KENTUCKY DEPARTMENT OF EDUCATION
702 KAR 4:160

CHANGE ORDER SUPPLEMENTAL INFORMATION FORM

BG #: 15-016 Change Order No.: 8-2

District: Henderson County District Code: 251 Facility Name: SPOTTSVILLE ELEMENTARY RENOVATION/ADDITION School Code: 110

Project: SPOTTSVILLE ELEMENTARY RENOVATION/ADDITION Time Extension Required: ☐ Yes **X** No If yes, by _____ day(s)

Date of Change Order: Tuesday, May 30, 2017 Change Order Amount: ☐ Increase **X** Decrease ☐ Unchanged

Contractor / Vendor Name: PREFERRED CONSTRUCTION SERVICES, INC. Bid Package No.: 008

1. This Requested Change Order Amount + / -	$	($26,472.00)
2. Remaining Construction Contingency Balance: (including line 1 above)	$	

3. Change in A/E Fee for this Change Order +/-	$	
4. Change in CM Fee for this Change Order +/-	$	

Note: Change Orders equal to or greater than $25,000 shall be submitted to KDE with detail cost breakdown.
Attach additional pages if necessary.

Contract change requested by: ☐ Local Board of Education **X** General Contractor ☐ Architect/Engineer
☐ Construction Manager ☐ Code Enforcement Official ☐ Other:_____

Contract change reason code: ☐ Reduction of Scope ☐ Expansion of Scope ☐ Improved Plans/Specs
☐ Found Condition ☐ Code Compliance ☐ Other:_____

Change Order Description and Justification:	Cost Benefit to Owner:
Value Engineering Change to Loadmaster Roof System per attached documentation.	

Have contract unit prices been utilized to support the cost associated with this change order?
☐ Yes ☐ No If no, provide a detailed cost breakdown which separates labor, material, profit and overhead.

Cost Breakdown:

Total Change Order Amt.:	Labor	Materials	Profit & Overhead*	Bond & Insurance
$	$	$	$	$
% of Total Change Order Amt.:	%	%	%	%

***Profit & Overhead shall not exceed 15% of net cost of change order**

Is the cost for this change order supported by an alternate bid or competitive price quote(s)?

☐ Yes ☐ No If no, explain why _____

_____ Board of Education Designee's Signature Date

_____ Architect's Signature Date

_____ Finance Officer's Signature Date

_____ Construction Manager's Signature Date

AIA® Document G701/CMa™ – 1992

Change Order - Construction Manager-Adviser Edition

OWNER ☒
CONSTRUCTION MANAGER ☐
ARCHITECT ☐
CONTRACTOR ☐
FIELD ☐
OTHER ☐

PROJECT *(Name and address):*
SPOTTSVILLE ELEMENTARY RENOVATION/ADDITION
9190 US 60 EAST
SPOTTSVILLE KY 42458

CHANGE ORDER NUMBER: 8-2
INITIATION DATE: 5/30/2017

TO CONTRACTOR *(Name and address):*
PREFERRED CONSTRUCTION SERVICES, INC.
P.O. BOX 283
HENDERSON KY 42419-0283

PROJECT NUMBERS: CMA-KDE-000664 / 15-016
CONTRACT DATE: 12/8/2016
CONTRACT FOR: BID PACKAGE #08 ROOFING

THE CONTRACT IS CHANGED AS FOLLOWS:
VALUE ENGINEERING CHANGE TO LOADMASTER ROOF SYSTEM PER ATTACHED DOCUMENTATION.

The original Contract Sum was	$729,500.00
Net change by previously authorized Change Orders	$0.00
The Contract Sum prior to this Change Order was	$729,500.00
The Contract Sum will be decreased by this Change Order in the amount of	($26,472.00)
The new Contract Sum including this Change Order will be	$703,028.00

The Contract Time will not be effected.
The date of Substantial Completion as of the date of this Change Order therefore is 9/25/2018

NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND CONSTRUCTION MANAGER.

Codell Construction
CONSTRUCTION MANAGER *(Firm Name)*
4475 Rockwell Rd., Winchester, KY 40392
ADDRESS

BY *(Signature)*

(Typed Name) **DATE:**

RBS DESIGN GROUP
ARCHITECT *(Firm Name)*
723 HARVARD DRIVE OWENSBORO, KY 42301
ADDRESS

BY *(Signature)*

(Typed Name) **DATE:**

PREFERRED CONSTRUCTION SERVICES, INC.
CONTRACTOR *(Firm Name)*
P.O. BOX 283 HENDERSON, KY 42419-0283
ADDRESS

BY *(Signature)*

(Typed Name) **DATE:**

HENDERSON COUNTY BOARD OF EDUCATION
OWNER *(Firm Name)*
1805 SECOND STREET HENDERSON, KY 42420
ADDRESS

BY *(Signature)*

(Typed Name) **DATE:**

User Notes: (1884033357)

♦ INDUSTRIAL
♦ ROOFING
♦ SHEET METAL

Preferred

Construction Services, Inc.

3/31/2017
Mr. John Hagan Codell
Mr. Craig Thomas AIA

RE: Spottsville School Bid Package 8revised

Gentlemen:

Per your request I have developed a potential cost savings for the deck system and insulated underlayment on the steep slope section of the new Spottsville School project. The attachments further describes the products used. If there is additional information that is required please let me know and I will attempt to obtain it.

The basics of this proposal are:

1. 22 gauge galvanized steel 22 gauge 1.5B deck fastened per industry and design specifications provided (no change from original bid and design)
2. 1 layer of 2.8" Energy 3 isocyanurite insulation laid over deck.
3. 1 layer of 3.1" Vented Hunter Panels Nailbase with 5/8" fire treated plywood .
4. Johns Manville screws and 3" plates fastened to the metal deck per wind uplift design criteria. This deletes the Martin Fireproofing- IMETCO (Loadmaster design) materials.
5. Shingle roof and underlayment per original specifications and design.

If the above changes are accepted we offer a deduct of $71,240.00 from our bid amount. We believe that the vented nailbase will offer a superior product to enable the shingles to last a substantially longer period. Our understanding is this will meet the 2B rating that is required. We would amend and change the DOP's to reflect this change if accepted.

Sincerely:
David Coudret

P.O. BOX 283 ♦ 3069 OHIO DRIVE ♦ HENDERSON, KY 42419-0283 ♦ 270-827-5800 ♦ 270-826-3273 (Fax)
EVANSVILLE, IN 812-471-1480 ♦ OWENSBORO, KY 270-926-8055

From:	David Coudret
To:	"Craig Thomas"; "Kyle Abney"; John Hagan Codell
Subject:	FW: Cool Vent
Date:	Monday, April 03, 2017 4:59:49 PM
Attachments:	Cool-Vent.pdf ATT00001.htm Spottsville steep slope change proposal revised.doc Spottsville spec data steep slope change-decking.pdf

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Attached is the proposal for the elimination of the “Loadmaster” system. I think everyone is on the same page that this is worthy of consideration. Please let me know if there is any additional information needed.

David Coudret- President
Preferred Construction Services, Inc.
PO Box 283
Henderson, KY 42419
270-827-5800 office
270-993-5868 cell

From: David Coudret [mailto:prefer1@henderson.net]
Sent: Friday, March 24, 2017 8:36 AM
To: 'Craig Thomas' <CraigThomas@rbsdesigngroup.com>; 'Kyle Abney' <kyle@rbsdesigngroup.com>
Subject: FW: Cool Vent

Craig, Kyle: This is the spec sheet for the fire treated nail base: The option that is recommended is the vented version so as to allow heat to dissipate so as to not “cook” the shingles. The fire treated plywood is 5/8” which thicker than most standard OSB versions as well. I will complete the proposal and forward to you today. This should allow us to maintain the 2B rating and give the owner a better long term product and also a deduct that is significant. Thanks for your help on this. Dave

David Coudret- President
Preferred Construction Services, Inc.
PO Box 283
Henderson, KY 42419
270-827-5800 office
270-993-5868 cell

From: Daihl, Galen [mailto:GDaihl@NorthCoastRoofingSystems.com]
Sent: Thursday, March 23, 2017 2:40 PM
To: Dave Coudret <prefer1@henderson.net>
Subject: Fwd: Cool Vent

D, see attached from Hunter on the cool vent. They do provide a simple drawing at the time it's ordered to sign off on that would show the exact thing you're getting if that helped?

Sent from my iPhone

Begin forwarded message:

From: "Stewart, Christine" <Christine.Stewart@hpanels.com>
To: "Daihl, Galen" <GDaihl@NorthCoastRoofingSystems.com>
Subject: Cool Vent

Hi,

Our Cool Vent is general but lists all options available (osb, plywood, 1", 1.5" and 2" air). We do not have one for specific sizes.

Please review and let me know if any questions.

Thanks,
Christine Stewart
Hunter Panels

♦ INDUSTRIAL
♦ ROOFING
♦ SHEET METAL

Preferred

Construction Services, Inc.

5/19/2017
Mr. John Hagan Codell
Mr. Craig Thomas AIA

RE: Spottsville School Bid Package 8 revised ODP's

Gentlemen:

Below are our revised ODP's for the Spottsville project:

New ODP's

1. Nucor- Vulcraft Fort Payne	Galvanized Metal Deck	$38,000.00
2. NorthCoast Roofing Supply	Nailbase- fire treated and vented	$78,880.00

Revised ODP's

1. Johns Manville ADD	Sloped roof insulation base layer	$24,752.00
	Original ODP- $90,000.00 new ODP	$114,752.00

Unchanged ODP's

1. Peterson Aluminum	Metal trim	$35,000.00
2. Dairyman's Supply	Shingles system	$48,000.00

Deleted ODP's

1. Martin Fireproofing/ IMTECO Loadmaster System	($186,400.00)

The other items that have changed are smaller in nature and we are not requesting ODP's on these items.

Sincerely:
David Coudret

P.O. BOX 283 ♦ 3069 OHIO DRIVE ♦ HENDERSON, KY 42419-0283 ♦ 270-827-5800 ♦ 270-826-3273 (Fax)
EVANSVILLE, IN 812-471-1480 ♦ OWENSBORO, KY 270-926-8055

From: Craig Thomas
To: John Hagan Codell
Subject: RE: Cool Vent
Date: Friday, April 28, 2017 12:51:34 PM

Yes, approved. Please process the change order.
Thanks

Craig

Craig Thomas, A.I.A.
Architect

Office: (270) 683-1158
Cell: (270) 570-7636
Fax: (270) 683-2446

723 Harvard Drive
Owensboro, KY 42301

RBS DESIGN GROUP
ARCHITECTURE

"Your partner in design from concept to completion."

From: John Hagan Codell [mailto:JHCodell@codellconstruction.com]
Sent: Friday, April 28, 2017 11:31 AM
To: Craig Thomas; Kyle Abney
Subject: Fwd: Cool Vent

See below and attached

Sent from my iPhone

Begin forwarded message:

> **From:** "David Coudret" <prefer1@henderson.net>
> **To:** "'Craig Thomas'" <CraigThomas@rbsdesigngroup.com>, "'Kyle Abney'" <kyle@rbsdesigngroup.com>, "John Hagan Codell" <JHCodell@codellconstruction.com>
> **Subject: FW: Cool Vent**
>
> Attached is the proposal for the elimination of the “Loadmaster” system. I think everyone is on the same page that this is worthy of consideration. Please let me know if there is any additional information needed.
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> David Coudret- President
> Preferred Construction Services, Inc.
> PO Box 283
> Henderson, KY 42419
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Dave

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Henderson, KY 42419
270-827-5800 office
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Subject: Fwd: Cool Vent

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Sent from my iPhone

Begin forwarded message:
From: "Stewart, Christine" <Christine.Stewart@hpanels.com<mailto:Christine.Stewart@hpanels.com>>
To: "Daihl, Galen" <GDaihl@NorthCoastRoofingSystems.com<mailto:GDaihl@NorthCoastRoofingSystems.com>>
Subject: Cool Vent
Hi,

Our Cool Vent is general but lists all options available (osb, plywood, 1”, 1.5” and 2” air). We do not have one for specific sizes.

Please review and let me know if any questions.

Thanks,
Christine Stewart
Hunter Panels

From:	Joni Young
To:	John Hagan Codell
Cc:	Craig Thomas; Kyle Abney
Subject:	FW: Spottsville / Request for Change / Case #129187-000-0
Date:	Monday, May 01, 2017 9:20:52 AM

See below for response from HBC on the changes to Spotsville.

From: Hogan, Jeff (PPC) [mailto:Jeff.Hogan@ky.gov]
Sent: Monday, May 01, 2017 8:10 AM
To: Joni Young
Subject: RE: Request for Change / Case #129187-000-0

I am familiar with this product and it will be acceptable to use in this circumstance with the Fire Retardant Treated (FRT) plywood as the nailable base.
2013 KBC states:
Section 603.1(1)(1.3) FRT is permitted in IIB roof construction including girders trusses framing and decking.

Jeff Hogan
State Plans Reviewer III
Department of Housing, Buildings, and Construction
Division of Building Code Enforcement
101 Sea Hero Road, Suite 100
Frankfort, KY 40601-5405
Phone: 502-573-0373
Fax: 502-573-1059
jeff.hogan@ky.gov

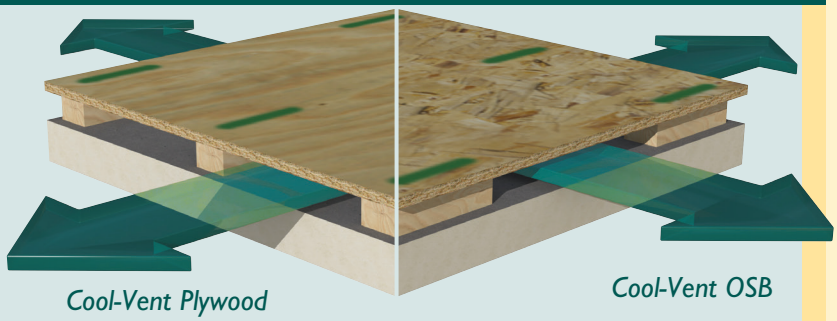
From: Joni Young [mailto:joni@rbsdesigngroup.com]
Sent: Friday, April 28, 2017 3:57 PM
To: Hogan, Jeff (PPC) <Jeff.Hogan@ky.gov>
Subject: Request for Change / Case #129187-000-0

Attached is a letter explaining a proposed change to the deck system and insulated underlayment on the steep slope section of the new Spottsville Elementary School. We are asking for your review and comments as to whether or not this is acceptable. Please advise - thanks so much !

Joni Young
Administrative Assistant
(270) 683-1158

RBS DESIGN GROUP
ARCHITECTURE

Cool-Vent *Ventilated Nailbase Polyiso Panel*



Cool-Vent Plywood *Cool-Vent OSB*

PRODUCT DESCRIPTION

Cool-Vent is a venting composite insulation board that consists of a 4'x8' panel of rigid polyiso, a middle layer of solid wood spacers, creating a standard 1" air space and a top layer of APA/TECO rated OSB or plywood. Cool-Vent is the environmentally intelligent choice for steep slope roofing applications and is viable in green and sustainable building designs.

FEATURES AND BENEFITS

- Manufactured with NexGen Chemistry: Contains no CFCs, HCFCs, is Zero ODP, EPA Compliant and has virtually no GWP
- 75% lateral air movement
- Optimal cooling and ventilation through 92% open air space
- The edges of the wood panels are rabbeted to provide for expansion and contraction of the wood while allowing the foam edges to be installed tightly to achieve thermal integrity across the entire roof deck
- Wood spacers less than 12" apart; minimizes deflection
- Design flexibility: 1.5" and 2" wood spacers available for increased air flow (when eave ridge distance is over 20 feet)
- Exceeds requirements of ARMA Tech Bulletin 211-RR-24 regarding minimum depth of air space
- When Cool-Vent is manufactured with H-Shield F it performs as a radiant barrier.

PANEL CHARACTERISTICS

- Available in two grades of compressive strengths per ASTM C1289 Type V, Class 1 Grade 2 (20 psi) or Grade 3 (25 psi)
- Also available in ASTM C1289 Type V, Class 2 (H-Shield CG), Grade 2 and ASTM C1289 Type I, Class 1 (H-Shield F), Grade 2
- Available in 4' x 8' (1220mm x 2440mm) panels in overall thicknesses of 2.5" (64mm) to 5.0" (127mm)
- Available with FSC® Certified OSB or plywood (special order)
- When FSC wood is specified, Cool-Vent is manufactured with H-Shield CG and FSC Wood blocks.
- Multiple Substrate Types Available:

OSB: · 7/16" or 5/8"

Plywood: · 5/8" or 3/4" CDX · Fire-Treated

ROOFING APPLICATIONS

Cool-Vent is custom built to incorporate the individual specifications of the building designer. Cool-Vent is for use on slopes of 3:12 or greater (for lower slope considerations see H-Shield NB).

Applicable construction types include:

- Non-insulated Cathedral and Vaulted Ceilings
- Exposed ceiling designs beneath steel, wood, tongue & groove deck types in commercial and residential constructions
- Log Home applications
- Post & Beam constructions

Acceptable Roof Coverings:

- Shingles
- Slate (Natural and Synthetic)
- Tile
- Metal Roof Systems

COOL-VENT THERMAL VALUES

THICKNESS† (INCHES)	(MM)	MINIMUM R-VALUE*	FLUTE SPANABILITY
2.5"	64	5.7	2 5/8"
3.0"	76	8.6	4 3/8"
3.5"	89	11.4	4 3/8"
4.0"	102	14.4	4 3/8"
4.5"	114	17.4	4 3/8"
5.0"	127	20.5	4 3/8"

*Long Term Thermal Resistance Values are based on ASTM C 1289.

†Thickness is calculated with 7/16" OSB and 1" airspace.
For other dimensions contact Hunter Panels.

To achieve optimal thermal performance Hunter Panels recommends installation of a multi-layered system when using Cool-Vent. R values other than those listed in the above chart can be achieved by altering the base layer of flat polyiso in conjunction with the thickness listed above..

Codes and Compliances

- ASTM C 1289 Type V, Class 1 Grade 2 (20 psi) or Grade 3 (25 psi)
- International Building Code (IBC) Chapter 26
- State of Florida Product Approval Number FL 5968
- Miami Dade County Product Control Approved

Underwriters Laboratories Inc Classifications

- TGDY. R20624 Shingle Deck Accessory; Cool-Vent roof insulation is classified for use with any Class A, B, or C asphalt organic shingles, metal or tile roof coverings.
- UL 1256
- Insulated Metal Deck Construction Assemblies – No. 120, 123
- UL 790
- UL 263 Hourly Rated P Series Roof Assemblies

UL Classified for use in Canada

- Refer to UL Directory of Products Certified for Canada for more details

Factory Mutual Approvals

- FM 4450, FM 4470

LEED Potential Credits for Polyiso Use

Energy and Atmosphere

- Optimize Energy Performance

Materials & Resources

- Building Life-Cycle Impact Reduction
- Environmental Product Declarations
- Materials Reuse
- Recycled Content
- Construction and Demolition Waste Management
- FSC-Certified Wood Products

TYPICAL PHYSICAL PROPERTY DATA CHART PER ASTM C 1289 – *POLYISO FOAM CORE ONLY*

PROPERTY	TEST METHOD	VALUE
Compressive Strength	ASTM D 1621	20 psi* (138kPa, Grade 2)
Dimensional Stability	ASTM D 2126	2% linear change (7 days)
Moisture Vapor Transmission	ASTM E 96	< 1 perm (57.5ng/(Pa•s•m²))
Water Absorption	ASTM C 209	< 1% volume
Flame Spread**	ASTM E 84	< 75
Smoke Developed**	ASTM E 84	< 450
Service Temperature	–	-100° to 250° F (-73°C to 122°C)

*Also available in 25 psi, Grade 3

**Meets the requirements of the IBC code. For specific Flame Spread or Smoke Developed Ratings - please contact the Hunter Panels Technical Department.

WARNINGS AND LIMITATIONS

Insulation must be protected from open flame and kept dry at all times. Install only as much insulation as can be covered the same day by completed roof covering material. Hunter Panels will not be responsible for specific building and roof design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site or for improper storage and handling. Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. For more information refer to the Storage and Handling Technical Bulletin at www.hunterpanels.com, or refer to PIMA Technical Bulletin No. 109: *Storage & Handling Recommendations for Polyiso Roof Insulation* at www.polyiso.org.

Definition of NFA/LF

The Net Free Area of Ventilation Per Linear Foot is derived by multiplying the air space in inches by the length in inches of the Cool-Vent panel. The area of the wood spaces is then subtracted and the difference is divided by 4 or 8.

AIRSPACE DIMENSION	NFA/LF
1.0"	7.5/9.5 sq inch
1.5"	11.25/14.25 sq inch
2.0"	15.00/19.0 sq inch

INSTALLATION

- Install Cool-Vent only over fully supported structural decking
- **Cool-Vent is NOT a structural panel**
- Cool-Vent must be applied perpendicular to the flutes in steel deck applications
- The use of 15# and 30# roofing felt is not recommended under asphalt shingles when using Hunter Panels Cool-Vent product
- Install Cool-Vent on slopes 3:12 or greater

NOTE: When installing Cool-Vent over an acoustical deck, check local codes for fire ratings. The use of a ⅝" minimum gypsum fire barrier may be required.

The Use of Synthetic Underlayments

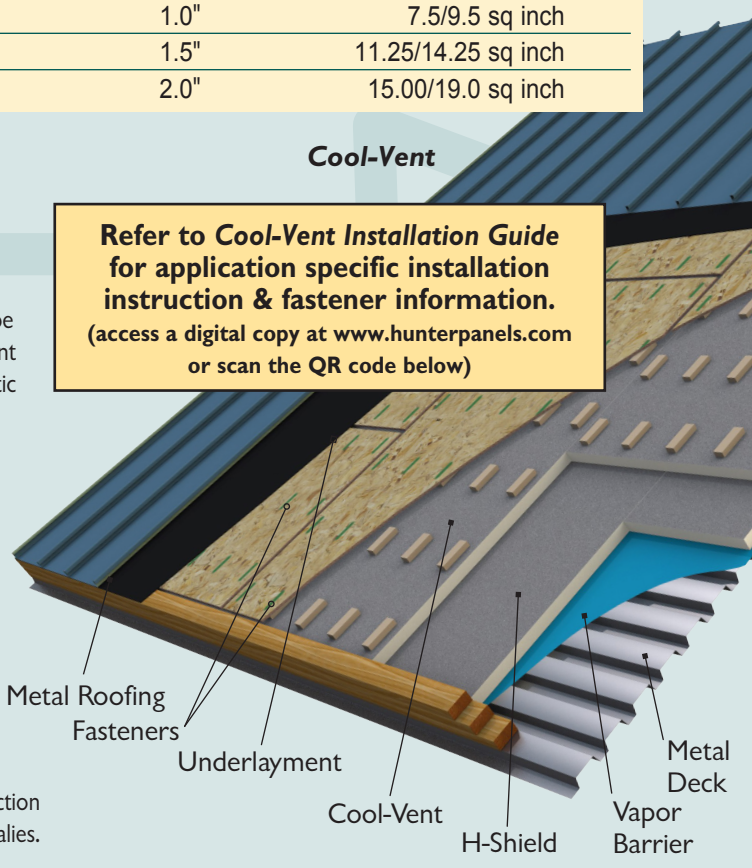
The use of synthetic underlayments is becoming an industry norm (for steep slope application). Hunter Panels strongly suggests the use of a synthetic underlayment under asphalt shingles unless otherwise specified by the shingle manufacturer. Synthetic underlayments provide excellent water resistance and absorb no moisture.

Vapor Retarders

The incorporation of a vapor barrier or retarder within the roofing assembly is highly recommended when the project is located in Zones 4 - 8 as determined by the International Code Council Dept. of Energy NW National Lab of the United States (map located at www.polyiso.org.). Consult a licensed design professional, architect or engineer to establish whether or not a vapor barrier is necessary and to specify its type and location within the system. This is especially important during the construction phase when excessive moisture drive is present. Hunter Panels recommends that a dew point calculation be performed prior to the installation of any product. This calculation is based on the buildings interior relative humidity, interior temperature conditions and outside temperature. Excessive moisture migration and temperature fluctuations during construction will potentially damage the system and cause unwanted condensation and aesthetic anomalies.

Cool-Vent

Refer to *Cool-Vent Installation Guide* for application specific installation instruction & fastener information.
(access a digital copy at www.hunterpanels.com or scan the QR code below)



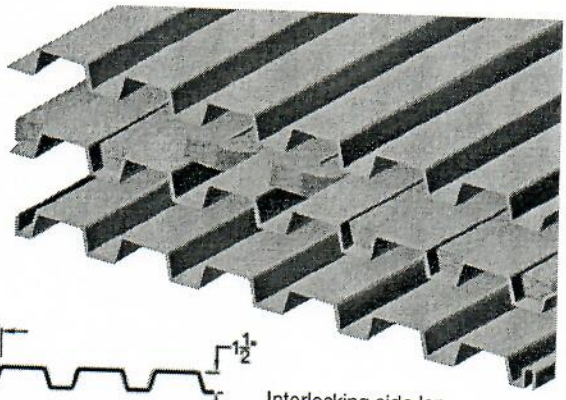
Scan to access online Installation Guide

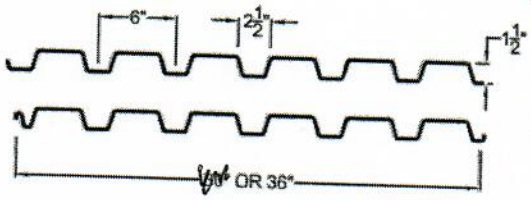
HUNTER
Energy Smart Polyiso

HUNTERPANELS.COM
15 FRANKLIN STREET, PORTLAND, ME 04101 · 888.746.1114 · FAX: 877.775.1769

1.5 B, BI, BA, BIA, BSV

Maximum Sheet Length 42'-0
Extra charge for lengths under 6'-0
ICC ER-3415
FM Global Approved[2]
Galvanized





Interlocking side lap is not drawn to show actual detail.

SECTION PROPERTIES

Deck type	Design thickness in.	W psf	Section Properties				V_a lbs/ft	F_y ksi
			I_p in⁴/ft	S_p in³/ft	I_n in⁴/ft	S_n in³/ft		
B24	0.0239	1.46	0.107	0.120	0.135	0.131	2634	60
B22	0.0295	1.78	0.155	0.186	0.183	0.192	1818	33
B20	0.0358	2.14	0.201	0.234	0.222	0.247	2193	33
B19	0.0418	2.49	0.246	0.277	0.260	0.289	2546	33
B18	0.0474	2.82	0.289	0.318	0.295	0.327	2870	33
B16	0.0598	3.54	0.373	0.408	0.373	0.411	3578	33

ACOUSTICAL INFORMATION

Deck Type	Absorption Coefficient						Noise Reduction Coefficient[1]
	125	250	500	1000	2000	4000	
1.5BA, 1.5BIA	.11	.18	.66	1.02	0.61	0.33	0.60

[1] Source: Riverbank Acoustical Laboratories.
Test was conducted with 1.50 pcf fiberglass batts and 2 inch polyisocyanurate foam insulation for the SDI.

Type B (wide rib) deck provides excellent structural load carrying capacity per pound of steel utilized, and its nestable design eliminates the need for die-set ends.

1" or more rigid insulation is required for Type B deck.

Acoustical deck (Type BA, BIA) is particularly suitable in structures such as auditoriums, schools, and theatres where sound control is desirable. Acoustic perforations are located in the vertical webs where the load carrying properties are negligibly affected (less than 5%).

Inert, non-organic glass fiber sound absorbing batts are placed in the rib openings to absorb up to 60% of the sound striking the deck.

Batts are field installed and may require separation.

VERTICAL LOADS FOR TYPE 1.5B

No. of Spans	Deck Type	Max. SDI Const. Span	Allowable Total (PSF) / Load Causing Deflection of L/240 or 1 inch (PSF) Span (ft.-in.) ctr to ctr of supports										
			5-0	5-6	6-0	6-6	7-0	7-6	8-0	8-6	9-0	9-6	10-0
1	B24	4'-8	115 / 56	95 / 42	80 / 32	68 / 26	59 / 20	51 / 17	45 / 14	40 / 11	35 / 10	32 / 8	29 / 7
	B22	5'-7	98 / 81	81 / 61	68 / 47	58 / 37	50 / 30	44 / 24	38 / 20	34 / 17	30 / 14	27 / 12	25 / 10
	B20	6'-5	123 / 105	102 / 79	86 / 61	73 / 48	63 / 38	55 / 31	48 / 26	43 / 21	38 / 18	34 / 15	31 / 13
	B19	7'-1	146 / 129	121 / 97	101 / 75	86 / 59	74 / 47	65 / 38	57 / 31	51 / 26	45 / 22	40 / 19	36 / 16
	B18	7'-8	168 / 152	138 / 114	116 / 88	99 / 69	85 / 55	74 / 45	65 / 37	58 / 31	52 / 26	46 / 22	42 / 19
	B16	8'-8	215 / 196	178 / 147	149 / 113	127 / 89	110 / 71	96 / 58	84 / 48	74 / 40	66 / 34	60 / 29	54 / 24
2	B24	5'-10	124 / 153	103 / 115	86 / 88	74 / 70	64 / 56	56 / 45	49 / 37	43 / 31	39 / 26	35 / 22	31 / 19
	B22	6'-11	100 / 213	83 / 160	70 / 124	59 / 97	51 / 78	45 / 63	39 / 52	35 / 43	31 / 37	28 / 31	25 / 27
	B20	7'-9	128 / 267	106 / 201	89 / 155	76 / 122	66 / 97	57 / 79	51 / 65	45 / 54	40 / 46	36 / 39	32 / 33
	B19	8'-5	150 / 320	124 / 240	104 / 185	89 / 145	77 / 116	67 / 95	59 / 78	52 / 65	47 / 55	42 / 47	38 / 40
	B18	9'-1	169 / 369	140 / 277	118 / 213	101 / 168	87 / 134	76 / 109	67 / 90	59 / 75	53 / 63	48 / 54	43 / 46
	B16	10'-3	213 / 471	176 / 354	149 / 273	127 / 214	110 / 172	95 / 140	84 / 115	74 / 96	66 / 81	60 / 69	54 / 59
3	B24	5'-10	154 / 120	128 / 90	108 / 69	92 / 55	79 / 44	69 / 35	61 / 29	54 / 24	48 / 21	43 / 17	39 / 15
	B22	6'-11	124 / 167	103 / 126	87 / 97	74 / 76	64 / 61	56 / 50	49 / 41	43 / 34	39 / 29	35 / 24	31 / 21
	B20	7'-9	159 / 209	132 / 157	111 / 121	95 / 95	82 / 76	72 / 62	63 / 51	56 / 43	50 / 36	45 / 31	40 / 26
	B19	8'-5	186 / 250	154 / 188	130 / 145	111 / 114	96 / 91	84 / 74	74 / 61	65 / 51	58 / 43	52 / 37	47 / 31
	B18	9'-1	210 / 289	174 / 217	147 / 167	126 / 132	108 / 105	95 / 86	83 / 71	74 / 59	66 / 50	59 / 42	54 / 36
	B16	10'-3	264 / 369	219 / 277	185 / 214	158 / 168	136 / 135	119 / 109	105 / 90	93 / 75	83 / 63	74 / 54	67 / 46

Notes: 1. Minimum exterior bearing length required is 1.50 inches. Minimum interior bearing length required is 3.00 inches. If these minimum lengths are not provided, web crippling must be checked.
2. FM Global approved numbers and spans available on page 21.

FLAT & TAPERED ENRGY 3®

Polyisocyanurate Roof Insulation

Meets the requirements of ASTM C 1289, Type II, Class 1, Grade 2 (20 psi)

- **ENRGY 3 / Tapered ENRGY 3**

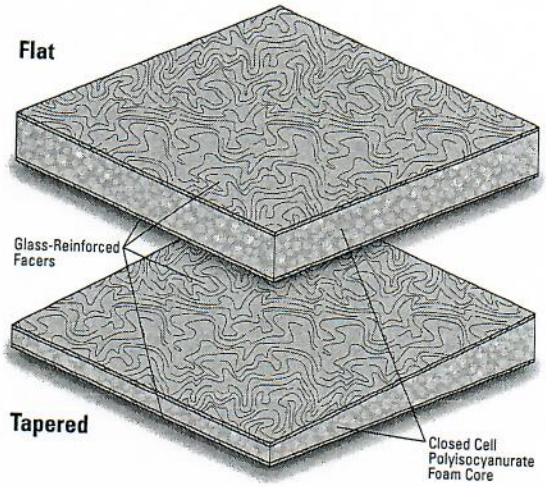
Grade 3 (25 psi)

- **ENRGY 3 25 PSI / Tapered ENRGY 3 25 PSI**

Features and Components

Glass-Reinforced Facers: Provides rigidity and resistance to indentation and crushing, and are compatible with BUR, modified bitumen and single ply membrane systems.

Closed Cell Polyisocyanurate Foam Core: Provides high R-value per inch in built-up, modified bitumen, metal roof and single ply roof systems, and approved for direct application to steel decks.



System Compatibility

This product may be used as a component in the following systems. Please reference product application for specific installation methods and information.

Multi-Ply	BUR		APP		SBS			
	HA	CA	CA		HA	CA		SA
	Compatible with the selected Multi-Ply systems above							

Single Ply	TPO		PVC		EPDM			
	MF	FA	MF	FA	MF	FA		BA
	Compatible with all Single Ply systems							

Key: **HA** = Hot Applied **CA** = Cold Applied **HW** = Heat Weldable **SA** = Self Adhered **MF** = Mechanically Fastened **FA** = Fully Adhered **BA** = Ballasted

Energy and the Environment

LEED®	Recycled Content	Varies with thickness, see *Product Data and Packaging* table on next page.
Produced with a pentane blowing agent with zero ozone depletion and virtually no global warming potential.		

Peak Advantage® Guarantee Information

Systems
For use in approved JM Peak Advantage Roofing Guarantees

Codes and Approvals

- FM® Standards 4450/4470 Approvals (refer to FM RoofNav℠)
- UL® Standard 790, 263 and 1256 (refer to UL Roofing Materials system directory)
- Meets the requirements of CAN/ULC S704, Type 2 & 3, Class 3
- California Code of Regulations, Title 24, Insulation Quality Standard License #TI-1341
- Third-party certification with the PIMA Quality Mark™ for Long-Term Thermal Resistance (LTTR) values

Refer to the Safe for Use instructions and product label prior to using this product. The Safe for Use instructions are available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.

Note: Technical information on this data sheet is intended to be used as a general guideline only and is subject to change without notice. Contact your JM Sales Representative for further details.

Installation/Application

Refer to the application instructions guidelines for proper utilization of this product.

Flute Span:

Width of Rib Opening:	Up to 2⅝" (6.67 cm)	Up to 3⅜" (8.57 cm)	Up to 4⅜" (11.11 cm)
Insulation Thickness *(min)*:	1.0" (2.54 cm)	1.2" (3.05 cm)	1.3" (3.30 cm)

Packaging and Dimensions

Flat Sizes[1]	4' x 4' (1.22 m x 1.22 m)		4' x 8' (1.22 m x 2.44 m)
Tapered Size[2]	4' x 4' (1.22 m x 1.22 m)		
Producing Locations	Bremen, IN Hazleton, PA	Cornwall, ONT Jacksonville, FL	Fernley, NV
Stocking Locations[3]	Grand Prairie, TX	Southgate, CA	Tracy, CA

1. For available thicknesses, see *Product Data and Packaging* table on page 2 of this data sheet. Other sizes available by special request, some sizes are not stocked and special order with minimum order quantities. Contact your JM Sales Representative for details.
2. Tapered ENRGY 3 and Tapered ENRGY 3 25 PSI are available in thicknesses of 1/2" to 4". Available profiles are shown on page 3 of this data sheet. In some regions extended panels are also available.
3. Not all sizes, thicknesses, and products are stocked at all locations, please call Customer Service at 1-877-766-3295.

Johns Manville

FLAT ENRGY 3®

Polyisocyanurate Roof Insulation

Typical Physical Properties

Test		ASTM	Values
Strength	Tensile Strength	C 209	500 psf (24 kPa) *(min)*, 730 psf (35 kPa) *(nom)*
	Compressive Resistance 10% Consolidation	D 1621	Grade 2: 20 psi (138 kPa), Grade 3: 25 psi (172 kPa) *(min)*
	Dimensional Stability Change, *(length & width)*	D 2126	0.5% *(nom)*, 2% *(max)*
Moisture	Moisture Vapor Permeance	E 96	1 perm, 57.2 ng/(Pa•s•m²) *(nom)*, 1.5 perm, 85.8 ng/(Pa•s•m²) *(max)*
	Water Absorption	C 209	1.0% *(max)*
Insulation	Service Temperature	D 1623	-100°F – 250°F (-73°C – 121°C)
	Flame Spread, *(foam core)*	E 84	20 - 30 *(nom)*, 75 *(max)*
	Smoke Developed, *(foam core)*	E 84	55 - 250 *(nom)*, 450 *(max)*

Product Data and Packaging

Thickness		Long-Term Thermal Resistance (LTTR) Values[1]		Recycled Content[2] 20 PSI / 25 PSI			Boards per Pallet	Square Feet per Pallet		Pallets per Truck[3]	
in.	mm	(hr•ft²•°F)/BTU	m²•°C/W	% Pre-Consumer	% Post-Consumer	% Total	4x4 and 4x8	4x4	4x8	4x4	4x8
1.0	25.4	5.7	1.00	5.3 / 5.2	31.8 / 29.9	37.1 / 35.1	48	768	1536		
1.1	27.9	6.3	1.10	5.2 / 5.2	30.0 / 28.1	35.3 / 33.3	41	656	1312		
1.2	30.5	6.8	1.20	5.2 / 5.2	28.4 / 26.6	33.6 / 31.76	38	608	1216		
1.25	31.8	7.1	1.25	5.2 / 5.2	27.7 / 25.8	32.9 / 31.0	35	560	1120		
1.3	33.0	7.4	1.30	5.3 / 5.3	27.0 / 25.2	32.3 / 30.4	35	560	1120		
1.4	35.6	8.0	1.41	5.3 / 5.2	25.7 / 23.9	31.0 / 29.2	32	512	1024		
1.5	38.1	8.6	1.51	5.2 / 5.2	24.5 / 22.8	29.8 /28.0	32	512	1024		
1.6	40.6	9.1	1.61	5.2 / 5.2	23.4 / 21.7	28.7 / 27.0	28	448	896		
1.7	43.2	9.7	1.71	5.2 / 5.2	22.4 / 20.8	27.7 / 26.0	27	432	864		
1.75	44.5	10.0	1.76	5.2 / 5.2	22.0 / 20.4	27.2 / 25.6	27	432	864		
1.8	45.7	10.3	1.81	5.2 / 5.2	21.5 / 19.9	26.7 / 25.1	25	400	800		
1.9	48.3	10.8	1.91	5.2 / 5.2	20.7 / 19.1	25.9 / 24.3	24	384	768		
2.0	50.8	11.4	2.01	5.2 / 5.2	19.9 / 18.4	25.1 / 23.6	24	384	768		
2.1	53.3	12.0	2.11	5.2 / 5.2	19.2 / 17.7	24.4 / 22.9	21	336	672		
2.2	55.9	12.6	2.22	5.2 / 5.2	18.5 / 17.1	23.7 / 22.3	20	320	640		
2.3	58.4	13.2	2.32	5.2 / 5.2	17.9 / 16.5	23.1 / 21.7	20	320	640		
2.4	61.0	13.8	2.43	5.2 / 5.2	17.3 / 16.0	22.5 / 21.1	19	304	608		
2.5	63.5	14.4	2.53	5.2 / 5.2	16.8 / 15.4	22.0 / 20.6	19	304	608		
2.6	66.0	15.0	2.64	5.2 / 5.1	16.3 / 15.0	21.4 / 20.1	18	288	576		
2.7	68.6	15.6	2.74	5.2 / 5.1	15.8 / 14.5	21.0 / 19.7	17	272	544		
2.8	71.1	16.2	2.85	5.2 / 5.1	15.3 /14.1	20.5 / 19.2	16	256	512	48	24
2.9	73.7	16.8	2.96	5.2 / 5.1	14.9 / 13.7	20.1 / 18.8	16	256	512		
3.0	76.2	17.4	3.06	5.2 / 5.1	14.5 / 13.3	19.7 / 18.4	16	256	512		
3.1	78.7	18.0	3.17	5.1 / 5.1	14.1 / 12.9	19.3 / 18.1	14	224	448		
3.2	81.3	18.6	3.28	5.1 / 5.1	13.8 / 12.6	18.9 / 17.7	14	224	448		
3.25	82.6	18.9	3.33	5.1 / 5.1	13.6 / 12.4	18.7 / 17.6	14	224	448		
3.3	83.8	19.2	3.39	5.1 / 5.1	13.4 / 12.3	18.6 / 17.4	14	224	448		
3.4	86.4	19.9	3.50	5.1 / 5.1	13.1 / 12.0	18.2 / 17.1	13	208	416		
3.5	88.9	20.5	3.61	5.1 / 5.1	12.8 / 11.7	17.9 / 16.8	13	208	416		
3.6	91.4	21.1	3.72	5.1 / 5.1	12.5 / 11.4	17.6 / 16.5	12	192	384		
3.7	94.0	21.7	3.82	5.1 / 5.1	12.2 / 11.1	17.3 / 16.3	12	192	384		
3.75	95.3	22.0	3.88	5.1 / 5.1	12.0 / 11.0	17.2 / 16.1	12	192	384		
3.8	96.5	22.3	3.94	5.1 / 5.1	11.9 / 10.9	17.0 / 16.0	12	192	384		
3.9	99.1	23.0	4.05	5.1 / 5.1	11.7 / 10.7	16.8 / 15.8	12	192	384		
4.0	101.6	23.6	4.16	5.1 / 5.1	11.4 / 10.4	16.5 / 15.5	12	192	384		
4.1	104.0	24.2	4.26	5.1 / 5.1	11.2 / 10.2	16.3 / 15.3	11	176	352		
4.2	107.0	24.9	4.39	5.1 / 5.1	10.9 / 10.0	16.0 / 15.1	11	176	352		
4.3	109.0	25.5	4.49	5.1 / 5.1	10.7 / 9.8	15.8 / 14.9	11	176	352		
4.4	112.0	26.1	4.60	5.1 / 5.1	10.5 / 9.6	15.6 / 14.7	10	160	320		
4.5	114.0	26.8	4.72	5.1 / 5.1	10.3 / 9.4	15.4 / 14.5	10	160	320		

1. The Long-Term Thermal Resistance (LTTR) values were determined in accordance with CAN/ULC S770 at 75°F (24°C). The ultimate R-Value of these products will depend on individual installation circumstances. 2. Value represents average results (Grade 2/Grade 3). 3. Assumes 48' flatbed truck.

Refer to the Safe for Use instructions and product label prior to using this product. The Safe for Use instructions are available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.

RS-5137 10-15 (Replaces 8-15)

Nailboard®

Polyisocyanurate Nailable Roof Insulation

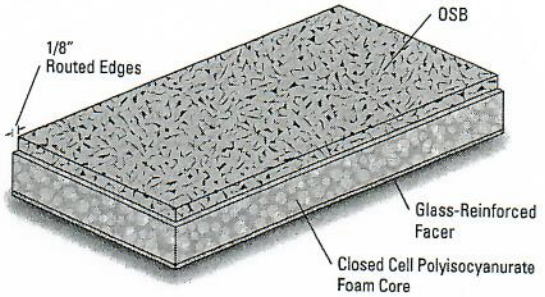
Meets the requirements of ASTM C 1289, Type V (available with 20 or 25 psi ENRGY 3®)

Features and Components

Oriented Strand Board (OSB): Provides a strong nailable surface; always install wood side up. Available wood thickness standard 7/16" or 5/8" thick rated "1 OSB". Wood edges are routed 1/8" to allow for expansion and contraction of the wood.

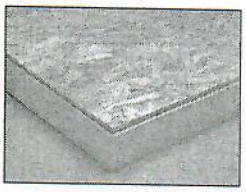
ENRGY 3: Closed cell polyisocyanurate foam core bonded inline to the wood base on one side and a glass-reinforced facer on the other. Nailboard can also be manufactured off-line using an adhesive between the wood and ENRGY 3.

Optional Woods: The following woods are available as special orders: ¾" OSB; Fire Treated.



Component: I Insulation — Multi-Ply, Single Ply

Type: HT High Thermal; CP Composite



System Compatibility

This product may be used as a component in the following systems. Please reference product application for specific installation methods and information.

Multi-Ply	BUR		APP		SMS			
	HA	CA	CA	HW	HA	CA	HW	SA
	Do not use in Multi-Ply systems							

Single Ply	TPO		PVC		EPDM		
	MF	FA	MF	FA	MF	FA	BA
	Compatible with the selected Single Ply systems above						

Key: **HA** = Hot Applied **CA** = Cold Applied **HW** = Heat Weldable **SA** = Self Adhered **MF** = Mechanically Fastened **FA** = Fully Adhered **BA** = Ballasted

Energy and the Environment

LEED®	Recycled Content	Varies with thickness, see *Product Data and Packaging* table on back page.
Produced with a pentane blowing agent with zero ozone depletion and virtually no global warming potential.		

Peak Advantage® Guarantee Information

Systems
Contact Guarantee Services regarding system warranty availability.

Codes and Approvals

- FM® Standards 4450/4470 Approvals (refer to FM RoofNav℠)
- UL® Standard 790, 263 and 1256 (refer to UL Roofing Materials system directory)
- California Code of Regulations, Title 24, Insulation Quality Standard License #TI-1341
- Third-party certification with the PIMA Quality Mark™ for Long-Term Thermal Resistance (LTTR) values
- Incorporates APA/TECO Rating Sheathing Exposure 1 OSB

Installation/Application

Mechanically Fastened

- All Nailboards must be mechanically attached with JM-approved fasteners Nail-Lok™ SD and Nail-Lok™ WD.
- Install Nailboard wood-side up.
- Foam edges should contact each other to achieve thermal performance.
- Refer to the insulation installation instructions for proper utilization of this product.

Packaging and Dimensions

Foam Size	4' x 8' (1.22 m x 2.44 m)
Producing Locations	Bremen, IN

1. For available thicknesses, see *Product Data and Packaging* table on back side of this data sheet. Contact your JM Sales Representative for details.

Refer to the Safe for Use instructions and product label prior to using this product. The Safe for Use instructions are available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.

Note: Technical information on this data sheet is intended to be used as a general guideline only and is subject to change without notice. Contact your JM Sales Representative for further details.

RS-5035 11-16 (Replaces 5-16)

Johns Manville

Nailboard®

Polyisocyanurate Nailable Roof Insulation

Meets the requirements of ASTM C 1289, Type V

Typical Physical Properties (ENRGY 3® Foam Layer Only)

Test		ASTM Values	Nailboard Results
Strength	Tensile Strength	C 209	500 psf (24 kPa) *(min)*
	Compression Resistance 10% Consolidation	D 1621	20 psi (140 kPa) *(min)*, 25 psi (172 kPa) *(min)*
	Dimensional Stability Change, *(length & width)*	D 2126	2% linear *(max)*
Moisture	Water Absorption	C 209	1.0% *(max)*
Installation	Service Temperature	D 1623	-100°F – 250°F (-73°C – 121°C)
	Flame Spread, *(foam core)*	E 84	20 - 30
	Smoke Developed, *(foam core)*	E 84	55 - 250

Product Data and Packaging

Composite Thickness[1]		7/16" (1.11 cm) OSB					5/8" (1.59 cm) OSB					Boards per Pallet	Square Feet per Pallet	Pallets per Truck[4]
		Long-Term Thermal Resistance (LTTR) Values[2]		Weight		Total Recycled Content	Long-Term Thermal Resistance (LTTR) Values[2]		Weight		Total Recycled Content			
in.	mm	(hr-ft²-°F)/BTU	m²-°C/W	lb/ft²	kg/m²	%	(hr-ft²-°F)/BTU	m²-°C/W	lb/ft²	kg/m²	%			
2.0	51	9.2	1.61	1.75	8.54	2.8						24	768	
2.1	53	9.7	1.71	1.76	8.61	2.8	9.2	1.62	2.37	1.07	2.8%	21	672	
2.2	56	10.3	1.81	1.78	8.68	2.8	9.7	1.71	2.38	1.08	2.8%	20	640	
2.3	58	10.9	1.91	1.79	8.74	2.8	10.3	1.81	2.39	1.09	2.8%	20	640	
2.4	61	11.4	2.01	1.80	8.81	2.8	10.9	1.91	2.41	1.09	2.8%	19	608	
2.5	64	12.0	2.11	1.82	8.88	2.9	11.4	2.01	2.42	1.10	2.8%	19	608	
2.6	66	12.6	2.22	1.83	8.94	2.9	12.0	2.11	2.43	1.10	2.8%	18	576	
2.7	69	13.2	2.32	1.85	9.01	2.9	12.6	2.22	2.45	1.11	2.9%	17	544	
2.8	71	13.8	2.43	1.86	9.08	2.9	13.2	2.32	2.46	1.12	2.9%	16	512	
2.9	74	14.4	2.53	1.87	9.15	2.9	13.8	2.43	2.48	1.12	2.9%	16	512	
3.0	76	15.0	2.64	1.89	9.21	2.9	14.4	2.53	2.49	1.13	2.9%	16	512	
3.1	79	15.6	2.74	1.90	9.28	2.9	15.0	2.64	2.50	1.14	2.9%	14	448	24
3.2	81	16.2	2.85	1.91	9.35	3.0	15.6	2.74	2.52	1.14	2.9%	14	448	
3.3	84	16.8	2.96	1.93	9.41	3.0	16.2	2.85	2.53	1.15	2.9%	14	448	
3.4	86	17.4	3.06	1.94	9.48	3.0	16.8	2.95	2.54	1.15	2.9%	13	416	
3.5	89	18.0	3.17	1.96	9.55	3.0	17.4	3.06	2.56	1.16	2.9%	13	416	
3.6	91	18.6	3.28	1.97	9.62	3.0	18.0	3.17	2.57	1.17	3.0%	12	384	
3.7	94	19.2	3.39	1.98	9.68	3.0	18.6	3.28	2.59	1.17	3.0%	12	384	
3.8	97	19.8	3.49	2.00	9.75	3.0	19.2	3.38	2.60	1.18	3.0%	12	384	
3.9	99	20.5	3.60	2.01	9.82	3.0	19.8	3.49	2.61	1.19	3.0%	12	384	
4	102	21.1	3.71	2.02	9.88	3.1	20.5	3.61	2.63	1.19	3.0%	12	384	
4.1	104						21.1	3.71	2.64	1.20	3.0%	11	352	

1. Thickness less than 2.0" and more than 4.1" is special order and can only be fulfilled with OSB.
2. The Long-Term Thermal Resistance (LTTR) values were determined in accordance with CAN/ULC S770 at 75°F (24°C). The ultimate R-Value of these products will depend on individual installation circumstances.
3. Value represents average results.
4. Assumes 48' flatbed truck.

Refer to the Safe for Use instructions and product label prior to using this product. The Safe for Use instructions are available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.