

**Participant information**

Stinson Builders, Inc.  
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**Category**

Single Family Homes (under 3,000 sq. ft.)

**Project information**

Nielsen Hus  
229 Peninsula Road  
Medicine Lake, MN 55441

**Date Completed:**

July 2019

**Total cost of project (exclusive of land):**

\$450,000

**Dimensions of building (all floors of multi-story building):**

Main Level: 48' x 24'  
Upper Level: 36' x 24'

**Total sq. ft. of conditioned space:**

2,016 sq. ft.

**Built By (if different than applicant)**

Stinson Builders, Inc.  
Chris Nielsen  
315 West 48th Street  
Minneapolis, MN 55419

**Panels Manufactured By Company Name (members only):**

Extreme Panel Technologies

**Designed By (if different than applicant - SIPA will only recognize members)**

Modern Oasis  
Chuck Thiss  
18304 Minnetonka Boulevard  
Deephaven, MN 55391

**Describe the end use of the building:**

Nielsen Hus has always been a dream for Chris and Kirstin Nielsen (owners). Living in a modest 700 s/f home in the small community of Medicine Lake, they were looking to add square footage

to raise their two children. Looking at their options and knowing they did not want to leave their small community they decided to demolish the existing home and build new. Building within a flood plain, though, provided various design challenges.

The old home (slab on grade) had continuous water and mold problems due to the high-water table. Not wanting to bring in yards and yards of fill to raise their new home and potentially put their neighbor's property in jeopardy, the owners decided on an elevated home built on helical piers. The helical piers provide the structure for a wood beam foundation grid on which a SIPs floor sits.

This structural foundation system allows the entire house envelope to be constructed with SIPs (floor, walls and roof) which made for an efficient build and a very tight home. Nielsen Hus received its Certificate of Occupancy in July 2019 and the owners moved in shortly thereafter to enjoy their new energy efficient, healthy and beautiful home.

#### **How did SIP construction help you get this job?**

The Owners knew they wanted to use SIPs for the construction of their house. With previous experience building with SIPs and a strong relationship with Extreme Panel Technologies, Stinson Builders was able to step in and work with the team to design and construct this efficient home.

#### **SIP wall thickness and core material:**

Walls: 6-1/2" with closed cell EPS foam (R-24) core material  
Floor: 10-1/2" with closed cell EPS foam (R-40) core material

#### **SIP roof thickness and core material:**

Roof: 12-1/4" with closed cell EPS foam (R-49) core material

#### **Describe the benefits of using SIPs on this project. Did SIPs help save time, labor, construction costs, or energy?**

With a late start to demolition (October), it was important that construction be efficient to get the home weather tight before the long and cold Minnesota winter. Using SIPs for the entire envelope provided for quick, efficient and stressless construction.

Utilizing a small crew of 1 lead, 1 carpenter and 1-2 laborers/volunteers, the envelope was constructed in short time. With the entire envelope sealed, two (2) small electric heaters were able to heat the home throughout interior winter construction. In addition, constructing with SIPs minimized construction waste on the project.

Nielsen Hus utilized just one (1) dumpster on the entire project, saving money and limiting waste going to landfills. Nielsen Hus has received many positive comments from the community as to the beauty of the home and the efficiency of its construction.

#### **Describe any innovative design elements or structural engineering involved:**

Located within a floodplain area, Nielsen Hus was designed so that no part of the home touches the ground. Helical piers support an above ground structural beam system on which the SIPS floor rests (see photos).

The entire envelope of the home (floor, walls, roof) is constructed with SIPs. In addition, utilizing

SIPs allowed the architect to design clean vaulted ceilings with no ridge beam, and 4' overhangs on the front of the home with no structural posts.

**Please list any certifications the project received, such as ENERGY STAR, LEED, National Green Building Standard, WELL, Passive House, Green Globes or local green building programs. Only list certifications that are completed:**

No certifications were applied for. The Owner made it clear early on that what was most important to them was that the construction process be efficient in schedule and waste and that the home be energy efficient with a future goal of Net Zero.

**HERS Index (required only for High Performance Category and recommended for residential projects):**

41

**Blower door test results (ACH50) (required only for High Performance Category and recommended for residential projects):**

.6 ACH50

**Describe the HVAC system used on the project:**

Understanding that the modest size (at 2,000 s/f, it is smaller than the average home built in the US) and anticipated efficiency of the home did not require a typical sized HVAC system, Stinson Builders worked with Green Building Technologies to design and size the HVAC system.

The Owner requested hydronic radiant floor heating throughout the main level which is supplied by a 95% efficient on-demand combi boiler (heating and domestic). The hydronic tubes are stapled to the 10-1/2" SIPs floor and encased in 2" of gypcrete and a finished cementitious top coating allowing the thermal mass to warm the house.

In addition, an 18,000 BTU Dettson smart duct air handler and 21 SEER Alize condenser was installed for cooling and back-up heating of the home. Two (2) Panasonic WhisperComfort ERV's were installed to provide balanced ventilation. It is anticipated that future solar installation will provide a Net Zero house.

**Describe any other energy-saving materials used in the building envelope other than SIPs. List U-values of windows used and the U or R-value of any insulation materials. (judged only for High Performance Category):**

Duxton Triple Pane windows and doors with a U-Value of .21 were installed throughout the home. The windows utilized a wide perimeter nailing fin which set the window deeper into the wall cavity creating elegant shadow lines while also increasing the efficiency of the windows.

**Please list any energy-efficient products or design features, such as lighting, hot water heating, appliances, passive solar (judged only for High Performance Category):**

\* Hot water is supplied by a 95% efficient tankless on-demand boiler.

\* General lighting throughout the interior and exterior of the home consists of 6" (13W) and 4" (8W) LED lighting that mimics typical can lighting, but can be installed in SIPs. In addition, all surface mount fixtures and under cabinet lighting are LED.

\* Based on Scandinavian design, the wood siding (black ash) was harvested and milled in Northern Minnesota (3 hours from the home's location).

\* Dual flush toilets are utilized in all three bathrooms.

**Were any solar panels installed on the project? If so, indicate the size of the system (judged only for High Performance Category):**

At this time, no solar panels are installed. The upper SE roof is slated for future panels with a goal of Net Zero.

**Please list any sustainable materials or design features not listed above, such as recycled materials, low-VOC finishes, landscaping, etc. (judged only for High Performance Category):**

\* All paint utilized inside the home was low or zero VOC.

\* The Chinese Elm wood that was utilized as a design feature on the main level ceiling and the back of the kitchen island was harvested from a job site in Minneapolis and milled locally.

**Any additional comments on the project:** It should be noted that Stinson Builders has been contracted to build another SIPs home in the Medicine Lake community based on the positive reaction to the efficient SIPs construction process and energy efficiency of Nielsen Hus.