

Project #50 – High Performance



Trenbeath Residence

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Participant Information:
Extreme Panel Technologies
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Category: Single Family Homes under 3,000 sq. ft. - High Performance

Project Information:
Trenbeath Residence
3275 Mystery Lane
Hot Springs, SD 57747

Date completed: 02/01/21

Total cost of project: \$550,000

Total sq. ft.: 2,566 square feet

Built by:
Erskin Construction
Todd Erskin
27407 Woodland Rd
Hot Springs, SD 57747
605-890-9975

Panels Manufactured by: Extreme Panel Technologies

Designed by:
Erskin Construction
Todd Erskin
27407 Woodland Rd
Hot Springs, SD 57747
605-890-9975



Building use:
Single Family Home

How did SIP construction help you get this job?

Erskin Construction is known in this area as a high performance builder. When a person is looking to build an energy efficient home they typically call me. I've been using SIPs exclusively for 17 years. This homeowner was interested in achieving the most energy efficient and comfortable home she could and so she was referred to Erskin Construction. She was so committed to this process that she was willing to pay a little extra so that I could use roof SIPs to create a flat ceiling and the perfect thermal envelope. She wanted flat ceilings and flat roof, but the Homeowners Association would not allow for the flat roof, so we put 3/12 hip trusses over the roof/ceiling SIPs.

SIP wall thickness: 6 1/2" EPS
SIP roof thickness: 12 1/4" EPS

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The benefits of using SIPs on this project:

This is a slab on grade home. We used foundation SIPs for the frost walls. We were able to install the frost panels in 2 days with a crew of 4 and continue construction immediately. Using frost panels instead of concrete saved at least a week in construction time. The main floor walls were also SIPs and installed in 2 days with the same crew. We then installed the roof SIPs flat on top of walls in 2 days. Within 6 days, we had the thermal envelope up and we could then choose to work inside or outside depending on the weather. Throughout the construction of this home we had some very severe weather and yet the inside of the home stayed moderate even without any heat or AC. It could be 105F outside and yet the temperature never rose above 80F inside, even without windows installed. Inversely, it could be 20F outside and yet stay at 60F. Of course we had the windows installed by this time. I believe the SIPs saved in the over all cost of this home. The reason I say this is because just after the homeowner moved in a realtor stopped to ask if she would consider selling. The realtor estimated the asking price at \$1,200,000. This is more than double what it cost to build. The homeowner actually thought about selling and building another home, but when I told her I was booked for 4 years she decided not to.

Additional innovative design elements:

As I described above, this home is completely built with SIPs from footings all the way to the roof/ceiling. The foundation SIPs have an R-value of 26 with an EPS foam core. The main floor walls we were able to be installed with no headers which dramatically sped up construction and eliminated thermal bridging. We installed a laminated beam around the perimeter of the flat roof sips. The laminated beam is what supported the 3/12 hip roof trusses. This engineering helped the performance of the home and the speed of construction. Even installing the truss system went faster because we had a flat surface to build it on. It was kind of like building it on the ground and lifting it into place. The attic space created by the trusses is outside the thermal envelope and completely accessible for potential future changes.

HERS Index: 63

Blower door test results: .28 ACH50

Energy use intensity in kBtu/ft2: see attached report

HVAC System:

Heating and AC is provided with a ducted air source heat pump SEER 16

Ventilation is provided with a Zehnder ERV CA350

It also has a back up heat source of a pellet stove that is direct vented with its own fresh air intake.

Additional energy-saving materials used in the building envelope:

Windows are Pella Contemporary series .28 u-value

Holmes Garage door R-value 18.4

Additional energy-efficient products or design features, such as lighting, hot water heating, appliances:

100% of the lighting is LED

Zehnder ERV Ventilation system

The home is oriented to take advantage of the southern sun during the winter with shading to keep the high summer sun out.

All Appliances are energy star rated.

Additional sustainable materials or design features:

Landscape is native grasses and washed river rock

ALL paint is low VOC

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