



Creekside Home

Creekside Home



Participant information

Taiga Design+Build, LLC
Anton Moody, Owner
PO Box 1428
Grand Marais, MN 55604
Phone: 218-370-0944
Email Address: anton.moody@gmail.com
Website: www.taigadesignbuild.com

Category

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

High Performance: No

Project information

Creekside
Grand Marais, MN 55604

Date Completed: September 1, 2018

Total cost of project (exclusive of land): \$325,000.00

Dimensions of building (all floors of multi-story building): 50' x 28'

Asking price/purchase price (Affordable Housing only): n/a

Total sq. ft. of conditioned space: 1,337 sq.ft.

Built By (if different than applicant)

Taiga Design+Build, LLC
Anton Moody, Owner
PO Box 1428
Grand Marais, MN 55604

Panels Manufactured By

Company Name (members only): Energy Panel Structures, Graettinger, IA



Creekside Home



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

Taiga Design+Build, LLC and EnvironDesign (Richard Olson)

Anton Moody

PO Box 1428

Grand Marais, MN 55604

Total sq. ft. of conditioned space: 1,337 sq.ft.

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

Describe the end use of the building: Single family residence

How did SIP construction help you get this job? We have been working to develop infill properties within Grand Marais focusing on unique design and energy efficiency. By working with SIPs and more specifically Energy Panel Structures, we have been able to meet both criteria. We have built other alternative envelope homes with great success on energy savings, but the quick assembly time of SIPs has allowed us to keep these high energy standards intact while completing the build in a shorter time frame.

SIP wall thickness and core material: 6" Neopor

SIP roof thickness and core material: 10" Neopor

Describe the benefits of using SIPs on this project. Did SIPs help save time, labor, construction costs, or energy? SIP construction in adverse conditions saves time and labor costs. Energy savings is evident with blower door testing and analysis. Site installed insulation, from dense pack cellulose to spray foam have a human element which needs to be inspected during the process. Having the SIP structure something we can complete within our firm means we don't have to guess if insulators did their job right. Having that confidence feels good that we are delivering the best product possible.

Describe any innovative design elements or structural engineering involved: A winder stairwell is run through the large chimney mass to access the roof deck, Integrated exterior fireplace, Marvin bi-fold exterior door which opens a whole wall of the kitchen up to the patio.

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: n/a

Creekside Home



HERS Index (required only for High Performance Category and recommended for residential projects): n/a

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

Energy use intensity in kBtu/ft² (required only for High Performance Category and recommended for commercial projects):
n/a

Describe the HVAC system used on the project: Hydronic in-floor heat fired by an on-demand LP boiler which also provides tankless domestic hot water. Zones controlled by "Smart" technology wireless Thermostats. Heat Recovery Air Exchange unit installed.

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) n/a

Please list any energy-efficient products or design features, such as lighting, hot water heating, appliances, passive solar (judged only for High Performance Category): LED lighting throughout home, on-demand water heating for domestic use, as well as infloor heating.

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

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 landscaping was done utilizing materials excavated from home site, i.e.: Boulder retaining walls. Richlite (recycled and pressed paper) used for counter tops, vanity tops, built in shelving, and desk.

Any additional comments on the project: n/a

Exterior front view

Creekside Home



Entrance

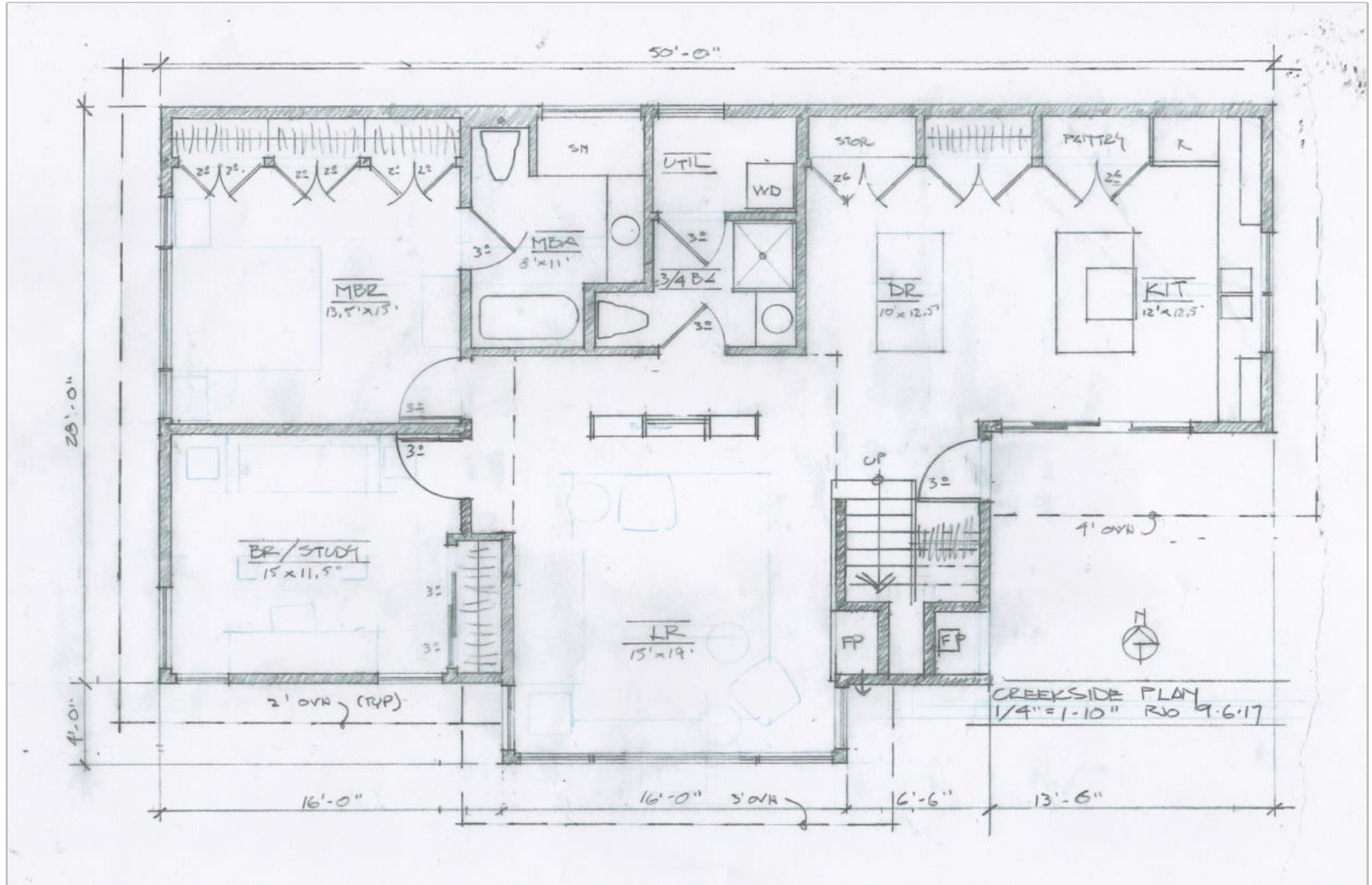
Creekside Home



Exterior view

Creekside Home





East Elevation

Creekside Home



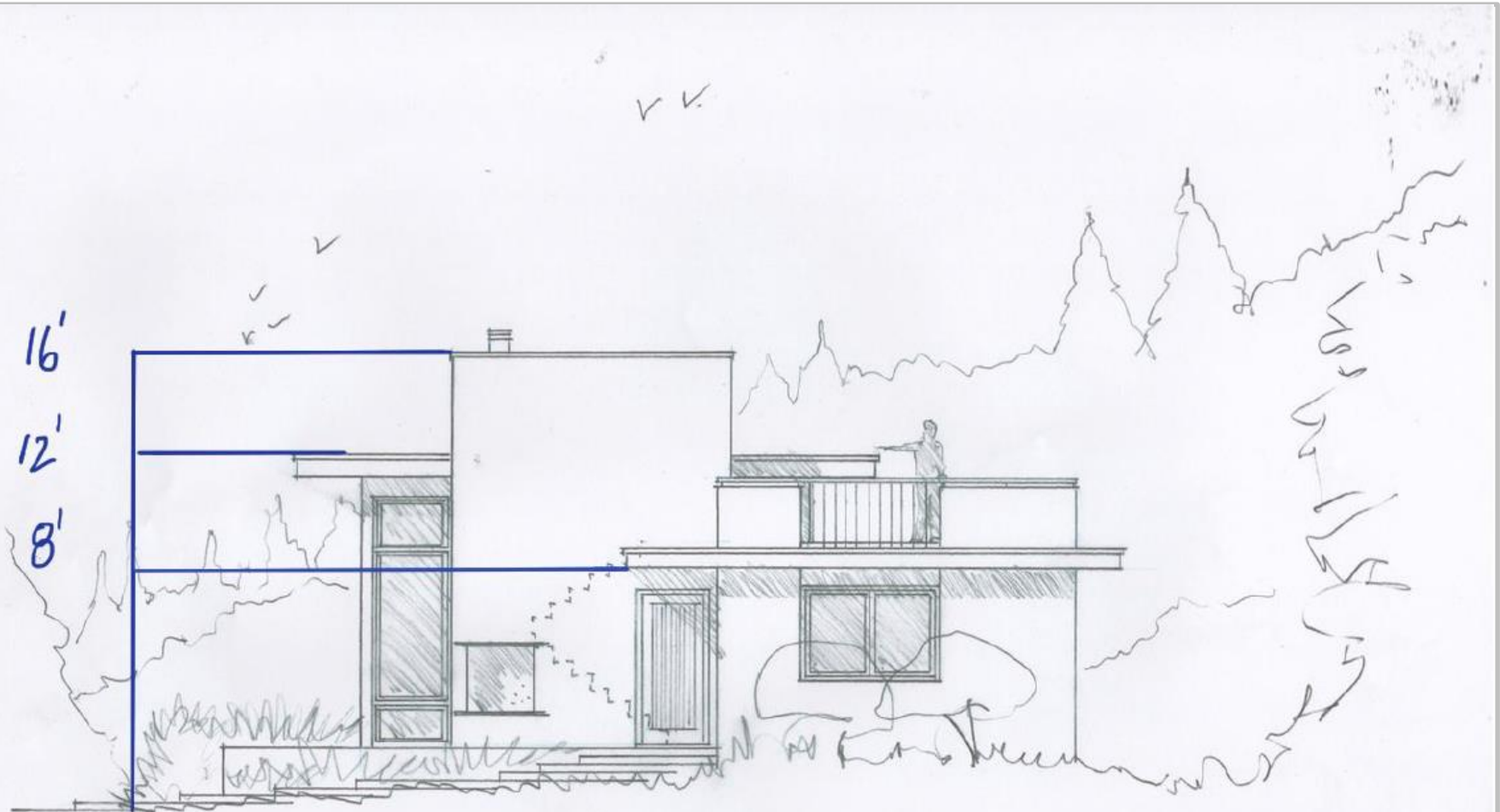
South Elevation

Creekside Home



Panel plan detail

Creekside Home



* Railing by Others

CREEKSIDE • EAST ELEVATION
1/4" = 1'-0" RJO 9.6.17

*Roof Panels/Thickness based on Engineering Recommendation

Panel plan detail

Creekside Home



BUILDING LEAKAGE TEST

Senty Inspection dba
Senty Construction LLC
PO Box 969
2043 Hy 61 West
Grand Marais, MN 55604

Date of Test: 10/10/2018 Test File: EPS Anton
Customer: EPS Foam Technician: MSenty
340 Gunflint Trail Project Number:
Grand Marais, MN 55604
Phone: 612-499-0756
Email: LBergum@epsbuildings.com Building Address: Anton Moodey, builder
Daniel Sigg, owner
340 Gunflint Trail
Grand Marais, MN 55604

Test Results

- Airflow at 50 Pascals: 181 CFM50 (+/- 0.6 %)
(50 Pa = 0.2 w.c.)
0.92 ACH50
0.1467 CFM50/ft2 floor area
0.0569 CFM50/ft2 surface area
- Leakage Areas: 19.1 in2 (+/- 2.0 %) Canadian EqLA @ 10 Pa
10.3 in2 (+/- 3.3 %) LBLELA @ 4 Pa
- Building Leakage Curve: Flow Coefficient (C) = 14.9 (+/- 5.3 %)
Exponent (n) = 0.638 (+/- 0.015)
Correlation Coefficient = 0.99869
- Test Settings: Test Standard: CGSB
Test Mode: Depressurization

Infiltration Estimates

- Estimated Average Annual Infiltration Rate: 11.7 CFM
0.06 ACH
2.9 CFM per person
- Estimated Design Infiltration Rate: Winter: 21.4 CFM Summer: 15.6 CFM
0.11 ACH 0.08 ACH

Cost Estimates

- Estimated Cost of Air Leakage for Heating: \$ 39 per year heating
- Estimated Cost of Air Leakage for Cooling:

Mechanical Ventilation Guideline (based on ASHRAE 62.2-2010)

Recommended Whole Bldg Rate: 62.3 CFM
Base Rate: 42.3 CFM
Supplemental Rate: 20.0 CFM
Infiltration Credit: <0.0 CFM>

BUILDING LEAKAGE TEST Page 2 of 4

Date of Test: 10/10/2018 Test File: EPS Anton

Building Information

| | |
|----------------------|-------|
| Volume | 11768 |
| Surface Area | 3181 |
| Floor Area | 1234 |
| Height | 16 |
| # of Bedrooms | 2 |
| # of Occupants | 4 |
| Year of Construction | 2018 |
| Wind Shield | E |

Location Climate Information

| | |
|----------------------------|----------|
| Ventilation Weather Factor | 1.00 |
| Energy Climate Factor | 17.00 |
| Heating Degree Days | 9050 |
| Cooling Degree Days | 51 |
| Design Winter Wind Speed | 10.3 mph |
| Design Summer Wind Speed | 11.7 mph |
| Design Winter Temp Diff | 86 deg F |
| Design Summer Temp Diff | 6 deg F |

Heating and Cooling Cost and Efficiency Information

| | |
|----------------------|---------------|
| Heating Fuel | Propane |
| Heating Fuel Cost | \$1.70/gallon |
| Heating Efficiency % | 95.00 |
| Cooling Fuel Cost | |
| Cooling SEER | |

Equipment Information

| Type | Manufacturer | Model | Serial Number | Custom Calibration Date |
|----------------|---------------------|----------------|---------------|-------------------------|
| Fan | Energy Conservatory | Model 3 (110V) | | - |
| Micromanometer | Energy Conservatory | DG700 | 5651 | 5/22/2014 |

Panel plan detail

Creekside Home



BUILDING LEAKAGE TEST Page 3 of 4

Date of Test: 10/10/2018 Test File: EPS Anton

Depressurization Test:

Environmental Data

| Indoor Temperature (°F) | Outdoor Temperature (°F) |
|-------------------------|--------------------------|
| 67.0 | 34.0 |

Data Points - Automated Test (TT 4.0.52.3)

| Nominal Building Pressure (Pa) | Baseline Adjusted Building Pressure (Pa) | Fan Pressure (Pa) | Nominal Flow (cfm) | Adjusted Flow (cfm) | % Error | Fan Configuration |
|--------------------------------|--|-------------------|--------------------|---------------------|---------|-------------------|
| -0.8 | n/a | n/a | | | | |
| -51.7 | -51.3 | 71.9 | 192 | 186 | 0.8 | Ring C |
| -48.9 | -48.5 | 64.5 | 181 | 176 | -1.1 | Ring C |
| -40.9 | -40.5 | 53.5 | 165 | 159 | 0.8 | Ring C |
| -35.7 | -35.3 | 43.2 | 147 | 143 | -1.5 | Ring C |
| -30.3 | -29.9 | 36.7 | 136 | 131 | 0.9 | Ring C |
| -25.5 | -25.1 | 28.9 | 120 | 116 | -0.3 | Ring C |
| -19.9 | -19.5 | 21.4 | 103 | 100 | 0.3 | Ring C |
| -0.1 | n/a | n/a | | | | |

Deviations from Standard CGSB - Test Parameters

- One or more of the test data points was taken at a building pressure that differed by more than 2.5 Pascals from the target pressure.
- Test data was not collected at all 8 recommended target building pressures.

BUILDING LEAKAGE TEST Page 4 of 4

Date of Test: 10/10/2018 Test File: EPS Anton

Comments

The Minnesota Energy Code leakage threshold is 3ACH@-50pa or less. This house passes at 0.92 ACH@-50pa. HRV rate 24/7 recommendation = 20CFM (or 60CFM at 20

minutes on)

Kitchen range hood fan rate: Low 390 cfm, High 600 cfm Info from manual. Pressure

pan

capacity exceeded and was not measured "as is".

SAFETY: Combustion Appliance Zone Test results: With CAZ door open, dryer

operating, &

kitchen range hood fan set at low, depressurization = -49pa. At medium = -81pa at

high

= -115pa. The depressurization limit of the propane boiler (closed combustion unit) =

-50pa. Exceeding the depressurization limit of the boiler is a safety hazard, including

CO

gas entering the home. CO gas can cause death. Inspector recommends disabling the range hood fan until conditions are modified to create safe conditions for fan operation. One option is make up air provided to the furnace room at a rate that reduces depressurization of the home when the fan is operated at high.

SIP panel reported date: Wall 5 1/2" core, R28, Ceiling 10" core R50

Panel plan detail

Creekside Home

**DEALER USE ONLY**

Quote Date: 9/22/17

Quoted By: JW

Price Based on Drawings Dated:

Spec Book Received? NO Any Addendums? NO

Addendum Number(s):

Price Version: August 23, 2017 Prices Effective: August 23, 2017

DEALER FORMAL QUOTATION

Dealer: TAIGA DESIGN BUILD

Address:

City: MN

Phone:

Fax:

E-mail:

Project Name: CREEKSIDE

Project Address:

Project City: GRAND MARAIS MN

Contact Phone:

Project E-mail:

PRICE IS VALID FOR 30 DAYS

Summary of Work:

The general scope of this proposal is to provide an EPS pre-engineered residential housing building package to include the building materials, construction drawings and details as outlined in scope below.
The base building package is designed in accordance with IBC2015.

Changes to Contract:

Should it be necessary to make additions, deletions or alterations to this contract, the changes shall be made with prior written approval of both parties in the form of a written change order. Change orders will not however alter the terms or provisions of the original contract and they shall become, upon acceptance of both parties, a part of this contract.

EPS Residential Building Package - Dealer Copy**Structure Loads:**

| | |
|----|------------------------------|
| 60 | = Ground Snow Load (psf) |
| 50 | = Roof Snow Load (psf) |
| 40 | = Floor Live Load (psf) |
| 10 | = Floor Dead Load T.C. (psf) |
| 5 | = Floor Dead Load B.C. (psf) |

The base house is designed per the provisions of the 2015 IBC Code and is designed for the calculated Roof Snow Load in addition to 10 psf T.C. Dead Load and 10 psf B.C. Dead Load. Panelized roofs are designed for the calculated Roof Snow Load in addition to 15 psf total Dead Load.

The base house The wind load design is based on IBC2015 Fig1609.3(1) (3 sec gust) Wind Exposure C

Wind Load Importance factor, $I_w=1.00$ (Cat II)Snow Load Importance factor, $I_s=1.00$ (Cat II)**Foundation Level**

Concrete Foundation Mudsill Package*: (See foundation plan for locations)

Treated 2x mudsill supplied for the following concrete/masonry foundation conditions

Ethafoam sill seal under entire plate

Description of concrete/masonry foundation conditions:

16" foundation wall (CONCRETE B.O.) 4' 0" tall

* Note: EPS Package includes mudsill and sill seal only. All other foundation material is not included.

SIP Wall Package Includes:

All necessary top and bottom plates, studs, and splines with panels routed to accept these items.

SIPS screws at corners and SIP-Seal adhesive for plate and spline connections.

Panel foam cores that are 1.0 lbs density expanded polystyrene unless noted otherwise.

Panel edges factory-sealed with Anchorseal® wax emulsion end sealer to prevent end checking & degrade.

House-wrap and house tape are provided for exterior panels.

No foam sealant is included to seal penetrations caused by other trades (electrical, mechanical, plumbing, etc.).

1st Floor Exterior Wall Package: (See floor plan for locations)

Panel Description:

124' SIP panels 8' 1-1/8" Ceiling Height

7/16 OSB exterior sheathing/ 5-5/8" (R-26) EPS foam core/ 7/16 OSB interior sheathing

2 horizontal wire chase included in panel at 16" and 44" A.F.F.

Jumbo panels will be used when applicable

24' SIP panels 12' 1-1/8" Ceiling Height

7/16 OSB exterior sheathing/ 5-5/8" (R-26) EPS foam core/ 7/16 OSB interior sheathing

2 horizontal wire chase included in panel at 16" and 44" A.F.F.

Jumbo panels will be used when applicable

20' SIP panels 16' 1-1/8" Ceiling Height

7/16 OSB exterior sheathing/ 7-3/8" (R-33) EPS foam core/ 7/16 OSB interior sheathing

2 horizontal wire chase included in panel at 16" and 44" A.F.F.

Jumbo panels will be used when applicable

20' SIP panels 8' 1-1/8" Ceiling Height

7/16 OSB exterior sheathing/ 5-5/8" (R-26) EPS foam core/ 7/16 OSB interior sheathing

2 horizontal wire chase included in panel at 16" and 44" A.F.F.

Jumbo panels will be used when applicable

40' SIP panels 4' 1-1/8" Ceiling Height

7/16 OSB exterior sheathing/ 5-5/8" (R-26) EPS foam core/ 7/16 OSB interior sheathing

2 horizontal wire chase included in panel at 16" and 44" A.F.F.

Jumbo panels will be used when applicable

*Note: 7/16" OSB interior must be covered with a minimum 1/2" Type "X" sheetrock to provide an adequate thermal barrier.

*Note: Verify all foundation dimensions, steps, and wall heights before placing order. In some cases, such as window walls or bays, SIP walls are not feasible.

* Note: Jumbo panels are only available when using 7/16" OSB skins on both faces. Panels over 12' tall will be 4' wide (maximum panel size is 8' wide x 12' tall). EPS will effectively use a combination of jumbo panels and standard panels on tall walls and sloped gable end walls to minimize waste.

Exterior SIP Wall Openings:

5 rough openings 0'-4" wide in panels

4 rough openings 4'-6" wide in panels

3 rough openings Over 6' wide in panels

All openings wrapped with 2x jamb material.

Standard headers consist of 2" EPS core with 2x10 MSR 2400 lumber (for openings under 6' wide) or 1-3/4" x 11-1/4" LVL (for openings over 6' wide), factory pre-assembled and cut to length. Headers are field sheathed to match surrounding wall panels.

Loose Division Wall Framing:**First Level Interior Partitions:**

28 LF - 2x6 partitions 8' 1-1/8" tall

95 LF - 2x4 partitions 8' 1-1/8" tall

*Note: Interior partitions include single base plate and double top plate, studs are all Premium grade SPF#2 or better.

All studs are pre-cut to length except in vaulted ceiling areas.

Interior Openings:

3 non-load bearing opening(s) 0'-4" wide with standard 2X6 header material

7 non-load bearing opening(s) 4'-6" wide with 2X10 header material

2 load bearing opening(s) 0'-4" wide with standard 2X10 header

*Note: Standard headers are specified. Additional header material may be required upon engineering or if specified by the customer for special circumstances. Change orders may be applied.

First Floor System:

* Note: All stair stringers, treads, and risers are designed and supplied by others.

Concrete Slab Designed and Supplied by Others

Miscellaneous Options:

Paslode Gun Nail Package is Included

Stamped drawings are not provided.

Specialty Items:

3ply 9 1/2" LVL beams at elevation changes

10" SIP flat roof system 2ply LVL splines 4" o.c. / neopor foam in lieu of EPS foam

Wall panels to have neopor foam in lieu of EPS foam

Stair framing included

Panel plan detail

Creekside Home

**EPS Building Package Price:**

| | |
|------------------|------------------|
| Dealer Net: | \$40,364.75 |
| Sales Tax**: | 6.88% \$2,777.10 |
| Dealer Total: | \$43,141.85 |
| Freight Included | |

**Sales tax quoted (if any) is subject to change based on rates in effect at the time of invoicing and location where buyer takes possession of materials. Buyer agrees to pay all sales, use, occupation, excise or similar tax applicable to the transaction.

Dealer Signature Required To Place This Package On Order

By signing and agreeing to the above, I hereby state I have read and agree to the terms and conditions below.

10% Down Payment Due With Order: \$ 4,314

Requested Ship Date: _____

Purchase Order: _____

The following information is required before EPS can begin drawing/engineering your house package:

| | | |
|--|---------------------------|-------------------------|
| Building Floor Plan | Door/Window Locations | Address/Site Directions |
| Division Wall Location | Requested Ship Date | 10% Down Payment |
| Door/Window Rough Opening if By Others | Verify Garage Wall Height | |

****MISSING INFORMATION MAY RESULT IN DELAYS WITH THIS ORDER****

TERMS OF PAYMENT:

- 1) Payment terms are 10% non-refundable down payment with order, balance due upon delivery. There will be a 1.5% monthly service charge on all past due accounts.
- 2) All prices are F.O.B. factory, freight prepaid and included. Unless specified, all charges for unloading at the job site are at buyer's expense.
- 3) Prices subject to change without notice. Quote Is Valid For 30 Days
- 4) Sales tax quoted (if any) is subject to change based on rates in effect at the time of invoicing and location where dealer takes possession of materials. No taxes of any kind except those itemized above are included. In addition to the purchase price buyer agrees to pay the amount of any sales, use, occupation, excise or similar tax applicable to the transaction.
- 5) I, the Owner/Builder, agree to EPS's policies and procedures dated September 29, 2009, for this project. (See www.epsbldg.com for details). The Owner/Builder is responsible for following EPS's plans and details in addition to these EPS policies & procedures.
- 6) Estimates reflect our best evaluation of the plans and details submitted at the time of quotation. Extra engineering and costs may be required to satisfy the buildings' engineered loads as the building is entered into production and engineering. Additional headers, lumber, or other material may be required and will result in a change order when applicable.

BUILDING NOTES:

- 1) To insure compliance with code and/or insurance requirements, check with local building officials where the building is to be built.
- 2) This is a structural framing package and is to be used for that purpose only. Codes regarding fire safety, interior finishes, personal safety and injury are not addressed in the drawing and are the responsibility of the owner.
- 3) Dealer is responsible for verifying the correct information is on the quote. Even though EPS Personnel may have assisted in preparing the quote, the Dealer must verify that EPS's interpretations and assumptions made are correct.
- 4) The freight loads have been figured to minimize the quantity of loads being sent by maximizing the amount of materials on each load. If freight loads need to be added to have specific items arrive at different times that don't maximize the materials on each load, then additional loads of freight that are more than what is quoted will be charged for.
- 5) This quotation sheet is not all-inclusive of the package supplied. Please refer to the EPS manual for complete details.
- 6) The scope of work and specifications in this quotation are a contract.
- 7) FRP/NRP meets minimum requirements for Class C interior wall and ceiling finishes of flame spread less than 200, smoke developed 450 or less when tested per ASTM E-84.
- 8) See the 2015 International building code Table 1604.5 for occupancy category classifications.
- 9) See the 2015 International building code section 1609.4 for exposure factor definitions.
- 10) The attic of this structure must be properly ventilated. Consult an HVAC engineer for proper sizing of eave inlets, ridge openings, louvers, or mechanical systems. Failure to properly ventilate the attic may cause partitions to separate at roof/ceiling, larger air conditioning loads, condensation on roof materials, mold, mildew, corrosion of truss plates, premature degradation of structural building components.
- 11) SIP Buildings are designed for minimal air infiltration. It is recommended that General Contractors/Owner work in conjunction with a HVAC professional to design a system to insure appropriate air quality and moisture control. Air exchangers are recommended.
- 12) EPS does not provide for the design of the temporary bracing for this building, nor does EPS provide for the material for the temporary bracing. Both the design of and material for temporary bracing is the responsibility of the dealer, contractor, or owner.
- 13) Builder must refer to and at all times comply with the Building Component Safety Information (BCSI) materials related to truss installation, restraint and bracing for the building that are provided with your building package.
- 14) If building includes clear span trusses 60 feet or longer, you are required to:
 - A. Have EPS or another registered design professional (RDP) design temporary restraints/bracing to be used during construction. (EPS can provide this service at an additional charge or you can hire your own RDP.)
 - B. Have an RDP or your local inspection agency inspect temporary and permanent restraints/bracing during and after construction.
- 15) If building is adjacent to a higher building special snow loading may be required, or if is adjacent to a lower structure unintended snow loading may occur on existing.

Energy Panel Structures, Inc.
603 N Van Gordon Ave ~ PO Box 238 ~ Graettinger, IA 51342
Phone: 800-967-2130 ~ Fax: 712-850-3275
www.epsbldg.com