

CONVENIENCE OF OPEN WEB

FLEXIBILITY OF FIELD TRIMMING

ASSURANCE OF INDIVIDUAL TESTING





The only all-wood, open-web floor truss.



# The Only All-Wood, Open-Web Floor Trusses

# Improving on a Solid Concept

Open-web floor trusses have been meeting floor framing challenges for years. They allow long spans and make it easy to install electrical, plumbing and HVAC systems. Their strength comes from the structural power of a triangle...a building shape as old as civilization.

# **Open Joist Floor Trusses**

Open Joist from Universal Forest Products is a revolutionary all-wood, open-web, floor truss engineered with superior strength and load-carrying capabilities.

Universal Forest Products Eastern Division, Inc. manufactures the Open Joist product as a licensee of Distribution Open Joist 2000, Inc. All Open Joist product design and engineering calculations are created by the licensor, Distribution Open Joist 2000, Inc.

# **Open Joist Provides You With:**

### Reduced shipping time

All of the benefits of engineered floor trusses, with quick delivery from inventory.

### Wide nailing surface

Top and bottom flanges of 3x2 and 4x2 provide a wide nailing surface for fasteners and adhesives, to help ensure a quieter floor.

### Individually tested trusses

Open Joist is tested to more than twice its maximum allowable load and is the only individually tested floor truss product.

### Trimmable ends

Open Joist is available immediately from stock with trimmable ends to fit exact framing dimensions. Up to  $5-1/2^{\prime\prime}$  can be trimmed off each end.

### Lifetime guarantee

Offers builders and homeowners peace of mind with a lifetime guarantee.

### Code approvals

Open Joist is accredited by International Code Council Evaluation Service Report Number ESR-1035 and is in compliance with the following codes: 2006 International Building Code (IBC), 2006 International Residential Code (IRC), BOCA National Building Code/1999 (BNBC), 1999 Standard Building Code (SBC) and the 1997 Uniform Building Code (UBC). Open Joist is accredited by the city of Los Angeles (RR#25376 and RR#25584), New York City (MEA#300-00-E), the city of Houston (#434B) and the state of Florida (FL#5828). Code approval reports are available at www.openjoist.com.

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The pictures and diagrams in this brochure are for illustrative purposes only. Any construction or use of the product must be in accordance with local building codes. Universal Forest Products, Inc., its subsidiaries and affiliates ("Universal") may provide a warranty with this product. Please ask for a copy when purchasing the product. Universal makes no warranty of any kind, express or implied, except as may be in its written warranty. All installation should be done by a licensed professional and appropriate safety measures should be taken when installing. Universal shall not be liable for any damages, including special and consequential damages that may result from the assembly or installing of this product. All engineered wood products are designed with specific limits to load capacity. Installer and/or end user should not exceed load capacities. Universal makes no warranty as to design of wall and roof loads, and all loads should be verified by a licensed professional.



# **Mechanical Service Clearance**



# **Standard OPEN JOIST Configurations**

Joist Depth	Joist Length	Chord Size & Grade
9-1/4"	3' through 16'	3 x 2 - #2 SPF
9-1/4"	17' through 20'	4 x 2 - MSR 2100 SPF
11-7/8″	3' through 17'	3 x 2 - #2 SPF
11-7/8″	18' through 19'	4 x 2 - #2 SPF
11-7/8″	20' through 23'	4 x 2 - MSR 2100 SPF
14"	3' through 18'	3 x 2 - #2 SPF
14"	19' through 21'	4 x 2 - #2 SPF
14"	22' through 25'	4 x 2 - MSR 2100 SPF
16"	3' through 17'	3 x 2 - #2 SPF
16"	18' through 22'	4 x 2 - #2 SPF
16"	23' through 26'	4 x 2 - MSR 2100 SPF
16"	27' through 30'	4 x 2 - MSR 2400 SPF



91/4" Depth Maximum Live Load Deflection (L/360 and L/480, 11/2" minimum bearing each end)												
Chord* Size	Chord* Grade	Loading(PSF)		12″ O.C. L/360 L/480		16″ O.C. L/360 L/480		19.2″ O.C. L/360 L/480		24″ L/360	O.C. L/480	
3x2	#2	40	15	15′-9″	15′-9″	15′-9″	14'-11"	15′-6″	14'-0"	14'-3″	12′-10″	
4x2	MSR 2100	40	15	19′-9″	19′-5″	19′-1″	17'-3″	17'-11″	16′-6″	16′-11″		
3x2	#2	50	15	15′-9″	15′-3″	15′-3″	13′-9″	14'-3"	12'-10"	13'-2"	11'-11″	
4x2	MSR 2100	50	15	19′-9″	17'-11″	17'-11″	16'-4"	16′-11″				
3x2	#2	100	15	13′-2″	11'-11″	11'-11″	10′-8″	11′-1″	9'-11"	9'-3"	8'-9"	

11 <i>7</i> / <sub>8</sub> ″	117/8" Depth Maximum Live Load Deflection (L/360 and L/480, 1½" minimum bearing each End)												
Chord* Size	Chord* Grade	Loading (PSF) Live Dead		12″ O.C. L/360 L/480		16″ O.C. L/360 L/480		19.2″ O.C. L/360 L/480		24″ L/360	O.C. L/480		
3x2	#2	40	15	16'-9″	16′-9″	16'-9"	16'-9"	16′-9″	16'-8"	16′-9″	15'-2"		
4x2	#2	40	15	18′-9″	18'-9"	18′-9″	18'-9"	18′-9″	18'-7"	17′-2″	17′-2″		
4x2	MSR 2100	40	15	22'-9″	22'-9″	22'-9″	21'-0"	21'-5″	19'-10"	19′-3″			
3x2	#2	50	15	16′-9″	16′-9″	16′-9″	16'-5″	16'-9"	15'-2"	15'-4"	14'-1"		
4x2	#2	50	15	18′-9″	18′-9″	18′-9″	18'-5"	17'-8″	17'-3″	16'-3″			
4x2	MSR 2100	50	15	22'-9″	21'-5"	21'-5″	19'-8″	20'-3"					
3x2	#2	100	15	15'-7"	14'-1"	13'-11"	12'-9"	12'-3"	11'-11"	10'-4"	10'-4"		
4x2	#2	100	15	16′-11″									

\* Because Open Joist is a stock product, the length of an Open Joist truss determines the size and grade of the truss chords (see tables). Maximum spans published on the chart above may be limited by standard joist configuration. To find maximum clear span for each truss depth in a given loading condition, refer to the bottom line of spans shown for that load condition.

Open Joist is accredited by International Code Council Evaluation Service Report Number ESR-1035 and is in compliance with the following codes: 2006 International Building Code (IBC), 2006 International Residential Code (IRC), BOCA National Building Code/1999 (BNBC), 1999 Standard Building Code (SBC) and the 1997 Uniform Building Code (UBC). Open Joist is accredited by the city of Los Angeles (RR#25376 and RR#25584), New York City (MEA#300-00-E), the city of Houston (#434B) and the state of Florida (FL#5828). Open Joist is certified by Canadian report #CCMC 12118R and is in compliance with Part 4 and Part 9 of the National Building Code of Canada 1995, the Ontario Building Code 1995 and CAN/ CSA-086.1-M94 standards for limit state design and controlled vibration standards. Code approval reports are available at www.openjoist.com.



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14″ D	epth Max	kimum	Live L	oad De	flection	(L/360 a	nd L/480, <sup>-</sup>	1½″ minim	num bearin	g each end	l)
Chord* Size	Chord* Grade	Loading (PSF) Live Dead		12″ O.C. L/360 L/480		16″ L/360	16″ O.C. L/360 L/480		″ O.C. L/480	24″ O.C. L/360 L/480	
3x2	#2	40	15	17'-9″	17'-9″	17'-9″	17'-9″	17'-9″	17'-9"	17'-9"	16'-4"
4x2	#2	40	15	20'-9″	20'-9"	20'-9″	20'-9"	20'-9"	19'-10"	18′-9″	18′-5″
4x2	MSR 2100	40	15	24'-9"	24'-9"	24'-8″	22′-9″	23'-5"	21'-2"	20′-10″	
3x2	#2	50	15	17'-9″	17'-9″	17′-9″	17'-7"	17'-9″	16'-5″	16'-4"	15'-3"
4x2	#2	50	15	20'-9″	20'-9"	20′-9″	19′-8″	19′-9″	18′-6″		
4x2	MSR 2100	50	15	24'-9″	23'-2"	23'-2"	21'-0"	21'-10"			
3x2	#2	100	15	16'-9″	15'-2"	14'-4"	13′-8″	12'-10"	12'-8″	10'-9"	10'-9″
4x2	#2	100	15	18'-4"							

16″ D	16" Depth Maximum Live Load Deflection (L/360 and L/480, 1½" minimum bearing each end)												
Chord*	Chord*	Loading (PSF)		12″ O.C.		16″ O.C.		19.2″ O.C.		24″ O.C.			
JIZC	Urauc	LIVC	Deau	L/300	L/400	L/300	L/400	L/300	L/400	L/300	L/400		
3x2	#2	40	15	16'-9"	16'-9"	16'-9"	16'-9"	16'-9"	16'-9"	16'-9"	16'-9"		
4x2	#2	40	15	21'-9″	21'-9"	21′-9″	21'-9"	21'-9″	21'-9"	21'-9"	21'-9"		
4x2	MSR 2100	40	15	25′-9″	25'-9"	25′-9″	25'-9"	25′-9″	25'-6"	25'-9″	22'-5"		
4x2	MSR 2400	40	15	29′-9″	29'-8"	29′-9″	27'-7"	28′-5″		26'-10"			
3x2	#2	50	15	16′-9″	16'-9″	16′-9″	16′-9″	16'-9"	16'-9″	16′-9″	16′-9″		
4x2	#2	50	15	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"	20'-10"		
4x2	MSR 2100	50	15	25′-9″	25'-9"	25′-9″	25'-0"	25′-9″	22'-5"	23'-10"			
4x2	MSR 2400	50	15	29'-9"	28'-2"	28'-3"		26'-10"					
3x2	#2	100	15	16′-9″	16'-9"	16′-8″	16'-8"	13'-6"	13'-6"	11'-4"	11'-4"		
4x2	#2	100	15	21'-9"	20'-10"	19′-1″	19'-0"	16′-9″	15′-9″				
4x2	MSR 2100	100	15	23'-3"									

### NOTE

Clear spans shown on this chart are presented under the following conditions:

- (1) Bearing of 1-1/2";
- (2) "Strongback" bracing is not considered.
- (3) Assumes a single layer of APA-rated wood sheathing is nailed or screwed.
- (4) Spans are clear distance between supports for uniformly loaded trusses and include allowable increases for repetitive use members.

Details on fire-resistance assemblies for one-and two-hour endurance are available on www.openjoist.com



### Individually Tested

Open Joist is the only floor framing product utilizing continual testing. A hydraulically powered test press applies a load to the test truss equivalent to 2.1 times the maximum allowable load. If there are any defects within the truss, it will break or deform on the test rack. This process assures that you received the best quality product at your job site.



### **Lifetime Warranty**

Because Open Joist trusses are individually tested, they offer permanent quality assurance against floor system failure. Property owners can rest assured that their structure built with Open Joist comes with a lifetime warranty.

# OPEN JOIST<sup>™</sup> WARRANTY

Universal Forest Products Eastern Division, Inc. and its affiliates, manufacturer of OPEN JOIST products ("the Products"), warrants that its Products are certified by Warnock Hersey to ensure their compliance with the legal standards then applicable to the Products, and that each of its Products listed on its load table is tested at twice its maximum weight capacity as described on such load table, and that it shall be free of defects of workmanship and material.

In the unlikely event that a manufacturing defect arises, since each of the Products listed on the manufacturer's load table has been tested individually, the Company shall replace such defective Product, at its cost and expense, provided that the purchaser shall have given to the manufacturer notice of a defect in the Product within 30 days of the purchaser being notified or from when the purchaser first became aware of such defective Product. Such replacement is the purchaser's sole and exclusive remedy for breach of warranty. This warranty shall be in force for the lifetime of the structure of the end user.

#### LIMITATIONS AND EXCLUSIONS

THE ABOVE WARRANTY SHALL NOT EXTEND TO PRODUCTS MISUSED, NEGLECTED, SUBJECTED TO ABNORMAL STORAGE, USE OR EXPOSURE OR WHICH HAVE BEEN ALTERED IN ANY MANNER OR NOT MAINTAINED IN ACCORDANCE WITH PUBLISHED INSTRUCTIONS. THE PRODUCTS MUST BE HANDLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THE MANUFACTURER DOES NOT GRANT ANY WARRANTY, EITHER EXPRESS OR IMPLIED, LEGAL OR CONVENTIONAL, AND DISCLAIMS ALL IMPLIED WARRANTES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. THE MANUFACTURER SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF THE MANUFACTURER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Universal Forest Products Eastern Division, Inc.



**Handling and Safety** 

# **Temporary Bracing**

- No one should be allowed on the Open Joist system until all hangers, blocking, rim board and temporary bracing are completely installed.
- Open Joist must be held straight and plumb at the design spacing while all blocking, rim board and bracing are installed.
- Temporary bracing is required at all supports and at the interval shown in the drawing until permanent bracing elements and sheathing are installed.
- Cantilevers require lateral bracing at ends.

### Lateral Bridging and Bracing

 Installation of permanent strongback bridging for the purpose of load sharing is recommended. See Detail No. 5. Permanent bracing to transmit lateral forces or to provide stability in some applications may be required and should be specified by the building designer.

# Open Joist Nailing & Bearing

- Follow APA recommendations for nailing and gluing sheathing to top chord of Open Joist and to rim board.
- When nailing fillers, select nails long

enough to penetrate all layers of material to be held. When nails are too long, they should be clinched.

- Hangers and other hardware should be applied according to their manufacturer's instructions.
- Open Joist requires 1-1/2" min. bearing at end supports. See placement plan for specific application.
- Toe-nail rim board to supporting structure with 10d nails @ 6" o.c. or as specified by building designer.

# Handling & Storage

- Handle Open Joist upright and by bottom flange.
- · Avoid excessive flat-wise bending of Open Joist.



- · Store Open Joist on blocks out of mud and water.
- Blocks should be long enough to support entire bundle width and be spaced about 10' apart.
- · Blocks should provide even support for bundles.
- Bundles should not be stacked more than three high, with stickers between bundles located vertically above blocks on ground.
- Bundles of Open Joist stored outdoors should be wrapped or covered for protection from weather.
- · Bundles should remain banded until ready for use.
- · To avoid injury, exercise caution when breaking bands.

### Warning

- · Do not exceed design loads or allowed spans. See placement drawings.
- · Distribute piles of plywood, OSB or other materials in small bundles.
- Do not overload the Open Joist members.
- Double-check drawings to verify Open Joist depth, span, spacing, loading, bearing details, bridging requirements and bracing details.
- Concentrated dead loads in excess of 250 pounds should not be hung from the bottom chord of an Open Joist. Concentrated loads may require joist reinforcement. Consult your Open Joist Technical Representative.
- Do not cut, do not notch and do not drill Open Joist. Check framing layout to avoid conflict with drain traps.





# **Framing Detail Suggestions**

### **Truss End Trim**



### End-to-End on Interior Bearing



### End-to-End on Interior Bearing



#### Recommended Continuous Strongback Bridging



### Parallel Joist on End Bearing Wall



### Perpendicular Joist on End Bearing Wall



#### **Overlapping on Interior Bearing**



### Joist to Wood Beam with Appropriate Hanger



### Parallel Rim on End Bearing Wall







### Stair Header



### **Cantilevered Balcony or Platform**

#### Short Cantilever without Reinforcement Supporting Load Bearing Wall



#### **Reinforcement for Point Load**



#### Solid Lumber Cantilever Perpendicular to Open Joist



### Joist to Steel Beam with Appropriate Hanger



### **Typical Fire Separation Wall**



E\* Engineering required. Engineered drawings will specify gussets and fastening.





Code-accepted one-hour fire assembly with one layer of drywall

Pre-manufactured for

short lead times

Open design for easy mechanical access





You will appreciate the performance from OPEN JOIST when using a strongback to control vibration and increase stiffness. Continuous strongback bridging (kiln-dried) every 7'-0" nailed to bottom chord and webs is recommended. For greater effectiveness, nail all strongbacks before the installing the subfloor.

\* Because Open Joist is a "stock" product, the length of an Open Joist truss determines the size and grade of the truss chords (see tables). Maximum spans published on the chart (right) may be limited by standard joist configuration. To find maximum clear span for each truss depth in a given loading condition, refer to the bottom line of spans shown for that load condition.

### NOTE

Clear spans shown on this chart are presented under the following conditions: (1) Bearing of 1-1/2".

- (2) "Strongback" bracing is not considered.
- (3) Assumes a single layer of APA-rated wood sheathing is nailed or screwed.
- (4) Spans are clear distance between supports for uniformly loaded trusses and include allowable increases for repetitive use members.



9 <sup>1/4</sup> " Depth Maximum Live Load Deflection (L/480, 1 $\%$ " minimum bearing each end)												
Chord* Size	Chord* Grade	Loading(PSF) Live Dead		12″ O.C. L/360 L/480		16″ O.C. L/360 L/480		19.2″ O.C. L/360 L/480		24″ L/360	O.C. L/480	
3x2	#2	40	25	15′-9″	15′-9″	15′-9″	14'-11"	15′-6″	14'-0"	14'-2"	12′-10″	
4x2	MSR 2100	40	25	19′-9″	19′-5″	18′-9″	17'-3″	17'-11″	16'-6"	15'-3"		
3x2	#2	50	25	15′-9″	15′-3″	15'-3"	13'-9″	14'-3"	12'-10"	13'-0"	11'-11"	
4x2	MSR 2100	50	25	19′-9″	17'-11″	17'-11″	16'-4"	16′-6″				
3x2	#2	100	25	13'-2"	11'-11"	11′-11″	10'-8"	10'-5"	9'-11"	8'-6"	8'-6"	

11 <sup>7</sup> /8" Depth Maximum Live Load Deflection (L/480, 1½" minimum bearing each end)												
Chord* Size	Chord* Grade	Loadir Live	Loading (PSF) Live Dead		12″ O.C. L/360 L/480		16″ O.C. L/360 L/480		′ O.C. L/480	24″ O.C. L/360 L/480		
3x2	#2	40	25	16′-9″	16′-9″	16′-9″	16′-9″	16′-9″	16′-8″	16′-9″	15′-2″	
4x2	#2	40	25	18′-9″	18′-9″	18′-9″	18′-9″	18′-9″	18′-1″	17′-7″		
4x2	MSR 2100	40	25	22'-9"	22′-9″	22'-0"	21'-1"	20′-10″	20'-0"			
3x2	#2	50	25	16′-9″	16′-9″	16′-9″	16′-5″	16'-1″	15′-2″	14'-1"	14'-1"	
4x2	#2	50	25	18′-9″	18′-9″	18′-5″	18′-5″	17'-0″	17'-0"			
4x2	MSR 2100	50	25	22'-9″	21'-6"	21'-4″	19′-9″	19'-3″				
3x2	#2	100	25	15′-7″	14'-1"	13'-1"	12'-9"	11'-7"	11'-7"	9′-8″	9'-8"	



# 25 psf Dead Load Clear Span Floor Table



14″	14" Depth Maximum Live Load Deflection (L/480, 11/2" minimum bearing each end)													
Cho	ord*	Chord*	Loadi	Loading(PSF)		12″ O.C.		16″ O.C.		″ O.C.	24″ O.C.			
21	ze	Grade	Live	Dead	L/360	L/480	L/360	L/480	L/300	L/480	L/360	L/480		
3)	x2	#2	40	25	17′-9″	17'-9″	17′-9″	17′-9″	17′-9″	17′-9″	16'-4"	16'-4"		
4)	x2	#2	40	25	20'-9"	20'-9"	20'-9"	20'-9"	19′-9″	19′-9″	17'-4"	17'-4"		
4)	x2	MSR 2100	40	25	24'-9"	24'-9"	24'-8"	22'-9"	23′-5″	21'-3"	21'-4"			
3)	x2	#2	50	25	17′-9″	17'-9"	17′-9″	17'-7"	17′-1″	16′-5″	15′-2″	15′-2″		
4)	x2	#2	50	25	20'-9"	20'-9"	20'-4"	19′-8″	18′-2″	18′-2″				
4)	x2	MSR 2100	50	25	24'-9"	23'-2"	22'-10"	21'-0"	20'-1"					
3)	x2	#2	100	25	16'-8″	15'-3"	14'-8"	13′-9″	12'-7"	12'-7″	10′-8″	10′-8″		
4)	x2	#2	100	25	17′-9″									

16″ D	16" Depth Maximum Live Load Deflection (L/480, 1½" minimum bearing each end)												
Chord*	Chord*	Loadir	ng(PSF) Dead	12″ O.C.		16″ O.C.		19.2″ O.C.		24″	0.C.		
JIZC	Grade	LIVC	Deau	L/300	L/400	L/300	L/400	L/300	L/400	L/300	L/400		
3x2	#2	40	25	16′-9″	16′-9″	16'-9"	16′-9″	16'-9"	16′-9″	16'-9"	16'-9"		
4x2	#2	40	25	21'-9"	21'-9"	21'-9″	21'-9"	21′-9″	21'-9"	21'-9″	21'-9"		
4x2	MSR 2100	40	25	25′-9″	25′-9″	25′-9″	25'-9"	25′-9″	25'-6"	23'-10"			
4x2	MSR 2400	40	25	29′-9″	29'-8"	29′-9″	27'-7"	28′-5″	26'-0"	23'-10"			
3x2	#2	50	25	16′-9″	16′-9″	16′-9″	16′-9″	16′-9″	16′-9″	16′-9″	16'-9"		
4x2	#2	50	25	21′-9″	21′-9″	21'-9″	21′-9″	21'-9"	21'-9″	21′-6″	21'-0"		
4x2	MSR 2100	50	25	25′-9″	25′-9″	25′-9″	25'-0"	24'-10"	22'-5"				
4x2	MSR 2400	50	25	29′-9″	28′-2″	28'-2"							
3x2	#2	100	25	16′-9″	16′-9″	14'-8"	14'-8"	12′-7″	12'-7"	10'-8″	10'-8″		
4x2	#2	100	25	21'-9"	20'-0"	20'-0"	19′-0″						
4x2	MSR 2100	100	25	23'-5"									

\* Because Open Joist is a stock product, the length of an Open Joist truss determines the size and grade of the truss chords (see tables below). Maximum spans published on the chart (below left) may be limited by standard joist configuration. To find maximum clear span for each truss depth in a given loading condition, refer to the bottom line of spans shown for that load condition. **NOTE** 

Clear spans shown on this chart are presented under the following conditions:

- (1) Bearing of 1-1/2".
- (2) "Strongback" bracing is not considered.
- (3) Assumes a single layer of APA-rated wood sheathing is nailed or screwed.
- (4) Spans are clear distance
  between supports for
  uniformly loaded trusses
  and include allowable
  increases for repetitive
  use members.

# **Fire Assembly**

# One-Hour Floor / Ceiling System L/480 (#OJ/FCA 60-02)



- **1. Topping:** Topping is optional. Can be lightweight or proprietary topping.
- **2. Subflooring:** 5/8" tongue-and-groove plywood or oriented strandboard (OSB).
- 3. Structural members: Open Joist floor trusses, from a minimum depth of 9-1/4" to a maximum depth of 16", installed up to 24" on-center, maximum load design according to manufacturer L/480 load tables, with structural-graded 3x2 or 4x2 chords per NLGA grading rules for Canadian Lumber or graded by an inspection bureau or agency approved by the United States Department of Commerce Board of Review of the American Lumber Standards Committee with chord sizes of 3x2 or 4x2. Structural members should bear the WHI certification mark.
- **4. Bridging:** Continuous 2x4 lumber nailed to the bottom chord and the sides of the diagonals with 3" long nails.

- 5. Resilient channel: (Optional: For acoustic performance only.) Rigid steel furring channels (inverted hat-type) spaced 16" on-center and attached to the bottom chord by means of two Type W screws. Channels overlap on 10" at the end and are attached to each other by a 1-1/4" Type S screw.
- 6. Gypsum board: One layer of 5/8" Type X. Long edges located between joists perpendicular to the resilient channels. Short edges are staggered by 4 feet. Sheets are fastened to the resilient channels by means of 1-1/2" Type S screws located 1-1/2" away from the edge and 3" from the long edges. Screws are spaced 6" on-center. Joints are taped and finished with two layers of compound.
- **7. Insulation:** Insulation material is optional for acoustic and/or thermal protection.

Results obtained have been performed by Inchcape Testing Services NA Ltd-Warnock Hersey and are in accordance with ASTM E –119, CAN.ULC S-101 and UL-263.



# **Fire Assembly**

# Two-Hour Floor / Ceiling System L/480 (#OJ/FCA 120-01)



- **1. Topping:** Topping is optional. Can be lightweight or proprietary topping.
- **2. Subflooring:** Minimum 5/8" tongue-and-groove sheathing.
- **3. Structural members:** Open Joist, minimum depth 9-1/4", installed up to 24" on-center, with structural-graded 3x2 or 4x2 chords per NLGA grading rules for Canadian Lumber or graded by an inspection bureau of agency approved by the United States Department of Commerce Board of Review of the American Lumber Standards Committee with chord sizes of 3x2 and 4x2. Open Joist should bear the WHI certification mark.
- **4. Bridging:** Continuous 2x4 lumber nailed to the bottom chord and the sides of the diagonals with 2" long nails.

**The ceiling membrane** shall consist of three layers of 15.9-mm (5/8") proprietary Type C gypsum board. Each sheet will be not less than 1.22-m (4') wide. Acceptable products include, but are not limited to, Lafarge North America Firecheck C gypsum board National Gypsum Gold Bond Fireshield C gypsum board, and Georgia Pacific (GP) Gypsum ToughRock Fire Guard C gypsum board.

5. Resilient channel: Rigid steel furring channels (inverted hat-type) approximately 19-mm (3/4" deep) spaced not more than 406-mm (16") o.c. These channels shall be oriented perpendicular to the joists and attached to each truss using 70-mm (1-1/2") Type S or W screws.

If Open Joist members are installed at 16" o.c. or less, this resilient channel is optional.

Results obtained have been performed by Intertek Testing Services NA, Inc., and are in accordance with ASTM E –119, CAN.ULC S-101 and UL-263.

# **Fire Assembly continued**

### 6. Gypsum board:

### Base layer of gypsum board

The base or uppermost layer of gypsum board shall be attached directly to the channels (or bottom chord). The long edges of the gypsum board shall be oriented perpendicular to the trusses and with all end joints centered over the trusses. End joints must be staggered by at least two supports. The panels of gypsum board in the base layer shall be attached directly to the bottom of the trusses using Type S or Type W wallboard screws not less than 50mm (2") in length. The screws shall be spaced not more than 175-mm (7") apart along each truss. Screws shall be kept at least 38-mm (1-1/2") from the sides and 25-mm (1") from the ends of each sheet.

### Second layer of gypsum board

All joints between sheets in the second or middle layer of gypsum board must be staggered from those in the base layer. Except for the ends of each sheet, the second layer of gypsum board shall be attached to trusses using Type S or Type W wallboard screws not less than 64-mm (2-1/2") in length. The screws shall be spaced not more than 175-mm (7") apart along each truss. Screws shall be kept at least 38-mm (1-1/2") from the sides of each sheet. The ends of each sheet in the second layer of gypsum board shall be attached to the gypsum board in the uppermost layer using Type G wallboard screws not less than 38-mm (1-1/2") long. These screws shall be spaced not more than 175-mm (7") apart and will be kept at least 38-mm (1-1/2") from the ends of each sheet.

### Resilient channel

Rigid steel furring channels (inverted hat-type) approximately 19-mm (3/4" deep) spaced not more than 406-mm (16") o.c. shall be installed beneath the second layer of gypsum board. These channels shall be oriented perpendicular to the joists and attached to each truss using 70-mm (2-3/4") Type S screws.

### Face layer of gypsum board

The face or lowermost layer of gypsum board shall be attached directly to the rigid steel furring channels. The long edges of the gypsum board shall be oriented perpendicular to the furring channels and with all end joints centered over the channels. End joints must be staggered by at least two supports. The panels of gypsum board in the face layer shall be attached to the furring channels using Type S wallboard screws not less than 32-mm (1-1/4") in length. The screws shall be spaced not more than 175-mm (7") apart along each channel. Screws shall be kept at least 38-mm (1-1/2") from the sides and 12-mm (1/2") from the ends of each sheet.

All joints between adjacent sheets of gypsum board in the

face layer shall be taped and finished, and the heads of all screws used to attach that layer of gypsum board to the furring channels shall be treated (finished) as specified in ASTM C 840 Standard Specification for Application and Finishing of Gypsum Board and CAN/CSA A82.31-M91 Gypsum Board Application.

7. Insulation: Insulation material is optional.

HEXITHERM

Open Joist's unique finger-joinery construction is held together with

a structural adhesive that is resistant to water, heat and fire. Open Joist uses a phenol resorcinol adhesive developed by Hexion Specialty Chemicals, Inc. to ensure superior strength and performance.

HexiTherm Adhesives are a family of products specifically developed to provide superior heat performance for today's

engineered wood applications. Utilizing state-of-the-art thermosetting and emulsion technologies, HexiTherm products are thermally stable under the most rigorous conditions.

HexiTherm Adhesives meet or exceed the highest heat-and fireresistance standards in the wood products industry. They are certified, for example, by the American Lumber Standard Committee (ALSC) as Heat Resistant Adhesives (HRAs) for fingerjointed stud applications. They have also been tested and comply with specifications for 45-, 60- and 90-minute fire-rated doors.



# **Acoustical Performance**



- 1. **Topping:** Gypcrete or equivalent and/or carpet and pad (37 oz., 7/8" carpet with woven Polypropylene backing and 40 oz. felt pad or equivalent) or vinyl flooring (Armstrong Starstep or equivalent).
- **2. Subflooring:** Minimum 5/8" tongue-and-groove plywood or oriented strandboard (OSB).
- **3. Structural members:** Open Joist A II depths from 11-7/8" to and including 16", installed at 24" on-center or less.
- **4. Bridging** (optional): Continuous 2x nailed to the bottom chord and sides of the diagonals or verticals with 2" long nails.
- 5. Resilient channel: Galvanized steel 24-gauge spaced 16" on-center and attached to the bottom chord by means of two Type W screws. Channels overlap 10" at the end and are attached to each other by a 1-1/4" Type W screw.
- 6. Gypsum board: One layer of 5/8" Type X. Long edges located between joists perpendicular to the resilient channels. Short edges staggered by 4'. Sheets are fastened to the resilient channels by means of 1-1/2" Type S screws located 1-1/2" away from the edge and 3" away from the long edges. Screws are spaced 6" on-center. Joints are taped and finished with two layers of compound.
- **7. Insulation:** Cellulose (5-1/2" thick with 1.6 pcf density) or equivalent.

Open Joist Acoustical Characteristics Table											
Joist Depth	Insulation	Gypcrete	Carpet	Vinyl	STC	IIC					
11-7/8″	Yes	Yes	Yes	No	53	72					
11-7/8″	Yes	Yes	No	Yes	53	50					
11-7/8″	No	Yes	Yes	No	52	67					
14"	Yes	Yes	Yes	No	53	72					
14"	Yes	Yes	No	Yes	53	50					
14"	No	Yes	Yes	No	52	67					
16″	Yes	Yes	Yes	No	53	73					
16″	Yes	Yes	No	Yes	53	51					
16″	No	Yes	Yes	No	53	68					

JOIST LENGTH	9-1/4" DEPTH Chase (+ or – 1/4")	11-7/8" DEPTH Chase (+ or – 1/4")	14" DEPTH Chase (+ or – 1/4")	16" DEPTH Chase (+ or – 1/4")
3' 0"	6-1/4 x 21	8-7/8 x 21	11 x 21	13 x 21
4' 0"	Center post only	Center post only	Center post only	Center post only
5′ 0″	6-1/4 x 19-1/2	8-7/8 x 2-7/8	11 x 18-1/2	13 x 14-1/8
6' 0"	6-1/4 x 7-1/4	8-7/8 x 14-3/4	11 x 6-1/8	NONE
7′ 0″	6-1/4 x 18-1/8	8-7/8 x 6-3/8	11 x 18-1/4	13 x 10
8′ 0″	6-1/4 x 6-3/4	8-7/8 x 18-1/4	11 x 6	13 x 21-3/8
9′ 0″	6-1/4 x 18-5/8	8-7/8 x 10-1/8	11 x 18	13 x 5-1/8
10′ 0″	6-1/4 x 19-9/16	8-7/8 x 1-5/8	11 x 5-1/2	13 x 17-1/8
11′ 0″	6-1/4 x 18-3/8	8-7/8 x 13-7/8	11 x 17-1/8	13 x 21
12' 0"	6-1/4 x 22-3/4	8-7/8 x 5-5/8	11 x 5	13 x 7-1/4
13′ 0″	6-1/4 x 18-5/16	8-7/8 x 17-1/2	11 x 16-3/4	13 x 13-5/8
14' 0"	6-1/4 x 22-1/2	8-7/8 x 9-3/8	11 x 20-3/4	13 x 22-7/8
15' 0"	6-1/4 x 18-3/8	8-7/8 x 21-1/8	11 x 16-1/8	13 x 9-1/8
16' 0"	6-1/4 x 18-3/4	8-7/8 x 10-3/8	11 x 20-1/2	13 x 21-1/8
17′ 0″	6-1/4 x 6-3/8	8-7/8 x 19-1/2	11 x 10-1/8	13 x 4-3/8
18′ 0″	6-1/4 x 5-3/4	8-7/8 x 18-1/2*	11 x 19-1/2	13 x 16
19′ 0″	6-1/4 x 6-3/8	8-7/8 x 20-1/4	11 x 19-1/4*	13 x 20-1/8
20' 0"	6-1/4 x 5-5/8	8-7/8 x 22-3/8*	11 x 19	13 x 25-3/4*
21' 0"		8-7/8 x 24	11 x 20-1/4	13 x 21-1/4
22' 0"		8-7/8 x 15-3/4	11 x 20-1/4*	13 x 19-1/8*
23' 0"		8-7/8 x 15*	11 x 19-3/4	13 x 16-7/8
24' 0"			11 x 21-3/4*	13 x 20-3/8
25' 0"			11 x 19-1/4	13 x 12-1/8
26' 0"				13 x 18-3/8
27′ 0″				13 x 7
28' 0"				13 x 19-7/8
29' 0"				13 x 3
30' 0"				13 x 14-7/8

Chase openings are centered on joist unless otherwise indicated.

\* Not Centered

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# **Framing Connectors**







# **Top Flange Hangers**

JOIST HEIGHT	MODEL	NAILS		UPLIFT	DOWN LOAD	
		Header	Joist	(133)	DF/SP	SPF
JOIST \	NIDTH = 2-	1/2				
9-1/4	ITT39.37	6-10d	2-10dx1-1/2	210	1615	1200
11-7/8	ITT311.88	6-10d	2-10dx1-1/2	210	1615	1200
14	ITT314	6-10d	2-10dx1-1/2	245	1615	1200
16	ITT316	6-10d	2-10dx1-1/2	210	1615	1200
JOIST \	JOIST WIDTH = 3-1/2					
9-1/4	ITT49.37	6-10d	2-10dx1-1/2	210	1615	1200
11-7/8	ITT411.88	6-10d	2-10dx1-1/2	210	1615	1200
14	ITT414	6-10d	2-10dx1-1/2	245	1615	1200
16	ITT416	6-10d	2-10dx1-1/2	210	1615	1200

# Face Mount Hangers

JOIST HEIGHT	MODEL	NAILS		UPLIFT	DOWN	LOAD
		Header	Joist	(133)	DF/SP	SPF
JOIST V	VIDTH = 2-	1/2				
9-1/4	IUT310	8-10d	2-10dx1-1/2	210	890	770
11-7/8	IUT312	10-10d	2-10dx1-1/2	210	1110	960
14	IUT314	14-10d	2-10dx1-1/2	245	1555	1345
16	IUT316	16-10d	2-10dx1-1/2	210	1775	1535
JOIST V	JOIST WIDTH = 3-1/2					
9-1/4	IUT410	8-10d	2-10dx1-1/2	210	890	770
11-7/8	IUT412	10-10d	2-10dx1-1/2	210	1110	960
14	IUT414	14-10d	2-10dx1-1/2	245	1555	1345
16	IUT416	16-10d	2-10dx1-1/2	210	1755	1535

# Slope and Skew Hangers

JOIST HEIGHT	MODEL	NAILS		UPLIFT	DOWN	LOAD
		Header	Joist	(133)	DF/SP	SPF
JOIST \	NIDTH = 2 <sup>-</sup>	1/2				
9-1/4	LSSUH310	14-16d	12-10dx1-1/2	990	1600	1385
11-7/8	LSSUH310	14-16d	12-10dx1-1/2	990	1600	1385
14	LSSUH310	14-16d	12-10dx1-1/2	990	1600	1385
16	LSSUH310	14-16d	12-10dx1-1/2	990	1600	1385
JOIST WIDTH = 3 1/2						
9-1/4	LSSU410	14-16d	12-10dx1-1/2	990	1825	1580
11-7/8	LSSU410	14-16d	12-10dx1-1/2	990	1825	1580
14	LSSU410	14-16d	12-10dx1-1/2	990	1825	1580
16	LSSU410	14-16d	12-10dx1-1/2	990	1825	1580

# **Adjustable Height Hangers**

JOIST HEIGHT	MODEL	NAILS		UPLIFT	DOWN	LOAD
		Header	Joist	(133)	DF/SP	SPF
JOIST \	NIDTH = 2-	1/2				
9-1/4	THAI322	6-10d	2-10dx1-1/2	-	1835	1590
11-7/8	THAI322	6-10d	2-10dx1-1/2	-	1835	1590
14	THAI322	6-10d	2-10dx1-1/2	-	1835	1590
16	THAI322	6-10d	2-10dx1-1/2	-	1835	1590
JOIST \	JOIST WIDTH = 3-1/2					
9-1/4	THAI422	6-10d	2-10dx1-1/2	-	1835	1590
11-7/8	THAI422	6-10d	2-10dx1-1/2	-	1835	1590
14	THAI422	6-10d	2-10dx1-1/2	-	1835	1590
16	THAI422	6-10d	2-10dx1-1/2	-	1835	1590

# 45° Skew Hangers

JOIST HEIGHT	MODEL	NAILS		UPLIFT	DOWN	LOAD
		Header	Joist	(133)	DF/SP	SPF
JOIST	NIDTH = 2-	1/2				
9-1/4	SUR/L310	14-16d	6-10dx1 1/2	620	1860	1610
11-7/8	SUR/L310	14-16d	6-10dx1 1/2	620	1860	1610
14	SUR/L310	14-16d	6-10dx1 1/2	620	1860	1610
16	SUR/L314	18-16d	6-10dx1 1/2	825	2395	1795
JOIST WIDTH = 3-1/2						
9-1/4	SUR/L410	14-16d	6-16d	915	1860	1610
11-7/8	SUR/L410	14-16d	6-16d	915	1860	1610
14	SUR/L410	14-16d	6-16d	915	1860	1610
16	SUR/L414	18-16d	8-16d	1220	2395	1795

Shaded hangers require filler block at joist ends.

# **Notes on Hanger Charts**

- 1 a. Loads listed are based on hanger attachment to a Douglas Fir-Larch (DF) / Southern Pine (SP) or Spruce-Pine-Fire (SPF) species of LVL or solid-sawn header.
  - b. Down load column represents floor loading at 100% duration. Other load durations may apply; refer to the current Simpson Strong-Tie® Wood Construction Connectors catalog for allowable increases.
  - c. Minimum nail penetration required to achieve loads listed for face mount hangers: 10d common min. penetration = 1-3/4"; 16d common min. penetration = 2".
  - d. THAI hangers require a minimum of four top and two face nails installed.
  - e. Uplift loads are based on an SPF joist and have been increased 33% for earthquake and wind loading with no further increase allowed. Reduce according to the code for normal loading criteria like cantilever construction.

2. Hanger height less than 60% of joist height. Potential joist rotation may occur. See Simpson catalog for additional information.

SUL/R

- 3. Top flange hanger configuration and thickness of top flange need to be considered for flush frame conditions.
- 4. Refer to the current Composite Wood Products Connectors catalog for hanger models not shown.
- 5. Joists taller than 14" require lateral restraint at the top chord (or near the top) when used with the THAI hanger. Lateral restraint can be accomplished with filler blocks or blocking.
- 6. When filler blocks are required, the thickness of the filler blocks should provide an outside surface even with the outside edge of the flange.
- 7. All nails shown are common nails unless otherwise noted.







# **Open Joist Specifications**

This guide specification has been prepared by Universal Forest Products, Inc. to assist design professionals in the preparation of a specification section covering Open Joist open-web wood joists for use in floor framing in residential and commercial projects. These joists may only be used for roof framing where the roof slope is 1/2 in. 12 or less and when adequately sized for this condition. Refer to Open Joist literature for additional information on these products.

Open Joist products can be used in fire-rated and acoustical-rated floor assemblies when combined with other building components, including cementitious toppings, subflooring, and gypsum board as applicable to the tested assembly. Refer to Open Joist literature and Web site for information on fire-rated and acoustical-rated assemblies.

This specification may be used as the basis for developing either a project specification or an office master specification. Since it has been prepared according to the principles established in the Manual of Practice published by the Construction Specifications Institute (CSI), it may be used in conjunction with most commercially available master specification systems with minor editing.

This guide specification is available on our Web site at: www.openjoist.com

### **PART 1 - GENERAL**

### 1.1 Summary

- **A.** Section includes:
  - 1. Open-web wood floor joists.
  - 2. Bracing, blocking and accessories.
- B. Related sections:
  - 1. Division 1: Administrative, procedural, and temporary work requirements.
  - 2. Section 06110 Framing and Sheathing
    - a. Wood bracing, blocking and framing for openings.
    - b. Subflooring.

### 1.2 References

- A. International Code Council (ICC) (www.iccsafe.org) 2006 International Building Code (IBC) 2006 International Residential Code (IRC) 1999 BOCA National Building Code/1999 (BNBC) 1999 Standard Building Code (SBC) 1997 Uniform Building Code (UBC)
- B. National Institute of Standards and Technology (NIST) (www.nist.gov) PS20 American Softwood Lumber Standard.
- **C.** Canadian Wood Council member lumber grading agencies qualified by the American Lumber Standards Board of Review.

### **1.3 System Description**

- **A.** Design floor loads:
  - 1. Live load.
  - 2. Dead load.
  - 3. Deflection maximum.

### 1.4 Submittals

- A. Submittals for review:
  - Shop drawings: Indicate sizes and spacing of joists and associated components, web and chord member sizes, loading, bracing and blocking, and framed openings.
  - 2. Product data: Include joist configurations, bearing and anchor details, bracing and blocking.



# **Open Joist Specifications**



### 1.5 Quality Assurance

- A. Manufacturer:
  - 1. Experience in manufacture of open-web wood joists.
  - 2. Member of Wood Truss Council of America (WTCA).
- B. Lumber Grading Agency: Certified to NIST PS 20.
- **C.** Joists: Meet requirements of ICC International Building Code; certified by ICC Evaluation Service, Inc.

# 1.6 Delivery, Storage and Handling

- **A.** Handle joists upright by bottom flange.
- B. Prevent excessive flat-wise bending of joists.
- C. For joists stored outdoors:
  - 1. Place joists on blocks or spacers located at ends and maximum 10 feet on-center.
  - 2. Cover joists with properly vented, waterproof coverings.
  - 3. Do not stack joist bundles more than three high.
  - 4. Leave joist bundle bands in place until ready to use.

# PART 2 - PRODUCTS

### 2.1 Manufacturer

A. Contract documents are based on Open Joist by Universal Forest Products, Inc.

### 2.2 Materials

**A.** Lumber: Spruce-Pine-Fir, graded to requirements of Canadian Wood Council lumber grading agencies.

### 2.3 Accessories

- A. Lumber for bracing, blocking and framed openings.
- B. Fasteners.

### 2.4 Fabrication

A. Fabricate joists to achieve specified structural requirements.

### PART 3 - EXECUTION

### 3.1 Installation

- A. Install joists and accessories in accordance with manufacturer's instructions and approved shop drawings.
- B. Set joists level, plumb, right-side up, in correct position.
- **C.** Joists may be trimmed maximum 5-1/2 inches on each end; leave minimum 1-3/4 inches of solid end block intact.
- **D.** Do not cut, notch or drill joist top chords, bottom chords or webs.
- E. Provide minimum 1-1/2 inches of bearing at each end of joists.
- **F.** Fasten joists to top plates, bearing plates, rim boards, and other joists butting end to end or lapping at ends.
- **G.** Place temporary 2x4 lumber bracing perpendicular to joists at maximum 8 feet on-center, spanning minimum of three joists. Fasten bracing to each joist.
- **H.** Place triangulated 2x4 lumber bracing or 4-foot wide strip of temporary or permanent sheathing where end walls are not braced.
- I. Remove temporary bracing and sheathing progressively as permanent subflooring is installed.
- J. Install permanent bracing at locations indicated on shop drawings.
- K. Frame openings between trusses with lumber in accordance with Architect/Engineer requirements.
- L. Coordinate placement of subflooring with work of this section.
- M. Installation tolerances:
  - Location of framing members: Maximum 1 inch from indicated positions.



Notes	



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Technical inquiries: 800-584-5191

### www.openjoist.com

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