

PRODUCT EVALUATION REPORT

<u>State of Florida Professional Engineer:</u> Terrence E. Wolfe, P.E. # 44923 2405-a S. Houston Ave., Suite 500 Humble, TX 77396

<u>Validator</u>: Dan Farabaugh 515 Braddock Avenue Turtle Creek, PA 15145



Manufacturer:

MBCI, L.P. a division of NCI, L.P.

Houston

14031 West Hardy Houston, TX 77064

Lubbock 5711 FM-40 Lubbock, TX 79401

Oklahoma City 7000 S. Eastern Ave. Oklahoma City, OK 73149

San Antonio

8677 I-10 East Converse, TX 78109

Atlanta 2280 Monier Ave.

Lithia Springs, GA 30057

Tampa

402 N. Frontage Road Plant City, FL 33563

Richmond 801 South Ave. Colonial Heights, VA 23834

Indianapolis 1780 McCall Drive Shelbyville, IN 46176

Omaha

1011 Ellison Ave. Omaha, NE 68110

Memphis

300 Highway 51 North Hernando, MS 38632

Rome

6168 State Route 233 Rome, NY 13440

Adel

1600 Rogers Road Adel, GA 31620

Phoenix

660 South 91th street Tolleson, AZ 85353

Salt Lake City

1155 West 2300 North Salt Lake City. UT 84116

Jackson

201 Apache Dr. Jackson, MS 39272

Midland Metals

515 13th Ave E. Oskaloosa, IA 52577 **Big Rapids** 560 North Bronson Ave Big Rapids, MI 49307-9311

Atwater 550 Industry Way Atwater, CA 95301

Ennis 1804 Jack McKay Blvd. Ennis, TX 75119

Nicholasville 6975 Danville Rd. Nicholasville, KY 40340

SUBJECT:

Cold-formed, Structural standing seam, steel roof panels/cladding.

DESCRIPTION:

Ultra-Dek[®] – a 24", 18", or 12", wide, standing seam, structural, metal roof panel, available in 24-ga. (0.023"), or 22-ga. (0.029"). Ultra-Dek[®] is typically applied over open framing, plywood, or a metal deck substrate. Ultra-Dek[®] is a snap-seam panel.

CODE CRITERIA:

CHAPTER 15, FLORIDA BUILDING CODE 2004, ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1504 PERFORMANCE REQUIREMENTS

1504.1 Wind resistance of roofs. Roof decks and roof coverings shall be designed for wind loads in accordance with Chapter 16 and Sections 1504.3. *See attached installation manual.*

1504.3 Wind resistance of non-ballasted roof. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for cladding in Chapter 16.

1504.3.2 Metal panel roof systems. Metal panel roof systems through fastened or standing seam shall be tested in accordance with UL 580 or ASTM E 1592.

See attached UL Construction No. 205, 205A, 534, and 535. See Attached ASTM E 1592 Load Tables **1504.6 Physical properties.** Roof coverings installed on low slope roofs (roof slope < 2:12), in accordance with 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 153, ASTM G 155 or ASTM G 154.

See attached paint technical data sheet.

SECTION 1505 FIRE CLASSIFICATION

1505.1 General. Roof assemblies shall be divided into the classed defined below. Class A, B, and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790. See attached UL Fire Ratings data sheet.

SECTION 1506 MATERIALS

1506.1 Scope. The requirements set forth in this section shall apply to the application of roof covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the manufacturer's installation instructions.

See attached installation details.

1506.3 Material specifications and physical characteristics.

See attached section properties chart.

1506.4 Product identification. Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with 1505. See attached product label.

SECTION 1507 REQUIREMENTS FOR ROOF COVERINGS

1507.4 Metal roof panels. The installation of metal roof panels shall comply with the provisions of this section.

1507.4.1 Deck requirements. Metal roof panel roof coverings shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced supports. See attached limits of use.

1507.4.2 Deck slope. The minimum slope for standing seam of roof systems shall be one-quarter unit vertical in 12 unit's horizontal (2-percent slope). See attached limits of use.

1507.4.3 Material standards. Metal-sheet roof covering systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet roof coverings installed over structural decking shall comply with Table 1507.4.3.

Roof Covering Type	STANDARD APPLICATION RATE
Galvanized Steel	ASTM A 653 G-90 zinc coated
Prepainted Steel	ASTM A 755
Aluminum-zinc alloy coated steel	ASTM A 792
Lead-coated copper	ASTM B 101
Aluminum	ASTM B 209

Table 1507.4.3	Metal	Roof	Coverings
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See attached Galvalume spec. data sheet.

1507.4.4 Attachment. Metal roofing fastened directly to steel framing shall be approved manufacturers' fasteners.

See attached fastener data sheets.

CHAPTER 22 STEEL

SECTION 2209 COLD-FORMED STEEL

2209.1 Regular cold-formed steel. The design of cold-formed carbon or low alloy steel structural members shall be in accordance with the *North American Specification for the Design of Cold-Formed Steel Structural Members (AISI-NASPEC).* The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8.

LIMITATIONS OF USE FOR NON-HIGH VELOCITY HURRICANE ZONES

Minimum Slope: Substrate: Substrate Description: Substrate Attachment: Fire Barrier:	1/4:12 (per FBC 2004). Steel Purlins or FL P.E. designed equal. Designed by FL P.E. (Optional) ¼" Georgia Pacific "Dens Deck", or 5/8" water resistant type X gypsum sheathing with treated core and facer, or manufacturer
Insulation: Minimum Substrate Thickness: Application:	per manufacturer's instructions. 16-ga purlins or FL P.E. designed equal. Install Ultra-Dek [®] Panel per the manufacturers approved details.

Design Procedure: Based on the dimensions of the structure, appropriate loads are determined using Chapter 16 of the FBC. Loads include, roof live load, dead load and wind load. These loads are compared to the *panel load tables* (section properties for through-fastened panels and ASTM E 1592 for standing seam panels) in order to determine the appropriate panel span/fastener spacing. Based on the tributary area of the attachment, the fastener load is determined. The fastener load is compared to the allowable fastener capacity (pullout and pullover) from the *fastener manufacturer's data sheet* based on the substrate used. An appropriate factor of safety is applied to the calculation (typically 3.0). If the initial fastener spacing is too great, it is reduced until the fastener capacity is shown to be adequate. Fastener spacings are typically reduced in the edge zones of the structure to account for greater wind loads.



APPENDIX

- 1. Design/Installation Manual
- 2. ASTM E 1592 Load Tables
- 3. UL Construction Number 205, 205A, 534, and 535.
- 4. Galvalume Spec Data Sheet
- 5. Paint Spec Data Sheet
- 6. UL Impact Resistance
- 7. UL Fire Rating
- 8. Material Label
- 9. ASTM G 154 Test Report
- 10. Fastener Data Sheets



Houston Hardy: 877/713-6224 Houston Northwinds: 800/356-4418 Adel, GA. 888/46-6224 Atlanta, GA: 877/512-6224 Atwamer, CA: 80/0829-9324 Boise, ID: 800/632-3340 Datlas, TX: 800/853-6224 Indianapolis, IN: 800/735-5224 Lubbock, TX: 800/758-6224 Mamphis, TN: 800/206-6224 Oktahoma City, OK: 800/597-5224 Omaha, NK: 800458-8224 Phoenix, AZ: 888/533-5224 Richmond, VA: 800/728-6224

Features And Benefits

Rome, NY: 800/559-5224 Salt Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-5224 Tampa, FL: 800/359-5224 International Sales Office: 800/359-5224



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ENGINEERING
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Eave	ליםון 7 מוו
Snow Gutter	
Hip	
Valley	

SEE www.mbci.com FOR CURRENT INFORMATION

IMPORTANT NOTICE

READ THIS MANUAL COMPLETELY PRIOR TO BEGINNING THE INSTALLATION OF THE Ultra-Dek® ROOFING SYSTEM.

IF THERE IS A CONFLICT BETWEEN PROJECT ERECTION DRAWINGS PROVIDED OR APPROVED BY MBCI AND DETAILS IN THIS MANUAL, PROJECT ERECTION DRAW-INGS WILL TAKE PRECEDENCE.

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Descriptions and specifications contained herein were in effect at the time this publication was approved for printing. In a continuing effort to refine and improve products, MBCI reserves the right to discontinue products at any time or change specifications and/or designs without incurring obligation. To insure you have the latest information available, please inquire or visit our Web Site at http://www.mbci.com. Application details in this manual may not be appropriate for all environmental conditions, building designs, or panel profiles. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices. Insulation is not shown in these details for clarity.



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dianapolis, IN: 800/735-6224 Lubbock, TX: 600/758-6224 Memphis, TN: 600/206-6224 Oklahoma City, OK: 800/597-6224 Omaha, NE: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-8224

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ROOFING SYSTEM

ultra-dek®

FEATURES AND BENEFITS

DESIGN INTEGRITY 1.

MBCI's Ultra-Dek® begins and ends in the high, reducing the risk of leakage at the rake that can occur when finishing in the low. The panel seam is sealed with a factory-applied hot-melt mastic, a superior grade to mastics applied in the field.

FLOATING ROOF 2.

The Ultra-Dek® roof was designed to cope with the forces of expansion and contraction. This is accomplished by allowing the panels to freely move up and down the roof slope. Due to this design feature, the system offers no diaphragm capabilities or purlin stability.

CLIP SELECTION 3.

A large selection of clips is available for various types of construction. The articulating clip eliminates the binding and friction during panel expansion and contraction caused by a misformed, misaligned or improperly erected substructure. The clip provides a 3/1" clearance at the purlin to reduce water ponding on low pitch roofs. Constructed from 12 gauge material, this clip is an integral part of maintaining panel module within the floating system.

UL CLASS 90 RATING 4.

MBCI's Ultra-Dek® roof system has 10 different UL Class 90 construction numbers, each of which is available with several options.

FIRE RESISTANCE RATINGS 5.

The roof system qualifies for use in several UL design assemblies and carries a UL "Class A" fire rating.

SIMPLICITY 6.

No field seaming is required. The panels simply snap together forming a self-locking seal.

FLEXIBILITY 7.

MBCI's Ultra-Dek® roof system offers welcome flexibility to the erector. Wall covering can be erected before or after the roof is installed. Panel installation is an uninterrupted procedure.

EASE OF INSTALLATION 8.

The erector has the option to install each side of the roof separately or both sides simultaneously, which greatly increases the speed and convenience of erection. Being reversible end-for-end, sheets do not have to be special ordered for each side of the building. No field notching of panels at endlaps or ridge is required.

FORGIVING SYSTEM 9.

The Ultra-Dek® system design allows for the roof to be finished in the "high" when an out-of-square condition or other factors cause the roof to terminate up to 4" from the steel line.

BUILDING LENGTH 10.

Odd, as well as even, footage buildings can be terminated at a major rib with the use of our 12" and 18" panel or at other odd widths by field bending the panel.

PREPUNCHED PANELS AND COMPONENTS 11.

MBCI's prepunched system, combined with self-engaging back-up plates, assures panel module and speeds roof installation.

DURABILITY 12.

Every unpainted panel is manufactured from Galvalume Plus®, your assurance of the MBCI commitment to quality.

COLOR AND FINISHES 13.

Ultra-Dek® is available in a wide variety of popular colors in three different paint systems.

Ultra-Dek® is a registered trademark of Metal Building Components, L.P. Galvalume Plus® is the trademark of BIEC International, Inc.

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Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-6224 Sait Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampa, FL: 800/359-6224 International Sales Office: 800/359-6224



ENGINEERING

IMPORTANT READ THIS FIRST

CAUTION

Application and design details are for illustration purposes only, and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices

CAUTION

Ultra-Dek® is a snap together system. Use of a mechanical seaming tool on the Ultra-Dek® system will void all warranties.

In order to design, quote or order an Ultra-Dek® roof system, you must determine which system you need, based on building width and insulation requirements.

Low Fixed System - Double slope buildings 200' wide or less and single slope buildings 100' wide or less, with or without a 3/8" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

High Fixed System - Double slope buildings 200' wide or less and single slope buildings 100' wide or less, with 3/8", 5/8", or 1" thermal spacers. See Insulation/Thermal Spacer Selection Chart below.

Fixed systems utilize fixed clips that do not allow the roof panels to float on the substructure. For this reason, use fixed systems only on pre-engineered metal buildings with purlins, subject to the building width restrictions outlined above. Do not use fixed systems on buildings with bar joist construction, wood decks or metal decks.

Low Floating System - Double slope buildings over 200' wide or single slope buildings over 100' wide, with or without 3/8" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

High Floating System - Double slope buildings over 200' wide or single slope buildings over 100' wide, with 3/8", 5/8" or 1" thermal spacer. See Insulation/Thermal Spacer Selection Chart below.

Thermal calculations should be performed for each project to ensure that the thermal movement of the roof is not greater than the floating clip's capacity. Various densities of blanket insulation may affect the installation and or the appearance of a metal roof system. The installer is responsible for selecting the proper clip and thermal spacer for their conditions.

insul	ation/Thermal Spacer Selection (Chart
Insulation Thickness	Low System	High System
No insulation	3/8" Thermal Spacer	N/A
2" Insulation	N/A	1" Thermal Spacer
	N/A	5%" Thermai Spacer
	N/A	3/6" Thermal Spacer
6" Insulation	IN/A	is memerepeee

Notes:

- As with all standing seam roof systems, sound attenuation (example: blanket insulation) is required between the panel and the substructure to prevent "roof rumble" during windy conditions. Some composite roof systems may require additional acoustical consideration to ensure that thermal vibration noises are isolated from the building interior. Contact your architect and/or engineer for proper acoustical design.
- All metal roof systems should be designed by a registered, professional engineer for loads specified by the governing code, including the higher pressures encountered at the edge zones of the roof.



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ENGINEERING



UNDERWRITERS LABORATORIES APPROVAL Ultra-Dek®

Construction Number	Panel Width (In.)	Gauge	Сір Туре	Clip Spacing	Substrate	UL-2218 Impact Resistance	UL-263 Fire Rating	UL-580 Rating
205	24	24 min.	С	5'-0"	Open Framing	Class 4	Class A	Class 90
205A	24	24 min.	В	5'-0"	Open Framing	Class 4	Class A	Class 90
534	24	24 min.	В	5'-0¼"	Open Framing	Class 4	Class A	Class 90
535	24	24 min.	С	5'-01⁄4"	Open Framing	Class 4	Class A	Class 90

Clip Type: **A** (Fixed, Floating or Articulating); **B** (Floating or Articulating); **C** (Fixed or Floating); **D** (Utility or Articulating).

NOTES:

- 1. Wind uplift test procedures are in accordance with Underwriters Laboratories Standard UL-580 under "Tests For Uplift Resistance of Roof Assemblies".
- 2. A detailed installation method is available for each Construction Number above and can be found in the UL Roofing Materials and Systems Directory or at http://www.ul.com. The panels must be installed in a certain manner to achieve the published results.
- 3. The panel qualifies for a Class A fire rating in compliance with Underwriters Laboratories Standard UL-263.
- The panel system is listed under the following Fire Resistance Design Numbers: P224. P225, P227, P230, P233, P237, P265, P268, P508, P510, P512, P701, P711, P715, P717, P720, P722, P724, P726, P731, P734, P736, P801, P803, P814, P815, P819, P821, and P823. Refer to the UL Fire Resistance Directory for specific construction methods and hourly ratings.
- 5. Ultra-Dek® panels carry a Class 4 rating under UL-2218 "Test Standard For Impact Resistance."

ICBO APPROVAL

The ICBO Evaluation Service, Inc. has approved the **Ultra-Dek**® roofing system details, engineering, calculations, computer printouts and product data. This information has been found to comply with 1997 UBC Code and is listed in evaluation report number ER-5409. A copy of this report is available upon request.

ENGINEERING

ultra-dek®

Ultra-Dek® PANEL 24" Coverage



				SECTION PR	OPERTIES			
			N	EGATIVE BEND	ING	P	OSITIVE BEND	ING
PANEL	Fy (KSI)	WEIGHT (PSF)	lxe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)	lxe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)
26	50	1.02	0.1158	0.0835	2.4997	0.2202	0.0901	2.6987
20	50	1.23	0.1350	0.0951	2.8477	0.2798	0.1153	3.4524
22	50	1.56	0.1837	0.1332	3.9877	0.3640	0.1504	4.5020

NOTES:

1. All calculations for the properties of **Ultra-Dek®** panels are calculated in accordance with the 2001 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members.

2. Ixe is for deflection determination.

3. Sxe is for Bending.

- 4. Maxo is allowable bending moment.
- 5. All values are for the one foot of panel width.



The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the *North American Specification for the Design of Cold-Formed Steel Structural Members* published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.

ultra-dek®

ENGINEERING

Ultra-Dek® PANEL

24" Coverage



ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

26 Gauge (Fy =	= 50 KSI)							
SPAN	LOAD			SPAN I	N FEET			
TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5
SINGLE	LIVE LOAD	146.9	122.4	104.9	91.8	81.6	72.0	59.5
2-SPAN		146.9	122.4	104.9	91.8	81.6	66.7	55.1
3-SPAN		146.9	122.4	104.9	91.8	81.6	73.4	66.8
4-SPAN	LIVE LOAD	146.9	122.4	104.9	91.8	81.6	73.4	64.3
24 Gauge (Fy	= 50 KSI)							
SDAN				SPAN I	N FEET			
TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5
SINGLE	LIVELOAD	204.0	170.0	145.7	127.5	113.3	92.1	76.1
2-SPAN	LIVELOAD	204.0	170.0	145.7	118.7	93.8	75.9	62.8
2 SPAN	LIVELOAD	204.0	170.0	145.7	127.5	113.3	94.9	78.4
4-SPAN	LIVE LOAD	204.0	170.0	145.7	127.5	109.4	88.6	73.2
22 Gauge (Fy	= 50 KSI)							
CDAN	LOAD			SPAN	IN FEET			
TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5
SINGLE	LIVE LOAD	296.9	247.5	212.1	185.6	148.2	120.1	99.2
2 SPAN	LIVELOAD	296.9	247.5	212.1	166.2	131.3	106.3	87.9
2-OFAN		296.9	247.5	212.1	185.6	164.1	132.9	109.9
J-SPAN	LIVELOAD	296.9	247.5	212.1	185.6	152.3	124.1	102.6
4-3FAN	LIVE LOAD			1			. 11	

NOTES:

Allowable loads are based on uniform span lengths and Fy = 50 ksi.

2. LIVE LOAD is limited by bending, shear, combined shear & bending.

Above loads consider a maximum deflection ratio of L/180.

The weight of the panel has not been deducted from the allowable loads.

5. THE ABOVE LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.

Please contact manufacturer or manufacturer's website for most current allowable wind uplift loads.

 The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, bkp provided by the manufacturer may damage panels, void all warranties and will void all engineering data.

This material is subject to change without notice. Please contact the manufacturer for most current data.

The engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommanded that the design professional have a copy of the most current version of the *North American Specification for the Design of Cold-Formed Steel Structure Methods* outplished, by the American Iron and Steel Institute to facilitate design. This *Specification* contains the design criteria for cold-formed steel components. Along with the *Specification*, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental back of the formed design practices is desired. Please contact the manufacturer.

ENGINEERING

ultra-dek®

Ultra-Dek® PANEL 18" Coverage



				SECTION PR	OPERTIES			5
			N	EGATIVE BEND	ING	P	OSITIVE BEND	ING
PANEL	Fy	WEIGHT		Sxe (IN 3/FT.)	Maxo (KIP-IN.)	lxe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)
GAUGE	(KSI)	(PSF)	0.1266	0.0930	2,7843	0.2686	0.1173	3.5126
26	50	1.09	0.1300	0.0000	3 8134	0.3366	0.1477	4.4230
24	50	1.32	0.1804	0.1274	0.0104	0.4250	0 1015	5 7339
22	50	1.66	0.2444	0.1780	5.3298	0.4359	0.1915	0.7000

NOTES:

- 1. All calculations for the properties of Ultra-Dek® panels are calculated in accordance with the 2001 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members.
- 2. Ixe is for deflection determination.
- 3. Sxe is for Bending.
- 4. Maxo is allowable bending moment.
- All values are for the one foot of panel width.



The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Members published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.

ultra-dek®

ENGINEERING

TE O

other

Ultra-Dek® PANEL

18" Coverage



ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

26 Gauge (Fy =	= 50 KSI)											
SDAN	LOAD TYPE	SPAN IN FEET										
TYPE		2.5	3.0	3.5	4.0	4.5	5.0	5.5				
SINGLE	LIVE LOAD	195.8	163.2	139.9	122.4	108.8	93.7	77.4				
2-SPAN	LIVE LOAD	195.8	163.2	139.9	116.0	91.7	74.2	61.4				
3-SPAN	LIVE LOAD	195.8	163.2	139.9	122.4	108.8	92.8	76.7				
4-SPAN	LIVE LOAD	195.8	163.2	139.9	122.4	107.0	86.7	71.6				
24 Gauge (Fy	= 50 KSI)											
SPAN	LOAD			SPAN	N FEET							
TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5 77.4 61.4 76.7 71.6 5.5 97.5 84.0 105.1 98.1 98.1 5.5 126.4 117.5 146.8				
SINGLE	LIVE LOAD	272.0	226.7	194.3	170.0	145.6	117.9	97.5				
2-SPAN	LIVE LOAD	272.0	226.7	194.3	158.9	125.5	101.7	84.0				
3-SPAN	LIVE LOAD	272.0	226.7	194.3	170.0	151.1	127.1	105.1				
4-SPAN	LIVE LOAD	272.0	226.7	194.3	170.0	146.5	118.7	98.1				
22 Gauge (Fy	= 50 KSI)											
SPAN	LOAD	SPAN IN FEET										
TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5				
SINGLE	LIVE LOAD	395.9	329.9	282.8	238.9	188.8	152.9	126.4				
2-SPAN	LIVE LOAD	395.9	329.9	282.8	222.1	175.5	142.1	117.5				
3-SPAN	LIVE LOAD	395.9	329.9	282.8	247.5	219.2	177.7	146.8				
	LIVELOAD	395.9	329.9	282.8	247.5	204.8	165.9	13711				

NOTES:

Allowable loads are based on uniform span lengths and Fy = 50 ksi.

2. LIVE LOAD is limited by bending, shear, combined shear & bending.

Above loads consider a maximum deflection ratio of L/180.

The weight of the panel has not been deducted from the allowable loads.

5. THE ABOVE LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.

Please contact manufacturer or manufacturer's website for most current allowable wind uplift loads. 6.

The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake 7. provided by the manufacturer may damage panels, void all warranties and will void all engineering data.

This material is subject to change without notice. Please contact the manufacturer for most current data. 8

The engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Members published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the 1 200 3 Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If fur ther information or guidance regarding cold-formed design practices is desired. Please contact the manufacturer.

ENGINEERING

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Ultra-Dek® PANEL 12" Coverage



				SECTION PR	OPERTIES				
			N	EGATIVE BEND	ING	POSITIVE BENDING			
PANEL	Fy	WEIGHT	Ixe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)	lxe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)	
GAUGE	50	1.23	0 1742	0,1110	3.3221	0.3405	0.1649	4.9359	
20	50	1.20	0.2330	0 1540	4,6122	0.4258	0.2070	6.1988	
24	50	1.40	0.2330	0.1040	6 7019	0.5507	0.2682	8.0305	
22	50	1.86	0.3256	0.2238	6.7018	0.3507	0.2002		

NOTES:

1. All calculations for the properties of Ultra-Dek® panels are calculated in accordance with the 2001 edition of the North American Specification For Design Of Cold-Formed Steel Structural Members.

2. Ixe is for deflection determination.

3. Sxe is for Bending.

4. Maxo is allowable bending moment.

5. All values are for the one foot of panel width.



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Ultra-Dek® PANEL

12" Coverage



ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

Cauge (Ev a	= 50 KSI)										
20 Gauge (i y				SPAN IN	FEET						
SPAN	LOAD		30	3.5	4.0	4.5	5.0	5.5			
TYPE	TYPE	2.5	3.0	0.0	193.6	162.5	131.6	108.8			
SINGLE	LIVE LOAD	293.8	244.8	209.8	183.0	102.0	88.6	73.2			
2-SPAN	LIVE LOAD	293.8	244.8	180.8	138.4	109.4	00.0	01.5			
2-01741		293.8	244.8	209.8	173.0	136.7	110.7	91.5			
3-SPAN	LIVELOAD	293.8	244.8	209.8	161.5	127.6	103.4	85.4			
4-SPAN	LIVE LOAD	293.0	1.00								
24 Gauge (Fy	= 50 KSI)										
	1010	SPAN IN FEET									
SPAN	LOAD	2.5	3.0	3.5	4.0	4.5	5.0	5.5			
TTPE	1112	2.5	240.0	291.4	255.0	204.1	165.3	136.6			
SINGLE	LIVE LOAD	408.0	340.0	20111	102.2	151.8	123.0	101.6			
2-SPAN	LIVE LOAD	408.0	340.0	251.0	192.2	101.0	153.7	127.1			
3-SPAN	LIVE LOAD	408.0	340.0	291.4	240.2	189.8	133.7	119.6			
4 CDAN	LIVELOAD	408.0	340.0	291.4	224.3	177.2	143.5	110.0			
4-SPAN	LIVE COND										
22 Gauge (F)	/ = 50 KSI)										
05411	LOAD			5.5							
SPAN TYPE	TYPE	2.5	3.0	3.5	4.0	4.5	5.0	5.5			
inc		2.0	101.0	424.2	334.6	264.4	214.1	177.0			

TVDE	I IYPE I	25	3.0	0.0				
TIPE	1.11 -	2.0		424.2	334.6	264.4	214.1	177.0
SINGLE	LIVE LOAD	593.9	494.9	424.2	004.0			4477
ONVOLL			497.8	364.7	279.2	220.6	178.7	147.7
2-SPAN	LIVE LOAD	593.9	407.0			075.9	223.4	184.6
	LIVELOAD	593.9	494.9	424.2	349.1	275.8	220.4	
3-SPAN	LIVE LOAD	000.0		100.0	325.9	257.5	208.6	172.4
A SPAN	LIVE LOAD	593.9	494.9	422.2	525.5	20110		

NOTES:

Allowable loads are based on uniform span lengths and Fy = 50 ksi.

2. LIVE LOAD is limited by bending, shear, combined shear & bending.

3. Above loads consider a maximum deflection ratio of L/180.

The weight of the panel has not been deducted from the allowable loads.

5. THE ABOVE LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.

Please contact manufacturer or manufacturer's website for most current allowable wind uplift loads.

The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rak 6.

provided by the manufacturer may damage panels, void all warranties and will void all engineering data. 7. This material is subject to change without notice. Please contact the manufacturer for most current data.

8

The engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Mer by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If fur-1 2005 ther information or guidance regarding cold-formed design practices is desired. Please contact the manufacturer.

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Specifier: Notation [#] means that text following is a specifier's note or sample.

PART 1 - GENERAL

1.01 DESCRIPTION

Specifier: Do not alter paragraph A. except by adding section title in brackets.

A. General:

- 1. Furnish all labor, material, tools, equipment and services for all preformed roofing as indicated, in accord with provisions of Contract Documents.
- 2. Completely coordinate with work of all other trades.
- 3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
- 4. See Division 1 for General Requirements.

B. Related work specified elsewhere:

- 1. Structural steel: Section 05100.
- 2. Steel joists: Section 05200 or 05400.
- 3. Flashing and sheet metal: Section 07600.

Specifier: Delete references to sections not used and add any references which become pertinent.

1.02 QUALITY ASSURANCE

A. Applicable standards:

- 1. SMACNA: "Architectural Sheet Metal Manual" Sheet Metal and Air Conditioning Contractors National Association, Inc.
- 2. AISC: "Steel Construction Manual" American Institute of Steel Construction.
- 3. AISI: "Cold Form Steel Design Manual," American Iron and Steel Institute.
- 4. ASTM A792-83-AZ50: Specifications for steel sheet, aluminum-zinc alloy coated (galvanized) by the hot dip process, general requirements (Galvalume®).
- 5. ASTM E 1514-93: "Standard Specification for Structural Standing Seam Steel Roof Panel Systems", American Society for Testing and Materials.
- 6.UL: "Tests for Uplift Resistance of Roof Assemblies", Underwriters Laboratories, Inc.
- 7. UL: "Test Standard for Impact Resistance", Underwriters Laboratories, Inc.
- 8. ICBO: Evaluation Report No. ER-5409, ICBO Evaluation Service, Inc.
- 9. ASTM E 1680-95: "Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems", American Society for Testing and Materials.

- **SPECIFICATIONS**
- 10. ASTM E 1646-95: "Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference", American Society for Testing and Materials.

B. Manufacturer's qualifications:

1. Manufacturer has a minimum of three years experience in manufacturing metal roof systems of this nature. Panels specified in this section shall be produced in a factory environment (not job site roll formed) with fixed-base roll forming equipment assuring the highest level of quality control. A letter from the manufacturer certifying compliance will accompany the product material submittals.

C. Installation contractor's qualifications:

- Installer of the system shall be an approved installer, certified by the manufacturer, before beginning of installation of the metal roof system, specifically for MBCI's **Ultra-Dek**® roof system and meet the following minimum criteria:
 - a. Maintain a \$250,000 general liability coverage for each loss.
 - b. Maintain sufficient worker's compensation coverage as mandated by law.
 - c. Has no viable claims pending regarding negligent acts or defective workmanship on previously performed or current projects.
 - d. Has not filed for protection from creditors under any state or federal insolvency or debtor relief statutes or codes.
 - e. Project foreman is the person having received specific training in the proper installation of the specified system and will be present to supervise whenever material is being installed. Specific training program shall include the following:
 - 1. The instructor must have a minimum of 10 years' experience.
 - 2. A formal curriculum.
 - 3. Classroom instruction with review and thorough understanding of the specific product's technical manual.
 - Hands-on mock-up instruction with a review and thorough understanding of the specific product's details.
 - 5. The installer must pass a written and oral exam.
 - f. Provide five references from five different architects or building owners for projects that have been in service for a minimum of two years, stating satisfactory performance by the installer.
 - g. Provide certification letter that installer has a minimum of three years' of metal product installation experience immediately preceding the date upon which work is to commence.

D. Pre-installation Conference:

1. Prior to installation of roofing system, conduct a preinstallation conference at the project site.



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SPECIFICATIONS

- 2. Attendance: Owner, Architect, Contractor, Project Superintendent, and Roof Applicator
- 3. Agenda:
 - a. Roofing details and agenda
 - b. Critical work sequencing and review of phasing plan c. Inspection sequencing

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. Performance Testing:

- 1. Metal roof system must be tested in accordance with Underwriters Laboratories, Inc. (UL) Test Method 580 "Tests for Uplift Resistance of Roof Assemblies".
- 2. Metal roof system must be installed in accordance with UL Construction method [# choose one]:
- □ **205** (min. 16 gauge purlin, 5'-0" on center max. with low/high fixed/floating clips) or
- □ **205A** (min. 16 gauge purlin, 5'-0" on center max. with articulating clips, with Light Transmitting Panels) or
- □ **534** (min. 16 gauge purlin, 5'-0¼" on center max. with low/high floating/articulating clips with Light Transmitting Panels) or
- □ **535** (min. 16 gauge purlin, 5'-0¼" on center max. with low/high fixed/floating clips without Light Transmitting Panels) or
- 3. Resist the roof design pressures calculated in accordance with [# choose one: SBBCI, UBC, BOCA, ASCE or an applicable national or local building code]. Determine panel bending and clip-to-panel strength by testing in accordance with ASTM E 1592-95. Capacity for gauge, span or loading other than those tested may be determined by interpolating test results.
- 4. Metal roof system must meet the air infiltration requirements of ASTM E 1680-95 when tested with a 6.24 PSF pressure differential with resulting air infiltration of 0.251 cfm/sq ft.
- 5. Metal roof system must meet the water penetration requirements of ASTM E 1646-95 when tested with a 12.00 PSF pressure differential with no uncontrollable water leakage when five gallons per hour of water is sprayed per square foot of roof area.
- Metal roof system must qualify for a Class 4 rating when tested in accordance with Underwriters Laboratories, Inc. UL-2218 "Test Standard For Impact Resistance."

Specifier: Select construction method for paragraph A.1. and applicable building code for paragraph A.2.

1.04 DESIGN REQUIREMENTS

A. Roof Design Loads:

1. Design criteria shall be in accordance with [# choose one: MBMA, SBBCI, UBC, BOCA, ASCE or an applicable national or local building code.]

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- 2. Dead Loads
 - a. The dead load shall be the weight of the SSSMR system. Collateral loads, such as sprinklers, mechanical and electrical systems, and ceilings shall not be attached to the panels.
- 3. Live Loads
 - a. The panels and concealed anchor clips shall be capable of supporting a minimum uniform live load of -20 psf.
- 4. Roof Snow Loads
 - a. The design roof snow loads shall be as shown on the contract drawings.
- 5. Wind Loads
 - a. The design wind uplift for the roof system shall be as shown on the contract drawings. The design uplift force for each connection assembly shall be that pressure given for the area under consideration, multiplied by the tributary load area of the connection assembly. The safety factor listed below shall be applied to the design force and compared against the ultimate capacity. Prying shall be considered when calculating fastener design loads. aa. Single fastener in each connection3.0 bb. Two or more fasteners in each connection .2.25
- 6. Thermal Loads
 - a. Roof panels shall be free to move in response to the expansion and contraction forces resulting from a total temperature range of _____ degrees F during the life of the structure. [#Choose temperature differential based on Max. and Min. for specific area IAW MBMA Climatological Data]

Specifier: Select applicable building code for paragraph A.1 Select Temperature differential for paragraph A.6.

B. Framing Members Supporting the SSSMR System

1. Any additions/revisions to framing members supporting the SSSMR system to accommodate the manufacturer/fabricator's design shall be submitted for review and approval. New or revised framing members and their connections shall be designed in accordance with [\-AISC-\] [\-AISI-\] [\-SJI-\] design specifications. Maximum deflection under applied live load, snow, or wind load shall not exceed [# choose one: L/180, L/240] of the span length.

1.05 SUBMITTALS

A. Shop drawings:

- 1. Submit complete shop drawings and erection details, approved by the metal roofing manufacturer, to the architect (owner) for review. Do not proceed with manufacture of roofing materials prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the architect (owner) for shop or erection drawings.
- 2. Shop drawings show methods of erection, elevations

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and plans of roof and wall panels, sections and details, anticipated loads, flashings, roof curbs, vents, sealants, interfaces with all materials not supplied and proposed identification of component parts and their finishes.

B. Performance Tests:

1.Submit certified test results by a recognized testing laboratory or manufacturer's lab (witnessed by a professional engineer) in accordance with specified test methods for each panel system.

C. Calculations:

- 1. Submit engineering calculations defining cladding loads for all roof areas based on specified building codes, allowable clip loads and required number of fasteners to secure the panel clips to the designated substructure.
- 2. Compute uplift loads on clip fasteners with full recognition of prying forces and eccentric clip loading.
- 3. Calculate holding strength of fasteners in accordance with submitted test data provided by Fastener Manufacturer based on length of embedment and properties of materials.
- 4. Submit drainage calculations for valley, gutter, and downspout designs for a rainfall intensity (inches per hour) of [# choose one: 5 year or 25 year recurrence] for a 5 minute duration. (See MBMA Low Rise Building Systems Design Manual Section A22 for Wind, Snow, Seismic, and Rain Data by County)
- 5. Submit thermal calculations and details of floating clip, flashing attachments, and accessories certifying the free movement in response to the expansion/contraction forces resulting from a total temperature differential of 110 degrees F.

D. Samples:

- 1.Submit samples and color chips for all proposed finishes.
 - a. Submit one 8 inch long sample of panel, including clips.
 - b. Submit two 3 inch x 5 inch color chip samples in color selected by the architect (owner).

E. Warranty(s):

Metal roof system manufacturer, upon final acceptance for project, furnish a warranty. [#choose one:

- 1. Covering bare metal against rupture, structural failure and perforation due to normal atmospheric corrosion exposure for a period of 20 years.
- 2. Covering paint finish against cracking, checking, blistering, peeling, flaking, chipping, chalking and fading for a period of # choose one: twenty (20) years for roof panels (premium thermoset silicone polyester) or twenty (20) years for wall panels and twenty (20) years for roof panels (premium fluorocarbon coating produced with Kynar 500 or Hylar 5000 resin)].

SPECIFICATIONS

3.Submit specimen copy of manufacturer's Weathertightness Warranty, including evidence of application for warranty and manufacturer's acceptance of the applicator and warranty conditions.

F. Test Reports:

- 1. Submit Test Reports showing that metal panels meet the air infiltration requirements of ASTM E 1680-95 when tested with a 6.24 PSF pressure differential with resulting air infiltration of 0.251 cfm/sq ft.
- 2. Submit Test Reports showing that metal panels meet the water penetration requirements of ASTM E 1646-95 when tested with a 12.00 PSF pressure differential with no uncontrollable water leakage when five gallons per hour of water is sprayed per square foot of roof area.
- Submit Evaluation Report No. ER-5409 showing that metal panel system details, engineering calculations, computer printouts, and data have been examined by the ICBO Evaluation Service, Inc. and have been found to comply with the 1997 Uniform Building Code.

G. Metal roof system fabrication certification:

1. Submit a letter from the metal panel manufacturer certifying the **Ultra-Dek**® panels have been produced in a factory environment (not job site) with fixed-base roll forming equipment.

H. Installation contractor's qualifications:

- 1. Submit certificate from manufacturer certifying that installer of the metal roof system has met all of the criteria outlined in "1.02 C. Installer's qualifications" and is an authorized installer certified by the manufacturer within one year of the beginning of installation of the metal roof system.
- 2. Submit the formal syllabus for the classroom and hands-on training.
- Submit five references from five different architects or building owners for projects that have been in service for a minimum of two years, stating satisfactory performance by the installation contractor.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Deliver metal roof system to job site properly packaged to provide protection against transportation damage.

B. Handling:

1. Exercise extreme care in unloading, storing and erecting metal roof system to prevent bending, warping, twisting and surface damage.

C. Storage:

1. Store all material and accessories above ground on well skidded platforms. Store under waterproof



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SPECIFICATIONS

covering. Provide proper ventilation of metal roof system to prevent condensation build-up between each panel or trim/flashing component.

1.07 WEATHERTIGHTNESS WARRANTY

- **A.** The Contractor shall provide to the Owner, a single source warranty signed by the roofing manufacturer of the Standing Seam Roof System as outlined below:
 - 1. For a period of [#choose one: twenty (20), fifteen (15), ten (10), or five (5)] years from the date of substantial completion, the roofing manufacturer WARRANTS to the Building Owner ("Owner"): that the roofing manufacturer's furnished roof panels, flashing, and related items used to fasten the roof panels and flashing to the roof structure ("Roof System") will not allow intrusion of water from the exterior of the roofing manufacturer's Roof System into the building envelope, when exposed to ordinary weather conditions and ordinary wear and usage. The Date of substantial completion is the date that is certified by the Architect, Owner, or Owner's Representative, when the roofing manufacturer's Roofing System is completed and accepted by or on behalf of the Owner.
 - 2. The roofing manufacturer shall have the SOLE AND EXCLUSIVE obligation for all warranty work commencing on the date of substantial completion and under all circumstances, terminates on the [# insert appropriate number of years] year anniversary of the date certified as Substantial Completion of the roofing manufacturer's Roof System. During the period in which the roofing manufacturer has any warranty obligation, the roofing manufacturer shall take appropriate actions necessary to cause the nonperforming portions of the Roof System to perform their proper functions.

B. Roofing Manufacturer's Liability

 The total liability of the roofing manufacturer under this warranty is [# choose one: limited solely to two (2) times the cost of the roofing manufacturer's Roof System as invoiced to the roofing manufacturer's customer, or limited solely to four (4) times the cost of the roofing manufacturer's Roof System as invoiced to the roofing manufacturer's customer, or unlimited]. The roofing manufacturer shall have the right to charge to the liability account, all reasonable expenses (including, but not limited to, investigation expenses) incurred in satisfying the requirements of this warranty.

C. Field Quality Control

- During installation, provide for two on-site inspections of roof application by qualified technical representative of the manufacturer.
- Upon completion of installation, provide final inspection by a technical representative of roofing manufacturer to confirm that roofing system has been

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installed in accordance with manufacturer's requirements.

3. At completion of project, submit manufacturer's quality report of field inspections, including final inspection punch list.

PART 2 - PRODUCTS

[**#Ultra-Dek**® structural standing seam metal roof system; minimum slope of 1/4:12]

2.01 MATERIALS

A. Metal roof system profile:

1. 3 inch high rib x [# choose one: 24 inch, 18 inch or 12 inch] wide panel.

B. Metal roof system style:

1. Trapezoidal rib, positive snap together, standing seam, utilizing male and female rib configurations, with factory applied hot melt mastic in female rib.

C. Gauge: [# choose one]

- 1. 22 gauge (UL 90 rated Underwriters Laboratories).
- 2. 24 gauge (UL 90 rated Underwriters Laboratories).

D. Substrate:

1. Galvalume® steel sheet, minimum yield of 50,000 PSI.

E. Clip:

- 1. Two piece floating clip providing thermal expansion or contraction (UL 90 rated Underwriters Laboratories).
- Articulating clip, providing thermal expansion or contraction, correcting for out-of-plane sub-framing alignment to a maximum of 7 degrees (UL 90 rated -Underwriters Laboratories).
- 3. One piece fixed clip 22 gauge with factory applied mastic (UL 90 rated Underwriters Laboratories).

F. Texture: [# choose one]

- 1. Smooth.
- 2. Embossed (reduces oil canning effect).

G. Finish: [# choose one]

- 1. Premium thermoset silicone polyester (20 year warranty).
- 2. Premium fluorocarbon coating produced with Kynar 500 or Hylar 5000 resin (20 year warranty).
- 3. Bare Galvalume Plus® (20 year warranty).

H. Color:

1. Selected from metal roof system manufacturer's standard offering.

I. Acceptable manufacturer:

1. MBCI - Houston, TX - (281) 445-8555.

Insert: Architect's (owner's) method of approval of "or equals".

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J. Other manufacturers desiring approval, comply with Section 01630.

K. Acceptable Curb and Equipment Support units:

1. LM Curbs - Longview, TX.

L. Prefabricated Roof Jacks:

- 1. Construction Fasteners Wyomissing, PA.
- 2. ITW Buildex Itasca, IL.

M. Rooftop Walkways:

1. LM Curbs - Longview, TX.

2.02 MISCELLANEOUS MATERIALS

A. Fasteners:

- 1. All self-tapping/self-drilling fasteners, bolts, nuts, selflocking rivets and other suitable fasteners shall be designed to withstand specified design loads.
 - a. Use long life fasteners for all exposed fastener applications.
- b. Provide fasteners with a factory applied coating in a color to match metal roof system application.
- c. Provide neoprene washers under heads of exposed fasteners.
- d. Locate and space all exposed fasteners in a true vertical and horizontal alignment. Use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the neoprene washer.

B. Closures:

 Metal roof system must be installed with die cast metal closures at all ridge and high eave transitions. These die cast metal closures must be installed with Tri-Bead tape sealant and fasteners that stitch the panel to a 16 gauge preformed backer plate to ensure a positive compression of the tape sealant. The use of a continuous angle butted to the panel ends to form a closure is not an acceptable installation method.

C. Accessories:

- 1. Provide all components required per the metal roof system manufacturer's approved shop drawings for a complete metal roof system to include panels, panel clips, trim/flashing, fascias, ridge, closures, sealants, fillers and any other required items.
 - a. All outside closures will be fabricated from Galvalume Plus® sheet steel of the same gauge, finish and color as the panels.
- b. All tape seal is to be a pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with a release paper backing. Provide permanently elastic, non-sagging, non-toxic, nonstaining tape seal approved by the metal roof system manufacturer.
- c. All joint sealant is to be a one-part elastomeric polyurethane sealant approved by the metal roof system manufacturer.

SPECIFICATIONS

2.03 FABRICATION

- A. Material shall be in-line tension leveled prior to roll forming panel profile.
- B. Where possible, roll form panels in continuous lengths, full length of detailed runs.
- C. Standard panel length shall be no more than 45 feet long (for longer length availability, contact manufacturer).
- D. Fabricate trim, flashing and accessories to detailed profiles.
- E. Fabricate trim and flashing from same material as panel.

2.04 PREFABRICATED CURBS AND EQUIPMENT SUPPORTS

- A. General: Comply with loading and strength requirements as indicated where units support other work. Coordinate dimensions of curbs and supports with equipment supplier/manufacturer.
- B. Fabricate curbs of structural aluminum (Min. .080 in. thickness for mechanical gear up to 1000 lbs; .125 in. thickness for mechanical gear between 1000 lbs. and 2000 lbs.; use a two curb system per the manufacturer above 2000 lbs.), factory primed and prepared for painting with mitered and welded corner joints. Provide integral base plates and water diverter crickets. The upper flange of the curb must be a minimum of 15" above the water diverter. (This allows 12" of free area after the panel is lapped over the flange on the high side.) Curbs shall be designed to install under metal roof systems on the high side and over the metal roof system on the low side.
- C. Minimum height of curb shall be 8" above finished metal roof system.
- D. Curbs shall be constructed to match slope of roof and provide a level top surface for mounting equipment.
- E. Curb flanges shall be constructed to match configuration of roof panels.
- F. Curb manufacturer will provide their own curb structural support system that can be installed between the purlins that will allow proper thermal movement of the curb with the roofing system.
- G. Submit roof curb manufacturer's shop drawings to metal roof system manufacturer for approval before fabrication of curbs.

2.05 PREFABRICATED ROOF JACKS

A. Pipe flashings shall be a one piece [# choose one: EPDM (ethylene propylene diene monomer) molded rubber boot having a serviceable temperature range of -60°F to 270°F (for standard applications) or neoprene molded rubber boot having a serviceable temperature range of -45°F to 250°F (for exposure to petrochemicals) or silicone molded rubber boot having a serviceable tem-



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SPECIFICATIONS

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perature range of -100°F to 450°F (for high temperature applications)] and shall be resistant to ozone and ultraviolet rays. Units shall have an aluminum flanged base ring. Do not install pipe flashings through any panel seams - install ONLY in the flat portion of the panel.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examination:

- 1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
- 2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions. This specifically includes verifying that secondary structurals and/or decking are installed to meet UL and building code requirements. Coordinate with metal roof system manufacturer to insure that reduced clip spacings at eave, rake, ridge and corner areas are accommodated.

B. Discrepancies:

- 1. In event of discrepancy, notify the architect (owner).
- 2. Do not proceed with installation until discrepancies have been resolved.

3.02 INSTALLATION

- A. Install metal roof system so that it is weathertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
- B. Install metal roof system in accordance with manufacturer's instructions and shop drawings.
- C. Provide concealed anchors at all panel attachment locations.
- D. Install panels plumb, level and straight with seams and ribs parallel, conforming to design as indicated.

3.03 ROOF CURB INSTALLATION

A. Comply with metal roof system manufacturer's approved shop drawings, instructions and recommendations for installation of roof curbs. Refer to metal roof system manufacturer's standard installation details. Anchor curbs securely in place with provisions for thermal and structural movement.

3.05 CLEANING, PROTECTION

- A. Dispose of excess materials and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the architect (owner), any work that becomes damaged prior to final acceptance.

- D. Touch up minor scratches and abrasions.
- E. Do not allow panels or trim to come into contact with dissimilar metals such as copper, lead, graphite or cast iron. Water run-off from these materials is also prohibited. This specifically includes condensate from roof top A/C units.

END OF SECTION

DISCLAIMER: MBCI makes no warranty, express or implied, as to the merchantability or fitness for any particular purpose of any product manufactured by an optional manufacturer. If you choose to use a product manufactured by an optional manufacturer, as defined herein, you take the product as is and at your own risk. Descriptions and specifications contained herein were in effect at the time this publication was approved for printing. MBCI reserves the right to discontinue products at any time or change specifications and/or designs without notice and without incurring obligation.

To insure you have the latest information available, please contact MBCI or visit our web site at *www.mbci.com*

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ROOFING SYSTE

GENERAL DESCRIPTION



Coverage Width - 24" with minor ribs - prepunched 6 holes

18" with minor ribs - prepunched 5 holes

12" no minor ribs - no punching

Minimum Slope - 1/4 : 12

Panel Attachment - Low, high (fixed, floating, articulating), or utility (no insulation clearance)

Panel Substrate - Galvalume Plus® (standard)

Gauge - Standard: 24 Optional: 22 and 26

Finishes - Smooth or embossed with minor ribs

Coatings - Signature® 200, Signature® 300, Signature® 300 Metallic

FINISH	Signature® 300			Sigr	nature® (Metallic	300	Signature® 200			Galvalume Plus®		
	26	24	22	26	24	22	26	24	22	26	24	22
PRODUCT	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.	Ga.
Ultra-Dek®						_			-			•
24" Wide	5	כן			C							
18" Wide		•	ב	•			•					
12" Wide	 			<u> </u>	<u> </u>	<u> </u>			<u> </u>	•		-

PRODUCT SELECTION CHART

Signature is a registered trademark of MBC1 Galvatume Plus® is a registered trademark of BIEC International

Available in any quantity.

I - Minimum quantity may be required.

Signature® 200 White only 24 Ga. is available in all widths, at any quantity.

Other colors, finishes, gauges, and materials available; please inquire.

CAUTION

Diaphram capabilities and puritn stability are not provided by MBCI's Ultra-Dek® Roof system. Therefore, other bracing may be required to conform to A.I.S.C. or A.I.S.I. specifications



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** Total clip movement should be calculated for each project based on the anticipated temperature differential of the area in which the project is located **Floating clips have a maximum of 1" movement each direction. Articulating clips have a maximum movement of 1.74" each direction. The recommended panel run length is less when the system is installed over bar joist sub-framing

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EFFECTIVE DATE: AUGUST 31, 2005

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1⁄a" x ⅔" Pop Rivet

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ERAL INFORMATION :ra-dek® C PRODUCT CHECKLIST Special application fastener Fastener #9 For use on 2 x 4 lath and Fastener #8 Special application other solid wood deck (Not fastener For use on 2 x 4 lath and for use in plywood) other solid wood deck (Not for use in plywood) ananan annna> 10 x 11/2" Long Life Woodgrip 5/16"Hex Washer Head with sealing washer 10 x 11/2" Woodgrip (Long life exterior fastener) 1/4" Hex Washer Head with 1/2" O.D. washer Special application Fastener #11 Special application fastener Fastener #10 fastener For use on structural steel For use on masonry up to 1/2" thick Requires pre-drilled hole 1/4" x 11/4" Nail Drive \square 1/4"-14 x 1" Type B Masonry Anchor %" Hex Washer Head with %" O.D. washer Gutter strap to snow gutter Fastener #14 Support plate to purlins at Trim to trim connections Fastener #12 valley and hip conditions Rake angle to purlins mmmm 2 10 x 1" 1/8" x 3/16" Pop Rivet #2 Phillips Pancake Head Driller Light transmitting panel to Fastener #43 Snow gutter to eave plate panel and back-up plate Fastener #14A Outside closure to back-up angle at hip condition



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PRODUCT CHECKLIST



Specify Roof Pitch



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ultra-dek® **RAL INFORMATION** PREPARATORY REQUIREMENTS

- A single pitch eave strut must be used with the Uitra-Dek® roof system. 1
- Make sure a rake angle or an alternate structural flat surface has been installed on top of the purlins to accept the 2. "Rake Support".
- The walls do not have to be erected before the roof is installed. However, for the purpose of this manual, we have 3. assumed that the wall panels have been installed.
- All primary and secondary framing must be erected, plumbed and squared with bolts tightened according to accepted 4 building practices.
- The substructure (eave to ridge) must be on plane with a tolerance of ¼" in 20' and %" in 40'.
- 5. Ultra-Dek® can be erected on various types of construction. However, for the purpose of this manual, we have assumed that the roof will be installed on a new, pre-engineered metal building. 6.
- Ultra-Dek® roof panels can be furnished in 24", 18", and 12" widths. However, for the purpose of this manual, we 7. have assumed that the roof panels will be 24" wide.
- It is critical that the purlins or joists at the ridge and endlaps be exactly located as detailed in this manual and that they are straight from rafter to rafter. Any mislocation or bowing of these members can cause the fasteners at the 8. endiaps or outside closures to foul the purlin or the back-up plate to foul the clip as the panels expand and contract.
- Peak purlin spacing 12" (from the centerline of the building) or 16" for a 9" continuous vent. 9.
- For the purpose of this manual, we have assumed that this is a standard roof. If your roof is to be UL 90 rated, see 10. special UL 90 requirements on page UD-4.
- Read recommended erection practices on pages UD-49 and UD-50 before proceeding with roof installation.
- MBCI recommends the use of a screw gun with a speed range of 0 2000 RPM to properly install all fasteners 11. referenced in this manual. Tools rated to 4000 RPM should never be used for self drilling fasteners typically supplied 12 with metal building components.
- Field cutting of the panels should be avoided where possible. If field cutting is required, the panels must be cut with nibblers, snips, or shears to prevent edge rusting. Do not cut the panels with saws, abrasive blades, grinders, or 13. torches.

NOTE

It is the responsibility of the erector to install this roof using safe construction practices that are in compliance with OSHA regulations. MBCI is not responsible for the performance of this roof system if it is not installed in accordance with the instructions shown in this manual. Deviations from these instructions and details must be approved in writing by MBCI.

CAUTION

Diaphragm capabilities and purlin stability are not provided by MBCI's Ultra-Dek® roof system Therefore, other bracing may be required.

CAUTION

The minimum recommended slope for the roof system is % on 12

A slope of less than $\frac{32}{2}$ on 12 could cause severe ponding and will void material warranties

CAUTION

Application and design details are for illustration purposes only, and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices.

WARNING: Light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing or resting on them. MBCI DISCLAIMS ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk, step, stand or rest on or near these light transmitting panels or that they comply with any OSHA regulation.

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ultra-dek[®] GENERAL INFORMATION



UNLOADING

Upon receiving material, check shipment against shipping list for shortages and damages. MBCI will not be responsible for shortages or damages unless they are noted on the shipping list.

Each bundle should be lifted at its center of gravity. Where possible, bundles should remain banded until final placement on roof. If bundles must be opened, they should be retied before lifting.

When lifting bundles with a crane, a spreader bar and nylon straps should be used. NEVER USE WIRE ROPE OR CHAIN SLINGS. THEY WILL DAMAGE THE PANELS.

When lifting bundles with a forklift, forks must be a minimum of five feet apart. Do not transport open bundles. Drive slowly when crossing rough terrain to prevent panel buckling.

CAUTION

Improper unloading and handling of bundles and crates may cause bodily injury or material damage. The manufacturer is not responsible for bodily injuries or material damages during unloading and storage.


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10' to 12' 10' to 12' 5 **RIGHT WAY** WRONG WAY

HANDLING/PANEL STORAGE

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Standing on one side of the panel, lift it by the seam. If the panel is over 10' long, lift it with two or more people on one side of the panel to prevent buckling.

Do not pick panels up by the ends.

NOTE

Protective gloves should always be used while handling panels. OSHA safety regulations must be followed at all times.

Store bundled sheets off the ground sufficiently high enough to allow air circulation beneath bundle and to prevent rising water from entering bundle. Slightly elevate one end of bundle. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground PROLONGED STORAGE OF SHEETS IN A BUNDLE IS NOT RECOM-MENDED. If conditions do not permit immediate erection, extra care should be taken to protect sheets from staining or water marks.

Check to see that moisture has not formed inside the bundles during shipment. If moisture is present, panels should be uncrated and wiped dry, then restacked and loosely covered so that air can circulate between the panels.

BAND ONLY

This method is used on all orders, unless otherwise specified by customer. The panels are banded together, causing them to curl up. This enhances the strength of the bundles. Panels bundled in this manner may be handled by a forklift in lengths to 30'. The forklift should have at least 5' between forks. Lengths in excess of 30' must be lifted utilizing a spreader bar. Special care must be given during handling to avoid damage to the locking edges of the panels.

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ERECTION SEQUENCE

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LOW SYSTEM EAVE

For applications in which the wall panels have already been erected, install box panel cap trim to the eave strut with Fastener #14. Trim must be pulled tight to wall panels before fastening to eave strut. For applications in which the wall panels have not been erected, use offset panel cap trim. Use two fasteners per 10' piece or 3 fasteners per 20' piece.

For low systems, lay Tri-bead tape sealer on top of the panel cap trim (box or offset).

Install double-faced tape along the length of the top leg of the panel cap trim (box or offset). Double faced tape must be upslope from Tri-Bead tape sealer.

Lap box or offset panel cap trim 3". Apply two beads of urethane sealant between the trim pieces, approximately 21/2" from the end of the bottom piece.

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- P. (4)

ERECTION SEQUENCE

2 A





LOW SYSTEM EAVE/METAL INSIDE CLOSURE

Using Fastener #1, attach the first inside closure to the eave strut, locating the face of the inside closure with the steel line. NOTE THAT THE FIRST INSIDE CLOSURE MUST BE FIELD CUT IN HALF TO FILL THE VOID UNDER THE PARTIAL RIB.

Locate additional closures on 24" centers from the first closure to maintain panel module, attaching each with Fastener #1. Install two fasteners per closure. The first fastener should be installed through the slotted hole to allow for any adjustment that may be required. Place Tri-Bead tape sealer on the top and side of each closure to complete the seal at the eave. These may be pre-taped before installation. Measure from tab to tab located on the metal inside closure.

Roll out insulation from eave to peak, laying the side of the insulation on top of the rake support. The first roll should be 3' wide. This will keep insulation sidelaps 1' from panel sidelaps. Allow approximately 4" of insulation to hang past the double faced tape (downslope) before sticking the insulation to the double faced tape. Cut and remove the fiberglass approximately 4" and fold the vapor barrier back over the insulation (ups-lope).

CAUTION:

The fiberglass insulation must not interfere with the Tri-Bead tape sealer which provides a positive seal at the eave.

EFFECTIVE DATE: AUGUST 31, 2005



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ERECTION SEQUENCE



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HIGH SYSTEM EAVE Wall Panels Installed Before Roof

Install high eave plates flush with the outside of the high crowns of the wall panels. Install Fastener #1 in prepunched slot (1'-0" on center) of the eave plate. The first eave plate will butt against the rake support. You may install all of the eave plates at this time.

Install box panel cap trim to the top of the eave plates with Fastener #14. Use two fasteners per 10' piece and three fasteners per 20' piece. Trim must be pulled tight to wall panels before fastening to eave plates.

Lay Tri-Bead tape sealer across the top of the box panel cap trim, flush with the outside edge.

Install double faced tape along the length of the top leg of the box panel cap trim. Double faced tape must be upslope from the Tri-Bead tape sealer.

Wail Panels Installed After Roof

Install offset panel cap trim to eave strut with Fastener #14. Use two fasteners per 10' piece and three fasteners per 20' piece.

Install high eave plates flush with the outside of the offset panel cap trim. Install Fastener #1 in each prepunched slot (1'-0" on center) of the eave plate. The first eave plate will butt against the rake support. You may install all of the eave plates at this time.

Lay Tri-Bead tape sealer across the top of the eave plates, flush with the outside edge. Install double faced tape along the length of the bottom leg of the eave plate.

TRIM LAPS

Lap box or offset panel cap trim 3". Apply two beads of urethane sealant between the trim pieces, approximately 21/2" from the end of the bottom piece.

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STEF 2C



HIGH SYSTEM EAVE/METAL INSIDE CLOSURE

Using Fastener #1, attach the first inside closure to the eave plate, locating the face of the inside closure with the downslope edge of the eave plate. NOTE THAT THE FIRST INSIDE CLOSURE MUST BE FIELD CUT IN HALF TO FILL THE VOID UNDER THE PARTIAL RIB.

Locate additional closures on 24" centers from the first closure to maintain panel module, attaching each with Fastener #1. Install two fasteners per closure. The first fastener should be installed through the slotted hole to allow for any adjustment that may be required. Place Tri-Bead tape sealer on the top and side of each closure to complete the seal at the eave. These may be pre-taped before installation. Measure from tab to tab located on the metal inside closure.

Roll out insulation from eave to peak, laying the side of the insulation on top of the rake support. The first roll should be 3' wide. This will keep insulation sidelaps 1' from panel sidelaps. Allow approximately 4" of insulation to hang past the double faced tape (downslope) before sticking the insulation to the double faced tape. Cut and remove the fiberglass approximately 4" and fold the vapor barrier back over the insulation (upslope).

CAUTION:

The fiberglass insulation must not interfere with the Tri-Bead tape sealer which provides a positive seal at the eave.



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EP 3

THERMAL SPACER (FOR HIGH SYSTEM ONLY)

Position the thermal spacer on top of the insulation over each purlin and against the rake support prior to installing the roof panel.

Using spray adhesive, (not by MBCI) adhere the thermal spacer to the insulation. The thermal spacer increases the insulation capacity along the purlins. Houston Hardy: 877/713-6224 Houston Northwinds: 800/356-4416 Adel, GA: 888/446-8224 Atlanta, GA: 877/512-8224 Atlanta, GA: 80/0829-9324 Boise, ID: 800/632-3340 Deltas, ID: 800/632-3340 Indianapolis, IN: 800/735-6224 Lubbock, TX: 800/758-6224 Memphis, TN: 800/266-6224 Okishorma City, OK: 800/597-6224 Omaha, ME: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224

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STEP 4 FIRST PANEL

> Apply minor rib tape sealer to the underside of the minor ribs of the panel. Position so that this tape sealer will cross the Tri-Bead tape sealer on the eave trim (for low systems) or on the high eave plate (for high systems) when the panel is installed.

Position the panel so that it overhangs the eave strut by the thickness of the wall covering plus $3\frac{1}{2}$ ". The upper end of the panel must be 7" beyond the web of the pudin.

PREPUNCHED PANEL HOLES AT THE EAVE ARE INTENDED TO BE PART OF THE GUTTER OVERHANG AND WILL BE HID-DEN BY THE GUTTER. FOR A BUILDING WITH SCULPTURED EAVE TRIM, THE PRE-PUNCHED HOLES WILL BE USED TO ATTACH THE EAVE TRIM TO THE PANEL.

Lay the female lip of the panel over the rake support. To prevent wind damage, secure the female lip to the rake support with vise grips or temporary fasteners. Fasteners must go through rake support (Fastener #1E). The panel will not be fastened permanently to the rake support until the rake trim is installed.

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EFFECTIVE DATE: AUGUST 31, 2005



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CLIP INSTALLATION

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Before installing the first clip, clamp the male side of the panel to the side of the back-up plate with a pair of vise grips. This will help maintain panel module at the endlaps.

Install a clip on the male leg of the panel at the endlap. This should be the first clip installed as it controls the 24" module for the remainder of the panel. Remove vise grips and install clips on all remaining purlins.

FASTENER REQUIREMENTS

Purlins - Fastener #1 **Joists** - Fastener #6 (Two fasteners per clip)

CAUTION

For UL 90 Roofs, see page UD-4 for special requirements.

CAUTION

The panel clip has factory applied mastic in the upper lip. This mastic is compressed when the clip is rotated in place. If, for some reason, a clip must be removed, a new clip must be used.

IMPORTANT

As each clip is installed, maintain a 24" panel module.

NOTE

The floating clip is designed so it can only be properly seated when the upper portion of the clip (the tab) is centered on the base.



 Position the clip over the male leg of the panel as shown, and rotate clip downward.

 With the upper clip firmly seated, position the base firmly against the purlin flange.

 When properly positioned, the vertical legs of the upper and lower sections of the clip will be 90° to the purlin flange pointed upward, as shown. Houston Hardy: 877/713-5224 Houston Northwinds: 800/356-4416 Adel, GA: 888/446-5224 Atanta, GA: 877/512-6224 Atwater, CA: 800/829-9324 Boise, ID: 800/632-3340 Datas, TX: 800/653-6224 Indiana polis, IN: 800/735-6224 Lubbock, TX: 800/758-8224 Memphis, TN: 800/206-6224 Oklahoma City, OK: 800/597-8224 Omaha, NE: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/728-6224 Rome, NY: 800/559-6224 Sait Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampe, FL: 900/359-6224 International Sales Office: 800/359-6224



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NOTE

 Step 8A applies only where more than one panel is used in a single slope.

 All cinch straps on first panel run will require field modification.

Remove awl and insert in the hole nearest the male leg. All holes in the upper and lower panels and the back-up plate should now be aligned. See that the panel notches are aligned. Remove awl and place a cinch strap over the endlap. Replace awl in hole nearest male side of panel and, with Fastener #2B, install in proper sequence. Five fasteners are required at this time. The remaining fastener will be installed after the cinch strap for the next panel is applied

Apply Tri-Bead tape sealer over the notched portion of these male legs.

Install a back-up plate and tape sealer on the upper end of the panel as in Step 5 and install clips as in Step 5.

Repeat the endlap procedures as required for each panel until the ridge or high eave is reached.

A fastener is not required at the center of the cinch strap.

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EFFECTIVE DATE AUGUST 31, 2005



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SUBSEQUENT RUNS EAVE

Apply tape sealer to the male leg of the first panel run directly over the inside closure. This will prevent water infiltration through the end of the seam. Install the next run of insulation and another inside closure using Fastener #1. The second run of roof is now ready to install.

Position the panel with the female lip resting on top of the male leg. Align panel flush with adjacent panel. ONCE THE PANELS ARE SNAPPED TOGETHER, NO FURTHER ALIGNMENTS CAN BE MADE. Press down on the seam, snapping the two panels together. It is important to begin at one end of the panel and work to the other, applying pressure continuously all the way along the seam to avoid a bubble in the seam. Make certain the seams are fully locked together, particularly at the clips where greater resistance will be encountered.

Install fasteners at eave in the proper sequence. Eight fasteners are required at this location.

CAUTION



Never use a hammer to force the panels to snap together. This will cause severe damage to the panel and will nullify any warranty.

CAUTION

If a problem is encountered in fully snapping the seams together, such as an incorrectly installed clip damaged panel lip, or a bubble caused by faulty assembly: the shaping tool should enable the seam to be locked with minimal effort.



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SUBSEQUENT RUNS ENDLAP

Install back-up plate and tape sealer as in Step 5. However, on this and all subsequent runs, care must be taken to engage the tab on the side into the slot of the adjacent back-up plate. This procedure will assist in maintaining a 24" panel module.

Install clips as described in Step 6.

Install upper panel as described in Steps 7 & 8.

Repeat the endlap procedures as required for each panel until the ridge is reached.



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STEP 12



SUBSEQUENT RUNS RIDGE/OUTSIDE CLOSURE

NOTE

Always stay one panel run behind with the outside closures, otherwise, the next panel cannot be installed.

Install back-up plate and panel clips. Go to the previously installed ridge panel and peel protective paper from tape sealer. Apply tape sealer to the ridge panel just installed. Be sure to seal to the mastic on the previous panel.

Install the outside closure in previous ridge panel. Rotate outside closure into position contacting the female side of the panel first. Using an awi, align the first hole on the female side of the outside closure with the corresponding hole in the panel and back-up plate. Remove the awi and install Fastener #1E in the hole.

Push the other end of the outside closure into position and align the holes with the awl. Remove the awl and install Fastener #1E in all remaining holes except for the hole at the panel seam. Do not install the panel seam fastener at this time.

Check panel alignment at this time (See page UD-49).

Continue installing the roof until all but the last panel run has been installed.

Panel module should be checked every third or fourth run.



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LAST PANEL RUN

This roof system is designed to finish in the high on even footage buildings by using 24", 18", or 12" panels on the last run.

After laying the last insulation run, install the rake support over the insulation along the steel line. Lay the last panel run. Temporarily fasten the male leg to the rake support with vise grips.

If the panel ends 2"- 4" away from the rake support due to an out-of-square condition or other factors, simply install the panel clips. This system allows for the roof to be trimmed in the high.

CAUTION

The roof should be swept clean of any drill shavings at the end of each day to prevent rust.

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ultra-dek® SPECIAL ERECTION TECHNIQUES



RECOMMENDED ERECTION PRACTICES CORRECTING OUT-OF-PLANE SUBSTRUCTURE

Occasionally a purlin may be encountered that is lower (out-of-plane) than those adjacent to it. When a clip is attached to this purlin, it will go down further than those adjacent to it, distorting the seam. This can cause the next panel sidelap to be difficult to snap together in this area. To compensate for this lower purlin, a steel shim may be placed under the clip to bring it up to the proper height (in plane). This shim should be no thicker than 1/4". If 1/4" is not enough, then structural modification will be necessary.

Avoid "stair-stepping" of the panels at the eave. This will cause problems engaging back-up plates at the endlap and ridge. This also will create the need to warp the cinch strap (if used) over the high rib forcing it to align with the holes in the adjacent panel.

Any "stripped out" fasteners at the endlaps or outside closures should be immediately replaced with Fastener #2A. Place a 1" long piece of Tri-bead tape sealer over the "stripped out" hole before installing Fastener #2A. This will allow the fastener threads to be coated with tape sealer and provide a good seal.

NEVER ALLOW PANELS TO COME INTO CONTACT WITH LEAD, COPPER, GRAPHITE, GASOLINE OR OTHER HARSH CHEMICALS AS THIS WILL VOID THE GAL-VALUME WARRANTY.

CHECK ROOF FOR PANEL ALIGNMENT

Check the roof every three or four runs for panel alignment as it is being erected. This can be accomplished by two different means.

- Measure from the rake support to the seam of the last completed panel run. Take measurements at the ridge, eave, and all endlaps.
- Attach a stringline to the eave plate and ridge purlin, running parallel to the rake support. The stringline should stay ahead of the work and can be moved across the roof as construction progresses. Measure from the stringline back to the last completed panel run. Take measurements at the ridge, eave, and all endlaps



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SPECIAL ERECTION TECHNIQUES ultra-dek®



RECOMMENDED ERECTION PRACTICES (CONTINUED) ADJUSTING PANEL WIDTH

NOTE

Do not adjust panel width more than $\frac{1}{2}$ " on any panel area.

ARTICULATING CLIP ONLY

To stretch panel coverage, install an articulating clip at the panel endlap or ridge with the base angled away from the panel. As the fastener is installed through the base of the clip and into the purlin, the clip base will rotate down to the purlin causing the top of the clip to move outward, stretching the panel coverage. Install the remainder of the clips as usual.

To shrink panel coverage, install an articulating clip at the panel endlap or ridge with the base angled toward the panel. As the fastener is installed through the base of the clip and into the purlin, the clip base will rotate down to the purlin causing the top of the clip to move inward, shrinking panel coverage. Install the remainder of the clips as usual.

FIXED AND FLOATING CLIPS

To stretch panel coverage, bend the sides of the back-up plate out and install at endlap or ridge. Do not bend either side more than ¼". Install clips as usual.

To shrink panel coverage, bend the sides of the back-up plate in and install at endlap or ridge. Do not bend either side more than $\frac{1}{4}$ ". Install clips as usual.

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ultra-der SPECIAL ERECTION TECHNIQUES



UL 90 LIGHT TRANSMITTING PANEL INSTALLATION

The light transmitting panel is designed to be installed in a manner similar to a panel endlap application, utilizing the same panel lap (3") and fastener layout.

NOTE

The standard light transmitting panel is 10° -3" long, designed for applications with purlin spacing no greater than 5' - 0 3/16" (1:12 slope). Maximum width of purlin flange to be 31/2".

UL 90 light transmitting panels are shipped with a stiffener plate and ten self-drilling #1E fasteners for each light transmitting panel.

The stiffener plate is to be field installed on the bottom side of the light transmitting panel over the mid-purlin.

The light transmitting panel rivets that obstruct the stiffener plate must be drilled out and replaced with Fastener #1E in five places on each side. THIS STIFFENER PLATE MUST BE EXACTLY CENTERED OVER THE MID-PURLIN SO THAT THE THERMAL MOVE-MENT OF THE SYSTEM IS NOT RESTRAINED BY THE PURLIN.

NOTE

THE WASHERS REQUIRED AT THE DOWNSLOPE END OF THE LIGHT TRANSMITTING PANEL ARE #14 x 1%" BONDED.

IMPORTANT NOTE

Floating Clip must be used on UL 90 rated light transmitting panels.

WARNING: These light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing or resting on them. The manufacturer DISCLAIMS ANY WAR-RANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk. step, stand or rest on or near these light transmitting panels or that they comply with any OSHA regulation.



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LIGHT TRANSMITTING PANEL TRIM INSTALLATION (OPTIONAL)

Light transmitting panel trim is available to cover the exposed insulation at the sides of the light transmitting panel opening. Two pieces of $2^{1/4"}x3^{1/2"}x10^{1-3"}$ angle are required per light transmitting panel. This angle is designed to work with either the low or the high system. THE 2¹/4" LEG IS TURNED UP FOR THE LOW SYSTEM AND THE 3¹/4" LEG IS TURNED UP FOR THE HIGH SYSTEM.

INSTALLATION PROCEDURE

Install panels up to light transmitting panel run. Do not install clips on this run until first light transmitting panel trim piece is installed. Čut and remove insulation where light transmitting panel is to be located. Leave enough insulation at the top and bottom of the opening to be rolled back, allowing only the backing to be exposed. Place double faced tape on top of the horizontal leg of the trim to hold the insulation. Notch trim for back-up plates and install directly under male leg of last panel installed, running from lower light transmitting panel purlin to upper light transmitting panel purlin. Attach to purlins with Fastener #1. Install clips. Install lower light transmitting panel run panel. Leave upper-most clip off until next trim piece is installed. Fold insulation end tab under lower panel and install light transmitting panel. Fold upper insulation end tab above light transmitting panel. Fold upper insulation end tab above light transmitting panel and install upper light transmitting panel. Place double faced tape on next trim piece and notch for back-up plates. Install directly under male leg of light transmitting panel and clip all panels down.

TAPE SEALER PLACEMENT FOR LIGHT TRANSMITTING PANEL ENDLAPS

Install first layer of Tri-Bead tape sealer across panel width as outlined on page UD-37. However, for the upslope and downslope endlaps for light transmitting panels, install a second layer of Tri-Bead tape sealer across the trapezoid areas of the panel. Houston Hardy: 877/713-5224 Houston Northwinda: 800/356-4416 Adel, GA: 888/448-6224 Atlanta, GA: 877/512-5224 Atwater, GA: 800/829-9324 Boise, ID: 800/632-3340 Deltas, ID: 800/632-3340 Indianapolis, IN: 800/735-6224 Lubbock, TX: 800/758-6224 Memphis, TN: 800/758-6224 Oklahoma City. OK: 800/597-5224 Omaha, NE: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-6224 Sait Lake City, UT: 800/874-2404 San Antonio, TX: 800/359-6224 Tampa, FL: 800/359-6224 International Sales Office: 800/359-6224



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RIDGE VENTILATOR INSTALLATION

NOTE

MBCI does not recommend the use of a ridge ventilator on standing seam roof systems. Sidewall or endwall exhaust fans or other ventilating methods should be considered. These details are for your convenience only. Only a 9" ridge ventilator can be used with this SSR system. Do not use ridge ventilators on any roof over 200' in width or with a slope less than 1:12 or greater than 6:12.

Turn ventilator over and place gently on its top. Note that the end cap is pre-formed for a 1:12 roof pitch. The five bench mark dots represent 2:12, 3:12, 4:12, 5:12 and 6:12 roof pitches. Draw a line between indicated corners and the appropriate dot for the roof pitch. Cut and remove that portion of the end cap. On 5:12 and 6:12 roof pitches see vent manufacturer's special instructions for the installation of the vent skirt. The end cap is now ready to receive the end skirt.

Reposition end skirt onto end cap. Be sure the down-turned angle of the end skirt is inside of and up against the end cap. Attach end skirt to ventilator end cap with Fastener #4 in four places.



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RIDGE VENTILATOR INSTALLATION (CONTINUED)

Apply Tri-Bead tape sealer to top of outside closures. Install ventilator making sure to center in opening. Attach ventilator to outside closures with Fastener #4 on 6" centers. Use urethane sealant to seal between the outside of the ventilator and the end skirt.

Install the ridge flashing as in Step 14, except for those pieces on either side of ventilator. These will lay on top of, and seal to, the ventilator end skirt with a ridge end cap. Use Tri-Bead tape sealer to seal the ridge end cap to the ridge flashing and the end skirt. Use Fastener #4 to install the end cap. Six fasteners are required to tie the end cap to the ventilator end skirt. Eight fasteners are required to tie the end cap to the ridge flashing.

For continuous ventilators, install end skirts on both ends of the first ventilator and one end of all following ventilators. Attach ventilator to outside closures as outlined above. Install an additional Fastener #4 through the corner of the side skirt and into the end skirt.

Do not connect more than 4 vents to the same linkage. Houston Hardy: 877/713-5224 Houston Northwands: 800/356-4416 Adel, GA; 888/445-8224 Atlanta, GA: 877/512-8224 Atlanta, GA: 877/512-8224 Botaa, Dr. 800/632-3340 Dellas, TX: 800/632-3340 Indianapotis, IN: 800/735-5224 Lubbock, TX: 800/736-6224 Memphis, TN: 800/266-6224 Okishoma Cfty, OK: 800/597-8224 Omaha, NE: 800/458-6224 Phoenix, AZ: 888/535-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-6224 Saft Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampe, FL: 800/359-6224 Imernational Sales Office: 800/359-6224



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RIDGE VENTILATOR



NOTES:

ONLY 9" RIDGE VENTILATORS CAN BE USED WITH THIS SSR SYSTEM. DO NOT USE RIDGE VENTILATORS ON ANY ROOF OVER 200' IN WIDTH OR WITH A SLOPE LESS THAN 1:12 OR GREATER THAN 6:12

SEE PAGES UD-20 AND UD-21 FOR FASTENER SELECTION.



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MID SLOPE FIXED CONDITION





NOTES:

- This special detail is for use when a panel run exceeds the thermal movement capabilities of the panel clip. Please refer to page UD-3.
- A positive panel attachment is made at the mid-point in the panel run allowing for thermal movement to the eave and ridge.
- The standard floating ridge condition must be used in conjunction with this special eave detail.
- The floating eave plate must be used to allow for panel movement at the eave.
- Floating clips have a maximum movement of 1" in each direction. Articulating clips have a maximum movement of 1¼" in each direction. Thermal calculations must be performed for each project to ensure that the thermal movement of the roof will not exceed the design of the clips and slot in the floating eave plate.



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ROOF CURB

MBCI recommends that only one-piece aluminum curbs, such as those manufactured by LM Curb (800-284-1412) be used on its standing seam roof systems. The curb flange is constructed to match the configuration of the panel. The side flanges extend to the next natural seam in the roof panels and conform to the seam configuration. Cap strips, furnished by the curb manufacturer, secure the curb to the roof panels. The roof curb is installed under the roof panels on the upslope end and on top of the roof panels on the downslope end. Support framing should be supplied by the curb manufacturer. Back-up plates (for the roof panels at the down slope end of the curb), long-life fasteners and Triple Bead tape sealer must be ordered for each curb.

These curbs may be installed as the roof is being installed or after the roof has been installed. Since the curb sides are an integral part of the roof seam, the curb must align with the roof panel seams. If the curb can be shifted up to 12" to either side, the curb can be preordered and be installed with the roof panels or installed after the roof is in place. If the curb placement is critical, install the curb support framing at the desired location and roof over it. Measure the panel rib locations in reference to the required curb opening and order the roof curb for each location. The curbs can then be installed in each location, ensuring an exact fit.

INSTALLING CURB WITH ROOF

Install curb support framing at curb location. install full length roof panels up to curb location. Install lower panels at downslope end of curb. If the lower panels are field cut to length, you must (1) cut the downslope end, leaving a factory cut at the curb end or (2) if the curb end of the panel is field cut, notch the male leg as it is done in the factory. Place Triple Bead tape sealer across the full width of each panel as it is installed. To determine how far down on the panel to place the tape sealer, temporarily lay the curb in place and mark the down slope edge of the curb on the first panel. This will give you a reference point as to how far down slope to place the tape sealer. It is critical that the tape sealer be installed across each panel individually so that the tape sealer can be placed over the male leg. This will provide a seal in the panel seam when the next panel is installed. Install back-up plates onto each of the lower panels.

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INSTALLING CURB WITH ROOF (Continued)

Install the roof curb on top of the lower roof panels and the curb support framing. Do not attach the curb to the support framing as this may prevent the curb from floating with the roof. Fasten the down slope end of the roof curb to the lower roof panels and back-up plates with Fastener #1E as at a standard endlap. This will require six fasteners in the pan of the panel and one in each trapezoid for a total of eight fasteners per panel. Fasteners must go through the Triple Bead tape sealer.

Install Triple Bead tape sealer across the width of the upslope end of the roof curb. Use the down slope end of the inside cap cell, which is welded to the roof curb, as a guide for placement of the tape sealer.

Apply minor rib tape sealer to the underside of the minor ribs on the down slope end of the upper panels. Install the upper panels with Fastener #1E as at a standard endlap. This will require six fasteners in the pan of the panel and one in each trapezoid for a total of eight fasteners per panel. Fasteners must go through the Triple Bead tape sealer. The down slope edge of these panels should be flush with the down slope edge of the inside cap cell. Apply urethane sealant to the male leg of all panels directly over the inside cap cell. This will prevent water infiltration through the end of the panel seam.



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INSTALLING CURB WITH ROOF (Continued)

After all upper panels have been installed, install full length panel at side of curb. This panel will engage the male leg of the adjacent upper and lower panels. The female leg of this full length panel will overlap the leg of the roof curb.

Cap strips will be installed, full length, along both sides of the curb to seal the curb to the roof panels. Turn the cap strips upside down and install Tri Bead tape sealer to both sides and along the full length of the cap strip. Lower edge of tape sealer should be flush with the lower edge of the cap strip. Apply a generous bead of urethane sealant at both ends of the seam portion of the cap strip. Install each cap strip over the curb/roof panel sidelap with the lower end of the cap strip even with the lower end of the curb. Force the cap strip down tightly to the curb/roof panel sidelap and fasten both sides with Fastener #4 at 6" on center.

INSTALLING CURB AFTER ROOF INSTALLATION

When curbs must be installed in an exact location, the curb support framing can be installed before beginning the roof. When a curb is to be added after the roof is installed, the curb framing must be installed from below the roof after the roof panels have been cut for installation of the curb.

After roof is installed, identify the exact location for the curb. Measure from the center of the required opening to the nearest panel rib in each direction. Also, determine how many panels will be affected by the curb (minimum clearance between vertical wall of curb opening and panel rib is 6") and measure from center of rib of first panel affected to center of rib of last panel affected (if 24" panel module was not held during roof installation, this dimension will be critical). This information will be required to fabricate the curb so that it will fit the location exactly. Houston Hardy: 577/713-6224 Houston Northwinds: 600/356-4415 Adel, GA: 868/446-6224 Atamta, GA: 677/512-6224 Atwater, CA: 600/620-9324 Boise, ID: 600/632-3340 Dallas, TX: 800/653-8224 Indianapolis, IN: 800/735-6224 Lubbock, TX: 800/758-6224 Mamphis, TN: 800/206-6224 Oktahoma City, OK: 800/597-6224 Omaha, NE: 800458-6224 Phoenix, AZ: 880/533-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-6224 Salt Lake City, UT: 800/874-2404 San Antonio, TX: 800/596-6224 Tampe, FL: 800/359-6224 International Sales Office: 800/359-6224



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INSTALLING CURB AFTER ROOF (Continued)

Once curb is ready to be installed, lay curb on roof and align opening in the curb with the exact location the opening is required in the roof. At the up slope end of the roof curb, the roof panels will be cut on a line even with the beginning of the notch at the vertical leg on each side of the roof curb. Secondly, trace a line along the down slope edge of the roof curb. The roof panels will be cut on a line 4" up slope from this line.

Cut roof panels from rib of first panel affected by curb, to rib of last panel affected, along the top and bottom cut lines previously marked.

At the down slope end of the roof opening, install back-up plates onto the ends of the cut roof panels and Triple Bead tape sealer across the full width of these roof panels. The down slope edge of the tape sealer should be on the line previously traced along the downslope edge of the roof curb. The up slope edge of the tape sealer will be approximately 1-½" from the end of the cut panel.

Apply Triple Bead tape sealer across the full width of the up slope end of the roof curb. The down slope edge of the tape sealer will align with the down slope edge of the inside cap cells welded to the roof curb.

Install the roof curb under the roof panels at the up slope end and on top of the panels at the down slope end. This will require that you lift the roof panels up slightly at the up slope end to allow the upper flange of the roof curb to slide under the panels. Spray some soapy water on the tape sealer to prevent it from sticking to the roof panels until you have the curb completely in place.



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INSTALLING CURB AFTER ROOF (Continued)

Cap strips will be installed, full length along both sides of the curb to seal the curb to the roof panels. Turn the cap strips upside down and install Tri Bead tape sealer to both sides and along the full length of the cap strip. Lower edge of tape sealer should be flush with the lower edge of the cap strip. Apply a generous bead of urethane sealant at both ends of the seam portion of the cap strip. Install each cap strip over the curb/roof panel sidelap with the lower end of the cap strip even with the lower end of the curb. Force the cap strip down tightly to the curb/roof panel sidelap and fasten both sides with Fastener #4 at 6" on center. Houston Hardy: 877/7 13-6224 Houston Northwinds: 800/356-4416 Adel, GA: 888/46-6224 Atlanta, GA: 877/512-6224 Atwanar, GA: 807/512-6224 Atwanar, GA: 800/829-9324 Boise, JD: 800/632-3340 Dallas, TX: 800/853-6224 Indianapolis, IN: 800/735-5224 Lubbock, TX: 800/756-6224 Memphis, TX: 800/206-6224 Oktahomm City, OK: 800/597-6224 Omaha, NE: 900/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224 Roms, NY: 800/559-8224 Salt Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampa, FL: 800/359-6224 International Sales Office: 800/359-6224



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ROOF CURB CROSS SECTION

- 1. Ultra-Dek® Panel
- 2. Urethane Sealant
- 3. Outside Cap Cell
- 4. Back-up Plate
- 5. Fastener #1E
- 6. Triple Bead Tape Sealer
- 7. Roof Curb
- 8. Water Diverter
- 9, Inside Cap Cell

ROOF CURB ISOMETRIC



Curbs can be ordered from LM Curbs at 1-800-284-1412.


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NOTE: THE ABOVE GUTTER SHOULD NOT BE USED IN AREAS THAT EXPERIENCE SNOW LOADS OF 10 PSF OR HIGHER. SEE PAGE UD-72 FOR THE GUTTER DETAIL FOR THESE AREAS.

SEE PAGES UD-20 AND UD-21 FOR FASTENER SELECTION.



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TRIM DETAILS RIDGE







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SEE PAGES UD-20 AND UD-21 FOR FASTENER SELECTION.



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DESIGN



TRIM DETAILS FLOATING PEAK BOX





FLOATING PEAK BOX INSTALLATION

- Install rake trim on each side of ridge to within 2" of centerline of building.
- Install ridge flash so that it is on top leg of rake trim, 1" back from outside edge.
- Temporarily set peak box in place and mark perimeter of box on rake trim and ridge flash. Remove peak box.
- 4. Just inside mark, install tape sealer continuously across ridge flash, then down the face of rake trim on both sides of ridge.
- 5. Place flexible membrane over tape sealer and hold in place with cinch angles. Cinch angles should be attached with Fastener #4. To prevent leaks, flexible membrane should be tight against ridge flash and rake trim with no wrinkles at the sealed edges.
- Hook top of peak box over cinch angles installed on top of ridge flash and attach bottom of peak box to endwall with Fastener #4

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TRIM DETAILS RAKE



SEE www.mbci.com FOR CURRENT INFORMATION



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TRIM DETAILS





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DESIGN



TRIM DETAILS HIGH EAVE PARAPET



NOTE: HIGH SIDE PURLIN IS 9" DOWN SLOPE

UD-70 SUBJECT TO CHANGE WITHOUT NOTICE SEE WWW.mbci.com FOR CURRENT INFORMATION EFFECTIV

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NOTE: THIS OPTIONAL SCULPTURED EAVE TRIM IS AVAILABLE. HOWEVER, UNDER CERTAIN CONDITIONS IT MAY INDUCE STAINING OF WALL PANELS.



DESIGN

Houston Hardy: 877/713-8224 Houston Northwinds: 800/356-4418 Asint, GA: 886/466-6224 Ateane, GA: 877/512-8224 Atwater, CA: 800/829-9324 Boise, D: 800/832-3340 Delias, TX: 800/853-6324 Indiana polis, IN: 800/735-6224 Lubacet, TX: 800/735-6224 Memphis, TN: 800/206-6224 Oklahoma City, OK: 800/597-6224 Omaha, NE: 800/458-8224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-8224 Salt Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampa, FL: 800/359-6224 Insernational Sales Office: 800/359-6224

ultra-dek®



NOTES:

- 1. Attach gutter to eave plate with Fastener #14A (3 fasteners per 10' piece).
- 2. Install gutter straps 3'-0" O.C.
- 3 Apply Tri-Bead tape sealer to slope leg of gutter.
- 4. Use minor rib tape sealer to fill voids in panel at minor ribs as shown on page UD-35.
- 5. Install panel with Fastener #1E at prepunched holes. Panel must not overhang into gutter.
- 6. Front top edge of gutter must not project above the plane of the panel pan.

UD-72 SUBJECT TO CHANGE WITHOUT NOTICE SEE WWW.mbci.com FOR CURRENT INFORMATION

Houston Hardy: 877/713-6224 Houston Northwinds: 600/356-4416 Adel, GA: 886/485-6224 Atlanta, GA: 877/512-6224 Atwatar, CA: 800/829-9324 Beiser, ID: 800/632-3340 Dates, TA: 800/653-6224 Indianapolis, IN: 800/735-5224 Lubbock, TX: 800/758-5224 Memphis, TN: 800/266-5224 Ortainforms City, DK: 800/587-5224 Ortaint, NE: 800/458-5224 Phoenix, A2: 888/533-8224 Phoenix, A2: 888/533-8224 Richmond, VA: 800/728-8224

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ultra-dek®





All trapezoidal panels are extremely difficult to install at hips and valleys in a weathertight manner. The use of these details should only be attempted by installation crews that are highly experienced. In order to assure weathertightness, MBCI recommends one of it's vertical leg standing seam systems for use on roofs that require hips and valleys.



Houston Hardy: 877/713-6224 Houston Northwinds: 800/356-4416 Adat, GA: 888/445-6224 Attanta, GA: 877/512-6224 Atwater, CA: 800/829-9324 Boise, ID: 800/632-3340 Dellas, TX: 800/853-6324 Indianapolis, IN: 800/735-5224 Lubbock, TX: 800/756-5224 Mempha, TN: 800/266-6224 Oklahoma City, DK: 800/597-6224 Omaha, NE: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/729-6224 Rome, NY: 800/559-6224 Saft Lake City, UT: 800/874-2404 San Antonio, TX: 800/598-6224 Tampa, FL: 800/359-6224 Immersional Sales Office: 800/359-6224

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only be attempted by installation crews that are highly experienced. In 5 denie doubt one and a second stallation crews that are highly experienced. In 5 denies and valleys.

Houssian Hardy: 877/713-6224 Housson Northwinds: 800/356-4416 Adel, GA: 888/448-6224 Atlanta, GA: 87/712-6224 Atvester, CA: 800/829-8324 Beine, ID: 800/632-3340 Dates, TX: 800/653-6224 Indianapolis, IN: 800/735-5224 Lubbock, TX: 800/768-5224 Memphis, TN: 800/208-6224 Oktahoma City, DK: 800/597-6224 Omatum, IN: 800/458-6224 Phoenix, A2: 888/533-8224 Richmond, VA: 800/728-5224

Roms, NY: 800/559-6224 Saft Laise City, UT: 800/874-2404 San Antonae, TX: 800/598-6224 Tamps, FL: 800/359-6224 International Sales Office: 800/359-6224







Houston Hardy: 877/7 13-8224 Houston Northwinds: 800/356-4416 Adei, GA: 888/446-5224 Atlanta, GA: 877/512-8224 Atlanta, GA: 807/512-8224 Botes, ID: 800/832-3340 Dattas, TX: 800/853-6224 Indianapolis, WI: 300/735-6224 Lubbock, TX: 600/758-6224 Memphis, TN: 800/208-6224 Ottimisoma City, DX: 800/597-5224 Omaha, MC: 800/458-6224 Phoenix, AZ: 888/533-6224 Richmond, VA: 800/728-8224 Rome, NY: 800/559-6224 Sait Lake City, UT: 800/874-2404 San Amenico, TX: 800/598-6224 Temps, FL: 800/3598-8224 International Seles Office: 800/359-6224





Metal Roof and Wall Systems

For the most current information available, visit our Web Site at www.mbci.com

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Phoenix, AZ Fildenix, AZ 660 South 91st Avenue P.O. Box 739 Tolleson, AZ 85353 888/533-6224 Houston Northwinds 6800 Northwinds Drive P.O. Box 40220 Houston, TX 77240 800/356-4416

Indianapolis, IN 1780 McCall Drive P.O. Box 657 Shelbyville, IN 46176 800/735-6224

Richmond, VA
 Rome, NY
 Rome, NY

 801 South Avenue
 6168 State Route 233

 PO Box 239
 PO. Box 4141

 Colonial Heights, VA 23834
 Rome, NY 13442

 800/729-6224
 800/559-6224

Adel, GA 1601 Rogers Road P.O Box 1107 Adel, GA 31620 888/446-6224

Lubbock, TX 5711 East FM-40 P.O. Box 10133 Lubbock, TX 79408 800/758-6224

Rome, NY

Atianta, GA 2280 Monier Avenue P.O. Box 44729 Atianta, GA 30336 977/512-6224

Memphis, TN 300 Highway 51 North P.O. Box 366 Hernando, MS 38632 800/206-6224

Salt Lake City, UT 1155 West 2300 North P.O. Box 16027 Salt Lake City, UT 84116 800/874-2404

International Sales Office 402 N. Frontage Road P.O. Box 2418 Plant City, FL 33564 800/359-6224

Atwater, CA 550 industry Way P.O. Box 793 Atwater, CA 95301 800/829-9324

Oklahoma City, OK 7000 S. Eastern Avenue P.O. Box 95998 Oklahoma City, OK 73143 800/597-6224

San Antonio, TX 8677 1-10 East P.O. Box 69 Converse, TX 78109 600/598-6224 Boise, ID 1800 N. Elder P.O. Box 219 Nampa, ID B3653 800/632-3340

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Tampa, FL 402 N. Frontage Road P.O Box 2418 Plant City, FL 33564 800/359-6224



24" Ultra-Dek[®] 24 Ga.

Negative Design Loads (psf)

Span	Span 1592 Load Design Load	
1.00	105.73	65.67
1.50	103.13	64.06
2.00	100.53	62.44
2.50	90.42	56.16
3.00	80.31	49.88
3.50	70.20	43.60
4.00	60.09	37.32
4.50	49.98	31.04
5.00	39.87	24.76

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 5) Design Load contains a 1.61 factor of safety.
- 6) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 7) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- 8) This material is subject to change without notice. Please contact MBCI for most current data.





24" Ultra-Dek® 24 Ga.

Negative Design Loads (psf) Utility Clip and S-5! DL Windclamp

Span	1592 Load	Design Load 86.66	
2.50	152.53		
3.00	136.93	77.80	
3.50	121.33	68.94	
4.00	105.73	60.07	
4.50	90.13	51.21	
5.00	74.53	42.35	

Notes:

- Above loads for use with HW-208.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 2'-6 and 5'-0".
- 5) Design Load contains a 1.76 factor of safety.
- 6) The torque requirement for the S-5! UD Windclamp set screw is 140 in-lbs.
- These values do not consider fastener pullout or pullover, clip attachment must be designed separately. 7)
- 8) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- 9) This material is subject to change without notice. Please contact MBCI for most current data.





24" Ultra-Dek® 24 Ga.

Negative Design Loads (psf) S-5! UD Windclamp

Span	1592 Load	Design Load	
2.00	143.87	82.69	
2.50	132.32	76.04	
3.00	120.76	69.40	
3.50	109.20	62.76	
4.00	97.65	56.12	
4.50	86.09	49.48	
5.00	74.53	42.83	

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 2'-0" and 5'-0".
- 5) Design Load contains a 1.74 factor of safety.
- 6) The torque requirement for the S-5! UD Windclamp set screw is 140 in-lbs.
- These values do not consider fastener pullout or pullover, clip attachment must be designed separately. 7)
- The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all 8)
- engineering data. 9) This material is subject to change without notice. Please contact MBCI for most current data.





24" Ultra-Dek[®] 22 Ga.

Negative Design Loads (psf) S-5! UD Windclamp

Span	1592 Load	Design Load	
2.50	150.80	86.17	
3.00	137.63	78.64	
3.50	124.45	71.12	
4.00	111.28	63.59	
4.50	98.10	56.06	
5.00	84.93	48.53	

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- Test results are highlighted.
- All values are interpolated from tests performed at spans of 2'-6" and 5'-0".
- 5) Design Load contains a 1.75 factor of safety.
- 6) The torque requirement for the S-5! UD Windclamp set screw is 140 in-lbs.
- 7) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all 8) engineering data.
- 9) This material is subject to change without notice. Please contact MBCI for most current data.





24" Ultra-Dek[®] 22 Ga.

Negative Design Loads (psf)

Span	1592 Load	Design Load
1.00	192.40	109.94
1.50	169.87	97.07
2.00	147.33	84.19
2.50	131.16	74.95
3.00	114.98	65.70
3.50	98.80	56.46
4.00	82.63	47.22
4.50	66.45	37.97
5.00	50.28	28.73

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- Test results are highlighted.
- All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 5) Design Load contains a 1.75 factor of safety.
- These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 7) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- 8) This material is subject to change without notice. Please contact MBCI for most current data.





18" Ultra-Dek® 24 Ga.

Negative Design Loads (psf) S-5! UD Windclamp

	1592 Load	Design
Span		Load
2.50	199.33	113.90
3.00	176.10	100.63
3.50	152.88	87.36
4.00	129.65	74.09
4.50	106.43	60.81
5.00	83.20	47.54

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 2'-6" and 5'-0".
- 5) Design Load contains a 1.75 factor of safety.
- 6) The torque requirement for the S-5! UD Windclamp set screw is 140 in-lbs.
- 7) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 8) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- This material is subject to change without notice. Please contact MBCI for most current data.





18" Ultra-Dek[®] 24 Ga.

Negative Design Loads (psf)

Span	Span 1592 Load Desi	
1.00	130.00	80.75
1.50	116.14	72.13
2.00	102.27	63.52
2.50	92.16	57.24
3.00	82.05	50.96
3.50	71.94	44.68
4.00	61.83	38.40
4.50	51.72	32.12
5.00	41.67	25.88

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 5) Design Load contains a 1.61 factor of safety.
- 6) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 7) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- 8) This material is subject to change without notice. Please contact MBCI for most current data.





18" Ultra-Dek[®] 22 Ga.

Negative Design Loads (psf) S-5! UD Windclamp

Span	1592 Load	Design Load	
2.50	260.00	150.29	
3.00	230.88	133.46	
3.50	201.76	116.62	
4.00	172.64	99.79	
4.50	143.52	82.96	
5.00	114.40	66.13	

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- Test results are highlighted.
- All values are interpolated from tests performed at spans of 2'-6" and 5'-0".
- 5) Design Load contains a 1.73 factor of safety.
- 6) The torque requirement for the S-5! UD Windclamp set screw is 140 in-lbs.
- These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 8) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- This material is subject to change without notice. Please contact MBCI for most current data.





18" Ultra-Dek® 22 Ga.

Negative Design Loads (psf)

Span	1592 Load	Design Load
1.00	से के मे	***
1.50	***	***
2.00	161.20	80.60
2.50	146.46	73.23
3.00	131.73	65.86
3.50	117.00	58.50
4.00	102.26	51.13
4.50	87.53	43.76
5.00	72.80	36.40

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) *** indicates insufficient data.
- 5) All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 6) Design Load contains a 2.00 factor of safety.
- 7) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all 8) engineering data.
- 9) This material is subject to change without notice. Please contact MBCI for most current data.





12" Ultra-Dek[®] 24 Ga.

Negative Design Loads (psf)

Span	Span 1592 Load Desig	
1.00	***	***
1.50	***	***
2.00	208.00	104.00
2.50	190.66	95.33
3.00	173.33	86.66
3.50	156.00	78.00
4.00	138.66	69.33
4.50	121.33	60.66
5.00	104.00	52.00

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) *** indicates insufficient data.
- 5) All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 6) Design Load contains a 2.00 factor of safety.
- These values do not consider fastener pullout or pullover, clip attachment must be designed separately. 7)
- The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, 8) etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all
- engineering data. 9) This material is subject to change without notice. Please contact MBCI for most current data.





12" Ultra-Dek® 22 Ga.

Negative Design Loads (psf)

	Design	
15921080	Load	
364.00	182.00	
291.20	145.60	
218.40	109.20	
208.00	104.00	
197.60	98.80	
187.20	93.60	
176.80	88.40	
166.40	83.20	
156.00	78.00	
	1592 Load 364.00 291.20 218.40 208.00 197.60 187.20 176.80 166.40 156.00	

Notes:

- 1) Above loads for use with HW-210, HW-212, HW-2100 and HW-2120.
- 2) The above loads were derived from uplift tests done in accordance with ASTM E-1592.
- 3) Test results are highlighted.
- 4) All values are interpolated from tests performed at spans of 1'-0", 2'-0" and 5'-0".
- 5) Design Load contains a 2.00 factor of safety.
- 6) These values do not consider fastener pullout or pullover, clip attachment must be designed separately.
- 7) The use of any accessories including but not limited to clips, fasteners, and support plates (eave, backup, rake, etc.) other than those provided by the manufacturer may damage panels, void all warranties and will void all engineering data.
- 8) This material is subject to change without notice. Please contact MBCI for most current data.





1. Metal Roof Deck Panels* No. 26 MSG min coated steel. Panels continuous over two or more spans. End laps to occur adjacent to wood joist with panels overlapped 3 in. A line of sealant may be used at panel ends and side laps.

- A&S BUILDING SYSTEMS, INC.-"Ultra-Dek"
- CHIEF INDUSTRIES INC--"STC"
- GALVAK S A DE C V--"Gaivalok !" .
- KIRBY BUILDING SYSTEMS INC--"Kirbylok 2000".
- MBCI-"Ultra-Dek"
- MESCO METAL BUILDINGS "Ultra-Dek"
- NCI BUILDING SYSTEMS LP-"Ultra-Dek".
- UNITED STRUCTURES OF AMERICA INC--"Guardian I", "Guardian II" (seamed only).

2. Roof Deck Fasteners* (Panel Clips) - Articulating clip used with an upper tab clip formed to engage the metal roof deck panel rib (Item 1). Height of the clip to be 3-3/8 in. or "Utility Clip", one piece assembly fabricated from No. 22 MSG min. coated steel, 3 in. wide and nominal 2 11/16 in. height, when no thermal spacer (Item 5) is used, and 4-3/8 in, when a thermal spacer is used. Clips are spaced 60 in. OC. located at the panel sides with guide holes in bottom to accommodate one screw fastener (Item 4).

- CHIEF INDUSTRIES INC--"STC"
- GARCO BUILDING SYSTEMS--"Garco-Standing-Seam-Clip"
- KIRBY BUILDING SYSTEMS INC--"Kirbylok 2000 Clip" or "Kirbylok 2000 Clip II".
- NCI BUILDING SYSTEMS LP--"Ultra-Dek Articulating Clip" or "Ultra-Dek Utility Clip" .
- UNITED STRUCTURES OF AMERICA INC--"Guardian I"

3. Fasteners (Screws) - Screws used to attach each panel clip to plywood to be one (1) No. 10 by 1-1/2 in. long with 1/4 in. hex-head washer and a separate 1/2 in. neoprene and steel washer. As an alternate fastener, the screw used to attach a panel clip to plywood may be one (1) No. 14 by 1-1/2 in, long Type A with 3/8 in. hex-head and a separate 5/8 in. neoprene and steel washer.

When Items 9 (foamed plastic, rigid insulation) and Item 10 (bearing plate) are used, No. 12 Dekfast fastener to be used and installed through clip (Item 2), bearing plate (Item 10), foamed plastic, rigid insulation (Item 9) and deck (Item 5). Length of fastener to be equal to total thickness plus 7/8 in.

Screws used at the end lap to be 1/4-14 by 1 in. long with 3/8 in. hex-head washer and a separate 5/8 in. neoprene and steel washer. Five (5) fasteners are to be used in the flat section of the end lap panel with the first fastener located 3 in. from either rib, and then spaced in a 3-6-6-3 in. pattern. An additional fastener is to be located at the second slanted segment of the rib on both sides of the end lap panel, and one additional fastener located at the first slanted segment on both sides of one rib. Fasteners used with alternate 16 MSG min thick coated steel upper section to be No. 14 by 1 in long self-tapping fastener. First fastener located 3/8 in. from first slanted segment in a 4-5-1/2-5-1/2-4 in. pattern. One additional fastener located 1/2 in. from first slanted segment on opposite side of same rib where first fastener is located.

Screws used to attach plywood to wood joists to be No. 8 by 2 in. long bugle-head screws spaced at 12 in. O.C. Spacing at the butted ends of the plywood sections to be 6 in. O.C. 8d nails may be used, as an option, for the attachment of plywood to wood joist.

4. Wood Joists No. 2 Southern Yellow Pine or equivalent, spaced 24 in. O.C. max.

5. Deck Deck to be min 5/8 in. thick, Exposure 1, Sheathing Span "C-D", 40/20 plywood. (All butt joints to be sealed against leakage by using tape and/or caulk).

6. Thermal Spacer (Optional) (Not Shown) - Polystyrene, 1 in. nom thickness, 3 in. wide, cut to fit between panel clips.

7. Waterproof Membrane (Optional) - (Not Shown) - Used to protect plywood (Item 5). Installed under panels (Item 1).

8. Splice Plate Assembly (Not shown) - Used at panel end laps consisting of a lower section, 5-5/8 in. wide, with a 1 in. leg and formed to the general profile of the panel and having four 1 in. wide by 3/4 in. long tabs for sliding over the end panel. Upper section to be 2 in. wide and also formed to the general profile of the panel. Both parts 18 MSG in. min thick coated steel. Alternate 16 MSG min thick coated steel upper section 1-1/2 in. wide formed to the general profile of the panel with one end formed to fit over 2 side rib. Six 5/16 in. diam guide holes located in the flat area only.

9. Foamed Plastic (Rigid Insulation) (Optional, not shown) - Maximum thickness 1-1/2 in. Any rigid type having a minimum compressive strength of 25 psi or minimum density of 2 pcf. Supplied in 4 ft. wide sheets.

10. Bearing plates (Optional, not shown) - To be used with Item 9. Bearing plates to be minimum 16 MSG coated steel. Located under each clip (Item 2) for support. Refer to General Information, Roof Deck Construction, (Roofing Materials and Systems Directory) for Items Not Evaluated.

*Bearing the UL Classification Marking



Construction No. 308B

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* 24 MSG min coated steel. Panels continuous over two or more spans. End laps to occur adjacent to purlin with panels overlapped 3 in. A line of sealant may be used at panel ends and side laps.

- A&S BUILDING SYSTEMS, INC.-"Ultra-Dek".
- CHIEF INDUSTRIES INC--"STC".
- GALVAK S A DE C V-- "Galvalok I" .
- KIRBY BUILDING SYSTEMS INC--"Kirbylok 2000".
- MBCI--"Ultra-Dek "
- MESCO METAL BUILDINGS "Ultra-Dek"
- NCI BUILDING SYSTEMS LP-"Ultra-Dek".
- UNITED STRUCTURES OF AMERICA INC--"Guardian I".

2. Roof Deck Fasteners* (Panel Clips) - Articulating clip used with an upper tab clip formed to engage the metal roof deck panel rib (Item 1). The height of the clip to be 3-3/8 in. when no thermal spacer is used, and 4-3/8 in. when a thermal spacer is used (Item 5). Clips are spaced 5 ft. OC max along length of panels, located at the panel sides with guide holes in bottom to accommodate two screw fasteners (Item 3).

- CHIEF INDUSTRIES INC--"STC".
- GARCO BUILDING SYSTEMS--"Garco-Standing-Seam-Clip".
- KIRBY BUILDING SYSTEMS INC--"Kirbylok 2000-Clip" or "Kirbylok 2000 Clip II".
- NCI BUILDING SYSTEMS LP-"Ultra-Dek Articulating Clip"
- UNITED STRUCTURES OF AMERICA INC--"Guardian I".

2A. Roof Deck Fasteners* (Panel Clips) - fixed or sliding type fabricated from 0.032 in. thick steel. Width to be 3 in., heights to be 3-3/8 in. when no thermal spacer (Item No. 4) is used and 4-3/4 in. when thermal spacer is used. Clips spaced 5 ft. on center, located at panel slides over purlins.

NCI Building Systems LP-"Ultra-Dek Fixed Clip" or "Ultra-Dek Sliding Clip"

3. Fasteners - (Screws) Fasteners used to attach panel clips and bearing plates (Item 2 and 4A) through rigid installation (or optional plywood or OSB when bearing plate not used) and into metal deck (Item 7) to be No. 14 diameter. with Phillips head. Two screws per clip when Item 2 is used. When metal deck is not used, fasteners used to attach panel clips (Item 2) for panel clip-to-purlins are to be No. 14 diameter. Type A, hex washer head with 5/8 in. O.D. washer. Two screws per clip. Fasteners to be installed into purlins (Item 9). Fastener length to be min 1/2 in. longer than total thickness of optional plywood or OSB substructure (Item 4), insulation (Item 6) and metal deck (Item 7). Fasteners used to attach panel clips (Item 2A) for panel clip-to-purlins to be No. 12-14 by 1-1/4 in. long self-drilling, self-tapping, hex-head screw with a separate 5/8 in. O.D. neoprene washer. Two screws used for fixed type clip and one screw used for sliding type. Fasteners to be installed into purlins (Item 9).

Screws used at end lap are to be 1/4-14 by 1 in. long with 3/8 in. hex-washer head and separate 5/8 in. neoprene steel washer. Five (5) fasteners are to be used in the flat section of the end lap panel with the first fastener located 3 in. from either rib, and then spaced in a 3-6-6-3 in. pattern.

An additional fastener is to be located at the second slant segment of the rib on both sides of the end lap panel, and one additional fastener located at the first slanted segment on both sides of one rib. Fasteners used with alternate 16 MSG min thick coated steel upper section to be No. 14 by 1 in. long self-tapping fastener. First fastener located 3/8 in. from first slanted segment in a 4-5-1/2-5-1/2-4 in. pattern. Screws used to attach optional plywood or OSB substructure (Item 4) to metal deck (Item 7) to be No. 14 type with Phillips head. Fastener length to be min of 1/2 in. longer than total thickness of the plywood, insulation and metal deck. Spacing to be 6 in. O.C. at plywood ends and 12 in. O.C. at 2 ft., 0 in. pattern down length of plywood. (Total of 33 fasteners per 4 by 8 ft. plywood sheet).

(Alternate - When bearing plates replace plywood or OSB). An optional No. 10 by 1 in. self-drilling fastener may be used to attach clip to the bearing plate when installer chooses to install rigid board insulation and use bearing plate to hold it in place until clips and panels are installed.

4. Substructure (Plywood or OSB) - (Optional) - (Not shown) Plywood decking to be nom 1/2 in. thick, exposure sheathing span C-D 40/20 plywood or oriented strand board (OSB), nominal 7/16 in. thick, 4X8 ft. To be installed on top of rigid insulation (Item 6) max thickness 4 in. and in lieu of bearing plate (Item 4A).

4A. Substructure (Bearing Plates) - (Optional) To be used in lieu of plywood or OSB (Item 4) with rigid insulation (Item 6) max thickness of 4.4 in. Bearing plates to be 16 MSG min coated steel. Located under each clip (Item 2) for support.

5. Thermal Spacer - (Optional) - (Not shown) Polystyrene, 1 in. max thickness 3 in. wide, cut to fit between panel clips.

6. Rigid Insulation (Optional) - Foamed plastic. min 1 in. thickness, max thickness 4 in. when plywood or OSB is used and 4.4 in. when bearing plates are used. Density to be a min 2 pcf.

6A. Wallboard, Gypsum - (Optional)(Not shown) Any 5/8 in. thick gypsum wallboard supplied in sheets 2 x 4 to 4 x 12 ft. Applied perpendicular to steel deck direction with adhesive. End joints to occur over crests of steel roof deck and to be staggered 2 ft. in adjacent rows. The total cumulative thickness of the rigid board (Item 6) and gypsum board may not exceed total thickness shown under Item 6.

6B. Waterproof Membrane - (Optional)(Not shown) Used to protect plywood or OSB (Item 4). Installed under panels (Item 1).

6C. Vapor Barrier - (Optional)(Not shown) Installed on top of metal deck (Item 7) or on top of gypsum wallboard (Item 6A) if used. Minimum 6 mil plastic sheet.

7. Metal Deck (Optional) - 22 MSG min thickness coated steel. Min depth 1-1/2 in. with ribs at 6 in. O.C. End lap to be 4 in. min and occur over purlin. Metal deck to be welded to purlin in every other low flute, except for the end laps which are welded in every low flute.

8. End-Lap Plate Assembly - (Not Shown) Used at panel end laps consisting of a lower section, 5-5/8 in. wide, with a 1 in. leg and formed to the general profile of the panel and having four 1 in. wide by 3/4 in. long tabs for sliding over the end panel. Upper section to be 2 in. wide and also formed to the general profile of the panel. Upper section to have ribs formed with reinforcement. Both parts min 18 MSG coated steel. Alternate 16 MSG min thick coated steel upper section 1-1/2 in. wide formed to fit the general profile of the panel. Five 5/16 in. diam guide holes located in the flat area only.

9. Purlin Min 14 MSG steel (55,000 psi min yield strength).

*Bearing the UL Classification Marking



Construction No. 536

Uplift - Class 90

Fire Not Investigated



1. Metai Roof Deck Panels* No. 24 MSG min. Coated steel panels continuous over two or more spans. End laps to occur adjacent to purlins with panels overlapped 3 inch max. A line of sealant may be used at panel end and side laps.

- A&S BUILDING SYSTEMS, INC.-"Ultra-Dek"
- GARCO BUILDING SYSTEMS "Garco Standing Seam-GGS"
- MBCI-"Ultra-Dek"
- MESCO METAL BUILDINGS -- "Ultra-Dek"
- NCI BUILDING SYSTEMS LP--"Ultra-Dek"
- UNITED STRUCTURES OF AMERICA INC--"Guardian 1".

2. Roof Deck Fasteners* - (Panel Clips) - Two piece floating clip with a No. 14 MSG base and a .030 Stainless Steel top. Clips spaced at 60 inches O.C.

NCI BUILDING SYSTEMS LP - "High or Low Floating Clip"

3. Fasteners - (Screws) - Fasteners for panel clips and bearing plates (Items No. 2 and 4A) through rigid insulation (or optional plywood when bearing plates are not used) and into metal deck (Item No. 7) to be No. 14 type with a Phillips head. Two screws per clip. Fastener length to be 1/2 inch longer than the total thickness of the plywood (Item No. 4), rigid board (Item No. 6) and metal deck (Item No. 7). Screws used at the end lap to be ¼-14 by 1 inch long with 3/8 inch hex-head and separate 5/8 inch neoprene and steel washer. Six (6) fasteners are to be used in the flat section of the end lap panel with the first fastener located 3 1/4 inches from either rib and then spaced in a 3 1/2, 3 1/2, 3 1/2, 3 1/2 inch pattern. An additional fastener is to be located at the second slanted segment of the rib on both sides of the end lap panel. Fasteners used with alternate 16 MSG min. thick coated steel upper section to be No. 14 by 1 inch long self-tapping fastener. First fastener located 3/8 inch from first slanted segment in a 4, 5 1/2, 5 1/2, 4 inch pattern. Screws used to attach optional plywood substructure (Item No. 4) to the metal deck (Item No. 7) to be No. 14 type with Phillips head. Fastener length to be a minimum of 1/2 inch longer than the total thickness of the plywood, insulation and metal deck. Spacing to be 6 inches O.C. at plywood ends and 12 inch O.C. at a 2 foot pattern down the length of the plywood (total of 33 fasteners per 4 by 8 foot plywood sheet). (Alternate - When bearing plates replace plywood). An optional No. 10 by 1 inch self-drilling fastener may be used to attach clip to bearing plate when installer chooses to install rigid board insulation and use the bearing plates to hold it in place until clips and panels are installed.

4. Substructure - (Plywood) - (optional) - (not shown) - Plywood decking to be a nom 1/2 inch thick, exposure sheathing span C-D 40/20 plywood. To be used in lieu of bearing plates (Item No. 4A). When plywood is used, the rigid insulation (Item No. 6) maximum thickness is 4 inches.

4A. Substructure - (Bearing Plates) - (optional) - To be used in lieu of plywood (Item No. 4) with rigid insulation (Item No. 6) maximum thickness of 4.4 inches. Bearing plates to be 16 MSG minimum coated steel. Located under each clip, for support.

5. Thermal Spacer (optional) (not shown) - Polystyrene, 1 inch max thickness, 3 inches wide, cut to fit between panel clips.

6. Rigid Insulation - Foamed plastic, minimum 1 inch thickness, maximum thickness 5 1/2 inches when plywood is used and 6 inches when bearing plates are used. Density to be a min. 2 pcf.

6A. Waterproof Membrane - (optional)(not shown) Used to protect plywood (Item 4). Installed under panels (Item 1).

7. Metal Deck - 22 MSG minimum thickness coated steel. Min. depth 1 1/2 inches with ribs at 6 inch O.C. End laps to be 4 inch and occur over a purlin. Metal deck to be welded to purlins in every other flute, except for the end laps which are welded in every low flute.

8. End-Lap Plate Assembly - (not shown) - Used at panel end laps; Consisting of a lower section, 5 5/8 inches wide, with a 1 inch vertical leg, formed to the general profile of the panel and having four 1 inch wide by 3/4 inch long tabs for sliding over the panel end. Upper section (optional) to be 1 1/2 inches wide 24 inches long and also formed to the general profile of the panel. Both parts fabricated from No. 16 MSG thick coated steel.

9. Purlin - Minimum 14 MSG steel (55,000 psi min. yield strength)

*Bearing the UL Classification Marking.



Construction No. 541

Uplift - Class 90

Fire Not Investigated



1. Metal Roof Deck Panels* - No. 26 MSG min coated steel. Panels continuous over two or more spans. End laps to occur adjacent to wood joist with panels overlapped 3 inch max. A line of sealant may be used at panel end and side laps.

- A&S BUILDING SYSTEMS, INC.-"Ultra-Dek"
- GARCO BUILDING SYSTEMS "Garco Standing Seam-GGS"
- MBCI-"Ultra-Dek"
- MESCO METAL BUILDINGS -- "Ultra-Dek"
- NCI BUILDING SYSTEMS LP--"Ultra-Dek"
- UNITED STRUCTURES OF AMERICA INC--"Guardian I".

2. Roof Deck Fasteners* - (Panel Clips) - Two piece floating clip with a No. 14 MSG base and a .030 Stainless Steel or .035 Coated Steel top.

NCI BUILDING SYSTEMS LP - "High or Low Floating Clip"

3. Fasteners (Screws) - Fasteners for panel clip to plywood to be two (2) No. 10 by 1 1/2 inch long with 1/4 inch hex-head screw with separate 1/2 inch O.D. neoprene and steel washer. As an alternate fastener, the screw used to attach a panel clip to the plywood may be two (2) No. 14 by 1 1/2 inch long Type A with 3/8 inch hex-head and a separate 5/8 inch neoprene and steel washer. Screws used at the end lap to be 1/4-14 by 1 inch long with 3/8 inch hex-head and separate 5/8 inch neoprene and steel washer. Six (6) fasteners are to be used in the flat section of the end lap panel with the first fastener located 3 1/4 inches from either rib and then spaced in a 3 1/2, 3 1/2, 3 1/2, 3 1/2, 3 1/2, 1/2 inch pattern. An additional fastener is to be located at the second

slanted segment of the rib on both sides of the end lap panel. Fasteners used with alternate 16 MSG min. thick coated steel upper section to be No. 14 by 1 inch long self-tapping fastener. First fastener located 1/2 inch from first slanted segment on opposite side of same rib where first fasteners located. Screws used to attach plywood to wood joists to be No. 8 by 2 inch long buglehead screws spaced at 12 inches O.C. Spacing at the butted ends of the plywood sections to be 6 inch O.C. 8d nails may be used, as an option for attachment of plywood to wood joist.

4. Wood Joist - No. 2 Southern yellow pine or equivalent, spaced at 24 inches O.C. maximum.

5. Plywood Deck - Deck to be min. 5/8 thick, exposure 1, sheathing span "C-D", 40/20/ plywood. All butt joints to be sealed against leakage by using tape and/or caulk.

6. Thermal Spacer - (optional) (not shown) - Polystyrene, 1 inch max thickness, 3 inches wide, cut to fit between panel clips.

7. Moisture Barrier - (optional) Used to protect plywood (Item 5). Installed under panels (Item 1).

8. Splice Plate Assembly - (not shown) - Used at panel end laps; Consisting of a lower section 5 5/8 inches wide, with a 1 inch vertical leg, formed to the general profile of the panel and having four 1 inch wide by 3/4 inch long tabs for sliding over the panel end. Upper section (optional) to be 1 1/2 inches wide 24 inches long and also formed to the general profile of the panel. Both parts fabricated from No. 16 MSG thick coated steel. Five 5/16 inch guide holes located in the flat area only.

*Bearing the UL Classification Marking.



1. PRODUCT NAME

Galvalume® Sheet Steel

2. MANUFACTURER

Bethlehem Steel Corporation Sparrows Point Division Sparrows Point, MD 21219 Phone: (800) 521-4789

3. PRODUCT DESCRIPTION

Coating: "Galvalume" is the registered trade name for a patented sheet steel product having a coating of corrosion-resistant aluminum-zinc alloy applied by a continuous hot dipping process. The alloy coating of aluminum and zinc provides an optimum balance between (a) the long-term general corrosion resistance, high temperature oxidation resistance and heat reflectivity of aluminum, and (b) the galvanic protection of zinc at scratches and cut edges.

Basic Use: Galvalume sheet, both bare and painted, is intended for applications where superior corrosion resistance is required, as in roofing, siding, pre-engineered buildings, appliances, air conditioner housings and other uses. Galvalume sheet is also used for applications where resistance to oxidation at elevated temperatures is important, such as fireplaces, toasters and automotive exhaust systems.

Limitations: Based on experience to date, Bethlehem advises against contact of Galvalume sheet with lead, copper, graphite, unprotected steel. uncured concrete, or wet, green or pressure-treated wood; exposure of Galvalume sheet to water run-down from copper and use of Galvalume sheet in harsh chemical or intensive animal confinement environs.

4. TECHNICAL DATA

Coating: The composition of the Galvalume sheet coating is typically

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Gaivalume is a registered trade name of BIEC international, Inc.

55% aluminum, 1.6% silicon and the balance zinc, nominal percentages by weight. The product is described in ASTM Specification A 792 and is available in three coating classes:

ASTM Designation	AZ50	AZ55	AZ60
Triple Spot	-		
Average Minimu	m		
Oz/Sg Ft	.50	.55	.60
Single Spot			
Minimum			
Oz/Sg Ft	.43	.50	.52

A nominal coating weight of .50 Oz/Sq Ft (total both sides) is equivalent to .8 mil thickness on each side.

The coating is available as regular. spangle or extra smooth surface, with or without chemical treatment. An oil coating may also be specified.

Atmospheric Corrosion Resistance: Based on 13-year atmospheric test results (Figure 1), it is estimated that Galvalume (AZ50) sheet will outlast G90 galvanized by two to four times

in marine, industrial and rural atmospheres. When compared to aluminum coated sheet steel, Galvalume sheet has superior corrosion resistance at sheared edges.

Salt Spray Corrosion Resistance: With cut edges protected, the coating on Galvalume Sheet Steel (AZ50) lasts five to ten times longer than the coating on G90 galvanized. In salt spray tests conducted with bare cut edges exposed, the corrosion resistance is typically three to four times that of G90 galvanized (see Figure 2).

High Temperature Behavior: Galvalume sheet can be used at temperatures up to 600°F without discoloration and up to 1250°F without heavy oxidation and scaling.

Prolonged exposure to temperatures above 600°F can result in changes to the base metal characteristics of conventional Galvalume sheet. A new product, Galvalume H.T. Sheet (UL listed) will resist base metal

MANUFACTURED ROOFING AND SIDING





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cause the aluminum-zind coating is less susceptible to microfracturing during forming than is the zind coating on G90 galvanized. Less paint crazing results in improved corrosion resistance.

Corrosion Resistance: Based on atmospheric test results, bare Galvalume sheet is at least two or four times more resistant to atmospheric corrosion than G90 galvanized and is comparable to aluminum-coated Type 2.

FIGURE 1: REVERSE IMPACT Nine Joule (80 inch-pound)



Galvalume Sheet



G90 Galvanized

Prepainted Galvalume sheet has also exhibited excellent corrosion resistance in a variety of accelerated tests and atmospheric exposures. It has demonstrated equal or better performance than prepainted G90 galvanized in corrosion protection at flat areas, paint damaged areas, and formed areas where paint crazing has occurred. Prepainted Galvalume sheet exhibits less than 3mm of edge creep along sheared edges and no scribe creep after 750 hours salt-spray exposure (Specification ASTM 8 117). Additionally, no blistering or loss of paint adhesion occurs after 1,000 hours waterfog exposure (100% relative humidity at 100°F).

Edge Creep: Edge creep is paint undercutting along sheared edges on prepainted metal sheets. Outdoor exposures of Bethlehem-approved paint systems applied to Galvalume sheet demonstrate the product's excellent resistance to edge creep.

In tests of siliconized polyester paint systems, widely used in the industry, prepainted Galvalume sheet exhibits consistently low edge creep that tends to level off to about 1mm after three years of exposure at Bethlehem's most corrosive test site at Kure Beach, NC. This low level of edge creep is maintained up through at least 10 years of exposure, the longest exposure time for which data are available.

5. INSTALLATION

Certain precautions should be taken when installing prepainted Galvalume sheet.

• Prepainted Galvalume should not come in direct contact with wet concrete. Concrete's high alkalinity attacks the aluminum, subsequently causing the coating to peel.

• Prepainted Galvalume sheet should not be placed in contact with copper, lead, or the water run-off from either. Electrochemical reaction between these elements and the aluminumzinc alloy coating will lead to premature corrosion of the coating.

• Fasteners should have corrosion resistance at least equivalent to the expected life of the base material.

Otherwise, prepainted Galvalume sheet can be stored, handled, and installed using the same procedures as with prepainted galvanized or aluminum-coated sheet steels. Good installation practice includes removal of metal fines due to drilling, cutting, etc. from the sheet surface and avoiding exposure of insulation to the weather.

6. AVAILABILITY AND COST

Availability: Prepainted Galvalume sheet is available for shipment anywhere in the country. Galvalume sheet is manufactured at Bethlehem's plants at Sparrows Point, MD and Jackson, MS, and painted at approved coil coaters throughout the country. Prepainted Galvalume sheet can be obtained in thicknesses from 0.014" to 0.074" and in widths up to 48". Heavier and lighter thicknesses may be negotiated.

Cost: Prepainted Galvalume sheet is priced comparable to prepainted G90 galvanized on a price per square foot (or per part) basis. Specific price quotations will be furnished upon request.

7. WARRANTY

The Galvalume sheet *substrate* is conditionally warranted against rupture, structural failure or perforation due to corrosion for a period of 20 years and six months when used for building panel applications.

Paint finishes are warranted depending upon application, paint system and color. More specific information regarding warranties will be furnished upon request.

8. MAINTENANCE

Prepainted Galvalume sheet requires no special maintenance under normal use. Recommended touch-up paint systems are available upon request for repairing areas damaged during erection.

9. TECHNICAL SERVICES

For more information call one of Bethlehem's Product Application Engineers at (800) 521-4789 or write: Bethlehem Steel Corporation, Coated Sheet Marketing, 5111 North Point Boulevard, Sparrows Point, MD 21219. http://www.bethsteel.com

10. FILING SYSTEMS

SPEC-DATA[®] II




May 1995

Bethlehem Steel Corporation

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1. PRODUCT NAME

Prepainted Galvalume® Sheet

2. MANUFACTURER

Bethlehem Steel Corporation Sparrows Point Division Sparrows Point, MD 21219 Phone:(800) 521-4789

3. PRODUCT DESCRIPTION

Product and Application: Galvalume, the Bethlehem trade name for a patented sheet steel having a hotdip coating of corrosion-resistant, aluminum zinc ailoy, is available prepainted from the manufacturer. The use of prepainted Galvalume sheet offers the consumer many positive features in addition to the proven superior corrosion resistance of the substrate. These features include:

More uniform paint coating.

• Reduction of in-plant rejections resulting from defective material treatments and coatings.

• Longer tool life because of prepainted Galvalume sheet's lubricity and non-abrasiveness.

• Shorter production schedules by eliminating handling, cleaning and postpainting.

• Elimination of capital equipment by the fabricator; thus, saving money and maintenance time.

• Reduction of fire hazard and pollution problems by eliminating storage of volatile solvents.

• No special tooling requirement because prepainted Galvalume sheet is generally formed on press brakes and roll forming equipment with the same dies and rolls used for bare steel.

Prepainted Galvalume sheet is an ideal product for many painted applications where superior atmospheric corrosion resistance is needed, such as in pre-engineered buildings, architectural panels, siding, roofing (conventional and standing seam) and

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*Galvalume is the registered trademark of BIEC International, Inc.

other building components. It is also suitable for appliances and other end uses. A wide variety of colors and finishes is available to satisfy most applications.

4. TECHNICAL DATA

Typical Mechanical Properties

- (Commercial Quality):
- Yield Strength: 40-50 ksi
 Tensile Strength: 55-70 ksi
- Tensile Strength: 55-70 ksi
- Total Elongation: 20-36%
 Hardness: 50-65 HRB
- (Structural quality, grades, including

50 ksi and 80 ksi minimum yield strengths, are also available.)

Substrate: The Galvalume sheet coating consists of an alloy of nominally 55% aluminum, 1.6% silicon, and the balance zinc by weight, as listed in ASTM designation A 792. On a volume basis, the coating is approximately 80% aluminum. The high aluminum content of the coating results in Galvalume sheet having a lower density and less weight per unit area than G90 galvanized sheet of equivalent thickness.

This means that a ton of Galvalume sheet will yield more square feet of useable product than a ton of G90 galvanized of equivalent thickness. A Bethlehem sales representative can provide specific details for any particular application.

The metallic coating is applied by a continuous hot-dip process whereby properly cleaned low carbon, coldrolled steel is dipped into a molten aluminum-zinc bath. The patented alloy coating of Galvalume sheet provides an optimum balance between (a) the long-term general corrosion resistance of aluminum, and (b) the galvanic protection of zinc at scratches and cut edges.

Process Specification: Bethlehem has instituted a process control program to insure that prepainted Galvalume sheet is produced to prescribed standards. The program specifies the methods and materials to be used in each phase of the painting process, as well as stringent product performance requirements. The Bethlehem Process Specification for prepainted Galvalume sheet is based on extensive laboratory evaluation and outdoor exposure tests in cooperation with pretreatment and paint suppliers.

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical ac-

curacy.

Processing: Galvalume sheet is cleaned and pretreated in preparation for painting. Surface contaminants are removed using a suitable alkaline cleaner. The sheet is then pretreated with a chromate pretreatment. The pretreatment is a uniform, continuous deposit applied in a manner to provide excellent paint adhesion and corrosion resistance.

A minimum of two coats of paint are applied to both the face side and back side of the sheet: a corrosion inhibitive primer and a top coat. The primers are selected from a list of Bethlehem-approved paint systems. The primer is a uniform continuous film, compatible with the subsequently applied top coat. It is applied to each surface at a thickness specified by the paint manufacturer (typically 0.2-0.25 mil.). Top coat thickness varies depending on paint type and end use. The face side top coat has excellent long-term outdoor weathering characteristics. Both face side and back side top coats must meet various quality assurance tests, such as adhesion, flexibility and hardness.

Paint Adhesion: Paint adhesion on Galvalume sheet is consistently better and less variable than on G90 galvanized sheet. Adhesion is determined by pick-off on a tape pull on a crosshatch, wedge bend and nine joule (80 inch-pound) reverse impact dimple.

Flexibility: Based on laboratory testing, the coating flexibility of Galvalume sheet is superior to that of G90 galvanized sheet. When subjected to the nine joule reverse impact dimple test, prepainted Galvalume sheet shows less evidence of paint crazing than does prepainted G90 galvanized (Figure 1). Less paint crazing occurs with prepainted Galvalume sheet beFigure 2



change. Galvalume sheet applications subjected to these temperatures should be reviewed with a local Bethlehem Sales Office.

Formability: Galvalume sheet can be formed about as readily as continuously annealed galvanized sheet. Lock forming and roll forming are readily accomplished.

Weldability: Calvalume sheet is readily weldable with conventional resistance and arc welding processes. Conditions for resistance welding are similar to those used on galvanized steel. Spot welding electrodes should be redressed as required to maintain nugget size. RVVMA Class 2 or dispersion-strengthened copper alloy electrodes are suggested. Galvalume sheet can be arc welded with the shielded metal-arc and gas metal-arc processes. The lower zinc content of the coating of Galvalume sheet results in considerably less fuming during arc welding, providing reduced fume hazards to welders. For further information on welding, contact the nearest Bethlehem Sales Office.

Paintability: Properly pretreated Galvalume sheet has excellent paint adhesion. Bethlehem has approved specific pretreatment and primer systems which should be used to provide optimum long-term outdoor performance. The conditions of treatment, concentration, temperature, and time should be determined for each application to obtain the best paint-bonding properties and avoid excessive attack on the Galvalume coating. Bethlehem's Specification for Prepainting Galvalume Sheet which contains approved pre-treatment and primer systems is available upon request.

Galvalume sheet may be fieldpainted with most paints suitable for galvanized: zinc-dust primers, butyral wash primers and acrylic latex paints.

Typical Mechanical Properties (Commercial Quality)

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Yield	38 - 53 ksi
Tensile	50 - 65 ksi
Total Elongation	20-36%
Hardness	50-65 HRB
(Higher strength lev	els are also avail
able i	

5. INSTALLATION

To preserve the surface appearance of Galvalume sheet, only clean, dry gloves should be used during handling. Care should also be exercised to prevent the sheets from sliding over rough surfaces or each other. Fasteners and other component parts should have equivalent corrosion resistance. Galvalume sheet steel joints can be effectively closed using appropriate sealants such as neutral curing silicone rubber. If other types of sealants are considered, they should possess the long-term durability, adhesion and non-corrosive properties of neutral cure silicone rubber. Soldering is not recommended.

6. AVAILABILITY AND COST

Availability: Calvalume sheet is available for shipment anywhere in the country from our plants at Sparrows Point, MD and Jackson, MS. It can be obtained in thicknesses from 0.014". to .074" and in widths up to 48". Heavier thicknesses may be negotiated.

Cost: Galvalume sheet is generally priced comparable to G90 galvanized sheet. Specific price quotations for Bethlehem Galvalume sheet will be furnished upon request. Consult the telephone directory for the nearest Bethlehem Sales Office.

7. WARRANTY

Galvalume sheet conforms to the requirements of ASTM Specification A 792. Galvalume sheet is a component recognized by the American Gas Association and by Underwriters Laboratories, Inc. under File No. MH9372.

A warranty is available for bare and prepainted Galvalume sheet when used for building panel applications.

8. MAINTENANCE

Properly installed Galvalume sheet requires no special maintenance. Galvalume sheet, like galvanized, is subject to wet storage staining and turns gray to black if moisture is trapped between coil laps, cut length sheets, or roll formed parts during shipping and storage. The mill treats Galvalume sheet to retard wet storage staining (unless otherwise requested); however, the user should take precautions to keep Galvalume sheet dry in transit, in storage and at work sites.

9. TECHNICAL SERVICES

For more information call one of Bethlehem's Product Application Engineers at (800) 521-4789 or write: Bethlehem Steel Corporation, Coated Sheet Marketing, 5111 North Point Boulevard., Sparrows Point, MD 21219.

10. FILING SYSTEMS

SPEC-DATA® II

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Online Certifications Directory

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Roofing Systems

Guide Information

MBCI 14031 W HARDY HOUSTON, TX 77060 USA

OTHER SYSTEMS

Class A

Coated steel panels (surfacing) identified as "R" or "PBR", "Ultra-Dek", "Double-Lok", "BattonLok" or "SuperLok", "Vistasheen", "Craftsman Series SB", "Craftsman Series LB", "Craftsman Series HB", "MultiRib", "7.2 Panel", "LokSeam", "S-36", "5V-Crimp", "Estate Panel", "Slimeline", "Storm Proof" or "Imperial Rib", "Ameri-Drain" or "Rain Guard", "Regal Rib", "Monarch Rib", "Rugged Rib", "C" or "PBC", "3/4 High Rib" or "Heritage Panel", "Perma-Clad", "1/2 In. Corrugated", "1/4 In. Corrugated", "D" or "PBD", "7/8 Wide Rib" or "Weather Safe".

1. Deck: C-15/32 Incline: Unlimited Impact: Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck® with all joints staggered a min of 6 in. from the plywood joints.

Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield". **Surfacing:** Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

2. Deck: NC

Incline: Unlimited

Impact: Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck®. **Ply Sheet (Optional):** Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield". **Surfacing:** Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

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R8116

3. Deck: NC Incline: Unlimited Impact: Class 4

Barrier Board: 7/16 OBS or 5/8 in. plywood over polyisocyanurate insulation board or polyisocyanurate composite boad, any thickness.

Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield".

Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

4. Deck: NC Incline: Unlimited Impact: Class 4

Insulation: Polyisocyanurate, glass fiber, perlite or wood fiber, any thickness. Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield". Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

5. Deck: NC Incline: Unlimited Impact: Class 4

Insulation: None required, however any UL Classified insulations may be used over open purlin spans. Any combination and any total thickness of insulation may be used. **Surfacing:** Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

6. Deck: C-15/32

Incline: Unlimited

Impact: Class 4

Barrier Board: 1/4 in. min. G-P Gypsum Dens-Deck® with all joints staggered a min of 6 in. from the plywood joints.

Ply Sheet (Optional): Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or UL Classified prepared roofing accessory or WR Grace "Ice and Water Shield". Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

Class C

Coated steel panels (surfacing) identified as "R" or "PBR", "Ulta-Dek", "Double-Lok", "BattonLok" or "SuperLok", "Vistasheen", "Craftsman Series SB", "Craftsman Series LB", "Craftsman Series HB", "MultiRib", "7.2 Panel", "LokSeam", "S-36", "5V-Crimp", "Estate Panel", "Slimeline", "Storm Proof" or "Imperial Rib", "Ameri-Drain" or "Rain Guard", "Regal Rib", "Monarch Rib", "Rugged Rib", "C" or "PBC", "3/4 High Rib" or "Heritage Panel", "Perma-Clad", "1/2 In. Corrugated", "1/4 In. Corrugated", "D" or "PBD", "7/8 Wide Rib" or "Weather Safe".

1. Deck: C-15/32 Incline: Unlimited Impact: Class 4

Surfacing: Coated Steel roofing panels, mechanically fastened or with steel screws when roof deck fasteners (panel clips) not required.

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UL Listed and Classified Products Components Canada

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File R11609 SSR1



FLUROPON®

CERTIFIED LABORATORY TEST REPORT UV Exposure

UV Exposure

TEST PROCEDURE:

Accelerated Weathering 2016 hours Per ASTM G 154

PRODUCT TESTED:

TESTS RESULTS:

FILM INTEGRITY:

CHALKING:

COLOR CHANGE:

SAMPLE NUMBER:

LOCATION:

CERTIFIED BY:

Date

A. N. Dunlop / Date Vice President Coil & Extrusions



Valspar Fluropon[®]

Acceptable

No cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal

Chalk Rating of 8 or better per ASTM D 4214, Method A (ASTM D659)

Less than 5 AE Hunter units per ASTM D 2244

432A886

THE VALSPAR CORPORATION, Kankakee, IL

ATTESTED BY:

Funcieus 1/27/03 Date

Ann E. Landers Notary Public

April 13, 2005 My Commission Expires on: Date

THE VALSPAR CORPORATION certifies these tests to be true and accurate and performed by our laboratory.

• • •. 1997-1 # ₹1		CONSTRUCTION FASTENERS, INC.	HWH PLATED STEEL ILL FASTENER	AF): 1"; 1 1/2" AF): 1 1/4"; 1 1/2" NGTH: 3800 LBS RENGTH: 150 IN-LBS IGTH: 2850 LBS	١Ĺ	AZ55 GALVALUME HRS 0 .023 .031 .035 .049 .059 .074 1 .023 .031 .035 .049 .059 .074		TECHNICAL DATA PROVIDED HEREIN IS TO BE	OSEU AS A GAUE FUN TITAL SIRENGIT CHARCIERSINGS OULY.	VLL SINCHAIN VALUES SHOWN ARE ULIMATE VALUES, EXPRESSED IN POLUADS.	APPLIED BY THE USER TO OBTAIN ALLOWABLE LAMITS FOR DESIGN.	PULL OUT BEEN BEORT TRUNK I TOWN IN TRUNK IN DOCUMENTED PULL OVER PEOPORT VOID 9105.97	SHEAR OF ASSEMBLY DATA SHOWN HEREIN IS DOCUMENTED ON LAB TEST REPORT 3052.97	ILURE
			/4-14 ELF DR 2 PT.	TH "A" (3/8 (TH "A" (5/16 TENSILE STRE TORSIONAL ST SHEAR STREN	ASSEME (T-759)	.015 .019 .015 .019 .192 252			.049	40	* 2000	1687	1655	+ ZAC FA
			+`\]₩	LENG LENG NOM. NOM.	R OF	NATION NESS 1 NESS 2		LUME	.035	4	1500	1241	1064	
	Z	167			SHEA TEST M	ALLOY DESIG THICK VALUE		GALVA	.031	40	1647	1079	920	
	UATIC							AZ55	.023	40	1310	884	764	
	EVAL	"A" -		18/.193 16/.240 12/.185 18/.305 15/.367		S I			.019	40	794	616	502	
	NCE NCE			.19 .19 .30		AJ6 HRS strength: 5- 6" 15			.015	80	502	447	370	
	ERFORMAN	c		(5/16" A.F.): (3/8" A.F.):	ENGTH	HRS ENGTH: 57 KSI MIN. YEELD .074 .105 3/1 1312 2088 442	RENGTH	ALLOY DESIGNATION	THICKNESS	YIELD STRENGTH (KSI)	VÄLUE	VALUE	VALUE	98
_	FASTENER PI	REF: DWG P358A	H	PT. DIA. (#2 PT.): Major Diameter: Minor Diameter: Head - Across Flats Head - Across Flats	PULL OUT STRI TEST METHOD (T-750)	ALLOY DESIGNATION YELD STR THICKNESS 059 VALUE 903	PULL OVER STF TEST METHOD (T-751)		WASHER		ZAC	15mm O.D. BONDED WASHER	NONE	CH-63 6-12-

.

	4 HWH PLATED STEEL DRILLING FASTENER IMPAX) #2 PT.	1/4"; 1 1/2"; 2"; 2 1/2"; 3"; 4" 2900 LBS 92 IN-LBS 2050 LBS	R OF ASSEMBLY TEST METHOD (T-759)	- ************************************	 804 1158 137 153 269 350 418 518 		TECHNICAL DATA PROMDED HEREW IS TO BE USED AS A GUIDE FOR TYPICAL STRENGTH CHARACTERISTICS ONLY.	VALUES, EXPRESSED IN POUNDS. AN APPROPRIATE FACTOR OF SAFETY MUST BE	E APPLIED BY THE USER TO OBTIAN ALLOWABLE UMITS FOR DESIGN. PULLOUT DATA SHOWN HEREIN IS DOCUMENTED	PULLOVER DATA SHOWN HEREM IS DOCUMENTED	SHEAR OF ASSEMBLY DALA SHOWN HENELM IS DOCUMENTED ON LAB TEST REPORT LIR JO52.97	
	12-1 ELF #12	1"; 1 INGTH: RENGTH IGTH:	SHEA	MAT'	THOORS			.049	1500	1842	1866	FAILUR
	#0.J	3/4"; E STRE AAL ST STREN			.049 484		IE	.035	1500	1390	1295	ZAC
N		H "A": TENSILE ORSION SHEAR			317			.031	40	1247	1148	*
L UATI	467	LENGTH NOM. T MIN. T NOM.			.031 301		55 GAI	.023	1500	1056	901	
EV I		2002	50)	55 GA	.025 202	751)	AZ	.019	40 932	654	570	
NC NC		70/.16 15/.20 34/.15 38/.30	тнор (т7	AZ	.019 155	тнор (т <u> </u>		.015	80 665	542	462	
PERFORMA		30 - 17 217 218 - 16 5 FLATS - 30	NGTH TEST ME	SS eld strength	74 .105 .015 74 1965 143	ENGTH TEST ME	ALLOY DESIGNATION	THICKNESS	VIELD STRENGTH (KSI) VALUE (LBS. ULT.)	VALUE (LBS. ULT.)	VALUE (LBS. ULT.)	8
FASTENER	REF: UWG. P-V	PT. DIA. MAJOR DIAMETEF MINOR DIAMETEF HEAD – ACROS	PULL OUT STRE	MAT'L 57 KSI MIN. YI	MACKNESS = .059 .07 VALUE = 41 841 11	PULL OVER STF		WASHER	ZAC	BONDED WASHER 15mm 0.D.	NONE	CH 48 6-12-9

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