

PARTICIPANT INFORMATION

Company Name: Wickiup Builders

Contact Name: Tikker Jones

Address: PO Box 1

City: Ennis

State: Montana

Zip: 59729

Phone: 406-581-4676

Email: wickiup@3rivers.net

Website:

CATEGORY ENTRY *(check one category)*

- ☐ Single Family Homes (over 3,000 sq. ft.)
☒ Single Family Homes (under 3,000 sq ft.)
☐ Multifamily
☐ Agricultural
☐ Institutional / Industrial / Commercial
☐ Renovations
☐ Affordable Housing

PROJECT INFORMATION

Project Name: Barrel Vault

Address: 101 Pyramid Lane

City: Ennis

State: MT

Zip: 59729

Date completed: December 2011

Total cost of project (exclusive of land): \$360k

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

40'-6" x 68'8" living area over same sized unfinished basement

Asking price/purchase price (Affordable Housing only):

BUILT BY *(if different than applicant)*

Company Name:

Contact Name:

Address:

City:

State:

Zip:

PANELS MANUFACTURED BY *(members only)*

Company Name: Big Sky Insulations

DESIGNED BY *(if different than applicant – SIPA will only recognize members)*

Company Name: Owner

Contact Name: Whitney Lake

Address:

City: Ennis

State: Montana

Zip: 59729

Please answer each question with as much detail as possible.
Attach additional pages if necessary.

Describe the end use of the building:

see attached

How did SIP construction help you get this job?

The owner insisted on SIPs as he had used them on two previous projects.

Please answer each question with as much detail as possible to help in the judging process

SIP wall thickness and core material: 12.25" EPS / 10.25" EPS ENDWALLS

SIP roof thickness and core material: 12.5" EPS

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

see attached

Describe any innovative design elements or structural engineering involved:

see attached

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

Energy Star

HERS Index (residential projects): 22

Blower door test results (ACH50) (residential projects): .17Ach50

Describe the HVAC system used on the project:

see attached

Please list any energy-efficient products or design features other than SIPs:

see attached

Please list any sustainable materials or design features not listed above, such as recycled materials, low-VOC finishes, landscaping, etc.:

see attached

Any additional comments on the project:

see attached

CHECKLIST

- ☒ My company is a SIPA member. Panels for this project were manufactured by a SIPA member.
- ☒ I have answered ALL the questions completely
- ☒ I have enclosed the two required electronic images of the completed project meeting the requirements stated in the SIPA Building Excellence Awards guidelines
- ☒ I have indicated the HERS Index as determined by a RESNET certified home energy rater (residential projects)

PLEASE CONFIRM: I have read and understand the rules for this competition. This entry is structural insulated panel construction as defined in the SIPA Building Excellence Awards guidelines. I understand by making this submission that my pictures will be used by the Structural Insulated Panel Association (SIPA) to promote the use of structural insulated panels. I hereby give permission to SIPA to use the enclosed pictures for any use they see fit in that endeavor. I understand that where possible, SIPA will give credit for pictures used to my company as listed above.

Signature:

Date:

Entries that do not contain all required materials or are received after March 15, 2012 will not be considered

Complete and return to the SIPA office: P.O. Box 1699 Gig Harbor, WA 98335
For FedEx or UPS Deliveries ONLY:
6659 Kimball Drive NW, D-404
Gig Harbor, WA 98335
253.858.7472

2012 SIPA Building Excellence Awards Application Addendum for Wickiup Builders

End use of building: This building will be the informal office for the owner's conceptual learning institution- Alternative Energy Resource Institute. Its main use will be as a residence for participating visitors and relatives as evidenced by the 3 bedrooms and full kitchen and bath.

Benefits of SIPs: Curved (20' radius) 12" SIPs were used to form the vault. If we had traditionally framed this structure it would have required curved glulams or a metal Quonset type superstructure. Without utilizing SIPs it would have been extremely difficult to reach the desired insulation values and infiltration rate. The building became enclosed rather rapidly due to the modular nature of the panels.

Innovative design elements and structural engineering elements: Obviously the vault (half cylindrical) shape is novel for a complete structure especially using SIPs with such a tight radius. Interior buttresses, made from 6-1/2" SIPs panels made the vault extremely rigid, so much so that proposed internal horizontal rods were eliminated. Additionally the entire exterior was covered with an additional layer of SIPs osb to tie the panel sections together and to eliminate discrepancies in plane. On the interior a triple layer of osb was used on panel interfaces for not only strength and rigidity, but also to add an architectural design element. All interior walls are covered with osb, not drywall. Commercial vinyl tile covers the floor. Interior vestibule added to reduce cold air rushing in upon entering.

Heating system: A 95%+ efficient wood-fired gasification boiler is integrated into a closed loop radiant floor heating system. Regulated make up air from outside was required. Aluminum plates were attached under the subfloor, the PEX was snapped into these plates and a radiant barrier was added below. No other back-up heating is in place. No AC is necessary. A ducted balanced HRV system was installed.

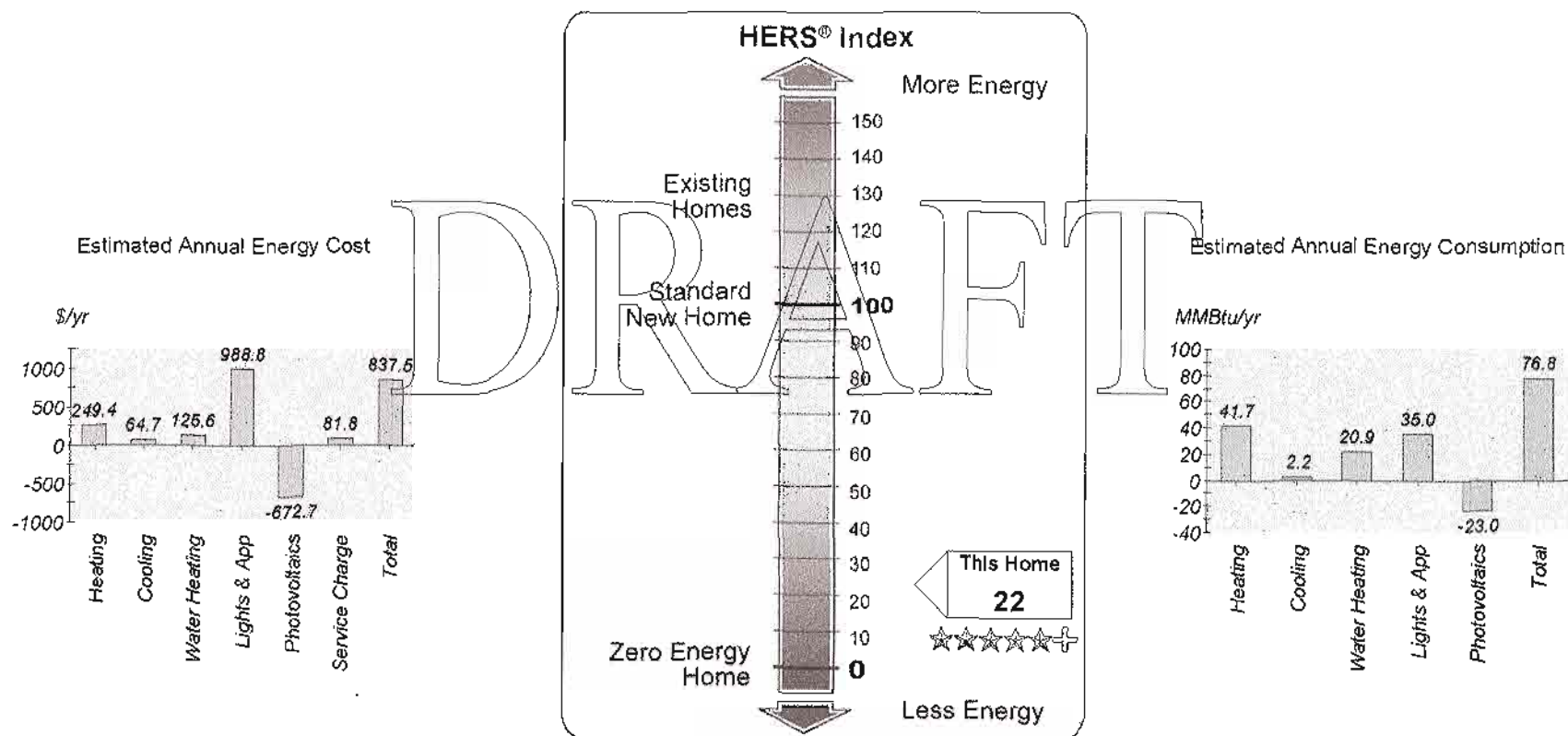
Other energy-efficient products: This project used Serious Windows 525 series which all have a U-value of around 20. Lower SHGC glass was used on the westerly face. The structure is completely off-grid having a 4KW PV system augmented by three 1KW wind generators. The rim and mudsill were spray foamed to match the wall/roof R- value. R-20 ICF basement walls. All lighting is LED.

Sustainable materials/ design features: This habitation replaces a triple-wide that sat over the full ICF basement. The triple-wide was moved off site and is utilized by a new owner. The off grid power system is the same system used to run the previous structure. We reused the basement by readjusting the new subfloor to square and elevation. The entire building is covered with 26 gauge colored standing seam steel, making it virtually maintenance-free. The decking material features recycled content and recycled 4" steel mesh netting. The interior buttresses are used as room dividers. All metal and EPS scraps were recycled. The interior osb is painted with low VOC paint. Bamboo butcher block is used as kitchen countertops.

Additional Comments: I was able to do blower door tests throughout the construction so that we traced down most of the infiltrations which lead to the low infiltration rate. An online blog was maintained demonstrating the construction: wickiupbuilders.tumblr.com

HOME PERFORMANCE WITH ENERGY STAR

ENERGY RATING CERTIFICATE



Address: 101 Pyramid Lane
Ennis, MT 59729

House Type: Single-family detached
Cond. Area: 5565 sq. ft.
Rating No.: 120-013
Issue Date: February 21, 2012
Certification: Verified

Annual Estimates*:

Electric(kWh): 3271
Propane(Gallons): 34
Wood(Cords): 3
CO2 emissions(Tons): 8

Annual Savings**: \$2787

* Based on standard operating condition.

** Based on a HERS 130 Index Home

TITLE

Company
Address

Certified Rater: Jon Shafer
Certification No: 120
Rating Date: 2/7/2012

REM/Rate - Residential Energy Analysis and Rating Software v12.97

This information does not constitute any warranty of energy cost or savings. © 1985-2012 Architectural Energy Corporation, Boulder, Colorado.
The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

Home Energy Rating Certificate

101 Pyramid Lane
Ennis, MT 59729



**5 Stars Plus
Confirmed Rating**

Uniform Energy Rating System

| 1 Star | 1 Star Plus | 2 Stars | 2 Stars Plus | 3 Stars | 3 Stars Plus | 4 Stars | 4 Stars Plus | 5 Stars | 5 Stars Plus |
|---------|-------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
| 500-401 | 400-301 | 300-251 | 250-201 | 200-151 | 150-101 | 100-91 | 90-86 | 85-71 | 70 or Less |

Energy Efficient

HERS Index: **22**

General Information

Conditioned Area: 5565 sq. ft. House Type: Single-family detached
Conditioned Volume: 65701 cubic ft. Foundation: Conditioned basement
Bedrooms: 3

Mechanical Systems Features

Integrated Htg/DHW: Wood, Htg eff 0.85 CAafue. DHW eff 0.65 CAef.

Duct Leakage to Outside: NA
Ventilation System: Balanced: HRV, 150 cfm, 110.0 watts.
Programmable Thermostat: Heating: No Cooling: No

Building Shell Features

Ceiling Flat: NA Exposed Floor: NA
Vaulted Ceiling: R-48 Window Type: .22 / .40*
Above Grade Walls: R-48, R-40 Infiltration:
Foundation Walls: R-20.0 Rate: Htg: 183 Cfg: 183 CFM50
Slab: R-10.0 Edge, R-0.0 Under Method: Blower door test

Lights and Appliance Features

Percent Interior Lighting: 100.00 Range/Oven Fuel: Propane
Percent Exterior Lighting: 0.00 Clothes Dryer Fuel: None
Refrigerator (kWh/yr): 548.00 Clothes Dryer EF: 3.01
Dishwasher Energy Factor: 0.00 Ceiling Fan (cfm/Watt): 0.00

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM/Rate - Residential Energy Analysis and Rating Software v12.97

This information does not constitute any warranty of energy cost or savings.

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Registry ID: 120-013
Rating Number: 120-015
Certified Energy Rater: Jon Shafer
Rating Date: 2/7/2012
Rating Ordered For: Whitney Lake

Estimated Annual Energy Cost Confirmed Rating

| Use | MMBtu | Cost | Percent |
|-------------------|-------|--------------|-------------|
| Heating | 41.7 | \$249 | 32% |
| Cooling | 0 | \$0 | 0% |
| Hot Water | 20.9 | \$126 | 16% |
| Lights/Appliances | 35.0 | \$989 | 128% |
| Photovoltaics | -23.0 | \$-673 | -87% |
| Service Charges | | \$82 | 11% |
| Total | | \$773 | 100% |

This home meets or exceeds the minimum
criteria for all of the following:

TITLE
Company
Address
City, State, Zip
Phone #
Fax #

From THE OWNER WHITNEY LAKE

The Quonset hut-shaped office began as an idea to replace a modular home, which used to occupy the approximately 40'x70' foundation. Once the modular had been moved construction began. The shape of the building was decided and agreed upon early in the planning process. Bob Bayley, architect, and Tikker Jones, builder, were both very close friends with vast experience and in whom the essentials of the project would be entrusted.

From the outset several challenges were acknowledged such as fenestration and roofing material choice. Can the barrel-vault be self-supporting? We all knew that we wanted Big Sky Insulation's R-Control panels to be a part of the structure. It was determined that the panels not only could be radiused but that their thickness provided insulation and structural integrity which exceeded any building codes.

It was decided that the optimum roofing material was a gently radiused steel from Bridger Steel. The steel could also be standing seam, which contributes clean lines and continuity of design.

Several innovations also contributed to the overall stability of the architecture:

Interior "flying buttresses," which are essentially pie-shaped support walls

An exterior "extra skin," consisting of ½" sheets of OSB, which overlapped all joints, glued and screwed in place

An interior "latticework," which was a "glue-lam" constructed in situ. Every joint, Either perpendicular or parallel, was spanned with consecutive ribs of 16", 12" And finally 8" to form the Parthenon-like appearance – the latticework. Not only Aesthetically pleasing but structurally reinforcing.

The foundation consists of insulated concrete forms. There is a radiant floor system as well as a high-efficiency wood gasification boiler. The entire structure is powered by a photovoltaic array and three wind turbines.

The BlowerDoor Test confirmed the planning and execution that produced such a structure and I am especially grateful to the Wickiup Builders (Tikker Jones, Zack Saunder, Mike and Jim Ott, Ron Barndt), Bob Bayley and to Bill and Tracy at Planetary Systems without whom none of this would have been possible. They are always there to meet the challenge of building unorthodox things, which serve to expand our horizons and inspire the imagination.