



Building Product Evaluation Report 0116

Topek True Roof Panels

Topek, LLC, dba Yankee Barn Homes, Inc.

Initial Acceptance: October 31, 2018

Expiration: December 21, 2026

Revision: December 11, 2024

Version: 2.0

TYPE OF ACCEPTANCE

Product Material – Wood and Plastics

CSI Specification Division: 06 12 00 (Structural Panels) and 06 17 00 (Plant Fabricated Structural Wood Panels)

MANUFACTURER IDENTIFICATION:

Topek, LLC, dba Yankee Barn Homes, Inc

131 Yankee Barn Road
Graham, NH 03763
1-603-863-9021
www.yankeebarnhomes.com

EVALUATION REPORT SUBJECT:

Structural Roof Panels for Exterior Applications
Installation on construction complying with International Residential Code® (IRC®)
Dwellings or with International Building Code® (IBC®) structures identified as Type
V-B construction

DESCRIPTION OF BUILDING COMPONENTS: (See Table 1 for additional information on components)

The exterior roof panels are prefabricated insulated structural panels produced at a manufacturing plant. The panels are fabricated using the following components:

1. General Panel Information

- (a) The structural panels are produced up to 8 ft. wide and produced up to 24 ft. long.
- (b) The structural panel rafters are spaced at 12 in. on center or 16 in. on center.

2. Exterior Side of Panel

- (a) The exterior roof panel covering is a wood-based sheathing or ZIP System® sheathing conforming to ESR-1473. The long dimension of the sheathing is installed perpendicular to the rafters. The wood sheathing is installed with staples at 4 in. on center around the edges and 8 in. on center in the field. The ZIP System sheathing is installed with nails at 6 in. on center around the edges and 12 in. on center in the field.

3. Interior Side of Panel

- (a) A single layer of vapor retarder material is installed to the bottom of the rafters before the installation of the straps and insulation.
- (b) Lumber Strapping is attached to the rafters at 16 in. on center. The strapping is installed to the rafters perpendicular to and across the bottom of the rafters.



- (c) A rigid foam plastic insulation board is installed between the straps, below the rafters and above the gypsum board. The foam plastic board is 1 in. thick. The foam plastic insulation board is installed perpendicular to the roof rafters.
- (d) The interior roof panel covering is a gypsum board. The long dimension of the gypsum board is installed parallel to the rafters. The gypsum board is fastened to the strapping at 6 in. on center. An alternative interior covering is a layer of tongue and groove wood (Eastern white pine) installed over the gypsum board and attached to the strapping.

4. Panel Cavity.

- (a) In addition to the 1 in. thick rigid insulation, a rigid fabricated foam plastic insulation board is placed in the cavity between the rafters as follows:
 - 1. For nominal 2x6 rafters, a single layer of 4 in. foam plastic insulation board is installed allowing air space for ventilation between the bottom of sheathing and top of plastic foam insulation.
 - 2. For nominal 2x8 rafters, a single layer of 4 in. foam plastic insulation board, plus an additional single layer of 2 in. foam plastic insulation board, is installed allowing air space for ventilation between the bottom of the sheathing and top of the plastic foam insulation.
 - 3. For nominal 2x10 rafters, a double layer of 4 in. foam plastic insulation board is installed allowing air space for ventilation between the bottom of sheathing and top of plastic foam insulation.
 - 4. For nominal 2x12 rafters, a double layer of 4 in. foam plastic insulation board, plus an additional single layer of 2 in. foam plastic insulation board, is installed allowing air space for ventilation between the bottom of sheathing and top of plastic foam insulation.

APPLICABLE CODES:

- 2012, 2015, 2018, and 2021 International Building Code (IBC)
- 2012, 2015, 2018, and 2021 International Residential Code (IRC)

APPLICABLE CHARACTERISTICS REVIEWED:

1. Structural Performance:

- (a) The structural panel has been reviewed for maximum spans as indicated in Table 2. The spans were developed by structural calculations. See Table 2 in this Report for more information and span limitations.

2. Materials:

- (a) The material components, described in Table 1, that are used in the fabrication of the structural panel have been reviewed for compliance with the code.

APPLICABLE USES:

Yankee Barn Homes manufactured structural panels are used in residential and commercial construction. The panels that are used in residential and commercial projects must be classified as Type V-B construction. The roof panels are prefabricated, insulated, and vented. The roof panels are alternatives to conventional construction.

LIMITATIONS OF ACCEPTANCE:

The structural panels described in this Report comply with those codes listed in the Applicable Codes section above and are subject to the following conditions:

- 1. The Yankee Barn Homes structural roof panel is limited to exterior construction complying with the IRC and the IBC on Type V-B construction.
- 2. The structural roof panels must be installed in accordance with this Report and the engineered plans, and must be covered by a roof covering complying with the appropriate building code. See Figure 1 for typical installation details.
- 3. The structural roof panel has not been evaluated as a member of a roof diaphragm system nor as a fire-resistance-rated assembly.
- 4. Yankee Barn Homes has a Third-Party inspection program provided by PFS TECO.

**DOCUMENTATION SUBMITTED:**

Submitted data was provided in accordance with PFS TECO 1601 (Quality control manual, Specifications, Manufacturer's installation instructions, Structural Calculations, and Descriptive information). The products have been evaluated in accordance with Chapter 23 of the IBC as designed roof assemblies.

This Report was formerly published as PFS TECO Research Report 0116 (RR 0116).

PRODUCT IDENTIFICATION:

The Yankee Barn Homes roof panels evaluated in this Report must be identified with a label, or stamp on each panel. The required information is as follows: the company name, address, product identification, the PFS TECO Building Product Evaluation Report number (BPER 0116), and PFS Certification Mark (see image below). Panels without this information are not covered under this Report.



Table 1: Structural Panel Materials

Materials	Description (minimum requirements)
Rafters	Nominal 2x6, 2x8, 2x10, or 2x12 kiln-dried dimension lumber, Spruce-Pine-Fir No. 2 or better complying with American Softwood Lumber Standard DOC PS 20 and grading rules of the approved agency
Strapping	Nominal 2x2 and 2x4 kiln-dried dimension lumber, Spruce-Pine-Fir No. 2 or better (see Figure 1)
Insulations	Rigid foam plastic insulation boards are factory installed as listed (see Figure 1): a. Single layer of 1" thick board above the gypsum wallboard between strappings b. Single layer of 4" thick board in the cavity between rafter for panels with 2x6 rafters c. Single layers of 4" and 2" thick boards in the cavity between rafter for panels with 2x8 rafters d. Double layers of 4" thick boards in the cavity between rafter for panels with 2x10 rafters e. Double layers of 4" thick and single layer of 2" boards in the cavity between rafter for panels with 2x12 rafters With the following approved insulation boards: a. Atlas EnergyShield insulation boards currently recognized in ESR-1375 b. Rmax Thermasheath-3 insulation boards currently recognized in ESR-1864
Exterior Sheathing	a. 5/8" thick CD Exp 1 plywood conforming to PS 1 and 2015 IBC Table 2304.8(3) as Exposure I, 40/20 rated sheathing. b. 5/8" thick ZIP System® square-finished-edge roof panel sheathing without radiant barrier as listed in ESR-1473, conforming to PS 1 and 2015 IBC Table 2304.8(3) as Exposure I, 40/20 rated sheathing
Interior Sheathing	a. 1/2" thick Gypsum board complying with ASTM C1396 b. Optional: Nominal 1x8 T&G Eastern White Pine boards having a flame spread index of less than 200 and of smoke density index of less than 450, when tested in accordance with ASTM E84
Fasteners	a. Nails: 0.131" dia x 3" long smooth shank nail, and 16 gage x 1-3/4" long finish nail b. Staples: 16 gage with 1/2" crown and 2" legs, and 6 x 1-1/4" legs c. Screws: Type W 1-1/4" drywall screw
Vapor Retarder	6 mil polyethylene sheet with a permeance rating of 1.0 or less

Table 2: Allowable Load Span Table ^{1,2,3,4,5}

Roof Pitch	Rafter		Dead Load (psf)	Allowable Sloped Roof Snow Loads ⁶ (psf)							
				Simply Supported at Ends Only				Continuously Supported at Ends and Mid-Span			
	Type	o/c Spacing		30	50	70	90	30	50	70	90
4:12	2x6	16"	11.5	10'-2"	8'-11"	8'-1"	7'-5"	11'-7"	9'-6"	8'-3"	7'-5"
		12"	12.0	11'-1"	9'-9"	8'-11"	8'-3"	13'-6"	11'-1"	9'-7"	8'-7"
	2x8	16"	12.3	13'-3"	11'-8"	10'-6"	9'-5"	14'-8"	12'-1"	10'-6"	9'-5"
		12"	13.0	14'-7"	12'-10"	11'-8"	10'-10"	16'-9"	13'-10"	12'-1"	10'-10"
	2x10	16"	13.2	16'-10"	14'-8"	12'-9"	11'-5"	17'-9"	14'-8"	12'-9"	11'-5"
		12"	13.9	18'-5"	16'-3"	14'-8"	13'-2"	20'-4"	16'-10"	14'-8"	13'-2"
	2x12	16"	13.9	20'-5"	16'-11"	14'-9"	13'-3"	20'-5"	16'-11"	14'-9"	13'-3"
		12"	15.0	22'-3"	19'-4"	16'-11"	15'-2"	23'-3"	19'-4"	16'-11"	15'-2"
6:12	2x6	16"	11.5	9'-8"	8'-6"	7'-9"	7'-2"	11'-6"	9'-6"	8'-3"	7'-5"
		12"	12.0	10'-7"	9'-4"	8'-6"	7'-11"	13'-4"	11'-0"	9'-7"	8'-7"
	2x8	16"	12.3	12'-8"	11'-2"	10'-2"	9'-4"	14'-6"	12'-0"	10'-5"	9'-4"
		12"	13.0	13'-11"	12'-3"	11'-2"	10'-5"	16'-7"	13'-9"	12'-0"	10'-9"
	2x10	16"	13.2	16'-1"	14'-2"	12'-8"	11'-5"	17'-7"	14'-7"	12'-8"	11'-5"
		12"	13.9	17'-7"	15'-7"	14'-3"	13'-1"	20'-1"	16'-8"	14'-7"	13'-1"
	2x12	16"	13.9	19'-6"	16'-9"	14'-8"	13'-2"	20'-2"	16'-9"	14'-8"	13'-2"
		12"	15.0	21'-3"	18'-10"	16'-10"	15'-2"	23'-0"	19'-2"	16'-10"	15'-2"
8:12	2x6	16"	13.1	9'-2"	8'-1"	7'-4"	6'-10"	11'-4"	9'-5"	8'-2"	7'-4"
		12"	13.7	10'-0"	8'-10"	8'-1"	7'-6"	13'-3"	10'-11"	9'-6"	8'-6"
	2x8	16"	14.1	12'-0"	10'-7"	9'-8"	9'-0"	14'-4"	11'-11"	10'-4"	9'-4"
		12"	14.8	13'-2"	11'-7"	10'-7"	9'-11"	16'-5"	13'-7"	11'-11"	10'-9"
	2x10	16"	15.0	15'-3"	13'-5"	12'-4"	11'-4"	17'-4"	14'-5"	12'-7"	11'-4"
		12"	15.9	16'-8"	14'-9"	13'-6"	12'-7"	19'-10"	16'-7"	14'-6"	13'-1"
	2x12	16"	15.9	18'-5"	16'-4"	14'-7"	13'-1"	19'-11"	16'-8"	14'-7"	13'-1"
		12"	17.1	20'-1"	17'-10"	16'-4"	15'-1"	22'-9"	19'-0"	16'-8"	15'-1"
10:12	2x6	16"	14.2	8'-7"	7'-7"	6'-11"	6'-6"	11'-3"	9'-4"	8'-2"	7'-4"
		12"	14.8	9'-5"	8'-4"	7'-7"	7'-1"	12'-9"	10'-10"	9'-5"	8'-6"
	2x8	16"	15.2	11'-3"	10'-0"	9'-1"	8'-6"	14'-2"	11'-9"	10'-4"	9'-3"
		12"	16.0	12'-4"	10'-11"	10'-0"	9'-4"	16'-3"	13'-6"	11'-10"	10'-8"
	2x10	16"	16.3	14'-3"	12'-8"	11'-7"	10'-10"	17'-1"	14'-3"	12'-6"	11'-3"
		12"	17.2	15'-8"	13'-11"	12'-9"	11'-11"	19'-7"	16'-5"	14'-5"	13'-0"
	2x12	16"	17.2	17'-3"	15'-4"	14'-1"	13'-0"	19'-8"	16'-6"	14'-5"	13'-0"
		12"	18.5	18'-10"	16'-10"	15'-5"	14'-5"	22'-5"	18'-10"	16'-7"	14'-11"
12:12	2x6	16"	15.4	8'-1"	7'-2"	6'-6"	6'-1"	10'-9"	9'-3"	8'-1"	7'-3"
		12"	16.1	8'-10"	7'-10"	7'-2"	6'-8"	11'-11"	10'-7"	9'-5"	8'-5"
	2x8	16"	16.5	10'-7"	9'-5"	8'-7"	8'-0"	14'-0"	11'-8"	10'-3"	9'-3"
		12"	17.4	11'-7"	10'-3"	9'-5"	8'-10"	15'-6"	13'-5"	11'-9"	10'-7"
	2x10	16"	17.7	13'-5"	11'-11"	10'-11"	10'-2"	16'-10"	14'-2"	12'-5"	11'-2"
		12"	18.7	14'-8"	13'-1"	12'-0"	11'-2"	19'-3"	16'-3"	14'-3"	12'-11"
	2x12	16"	18.7	16'-2"	14'-5"	13'-3"	12'-4"	19'-4"	16'-3"	14'-5"	12'-11"
		12"	20.1	17'-7"	15'-9"	14'-6"	13'-7"	22'-0"	18'-7"	16'-5"	14'-10"

Notes:

1. Panel length is limited to 24 ft.
2. Tabulated spans are based on the dead loads and snow loads as listed.
3. Tabulated dead load is based on the roof pitch and self-weight of roof panel plus 3.5 psf roof covering material and the roof pitch.
4. The tabulated spans are based on L/240 deflection limit for dead load plus snow load and L/180 deflection limit for dead load.
5. The tabulated snow loads are basic snow loads acting on the horizontal projection of the roof surface. Snow loads are assumed to be uniformly distributed. Effect of unbalanced or drifting snows loads is outside the scope of this Report.

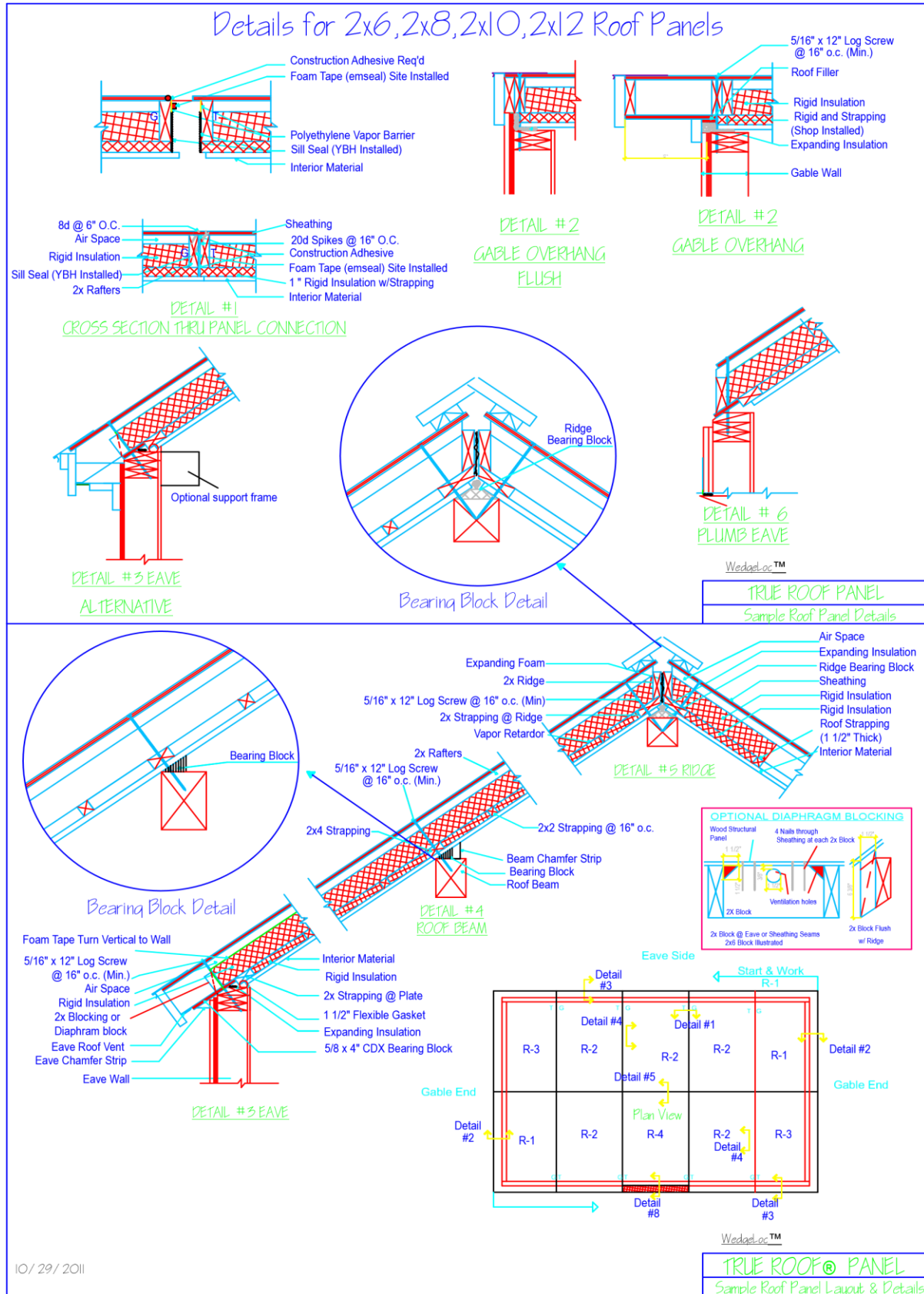


Figure 1: Typical Installation Details

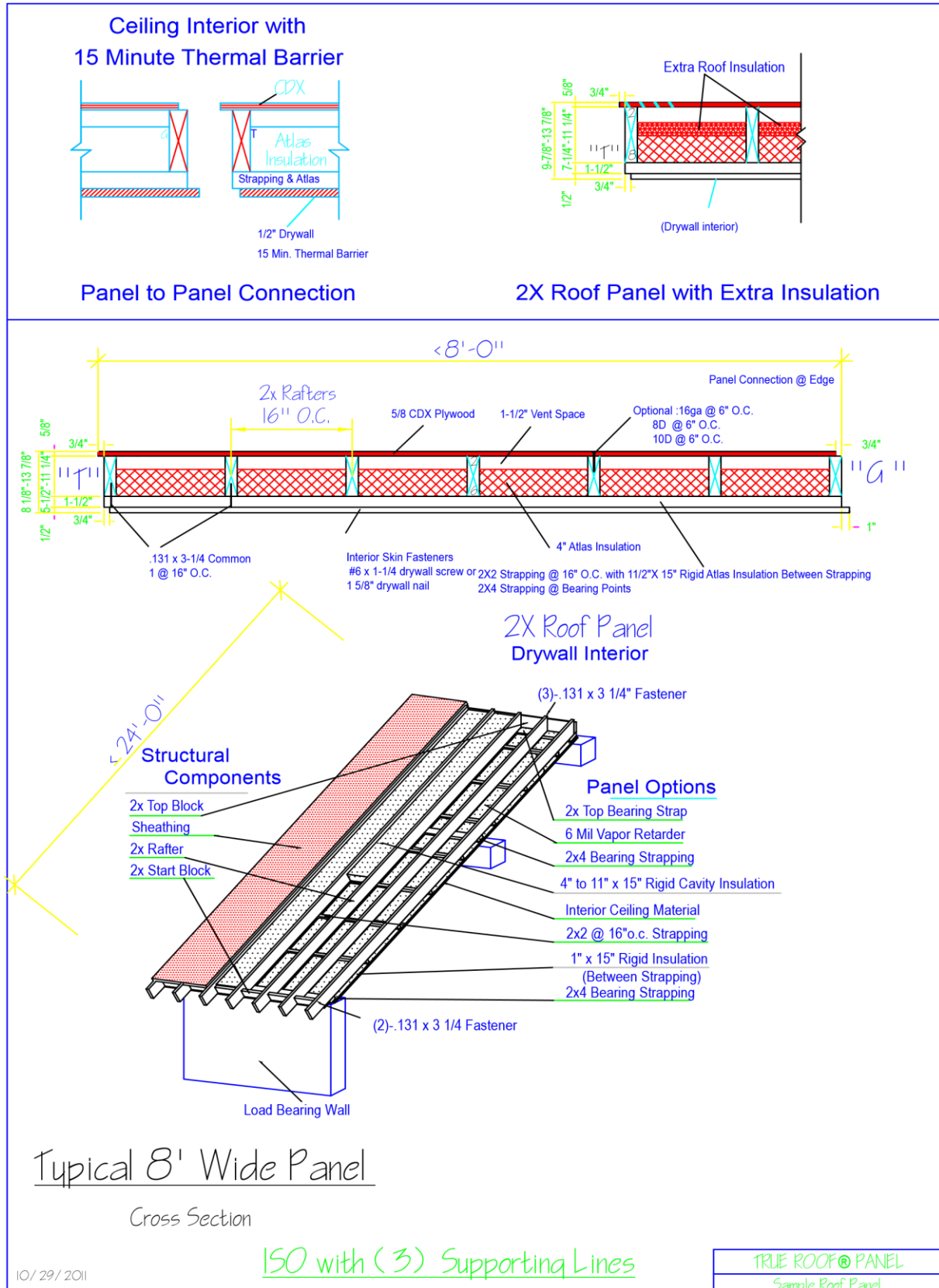


Figure 1 (Continued): Typical Installation Details