

ICC-ES Evaluation Report

ESR-2326

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This report is subject to re-examination in two years.

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 12 00—Structural Panels
Section: 06 17 00—Shop-Fabricated Structural Wood
REPORT HOLDER:

YANKEE BARN HOMES, INC.
131 YANKEE BARN ROAD
GRANTHAM, NEW HAMPSHIRE 03753
www.yankeebarnhomes.com

EVALUATION SUBJECT:
YANKEE BARN HOMES TRUE ROOF PANELS
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)

Property evaluated:

Structural

2.0 USES

True Roof Panels are structural, insulated, and vented prefabricated roof panels used in residential and nonresidential structures classified as Type V-B construction. The panels comply with Chapter 23 of the IBC as designed roof assemblies, and are alternatives to conventional light-frame wood construction as described in the IBC and IRC.

3.0 DESCRIPTION
3.1 General:

The True Roof Panels are factory-assembled roof panels that are up to 8 feet (2.43 m) wide and up to 24 feet (7.3 m) long. The panels consist of lumber rafters spaced at 12, 16 or 24 inches (305, 406 or 610 mm) on center with factory-installed plywood on the exterior side of the rafters. Lumber strapping, spaced at 16 inches (406 mm) on center, is attached to the rafters, perpendicular to, and across the bottom of, the rafters. Gypsum wallboard is factory-installed with the long dimension parallel to the rafters and attached to the strapping with fasteners spaced at 6 inches (152 mm) on center. An optional layer of Eastern white pine wood boards may be factory-installed on the interior side of the gypsum wallboard, and attached

to the strapping with fasteners. The plywood sheathing on the exterior side of the panels is installed with the long dimension of the plywood perpendicular to the rafters and attached to the rafters with fasteners spaced at 4 inches (101.6 mm) on center around the edges of the sheathing and 8 inches (203.2 mm) on center in the field.

A layer of 1-inch-thick (25.4 mm) foam plastic insulation, as described in Section 3.2.3, is factory-installed in the cavity of the roof panels above the gypsum wallboard and between the lumber strapping. A layer of 4-inch-thick (101.6 mm) foam plastic insulation, with or without an optional additional layer of 1-inch-thick (25.4 mm) foam plastic insulation, is factory-installed in the cavity between the rafters. A vapor retarder is installed on the bottom of the rafters prior to installation of the strapping. The insulation is installed with a 1½-inch (38 mm) air space, for ventilation, between the top of the insulation and the plywood sheathing.

3.2 Material Specifications:

3.2.1 Rafters: Nominally 2-by-6 or 2-by-8, kiln-dried, No. 2 Grade, spruce-pine-fir lumber complying with American Softwood Lumber Standard DOC PS20 and grading rules of the approved agency.

3.2.2 Strapping: Nominally 2-by-2, kiln-dried, No. 2 Grade spruce-pine-fir lumber.

3.2.3 Insulation: Atlas Energy Shield polyisocyanurate foam plastic rigid insulation currently recognized in ESR-1375.

3.2.4 Exterior Sheathing: C-D plywood, 15/32-inch- or 19/32-inch-thick (11.9 or 15 mm), span rated, exposure 1, conforming to PS 1 and IBC Table 2304.7 (3).

3.2.5 Interior Sheathing:

3.2.5.1 Gypsum Wallboard: Regular gypsum wallboard, ½ inch (12.7 mm) thick and complying with ASTM C 1396.

3.2.5.2 Wood Boards: Optional tongue-and-groove 1-by-8 Eastern white pine having a flame spread not exceeding 200 and smoke density of less than 450 when tested in accordance with ASTM E 84.

3.2.6 Fasteners: The fasteners are 0.131-inch-diameter-by-3-inch-long (3.32 mm by 76.2 mm) smooth shank nails; No. 16 gage staples with a ½-inch crown width and 2-inch-long (51 mm) legs; and No. 6, 1¼-inch-long (31.75 mm), Type W drywall screws for the framing, exterior sheathing and gypsum wallboard, respectively. One-by-eight boards are attached with No. 16 gage, 1¾-inch-long (44.45 mm) finish nails.

3.2.7 Vapor Retarder: Six-mil polyethylene sheet with a permeance rating of 1.0 or less.

4.0 DESIGN AND INSTALLATION:

4.1 Design:

Panel-to-panel connections and panel-to-support connections must be designed in accordance with the applicable code for applicable load conditions. Rafter spans for the dead load and snow load combination, shown in Table 1, are based on allowable stress design. Rafter spans for other load combinations, rafter spacings or rafter span and support conditions must be designed in accordance with the applicable code.

4.2 Installation:

True Roof Panels must be installed in accordance with the manufacturer's installation instructions, this report and the applicable code. See Figure 1 for typical installation. A roof covering complying with the applicable code must be installed on the roof panels. Exposed gypsum joints and fastener heads must be treated in accordance with the applicable code.

5.0 CONDITIONS OF USE

The True Roof Panels described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The panels must be manufactured and labeled in accordance with this evaluation report and the approved quality control manual.

- 5.2 Structures utilizing the panels must be designed in accordance with the applicable code to the satisfaction of the code official.

- 5.3 Prior to installation, calculations and details demonstrating compliance with this report must be submitted to the code official. The calculations and details must be prepared by a registered design professional where required by statutes of the jurisdiction in which the project is to be constructed.

- 5.4 The panels are installed in accordance with this report, the manufacturer's installation instructions, the applicable code and the plans are approved by the code official.

- 5.5 The panels are manufactured by Yankee Barn Homes, Inc., in Grantham, New Hampshire, under a quality program with inspections by PFS Corporation (AA-652).

6.0 EVIDENCE SUBMITTED

Product description, installation drawings and a quality control manual.

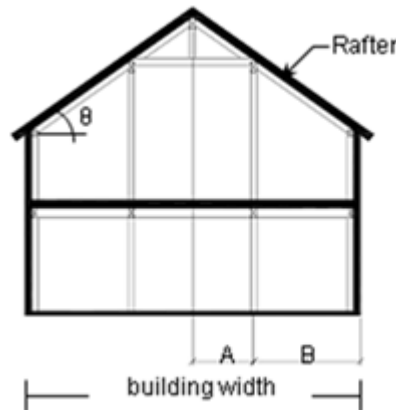
7.0 IDENTIFICATION

A label affixed to each panel bears the Yankee Barn Homes, Inc., company name and address, product name, panel model, evaluation report number (ESR-2326) and the name of the inspection agency (PFS Corporation).

TABLE 1—RAFTER SPANS FOR DEAD PLUS SNOW LOAD COMBINATION

SPAN CHART – CONTINUOUS RAFTER PANELS ^{1, 2}						
Model	Roof Slope, θ (degrees)	Building Width (ft)	Maximum Horizontal Span (ft)		Maximum Design Load – Ground Snow Load (psf) ^{3, 4}	
			A	B	Panels with 2 x 6 Rafters	Panels with 2 x 8 Rafters
Purlin 26' – Mark I	35.24	26.0	5.00	8.00	92.2	110
Purlin 27' – Prairie	37.86	27.0	5.25	8.10	93.7	110
Purlin 29' - Anderson	35.24	29.0	5.50	9.00	79.6	110
Putlin 31' – Hampton	37.86	31.0	5.63	9.74	67.4	110
Truss 25' – Truss	33.69	25.0	5.50	6.83	110	110
Truss 29' - Truss	35.24	29.0	6.33	8.00	90.6	110

For SI: 1 ft= 304.8 mm, 1 degree =0.017 radian, 1 psf = 0.047 kN/m².



¹Rafter spacing is 16 inches on center

²Maximum spans are based on minimum 20 psf dead load and 30 to 110 psf snow loads

³Design values are based on NDS-05 and ASCE 7-05 for balanced and unbalanced snow loads

⁴Design values based on a maximum of 1/240 span deflection for snow loads and a maximum of 1/180 of span deflection for dead and snow total loads.

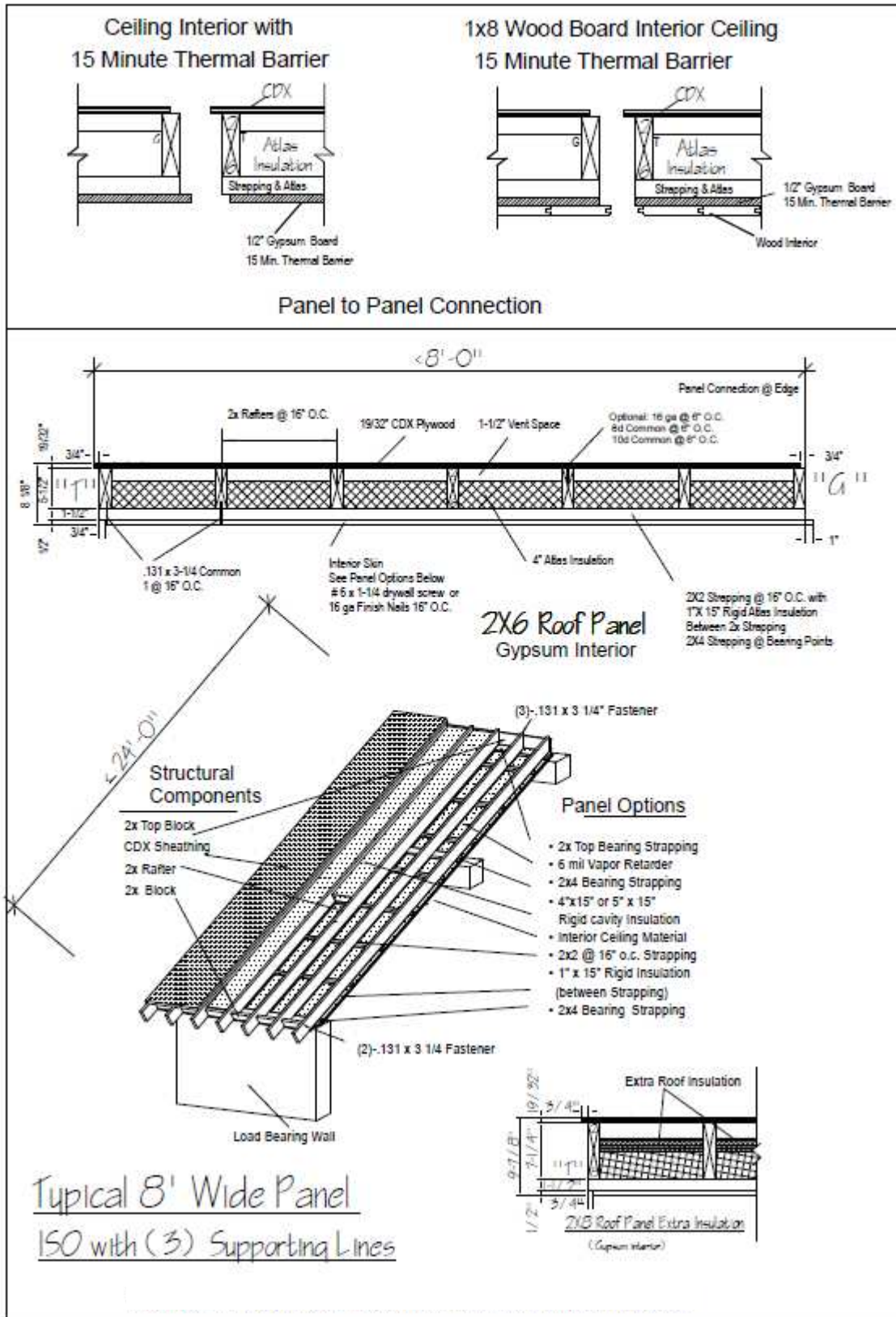


FIGURE 1—TRUE ROOF PANELS INSTALLATION DETAILS

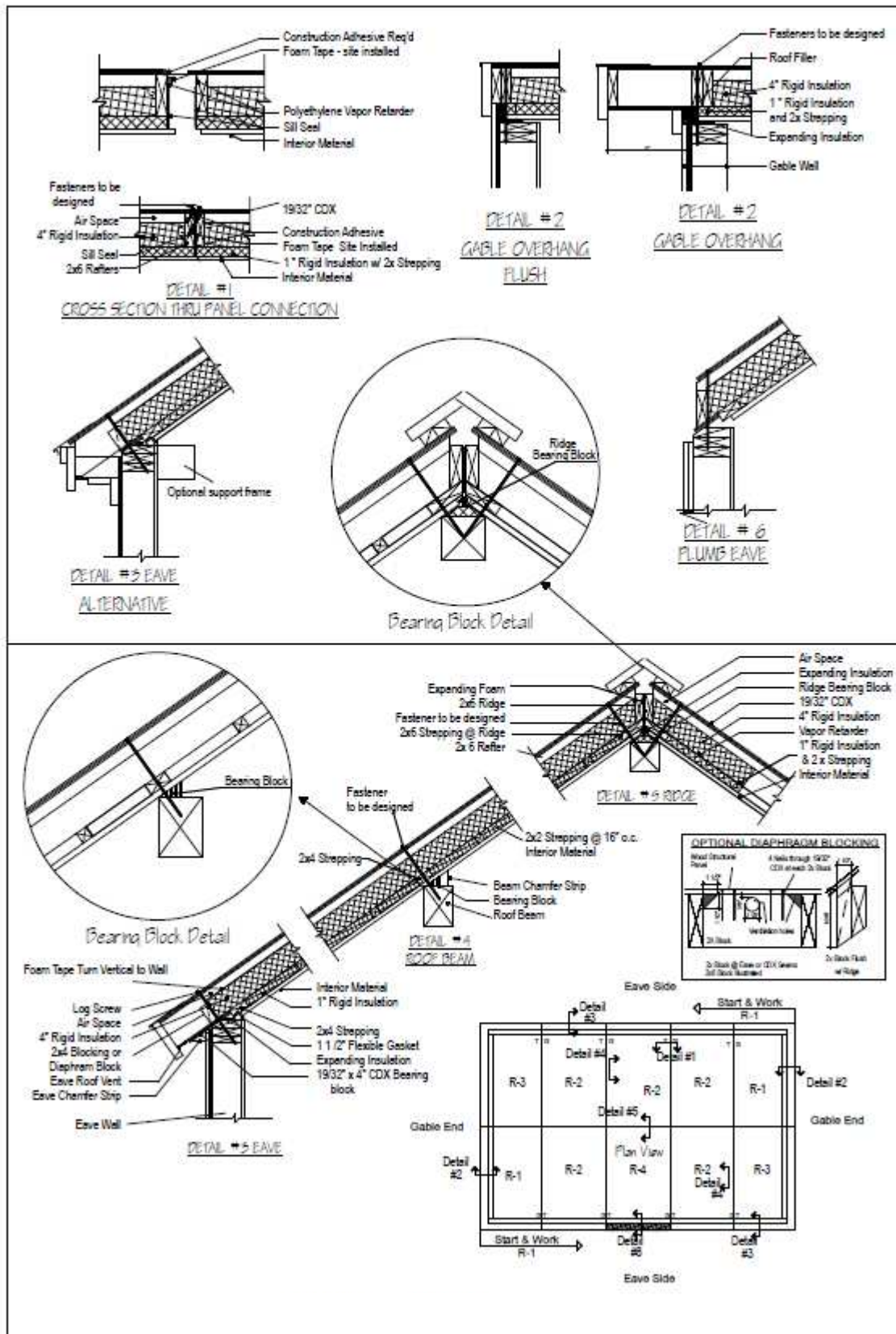


FIGURE 1—TRUE ROOF PANELS INSTALLATION DETAILS (Continued)