing the trusses for the Keeping Room. This was his first job that featured a radius in plan, an inner radius that is vaulted in a cone shape with the top chord having a radius slope. This area consists of two concentric circles on plan; the inner radius is 9'10" and the outer radius is 21' (see photo 1). The inner radius is vaulted in a conical fashion and the outer portion is flat. The roof has a 31' radius that is tangent to the 16/12 pitch at the top portion of the trusses. The trusses are piggy-backed due to height. The base trusses are segmented with seven different pitches and top chord oversized (see photo 2 on page 34). The framing contractor field trimmed the trusses to achieve the 31' radius.

In his design, Scherneck also incorporated a compression web bracing product since bracing the webs after installation was not possible. The Keeping Room's

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Photo 2

"Keeping Room" Showcases Unique Truss Design

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vaulted 6.75/12 pitch conical ceiling also cuts into the kitchen's vaulted 12/12 pitch ceiling, further complicating the design process, Scherneck says. With tools ranging from truss design software, AutoCAD LT, and Scherneck's handheld trigonometry calculator, he completed the design of the Keeping Room in due time with optimal accuracy. "Just to be sure it would work—which, according to the framer, it did very well," he says. May said it went together very well, thanks to a well-thought out plan and careful execution of the sequences. "It's definitely not something you see every day," he said.

The trusses were manufactured by Sterling Component Systems under the supervision of production manager Josh Clift and foreman Dave Hummel. Clift helped Scherneck build the prototype early on. "This was the first time I'd ever shipped out a sample," he said. Hummel said he was confident that his crew could build the unique trusses with precision. "Our cutting department and crew pay close attention to quality, so I wasn't worried about how the project would turn out."

In the end, Scherneck was able to design trusses into two-thirds of the home. Local building height restrictions, ceiling profiles and building geometry required that about one-third of the roof remain conventionally framed.

Scherneck says his previous experience designing complex custom homes gave him the confidence he needed to complete the Cherry Hills Village behemoth. "This was a very exciting challenge for me. I was fortunate to have many past jobs to fall back on," he says. And he thanks the team of contractors for giving him a shot: "There's no limit to what you can do with trusses. I'm glad to have been able to prove it to them." **SBC**

Steve Scherneck is a Colorado Truss Manufacturer's Association (CTMA) Board Member. Photos provided by Alisha M. Brown, Golden Dreams Photography.



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