



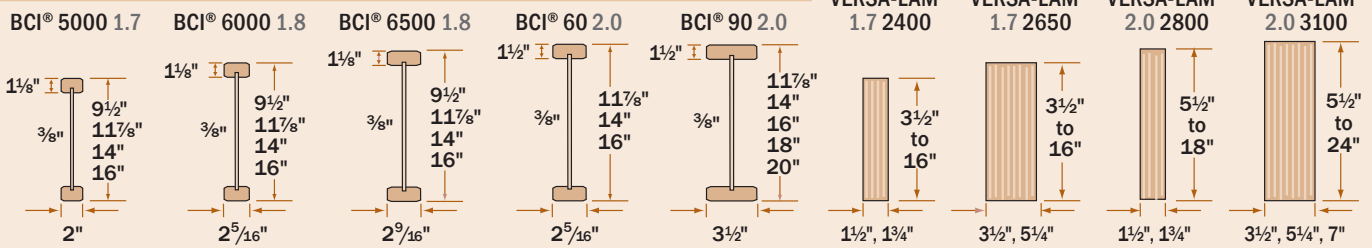
Boise Cascade
Engineered Wood Products

FIRE DESIGN & INSTALLATION GUIDE

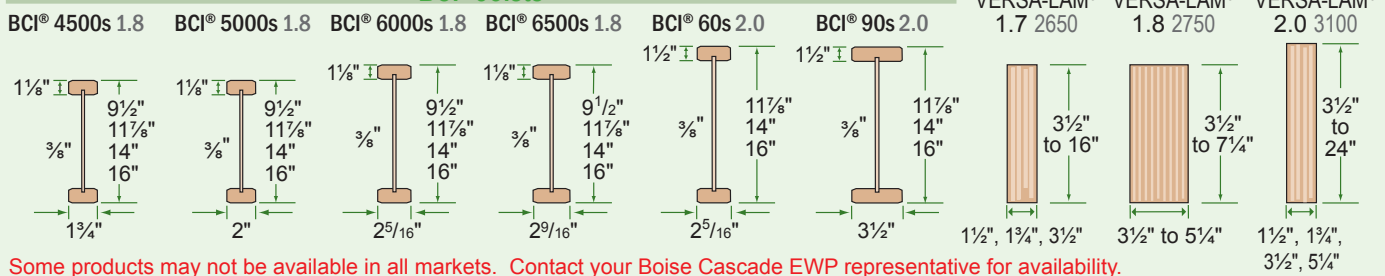
**LIMIT STATES DESIGN
CANADA**



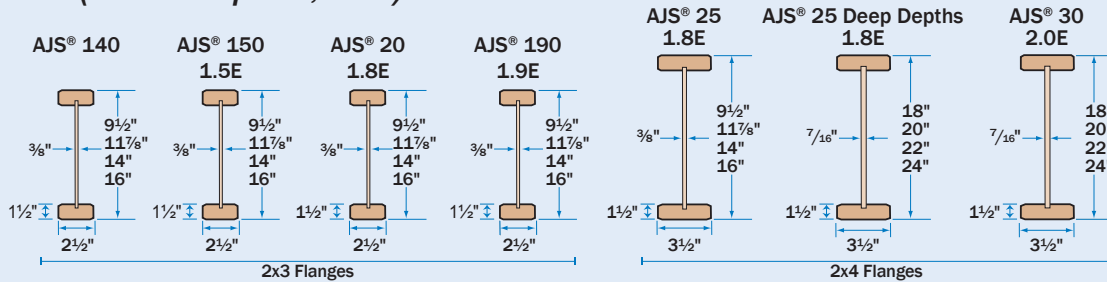
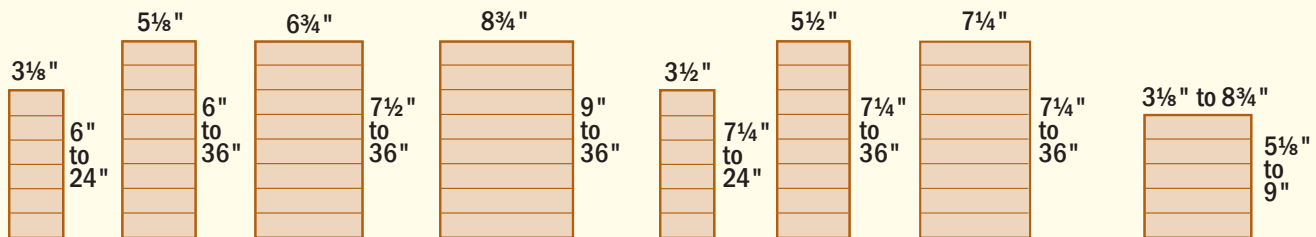
The information in this document pertains to use in CANADA ONLY, Limit States Design. Refer to the Fire Design and Installation, US Version for use in the United States.

BCI® Joists and VERSA-LAM® Beams — Western (White City, OR)**BCI® Joists**

Some products may not be available in all markets. Contact your Boise Cascade EWP representative for availability.
BCI® and VERSA-LAM® products shall be installed in dry-use applications only, per their respective ICC ESR evaluation reports.

BCI® Joists and VERSA-LAM® Beams — Eastern (Lena, LA)**BCI® Joists**

Some products may not be available in all markets. Contact your Boise Cascade EWP representative for availability.

ALLJOIST® (St. Jacques, NB)**BOISE GLULAM® (Homedale, ID)**

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Boise Cascade manufactures and distributes quality Engineered Wood Products for modern construction throughout the United States and Canada. These products include BCI® & AJS® wood I-joists, VERSA-LAM® beams/columns/studs, BOISE GLULAM® beams/columns, and BOISE RIMBOARD® products. When compared to sawn lumber, Boise Cascade Engineered Wood Products provide higher strength, stiffness and dimensional consistency through more efficient use of raw materials to exacting industry quality standards required for modern construction.

This guide provides detailed information for the design and construction professional about the relationship between Boise Cascade Engineered Wood Products, national building codes, and actual fire events. For further information, contact Boise Cascade EWP Engineering at (800) 232-0788 or your local Boise Cascade representative.



Construction and Fire Safety

The National Building Code of Canada (NBCC) is divided into three divisions; Division B providing acceptable solutions to objectives listed in Division A and Division C being administrative. Within Division B, Part 3 provides fire protection solutions for all buildings, with some exceptions of smaller structures such as housing. Part 3 of the NBC establishes occupancy classifications of buildings and for wood framing the most common classifications are Group C - Residential, Group D – Business and Personal Services, Group E – Mercantile, and Group F – Low Hazard Industrial.

Heavy Timber Construction is defined in section 3.1.4.7. Heavy Timber is allowed in combustible construction if the fire-resistance rating does not exceed 45 minutes. Because of wood's ability to maintain structural capacity during a fire, Heavy Timber allows large, open areas with exposed beams and columns. Minimum cross-sectional areas are required for framing members in Heavy Timber Construction; please see the table below for minimum BOISE GLULAM® and VERSA-LAM® sizes. A calculation method for beams and columns requiring fire-resistance ratings greater than 45 minutes is found in Appendix D-2.11.1 of Division B. Please contact Boise Cascade EWP Engineering for further information.



Supported Assembly	Structural Element	Minimum Sizes [in x in]
Roof Only	Columns	5.125 x 7.5
Roof Only	Beams, Girders	3.125 x 6
Floor or Floor + Roof	Columns	7 x 7.5
Floor or Floor + Roof	Beams, Girders	5.125 x 9 or 7 x 7.5

Fire resistive ratings are defined in section 3.1.7 of Division B. The rating of a material, assembly of materials, or a structural member shall be determined by testing per CAN/ULC-S101 or assigned a rating per Appendix D of the NBCC.

Part 9 of Division B provides solutions for housing and smaller buildings, as defined by subsection 1.3.3.3 of Division A. Specifically, Part 9 applies to buildings of three storeys or less, having an area no greater than 6,460 square feet, and having the classification of Group C, D, E, or F (divisions 2 and 3). Section 9.10 defines fire protection for these types of structures.

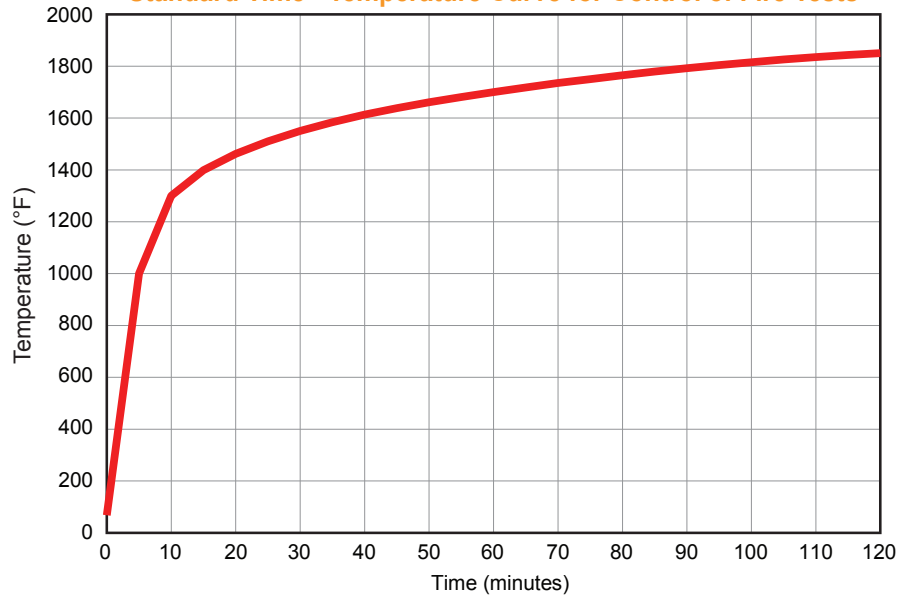
Fire Resistance Ratings

Fire resistance is the ability of materials or assemblies to prevent or restrict the passage of excessive heat, hot gases, or flames while continuing to support the structural loads. The performance of wall and floor assemblies exposed to fire is determined through testing in accordance with ASTM E 119 or NFPA 251 or CAN/ULC-S101. In a full-scale assembly test (at least 180 ft² for a floor assembly and 100 ft² for a wall assembly), a specimen is loaded to the maximum design load and directly exposed to flame. The rate of temperature rise is controlled to follow a standard time-temperature curve.

Results of full-scale fire endurance assembly tests provide a repeatable, relative measure of fire resistance based on three failure criteria: structural collapse, flame penetration, or excessive temperature rise on the unexposed surface of the assembly. National building codes require that certain types of buildings or occupancy classes be constructed with floor and wall assemblies that provide fire endurance for a specified period of time based on these tests.

When required by national building codes, fire endurance rated assemblies are available for BCI®, AJS® and VERSA-LAM® products. The fire endurance assemblies in this guide

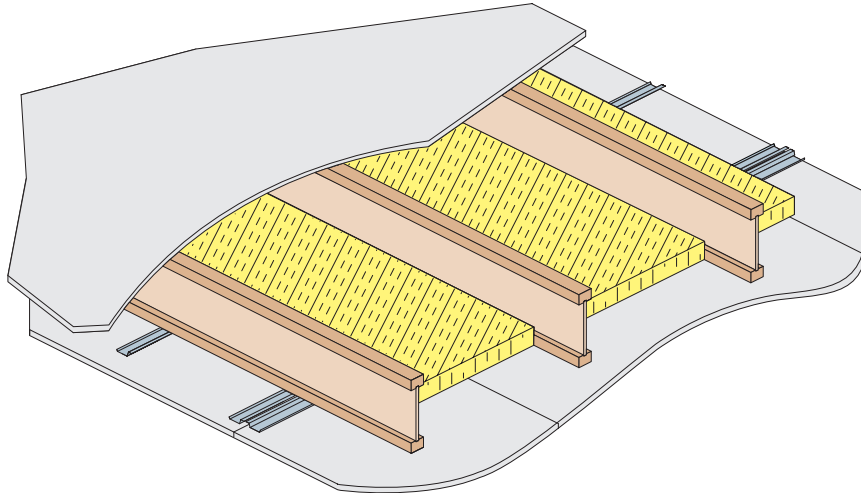
Standard Time - Temperature Curve for Control of Fire Tests



can be further referenced in the National Building Code Canada and/or assembly listings with APA – The Engineered Wood Association (APA Product Report PR-S201), the accredited testing and product certification agency for Boise Cascade EWP fire resistant assembly details. Per the section titled Certification, located on page xiv of NBCC 2010 Volume 1, accredited certification bodies are found on the Standards Council of Canada (SCC) web site, www.scc.ca. APA – The Engineered Wood Association is listed in the SCC directory; the following is the direct link: <http://www.scc.ca/en/accreditation/product-process-and-service-certification/directory-of-accredited-clients>. All fire resistant assemblies shown in this guide are found within the APA – The Engineered Association Product Report PR-S201: www.apawood.org/level_b.cfm?content=prd_rept_main.



One Layer 5/8" Type C Gypsum Wallboard - BCI® and AJS® Joists



BASE ASSEMBLY

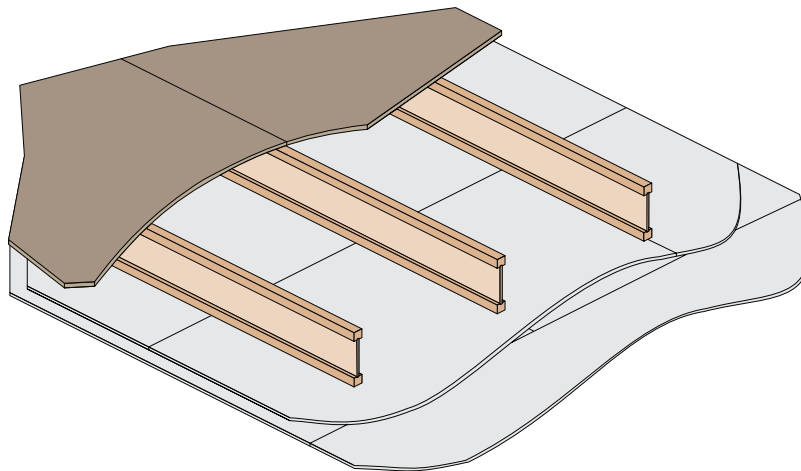
Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements..	
Insulation	Min. 3½ inch (89 mm) Glass Fiber Insulation or 2 inch (51 mm) Rock Wool Insulation, 2.5 pcf Nominal.
Reference sound ratings if applicable.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum BCI® flange dimensions of 1½ inch (29mm) thick by 1½ inch (38mm) wide. Minimum AJS® flange dimensions of 1½ inch (38mm) thick by 2½ inch (64mm) wide.	
Resilient Channels	Min. 0.019 inch (0.5mm) Galvanized Resilient Channel
Attached perpendicular to the bottom flange of the joist with 1½ inch (29mm) Type W drywall screws. Channels are spaced a maximum of 16 inches (406mm) on center. Additional channels required at gypsum wallboard end joints such that each board rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges.	
Ceiling	(1) Layer of 5/8 inch (16mm) Type C Gypsum Wallboard
Installed with long dimension perpendicular to resilient channels and fastened with minimum 1½ inch (29mm) Type S drywall screws at 7 inches (178 mm) on center. The end joints of the wallboard must be staggered the equivalent of two joist spacings with those of adjacent sheets. Screws shall be minimum 1½ inch (38mm) from board edge and ¾ inch (19mm) from board ends. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

REFERENCE

BCI® Joists	AJS® Joists
2010 NBCC Table A-9.10.3.1.B., Assembly Num. F8, F10, F14, and F20	2010 NBCC Table A-9.10.3.1.B., Assembly Num. F8, F10, F14, and F20
APA PR-S201 FR1	APA PR-S201 FR1

One-Hour Fire Resistance Rated Floor and Roof Assemblies

Two Layers 5/8" Type X Gypsum Wallboard - BCI® and AJS® Joists



BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation (Optional)	Max 9½ inch (241 mm) Glass Fiber Insulation
Reference sound ratings if applicable	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (29mm) thick by 1½ inch (38mm) wide.	
Resilient Channels (Optional)	Min. 0.019 inch (0.5mm) Galvanized Resilient Channel
Attached perpendicular to the bottom flange of the joist with 1¼ inch (32mm) Type S drywall screws. Channels are spaced a maximum of 16 inches (406mm), 24 inches (610mm) on center when I-joists are spaced a maximum of 16 inches on center.	
Ceiling	(2) Layers of 5/8 inch (16mm) Type X Gypsum Wallboard
Base Layer: Install with long dimension perpendicular to joist length. Attached to the bottom flange of the joists using 1¼ inch (32mm) Type W drywall screws at 24 inches (610 mm) on center. The end joints of the wallboard must be centered on the bottom flange of the joist and must be staggered the equivalent of two joist spacings with those of adjacent sheets. Face Layer: Install with long dimension perpendicular to joist length. Attached to the bottom flange of the joists through the first layer using 1 inch (48mm) Type W drywall screws spaced at 12 inches (305mm) on center. The longitudinal joints of this layer must be offset 24 inches (610mm) from those of the base layer. The end joints must be centered on the bottom flange of the joists and offset a minimum of one joist spacing from those of the base layer. Additionally, face layer end joints are attached to the base layer with 1½ inch (38mm) Type G drywall screws at 12 inches (305mm) on center placed 2 inches (51mm) either side of the joint. With Resilient Channels: attached as described above except use 1¾ inch (35mm) and 1¼ inch (44mm) Type S screws for the base and face layer, respectively. The end joints of the wallboard must be centered on a resilient channel and must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound	

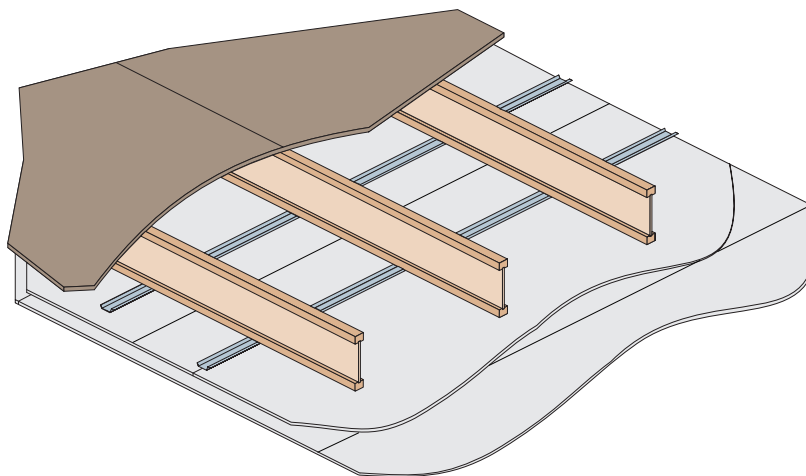
SOUND RATING (w/Resilient Channel)

Components	STC	IIC
Base Assembly with Carpet and Padding	54	68
Base Assembly with 3½" (89mm) Insulation	55	46
Base Assembly with additional layer of 5/8" Sheathing and 9½" Insulation	61	50
Base Assembly with Tarkett "Acoustiflor" vinyl and 3½" Insulation	59	50
Base Assembly with cushioned vinyl, ¾" Gypsum Concrete and 3½" Insulation	67	51

REFERENCE

BCI® Joists	AJS® Joists
2006 / 2009 IBC® Table 720.1(3), Item Number 22-1.1/21-1.1	2006 / 2009 IBC® Table 720.1(3), Item Number 22-1.1/21-1.1
ICC-ES ESR 1336 and APA PR-S201 FR2	APA PR-S201 FR2
Similar to 2010 NBCC Table A-9.10.3.1.B, Assembly Num. F4, F9, F11, and F13, F15, F17, and F21.	Similar to 2010 NBCC Table A-9.10.3.1.B, Assembly Num. F4, F9, F11, and F13, F15, F17, and F21.

Two Layers ½" Type C Gypsum Wallboard - BCI® and AJS® Joists



BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements..	
Insulation (Optional)	Max 9½ inch (241 mm) Glass Fiber Insulation
Reference sound ratings if applicable	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (29mm) thick by 1½ inch (38mm) wide.	
Resilient Channels (Optional)	Min. 0.019 inch (0.5mm) Galvanized Resilient Channel
Attached perpendicular to the bottom flange of the joist with 1¼ inch (32mm) Type S drywall screws. Channels are spaced a maximum of 16 inches (406mm), 24 inches (610mm) on center when I-joists are spaced a maximum of 16 inches on center.	
Ceiling	(2) Layers of ½ inch (13mm) Type C Gypsum Wallboard
Base Layer: Install with long dimension perpendicular to joist length. Attached to the bottom flange of the joists using 1¼ inch (32mm) Type W drywall screws at 12 inches (305 mm) on center. The end joints of the wallboard must be centered on the bottom flange of the joist and must be staggered the equivalent of two joist spacings with those of adjacent sheets. Face Layer: Install with long dimension perpendicular to joist length. Attached to the bottom flange of the joists through the first layer using 1½ inch (41mm) Type W drywall screws spaced at 12 inches (305mm) on center on intermediate joists and 6 inches (152mm) on center at end joints. The longitudinal joints of this layer must be offset 24 inches (610mm) from those of the base layer. The end joints must be centered on the bottom flange of the joists and offset a minimum of one joist spacing from those of the base layer. Additionally, face layer end joints are attached to the base layer with 1½ inch (38mm) Type G drywall screws at 8 inches (203mm) on center placed 6 inches (152mm) either side of the joint. With Resilient Channels: attached as described above except use 1¼ inch (32mm) and 1½ inch (41mm) Type S screws for the base and face layer, respectively. The end joints of the wallboard must be centered on a resilient channel and must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

SOUND RATING (w/Resilient Channel)

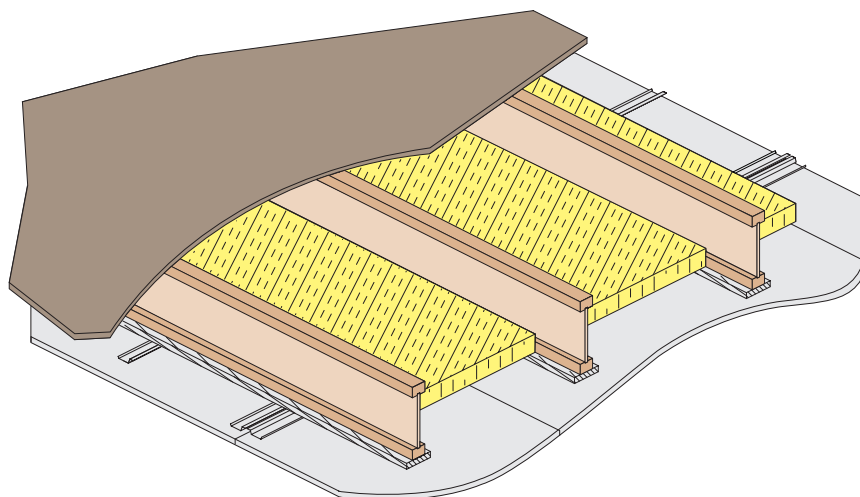
Components	STC	IIC
Base Assembly with Carpet and Padding	54	68
Base Assembly with 3½" (89mm) Insulation	55	46
Base Assembly with additional layer of ⅝" Sheathing and 9½" Insulation	61	50
Base Assembly with Tarkett "Acoustiflor" vinyl and 3½" Insulation	59	50
Base Assembly with cushioned vinyl, ¾" Gypsum Concrete and 3½" Insulation	67	51

REFERENCE

BCI® Joists	AJS® Joists
2006 / 2009 IBC® Table 720.1(3), Item Number 27-1.1/26-1.1	2006 / 2009 IBC® Table 720.1(3), Item Number 27-1.1/26-1.1
2006/2009 IBC Table 720.1(3), Item Number 28-1.1/27-1.1	2006/2009 IBC Table 720.1(3), Item Number 28-1.1/27-1.1
ICC-ES ESR 1336 and APA PR-S201 FR3	APA PR-S201 FR3
Similar to 2010 NBCC Table A-9.10.3.1.B, Assembly Num. F4, F9, F11, and F13, F15, F17, and F21.	Similar to 2010 NBCC Table A-9.10.3.1.B, Assembly Num. F4, F9, F11, and F13, F15, F17, and F21.

One-Hour Fire Resistance Rated Floor and Roof Assemblies

One Layer 5/8" Type C Gypsum Wallboard - BCI® 60/90 and AJS® Joists



BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation	Min. 2 inch (51 mm) Mineral Fiber Insulation, Min. 3.5 pcf
Installed adjacent to the bottom flange of the I-Joist and supported by the 1x4 furring strips. The ends of the batts must be centered over resilient channels.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (38mm) thick by 1½ inch (38mm) wide.	
Furring Strips	1x4 (Nominal) Wood Furring Strips
Centered on the bottom flange of the I-Joist and attached with 1½ inch (38mm) Type W screws at 24 inches (610mm) on center.	
Resilient Channels	Min. 0.019 inch (0.5mm) Galvanized Resilient Channel
Attached perpendicular to the bottom flange of the joist with 1½ inch (32mm) Type S drywall screws. Channels are spaced a maximum of 16 inches (406mm), 24 inches (610mm) on center when I-joists are spaced a maximum of 16 inches on center.	
Ceiling	(1) Layer of 5/8 inch (16mm) Type C Gypsum Wallboard
Installed with long dimension perpendicular to resilient channels and fastened with minimum 1½ inch (29mm) Type S drywall screws at 7 inches (178 mm) on center. The end joints of the wallboard must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

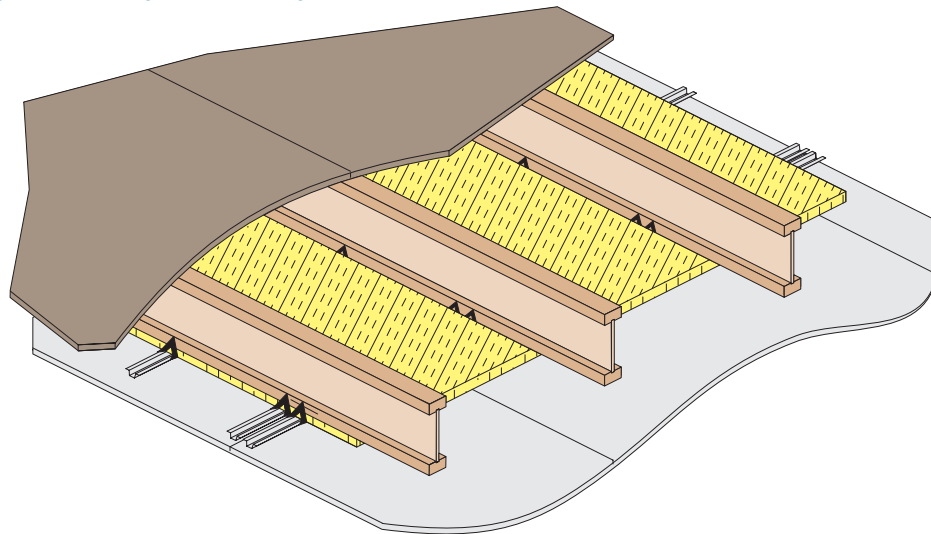
SOUND RATING (w/Resilient Channel)

Components	STC	IIC
Base Assembly with Carpet and Padding	52	66
Base Assembly with cushioned vinyl, 3/4" Gypsum Concrete	55	49
Base Assembly with cushioned vinyl, 3/4" Gypsum Concrete, 1/4" Acousti-Mat II	58	57

REFERENCE

BCI® Joists	AJS® Joists
2006 / 2009 IBC® Table 720.1(3), Item Number 23-1.1 ICC-ES ESR 1336 and APA PR-S201 FR4	2006 / 2009 IBC® Table 720.1(3), Item Number 23-1.1 APA PR-S201 FR4

One Layer ½" Type C Gypsum Wallboard - BCI® 60/90 and AJS® Joists



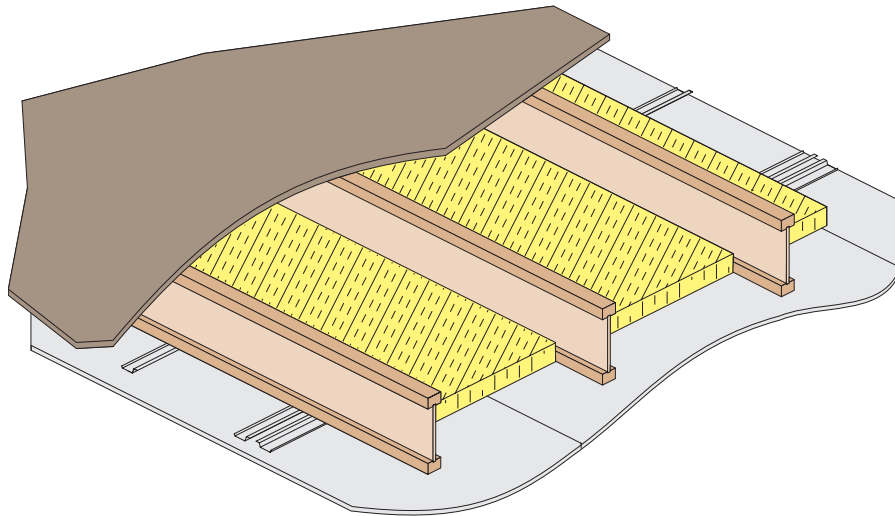
BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation	Min. 1 inch (25 mm) Mineral Fiber Insulation, Min. 6 pcf
Installed parallel to the I-Joist between the furring channel and bottom flange. The sides of the insulation must butt against the support clips. The ends of the batts must be centered over furring channels.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (38mm) thick by 2 ⁵ / ₁₆ inch (59mm) wide.	
Furring Channel	Min. 0.019 inch (0.5mm) Hat Shaped Galv. Steel Channels
Attached perpendicular to the bottom flange of the I-Joist, spaced a maximum of 24 inches (406mm) on center and doubled at each wallboard end joint extending to the next joist beyond each joint. The channels must be attached with Simpson Strong-Tie® CSC support clips (or equal) at each intersection with the joists. Clips must be nailed to the side of the joist bottom flange with one 8d x 1½ inch (38mm) long nail.	
Ceiling	(1) Layer of ½ inch (13mm) Type C Gypsum Wallboard
Installed with long dimension perpendicular to furring channels and fastened with minimum 1 inch (25mm) Type S drywall screws at 12 inches (305 mm) on center. The end joints of the wallboard must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

REFERENCE

BCI® 60/90 Joists	AJS® Joists
DCA #3 WIJ-1.4	DCA #3 WIJ-1.4

One Layer 5/8" Type C Gypsum Wallboard - BCI® 90 Joists and AJS® 25/30 Joists



BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation	Min. 1½ inch (38mm) Mineral Fiber Insulation, Min. 2.8 pcf
Installed adjacent to the bottom flange of the I-Joist and supported by the furring channels. The ends of the batts shall be centered over resilient channels.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (38mm) thick by 3½ inch (89mm) wide.	
Resilient Channels	Min. 0.019 inch (0.5mm) Resilient Channels
Attached perpendicular to the bottom flange of the I-Joist with 1½ inch (41mm) Type S drywall screws. Channels are spaced a maximum of 16 inches (406mm) on center and doubled at each wallboard end joint extending to the next joist beyond each joint.	
Ceiling	(1) Layer of 5/8 inch (16mm) Type C Gypsum Wallboard
Installed with long dimension perpendicular to resilient channels and fastened with minimum 1½ inch (29mm) Type S drywall screws spaced at 12 inches (305mm) on center on intermediate joists and 8 inches (203mm) on center at end joints. The end joints of the wallboard must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

SOUND RATING*

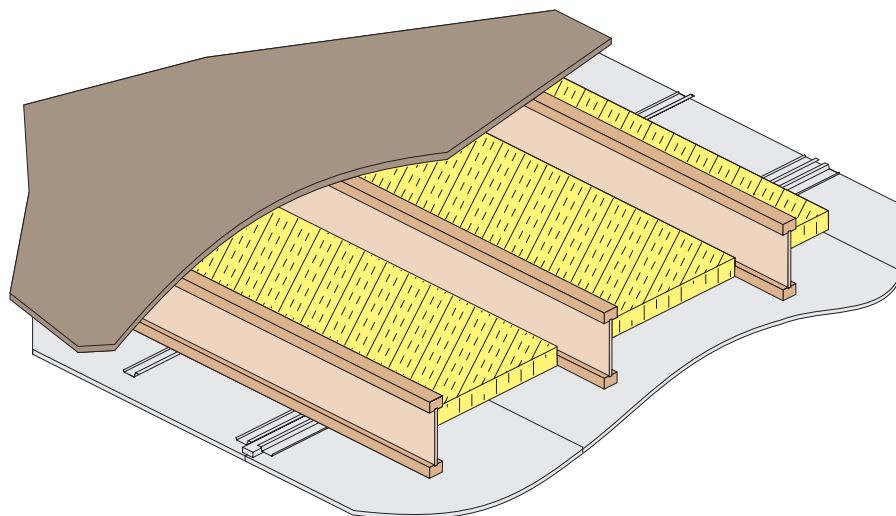
Components	STC	IIC
Base Assembly with cushioned vinyl	51	46
Base Assembly with Carpet and Padding	51	64
Base Assembly with cushioned vinyl, Gypsum Concrete	60	50
Base Assembly with Carpet and Padding, Gypsum Concrete	60	65

SIMILAR ASSEMBLIES

BCI® 90 Joists	AJS® 25/30 Joists
2006/2009 IBC® Table 720.1(3), Item Num. 26-1.1/25-1.1	
2012 IBC® Table 721.1(3), Item Num. 25-1.1	
2010 NBCC Table A-9.10.3.1.B., Assembly Num. F10, F14, and F20	
DCA 3, WIJ-1.2	
ICC-ES ESR 1336, Figure 5 and APA PR-S201 FR6	APA PR-S201 FR6

* Sound ratings from the American Wood Council publication Design for Code Acceptance 3. Retrieved from <http://www.awc.org/publications/DCA/DCA3/DCA3.pdf>.

One Layer 5/8" Type C Gypsum Wallboard & Strips - BCI® 90 Joists and AJS® 25/30 Joists



BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation	Min. 1½ inch (38mm) Mineral Fiber Insulation, Min. 3.5 pcf
Installed adjacent to the bottom flange of the I-Joist and supported by the furring channels. The ends of the batts shall be centered over resilient channels.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (38mm) thick by 3½ inch (89mm) wide.	
Furring Channels	Min. 0.019 inch (0.5mm) Resilient Channels
Attached perpendicular to the bottom flange of the I-Joist with 1¼ inch (32mm) Type W drywall screws. Channels are spaced a maximum of 16 inches (406mm) on center and doubled at each wallboard end joint extending to the next joist beyond each joint.	
Gypsum Strips	2 inch (51mm) wide by ½ inch (13mm) Type C Gypsum Wallboard
Installed perpendicular to the joists above each end joint of the 5/8 inch (16mm) gypsum wallboard. The strips are attached with one 1¼ inch (32mm) Type W drywall screw at each joist."	
Ceiling	(1) Layer of 5/8 inch (16mm) Type C Gypsum Wallboard
Installed with long dimension perpendicular to resilient channels and fastened with minimum 1½ inch (29mm) Type S drywall screws spaced at 8 inches (203mm) on center. The end joints of the wallboard must be staggered the equivalent of two joist spacings with those of adjacent sheets. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

SOUND RATING (w/Resilient Channel)

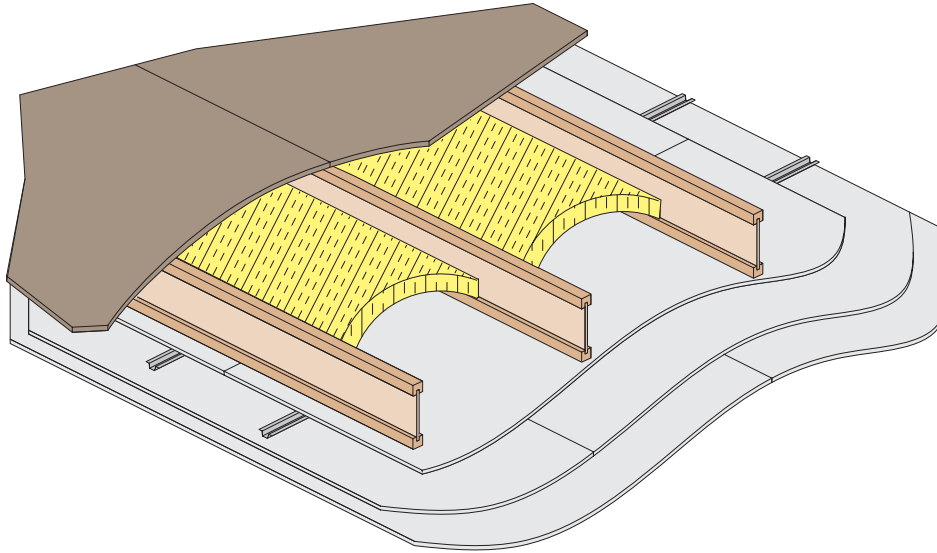
Components	STC	IIC
Base Assembly with Carpet and Padding	55	62
Base Assembly with cushioned vinyl, 3/4" Gypsum Concrete	58	45
Base Assembly with cushioned vinyl, Gypsum Concrete, 1/4" Acousti-Mat II	61	53

REFERENCE

BCI® 90 Joists	AJS® 25/30 Joists
ICC-ES ESR 1336 and APA PR-S201 FR7	APA PR-S201 FR7

Two-Hour Fire Resistance Rated Floor and Roof Assemblies

Three Layer 5/8" Type C Gypsum Wallboard - BCI® and AJS® Joists



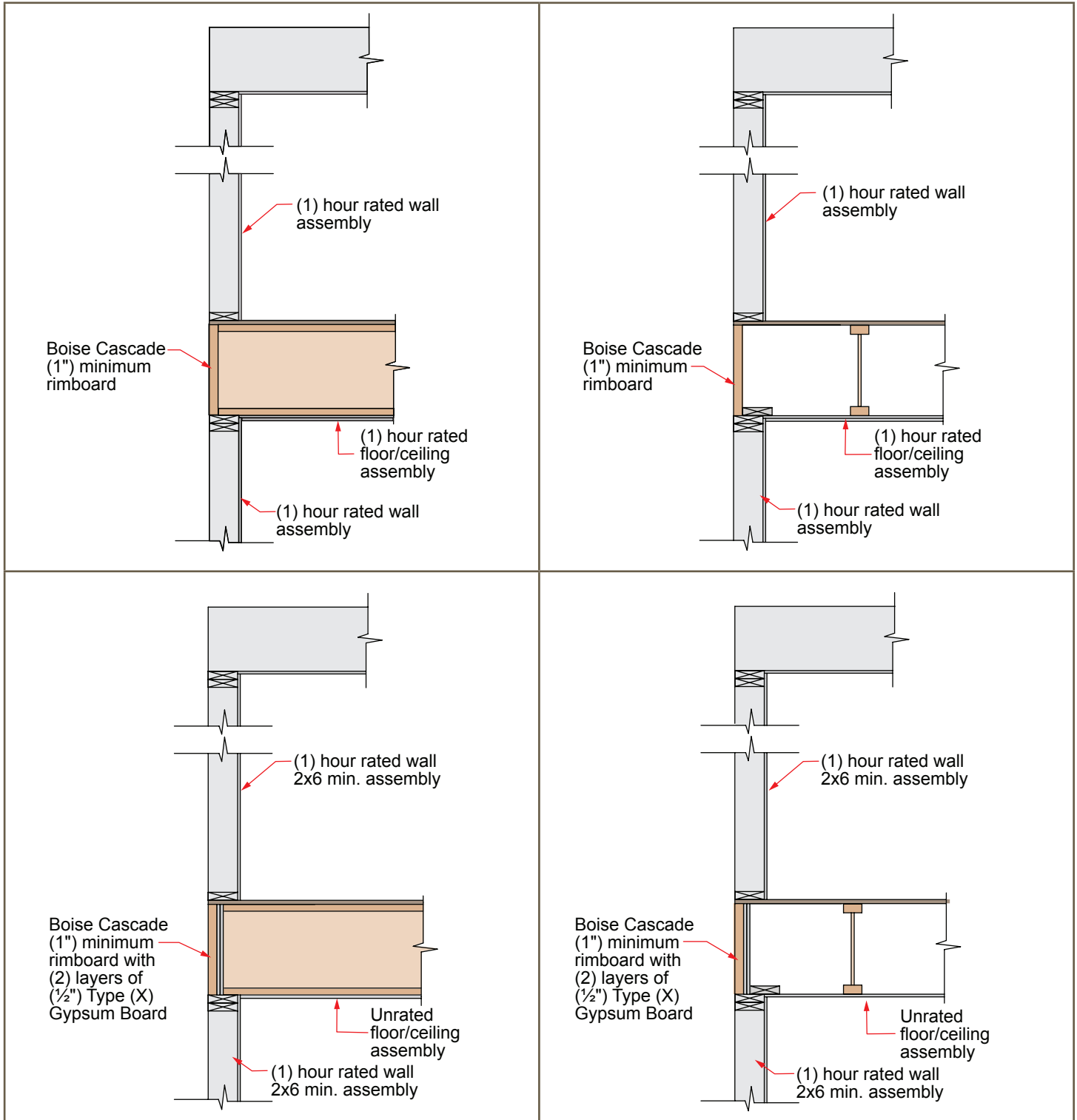
BASE ASSEMBLY

Component	Material Specification
Floor Topping (Optional)	Varies
Reference sound ratings if applicable	
Floor Sheathing	Min. 23/32 inch (18 mm) Wood Structural Panel
A modified contact construction adhesive must be applied to the top of the joists prior to placing sheathing. The sheets shall be installed with their long edge perpendicular to the joists with end joists centered over the top flange of joists and staggered one joist spacing with adjacent sheets. Floor sheathing must be installed per code requirements.	
Insulation	Max. 3½ inch (89mm) Unfaced Glass Fiber Insulation
Friction fitted between I-Joists and supported by stay wires spaced 12 inches (305mm) on center along the joist bottom flange.	
Structural Members	Min. 9½ inch (241mm) Deep Joists
Maximum 24 inch (610 mm) on center spacing. Minimum flange dimensions of 1½ inch (29mm) thick by 2 inch (51mm) wide.	
Furring Channels	Min. 0.019 inch (0.5mm) Hat Shaped Galv. Steel Channels
Attached perpendicular to the bottom flange of the I-Joist with 1½ inch (41mm) Type S drywall screws penetrating through the wallboard base layer into each joist flange. Channels are spaced a maximum of 16 inches (406mm) on center and doubled at each wallboard end joint extending to the next joist beyond each joint.	
Ceiling	(3) Layer of 5/8 inch (16mm) Type C Gypsum Wallboard
Base Layer: Install with long dimension perpendicular to joist length. Attached to the bottom flange of the joists using 1½ inch (41mm) Type S drywall screws at 12 inches (305 mm) on center. The end joints of the wallboard must be centered on the bottom flange of the joist and must be staggered the equivalent of two joist spacings with those of adjacent sheets. Middle Layer: attached to furring channels using 1-inch (25mm) Type S drywall screws at 12 inches (305mm) on center with the long dimension perpendicular to furring channels. End joints must be staggered from end joints of adjacent sheets and end joints on the face layer. Face Layer: attached to furring channels through the middle layer using 1½ inch (41mm) Type S drywall screws spaced at 8 inches (203mm) on center with long dimension perpendicular to furring channel. End joints must be staggered from end joints of adjacent sheets and staggered 32 inches (813mm) end joints on the middle layer. Edge joints (long dimension) must be offset 24 inches (610mm) from those of the middle layer. Finish: The face layer joints must be covered with tape and coated with joint compound. Screw heads must also be covered with joint compound.	

REFERENCE

BCI® Joists	AJS® Joists
2006 / 2009 IBC® Table 720.1(3), Item Number 29-1.1/28-1.1 ICC-ES ESR 1336 and APA PR-S201 FR8	2006 / 2009 IBC® Table 720.1(3), Item Number 29-1.1/28-1.1 APA PR-S201 FR8

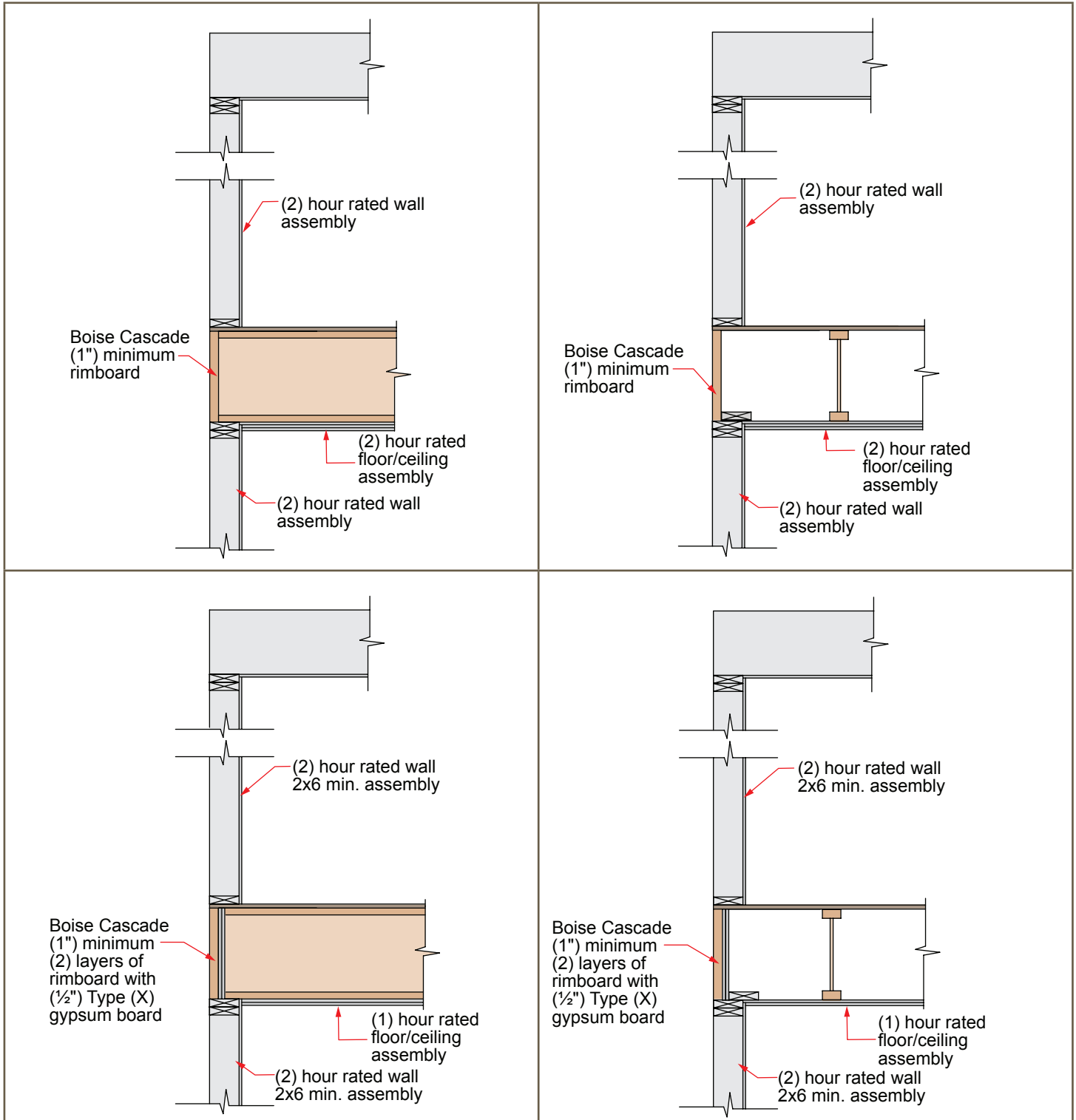
End Wall Application



Notes:

- Rim assembly for fire from inside of structure.
- Gypsum wallboard shown on the ceiling is to protect the Rim Board only; it does not necessarily cause the floor assembly to be rated.
- Attach 1/2" Type X to Rim Board with 1 1/2" Type W drywall screws spaced 12" o.c.
- Attach 5/8" Type X to Rim Board with 2" Type W drywall screws spaced 12" o.c.
- Provide minimum 1 3/4" bearing for I-Joist.
- Use only fire rated gypsum wallboard. Type C may be substituted for Type X.
- Rim Board and gypsum wallboard thickness are shown as minimums. Thicker Rim Board and gypsum wall board may be substituted.
- Rim board needs to be sized for vertical and lateral load.
- Details per APA PR-S201 RB1. Compliance of the fire-resistance rated construction assemblies with applicable building code is the responsibility of the design professional of record and/or authority having jurisdiction.

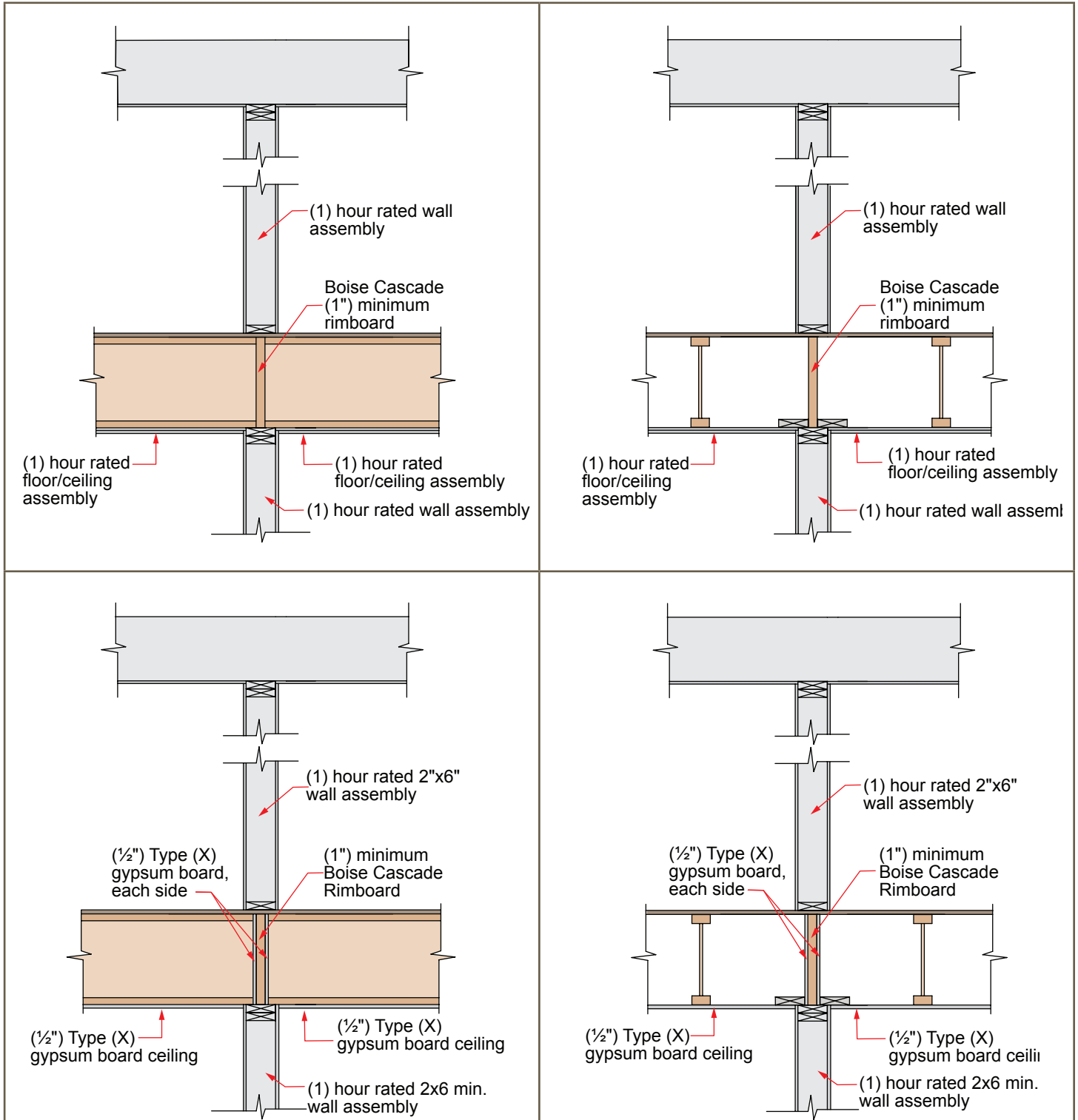
End Wall Application



Notes:

- Rim assembly for fire from inside of structure.
- Gypsum wallboard shown on the ceiling is to protect the Rim Board only; it does not necessarily cause the floor assembly to be rated.
- Attach $\frac{1}{2}$ " Type X to Rim Board with $\frac{1}{2}$ " Type W drywall screws spaced 12" o.c.
- Attach $\frac{5}{8}$ " Type X to Rim Board with 2" Type W drywall screws spaced 12" o.c.
- Provide minimum $1\frac{3}{4}$ " bearing for I-Joist.
- Use only fire rated gypsum wallboard. Type C may be substituted for Type X.
- Rim Board and gypsum wallboard thickness are shown as minimums. Thicker Rim Board and gypsum wall board may be substituted.
- Rim board needs to be sized for vertical and lateral load.
- Details per APA PR-S201 RB1. Compliance of the fire-resistance rated construction assemblies with applicable building code is the responsibility of the design professional of record and/or authority having jurisdiction.

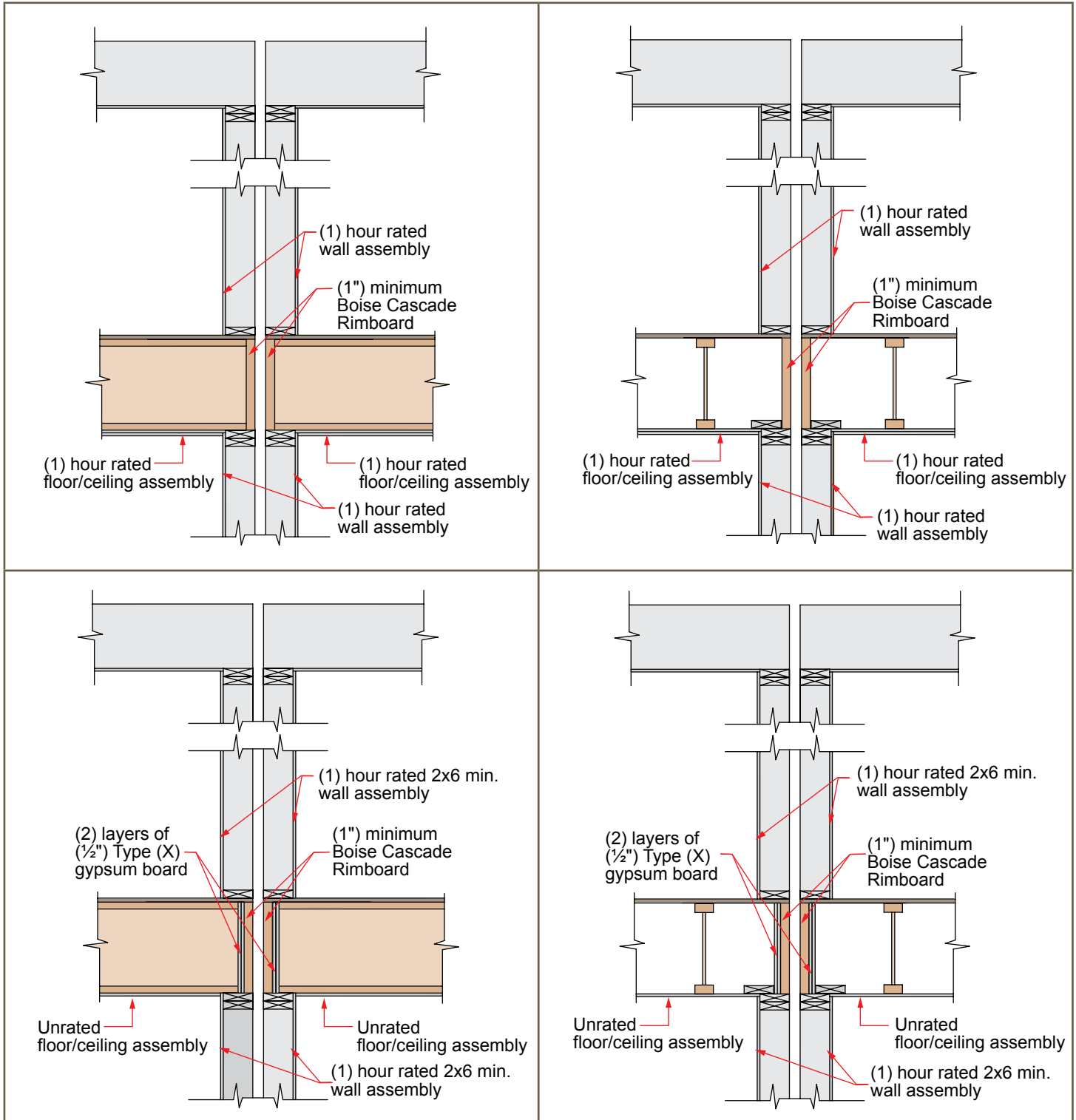
Interior Single Wall Application



Notes:

- Rim assembly for fire from either side of wall.
- Gypsum wallboard shown on the ceiling is to protect the Rim Board only; it does not necessarily cause the floor assembly to be rated.
- Attach 1/2" Type X to Rim Board with 1 1/2" Type W drywall screws spaced 12" o.c.
- Attach 5/8" Type X to Rim Board with 2" Type W drywall screws spaced 12" o.c.
- Provide minimum 1 3/4" bearing for I-Joist.
- Use only fire rated gypsum wallboard. Type C may be substituted for Type X.
- Rim Board and gypsum wallboard thickness are shown as minimums. Thicker Rim Board and gypsum wall board may be substituted.
- When two layers of gypsum wallboard are used, I-joist end nails shall be 16d box nails.
- Rim board needs to be sized for vertical and lateral load.
- Details per APA PR-S201 RB2. Compliance of the fire-resistance rated construction assemblies with applicable building code is the responsibility of the design professional of record and/or authority having jurisdiction.

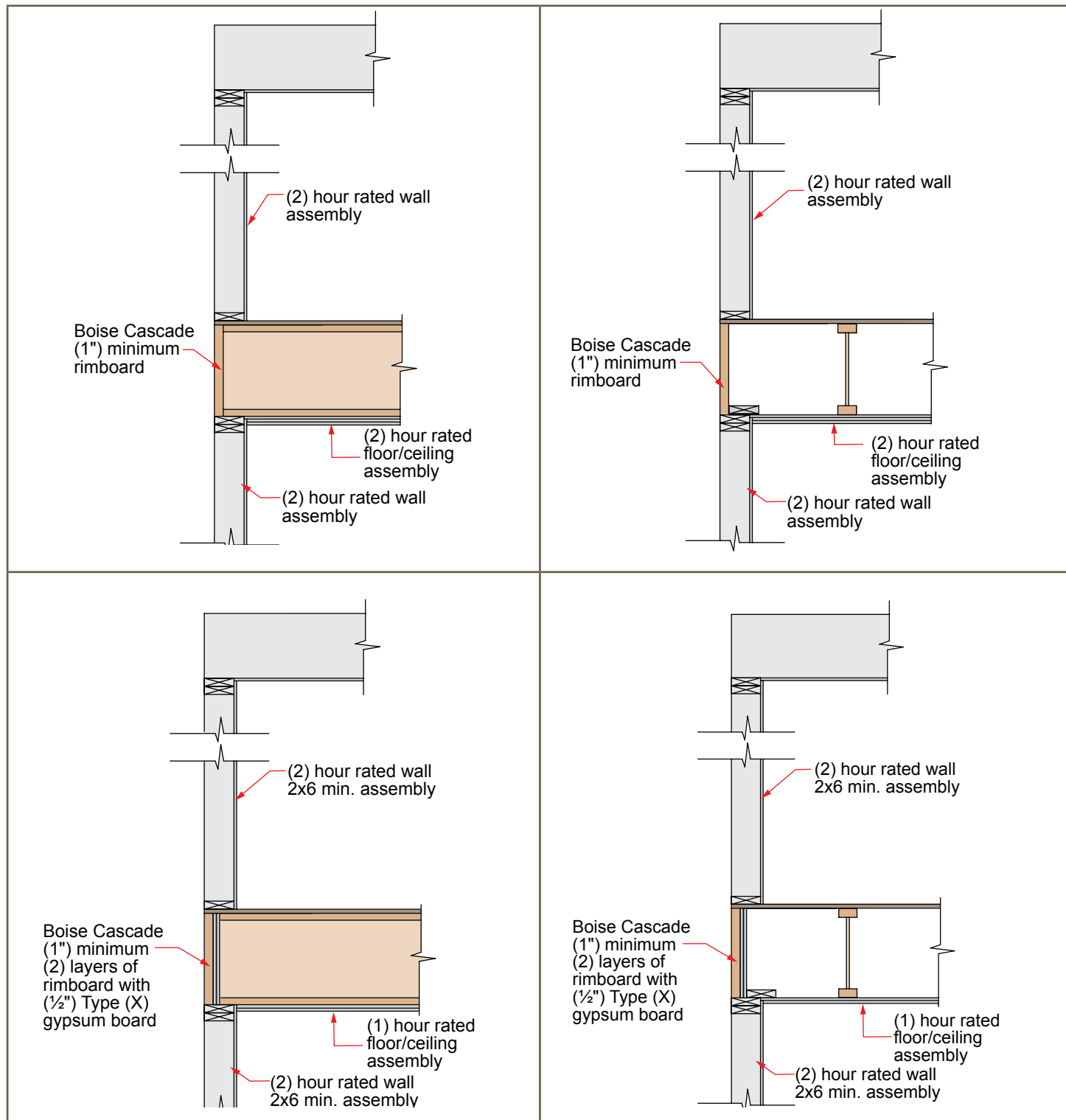
Interior Double Wall Application



Notes:

- Rim assembly for fire from either side of wall.
- Gypsum wallboard shown on the ceiling is to protect the Rim Board only; it does not necessarily cause the floor assembly to be rated.
- Attach 1/2" Type X to Rim Board with 1 1/2" Type W drywall screws spaced 12" o.c.
- Attach 5/8" Type X to Rim Board with 2" Type W drywall screws spaced 12" o.c.
- Provide minimum 1 3/4" bearing for I-Joist.
- Use only fire rated gypsum wallboard. Type C may be substituted for Type X.
- Rim Board and gypsum wallboard thickness are shown as minimums. Thicker Rim Board and gypsum wall board may be substituted.
- When two layers of gypsum wallboard are used, I-joint end nails shall be 16d box nails.
- Rim board needs to be sized for vertical and lateral load.
- Details per APA PR-S201 RB3. Compliance of the fire-resistance rated construction assemblies with applicable building code is the responsibility of the design professional of record and/or authority having jurisdiction.

Interior Double Wall Application



Notes:

- Rim assembly for fire from either side of wall.
- Gypsum wallboard shown on the ceiling is to protect the Rim Board only; it does not necessarily cause the floor assembly to be rated.
- Attach 1/2" Type X to Rim Board with 1 1/2" Type W drywall screws spaced 12" o.c.
- Attach 5/8" Type X to Rim Board with 2" Type W drywall screws spaced 12" o.c.
- Provide minimum 1 3/4" bearing for I-Joist.
- Use only fire rated gypsum wallboard. Type C may be substituted for Type X.
- Rim Board and gypsum wallboard thickness are shown as minimums. Thicker Rim Board and gypsum wall board may be substituted.
- When two layers of gypsum wallboard are used, I-joist end nails shall be 16d box nails.
- Rim board needs to be sized for vertical and lateral load.
- Details per APA PR-S201 RB3. Compliance of the fire-resistance rated construction assemblies with applicable building code is the responsibility of the design professional of record and/or authority having jurisdiction.

Introduction

Sprinkler systems provide reliable and effective suppression against fire. Though typically used in commercial-type buildings, sprinkler systems are also being installed in residential construction. Consult with the local building official for further information on sprinkler requirements. The details shown on pages 22-23 refer to the proper connection of commercial sprinkler pipe to Boise Cascade I-Joists. Connections to VERSA-LAM® and BOISE GLULAM® beams are similar to those used with solid-sawn

lumber. Sprinkler pipe may also be routed through webs of Boise Cascade I-Joists; please refer to the specific joist's hole chart on pages 24-25.

The following details may be used for residential sprinklers but it should be noted that residential systems typically use much lighter and smaller pipe. The 2" diameter and smaller pipes used in residential sprinkler systems may bear directly on the joist web when routed through web holes. Residential sprinkler attachment details are shown on page 23.

Commercial Sprinkler Pipe Weights

The weight of water-filled sprinkler pipe shall be added to the dead load of the joist or beam design. The following tables provide weights of typical commercial sprinkler pipe.

Water-Filled Sprinkler Pipe Weight

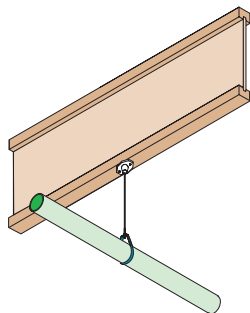
Schedule #40 Steel Pipe	
Pipe Size [diameter - in]	Total Weight [lb/ft]
1	2.1
1.5	3.6
2	5.1
2.5	7.9
3	10.8
3.5	13.4
4	16.3
5	23.3
6	31.5

Schedule #10 Steel Pipe	
Pipe Size [diameter - in]	Total Weight [lb/ft]
1.25	2.5
1.5	3.0
2	4.2
2.5	5.9
3	7.9
4	11.8
6	23.0

Sprinkler Attachment Details FS01 -FS03

FS01

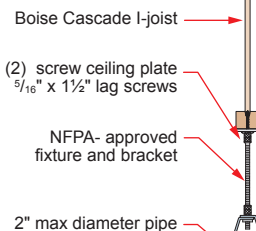
Two Screw Ceiling Flange



FS01

Two Screw Ceiling Flange

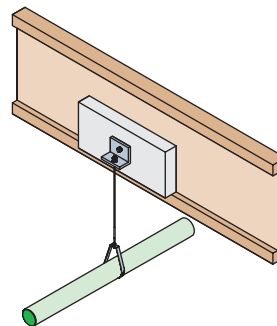
2" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- Pre-drill pilot holes for lag screws.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-Joist system shall also include the weight of the piping system and temporary loading.

FS03

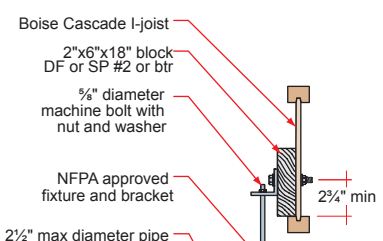
Side Beam Bracket



FS03

Side Beam Bracket

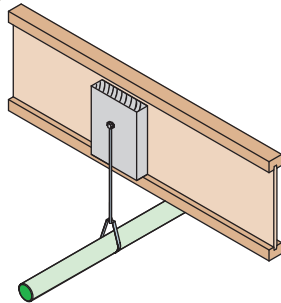
2½" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-Joist system shall also include the weight of the piping system and temporary loading.

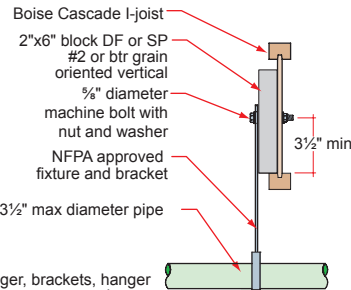
FS04

Eye Rod Hanger



FS04 Eye Rod Hanger

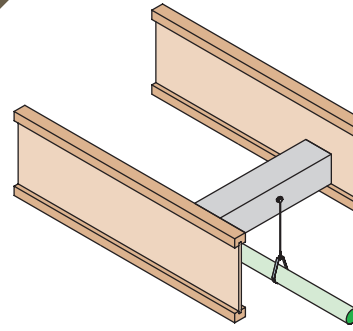
3 1/2" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.

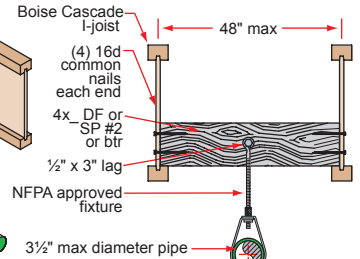
FS06

Eye Rod Hanger



FS06 Eye Rod Hanger

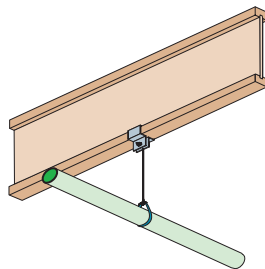
3 1/2" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2 1/2" for branch lines and 3" for main lines.

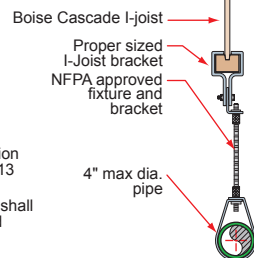
FS07

I-Joist Hanger



FS07 I-Joist Hanger

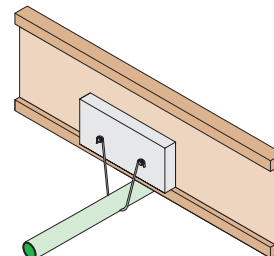
4" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.

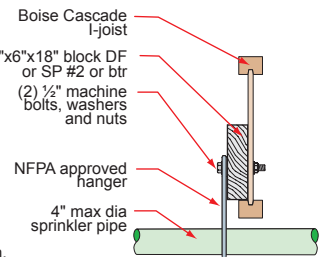
FS08

U Hanger



FS08 U Hanger

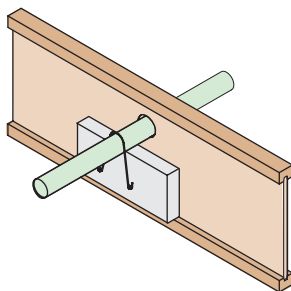
4" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.

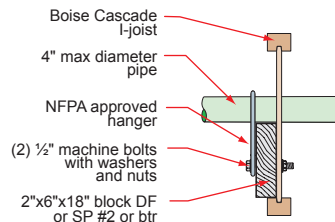
FS09

Inverted U Hanger



FS09 Inverted U Hanger

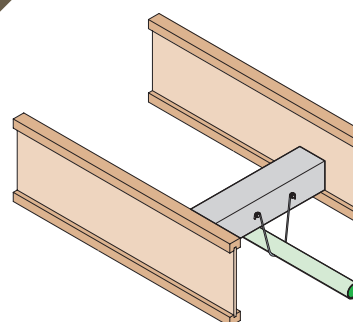
4" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.

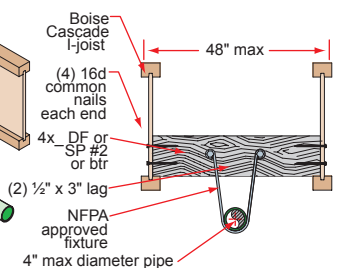
FS11

U Hanger



FS11 U Hanger

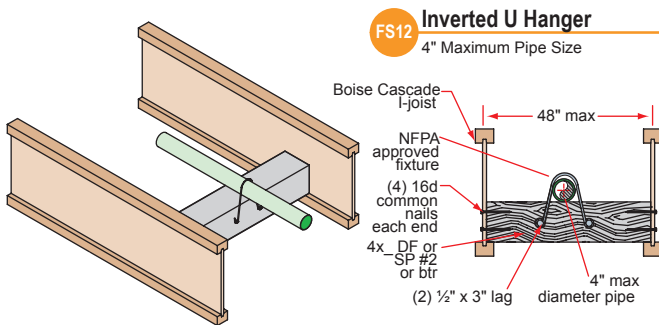
4" Maximum Pipe Size



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2 1/2" for branch lines and 3" for main lines.

FS12

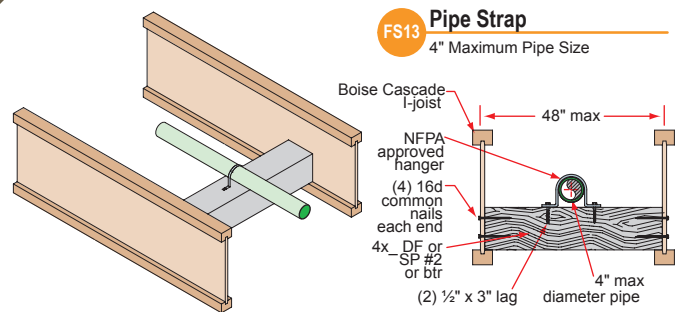
U Hanger



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2½" for branch lines and 3" for main lines.

FS13

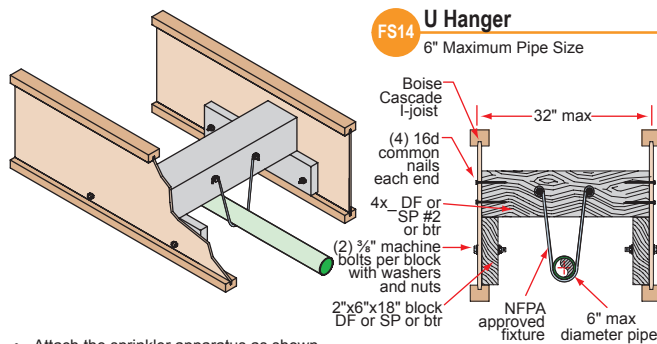
Pipe Strap



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2½" for branch lines and 3" for main lines.

FS14

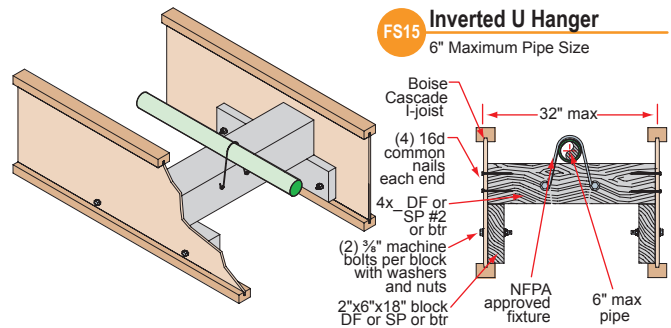
U Hanger



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2½" for branch lines and 3" for main lines.

FS15

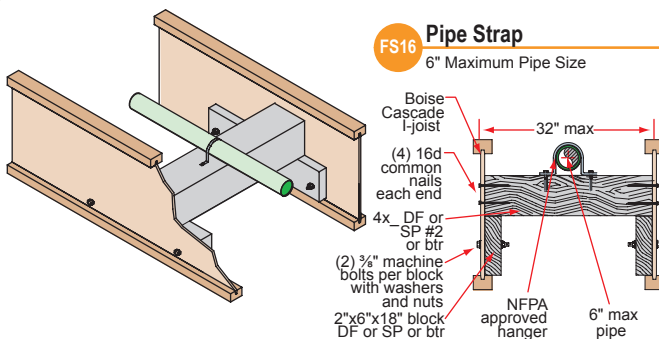
Inverted U Hanger



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2½" for branch lines and 3" for main lines.

FS16

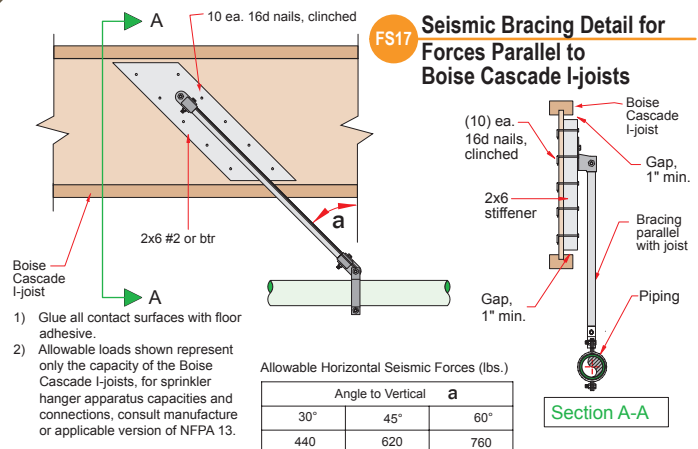
Inverted U Hanger



- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking, 2½" for branch lines and 3" for main lines.

FS17

Seismic Bracing



FS18 Seismic Bracing

Seismic Bracing Detail for Forces Parallel or Perpendicular to Boise Cascade I-Joists for Pipe Bracing

Notch 4x10 around joist flange, leave 1/8" gap as shown (sim)

(4) ea. 8d common staggered

Boise Cascade I-Joist

Floor sheathing

(8) ea. 10d per side common nails, attach as shown, stagger to limit splitting.

4x10

Alternate attachment method, attach per NFPA

See Boise Cascade I-Joist hole chart

1) Glue all contact surfaces with floor adhesive.
2) Allowable loads shown represent only the capacity of the Boise Cascade I-Joists, for sprinkler hanger apparatus capacities and connections consult manufacture or applicable version of NFPA 13.

Allowable Horizontal Seismic Forces (lbs.)

Angle To Vertical	a	
30°	45°	60°
390	600	600

FS19 Blocking Attachment to Joist

Blocking Attachment to Joist Hanger Attachment Varies
6" Maximum Pipe Size

Boise Cascade I-Joist

(4) 16d common nails each end

24" max

4x6 DF or SP #2 or btr

(2) 3/8" machine bolts per block with washers and nuts

2"x6"x18" block DF or SP #2 or btr

NFPA approved hanger 6" max pipe

- Attach the sprinkler apparatus as shown.
- The sprinkler apparatus including the hanger, brackets, hanger rod, pipe, clamps, nuts, bolts, washers, lag screws, wood screws and installation shall be per the current provisions of the NFPA 13, 13D, 13R or the authority having jurisdiction.
- The design of the Boise Cascade I-Joist system shall also include the weight of the piping system and temporary loading.
- Pre-drill pilot hole for lag screw, allow for proper clearance from the lag to the bottom of the blocking.

For additional Boise Cascade I-Joist fire sprinkler attachment details, please contact Boise Cascade EWP engineering.

Residential Sprinkler Details

FS20 Residential Construction Stand-off Hanger for CPVC Pipe

Residential Construction Stand-off Hanger for CPVC Pipe

3/4" & 1" CPVC pipe

Hanger / Restrainer

Boise Cascade I-Joist

Fire sprinkler piping

Install fire sprinkler system per current edition of NFPA 13

FS21 Residential Construction Perpendicular to Joists for CPVC Pipe

Residential Construction Perpendicular to Joists for CPVC Pipe

3/4" & 1" CPVC pipe bearing on web, no blocking required

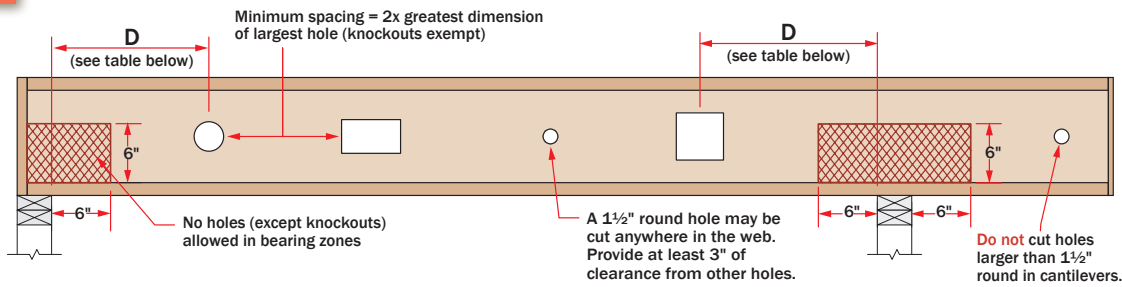
Hanger / Restrainer

Boise Cascade I-Joist

Fire sprinkler piping

Install fire sprinkler system per current edition of NFPA 13

Contact CPVC pipe manufacturer regarding installation and contact compatibility information



DO NOT
cut or notch
flange

DO
cut in web area
as specified

BCI® Joists are manufactured with 1 1/2" round perforated knockouts in the web at approximately 12" on center. Minimum distance from support, listed in table below, is required for all holes greater than 1 1/2"

TABLE 1

ROUND HOLES

Minimum distance from inside face of any support to centerline of hole													JOIST DEPTH • HOLE SIZE [IN]			
Span [ft]	9 1/2"				11 7/8"				14"				16"			
	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"
8'	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	1' - 0"
10'	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	1' - 0"
12'	1' - 0"	2' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	1' - 0"
14'	1' - 0"	3' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	2' - 0"
16'	1' - 0"	4' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	2' - 0"	-	1' - 0"	1' - 0"	1' - 0"	3' - 0"
18'	1' - 0"	5' - 0"	-	-	1' - 0"	2' - 0"	-	-	1' - 0"	1' - 0"	3' - 0"	-	1' - 0"	1' - 0"	1' - 0"	4' - 0"
20'	1' - 6"	6' - 6"	-	-	1' - 0"	3' - 0"	-	-	1' - 0"	1' - 0"	4' - 0"	-	1' - 0"	1' - 0"	2' - 0"	5' - 0"
22'	2' - 6"	7' - 6"	-	-	1' - 0"	4' - 0"	-	-	1' - 0"	1' - 6"	5' - 6"	-	1' - 0"	1' - 0"	3' - 0"	6' - 6"
24'	3' - 6"	9' - 0"	-	-	1' - 6"	5' - 6"	-	-	1' - 0"	2' - 6"	6' - 6"	-	1' - 0"	1' - 0"	4' - 0"	7' - 6"
26'	-	-	-	-	2' - 6"	6' - 6"	-	-	1' - 0"	4' - 0"	7' - 6"	-	1' - 0"	2' - 0"	5' - 0"	9' - 0"
28'	-	-	-	-	3' - 6"	7' - 6"	-	-	1' - 6"	5' - 0"	9' - 0"	-	1' - 0"	3' - 0"	6' - 6"	10' - 0"
30'	-	-	-	-	-	-	-	-	2' - 6"	6' - 0"	10' - 0"	-	1' - 0"	4' - 0"	7' - 6"	11' - 6"
32'	-	-	-	-	-	-	-	-	3' - 6"	7' - 0"	11' - 6"	-	2' - 0"	5' - 0"	8' - 6"	12' - 6"
34'	-	-	-	-	-	-	-	-	-	-	-	-	3' - 0"	6' - 0"	10' - 0"	14' - 0"

NOTES

- Hole may be positioned vertically anywhere in the web.
- Tables 1-3 are for uniformly loaded maximum loads of 40 psf live loads and 15 psf dead loads on simple span application.
- For other load conditions or hole sizes, contact your local distributor.
- It may be possible to exceed the limitations of those tables by analysing a specific situation with the BC CALC® Software.
- * = Holes may be acceptable, contact your local distributor.

TABLE 2

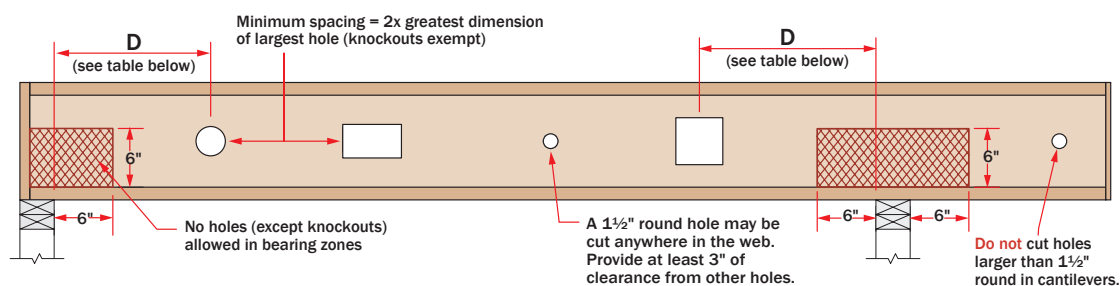
SQUARE HOLES

Minimum distance from inside face of any support to centerline of hole													JOIST DEPTH • HOLE SIZE [IN]			
Span [ft]	9 1/2"				11 7/8"				14"				16"			
	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"
8'	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	1' - 0"
10'	1' - 0"	1' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-	1' - 0"	1' - 0"	1' - 0"	2' - 0"
12'	1' - 0"	2' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	2' - 0"	-	1' - 0"	1' - 0"	1' - 0"	3' - 6"
14'	1' - 0"	3' - 6"	-	-	1' - 0"	2' - 0"	-	-	1' - 0"	1' - 0"	3' - 0"	-	1' - 0"	1' - 0"	2' - 0"	4' - 6"
16'	2' - 0"	4' - 6"	-	-	1' - 0"	3' - 0"	-	-	1' - 0"	1' - 6"	4' - 0"	-	1' - 0"	1' - 0"	3' - 0"	6' - 0"
18'	3' - 0"	6' - 0"	-	-	2' - 0"	4' - 0"	-	-	1' - 0"	3' - 0"	5' - 6"	-	1' - 0"	1' - 6"	4' - 0"	7' - 0"
20'	4' - 0"	7' - 0"	-	-	3' - 0"	5' - 6"	-	-	1' - 6"	4' - 0"	6' - 6"	-	1' - 0"	3' - 0"	5' - 6"	8' - 6"
22'	5' - 0"	8' - 6"	-	-	4' - 0"	6' - 6"	-	-	2' - 6"	5' - 0"	8' - 0"	-	1' - 6"	4' - 0"	6' - 6"	9' - 6"
24'	6' - 6"	9' - 6"	-	-	5' - 0"	8' - 0"	-	-	3' - 6"	6' - 0"	9' - 0"	-	2' - 6"	5' - 0"	8' - 0"	11' - 0"
26'	-	-	-	-	6' - 0"	9' - 0"	-	-	5' - 0"	7' - 6"	10' - 6"	-	3' - 6"	6' - 0"	9' - 0"	12' - 0"
28'	-	-	-	-	7' - 6"	10' - 6"	-	-	6' - 0"	8' - 6"	11' - 6"	-	5' - 0"	7' - 6"	10' - 0"	13' - 6"
30'	-	-	-	-	-	-	-	-	7' - 0"	10' - 0"	13' - 0"	-	6' - 0"	8' - 6"	11' - 6"	14' - 6"
32'	-	-	-	-	-	-	-	-	8' - 0"	11' - 0"	14' - 0"	-	7' - 0"	10' - 0"	12' - 6"	*
34'	-	-	-	-	-	-	-	-	-	-	-	-	8' - 6"	11' - 0"	14' - 0"	*

TABLE 3

RECTANGULAR HOLES

Minimum distance from inside face of any support to centerline of hole													JOIST DEPTH • HOLE SIZE [IN]			
Span [ft]	9 1/2"				11 7/8"				14"				16"			
	5"x8"	5"x10"	5"x12"	5"x14"	7"x10"	7"x12"	7"x14"	7"x16"	10"x12"	10"x14"	10"x16"	10"x18"	12"x14"	12"x16"	12"x18"	12"x20"
8'	1' - 0"	1' - 0"	1' - 6"	2' - 0"	1' - 0"	1' - 6"	2' - 0"	2' - 6"	1' - 6"	2' - 0"	3' - 0"	*	2' - 0"	3' - 0"	*	*
10'	1' - 6"	2' - 0"	2' - 6"	3' - 0"	2' - 0"	2' - 6"	3' - 0"	3' - 6"	2' - 6"	3' - 6"	4' - 6"	*	3' - 6"	4' - 0"	*	*
12'	2' - 6"	3' - 0"	4' - 0"	4' - 6"	3' - 0"	3' - 6"	4' - 6"	5' - 0"	4' - 0"	4' - 6"	5' - 6"	*	4' - 6"	5' - 6"	*	*
14'	4' - 0"	4' - 6"	5' - 0"	5' - 6"	4' - 0"	5' - 0"	5' - 6"	6' - 6"	5' - 0"	6' - 0"	*	*	6' - 0"	6' - 6"	*	*
16'	5' - 0"	5' - 6"	6' - 6"	7' - 0"	5' - 6"	6' - 0"	7' - 0"	7' - 6"	6' - 6"	7' - 0"	*	*	7' - 0"	*	*	*
18'	6' - 0"	7' - 0"	7' - 6"	8' - 6"	6' - 6"	7' - 6"	8' - 0"	*	7' - 6"	8' - 6"	*	*	8' - 6"	*	*	*
20'	7' - 6"	8' - 0"	9' - 0"	9' - 6"	8' - 0"	8' - 6"	9' - 6"	*	9' - 0"	*	*	*	9' - 6"	*	*	*
22'	8' - 6"	9' - 6"	10' - 0"	*	9' - 0"	10' - 0"	10' - 6"	*	10' - 0"	*	*	*	*	*	*	*
24'	10' - 0"	10' - 6"	11' - 6"	*	10' - 6"	11' - 0"	*	*	11' - 6"	*	*	*	*	*	*	*
26'	-	-	-	-	11' - 6"	12' - 6"	*	*	*	*	*	*	*	*	*	*
28'	-	-	-	-	13' - 0"	13' - 6"	*	*	*	*	*	*	*	*	*	*
30'	-	-	-	-	-	-	-	-	*	*	*	*	*	*	*	*
32'	-	-	-	-	-	-	-	-	*	*	*	*	*	*	*	*
34'	-	-	-	-	-	-	-	-	-	-	-	-	*	*	*	*



AJS® Joists are manufactured with 1 1/2" round perforated knockouts in the web at approximately 12" on center. Minimum distance from support, listed in table below, is required for all holes greater than 1 1/2"

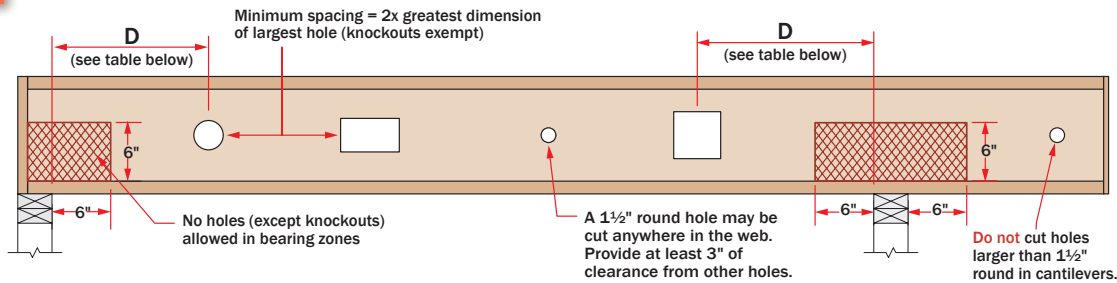
TABLE 1 ROUND HOLES												
Minimum distance from inside face of any support to the centerline of hole												
JOIST DEPTH • HOLE SIZE [IN]												
Span [ft]	9 1/2"				11 7/8"				14"			
	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"
8'	1' - 0"	1' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-
10'	1' - 0"	2' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-
12'	1' - 0"	4' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-
14'	1' - 0"	5' - 0"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 6"	-
16'	2' - 0"	6' - 6"	-	-	1' - 0"	2' - 0"	-	-	1' - 0"	1' - 0"	2' - 6"	-
18'	3' - 0"	7' - 6"	-	-	1' - 0"	3' - 6"	-	-	1' - 0"	1' - 0"	4' - 0"	-
20'	4' - 0"	9' - 0"	-	-	1' - 0"	4' - 6"	-	-	1' - 0"	1' - 0"	5' - 0"	-
22'	5' - 0"	10' - 0"	-	-	1' - 6"	5' - 6"	-	-	1' - 0"	2' - 6"	6' - 0"	-
24'	6' - 6"	11' - 6"	-	-	2' - 6"	7' - 0"	-	-	1' - 0"	3' - 6"	7' - 6"	-
26'	-	-	-	-	4' - 0"	8' - 0"	-	-	1' - 0"	4' - 6"	8' - 6"	-
28'	-	-	-	-	5' - 0"	9' - 0"	-	-	2' - 0"	5' - 6"	10' - 0"	-
30'	-	-	-	-	-	-	-	-	3' - 0"	7' - 0"	11' - 0"	-
32'	-	-	-	-	-	-	-	-	4' - 0"	8' - 0"	12' - 6"	-
34'	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2 SQUARE HOLES												
Minimum distance from inside face of any support to the centerline of hole												
JOIST DEPTH • HOLE SIZE [IN]												
Span [ft]	9 1/2"				11 7/8"				14"			
	3"	6"	9"	12"	3"	6"	9"	12"	3"	6"	9"	12"
8'	1' - 0"	1' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-
10'	1' - 0"	2' - 6"	-	-	1' - 0"	1' - 0"	-	-	1' - 0"	1' - 0"	1' - 0"	-
12'	1' - 6"	4' - 0"	-	-	1' - 0"	1' - 6"	-	-	1' - 0"	1' - 0"	2' - 6"	-
14'	2' - 6"	5' - 0"	-	-	1' - 0"	2' - 6"	-	-	1' - 0"	1' - 0"	3' - 6"	-
16'	3' - 6"	6' - 6"	-	-	1' - 6"	4' - 0"	-	-	1' - 0"	2' - 0"	4' - 6"	-
18'	5' - 0"	7' - 6"	-	-	2' - 6"	5' - 0"	-	-	1' - 0"	3' - 0"	6' - 0"	-
20'	6' - 0"	9' - 0"	-	-	3' - 6"	6' - 6"	-	-	2' - 0"	4' - 6"	7' - 0"	-
22'	7' - 0"	10' - 0"	-	-	5' - 0"	7' - 6"	-	-	3' - 0"	5' - 6"	8' - 6"	-
24'	8' - 6"	11' - 6"	-	-	6' - 0"	8' - 6"	-	-	4' - 0"	6' - 6"	9' - 6"	-
26'	-	-	-	-	7' - 0"	10' - 0"	-	-	5' - 0"	8' - 0"	11' - 0"	-
28'	-	-	-	-	8' - 6"	11' - 0"	-	-	6' - 0"	9' - 0"	12' - 0"	-
30'	-	-	-	-	-	-	-	-	7' - 6"	10' - 0"	13' - 6"	-
32'	-	-	-	-	-	-	-	-	8' - 6"	11' - 6"	14' - 6"	-
34'	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 3 RECTANGULAR HOLES												
Minimum distance from inside face of any support to the centerline of hole												
JOIST DEPTH • HOLE SIZE [IN]												
Span [ft]	9 1/2"				11 7/8"				14"			
	5"x8"	5"x10"	5"x12"	5"x14"	7"x10"	7"x12"	7"x14"	7"x16"	10"x12"	10"x14"	10"x16"	10"x18"
8'	1' - 6"	2' - 0"	2' - 0"	2' - 6"	1' - 0"	1' - 6"	2' - 0"	2' - 6"	1' - 6"	2' - 6"	3' - 0"	*
10'	2' - 6"	3' - 0"	3' - 6"	4' - 0"	2' - 0"	2' - 6"	3' - 6"	4' - 0"	3' - 0"	3' - 6"	4' - 6"	*
12'	3' - 6"	4' - 0"	4' - 6"	5' - 0"	3' - 6"	4' - 0"	4' - 6"	5' - 0"	4' - 0"	4' - 6"	5' - 6"	*
14'	5' - 0"	5' - 6"	6' - 0"	6' - 6"	4' - 6"	5' - 0"	6' - 0"	6' - 6"	5' - 0"	6' - 0"	*	*
16'	6' - 0"	6' - 6"	7' - 0"	7' - 6"	5' - 6"	6' - 6"	7' - 0"	*	6' - 6"	7' - 6"	*	*
18'	7' - 6"	8' - 0"	8' - 6"	*	7' - 0"	7' - 6"	8' - 6"	*	7' - 6"	8' - 6"	*	*
20'	8' - 6"	9' - 0"	9' - 6"	*	8' - 0"	9' - 0"	9' - 6"	*	9' - 0"	*	*	*
22'	10' - 0"	10' - 6"	*	*	9' - 6"	10' - 0"	*	*	10' - 6"	*	*	*
24'	11' - 0"	*	*	*	10' - 6"	11' - 6"	*	*	11' - 6"	*	*	*
26'	-	-	-	-	12' - 0"	*	*	*	*	*	*	*
28'	-	-	-	-	13' - 6"	*	*	*	*	*	*	*
30'	-	-	-	-	-	-	-	-	*	*	*	*
32'	-	-	-	-	-	-	-	-	*	*	*	*
34'	-	-	-	-	-	-	-	-	-	-	-	*

NOTES:

- Hole may be positioned vertically anywhere in the web.
- Tables 1-6 are for uniformly loaded maximum loads of 40 psf live loads and 15 psf dead loads on simple span application.
- For other load conditions or hole sizes, contact your local distributor.
- It may be possible to exceed the limitations of those tables by analysing a specific situation with the BC CALC® Software.
- * = Holes may be acceptable, contact your local distributor.



DO NOT
cut or notch
flange

DO
cut in web area
as specified

AJS® Joists are manufactured with 1 1/2" round perforated knockouts in the web at approximately 12" on center. Minimum distance from support, listed in table below, is required for all holes greater than 1 1/2"

TABLE 4

ROUND HOLES

Minimum distance from inside face of any support to the centerline of hole										JOIST DEPTH • HOLE SIZE [IN]							
Span [ft]	18"				20"				22"				24"				
	3"	6"	9"	12"	6"	9"	12"	15"	6"	9"	12"	15"	9"	12"	15"	18"	
8'	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	2'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	
10'	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	3'-6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	
12'	1'-0"	1'-0"	1'-0"	2'-6"	1'-0"	1'-0"	1'-0"	4'-6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	2'-0"	
14'	1'-0"	1'-0"	1'-0"	3'-6"	1'-0"	1'-0"	1'-0"	6'-0"	1'-0"	1'-0"	1'-0"	1'-6"	1'-0"	1'-0"	1'-0"	3'-6"	
16'	1'-0"	1'-0"	1'-0"	4'-6"	1'-0"	1'-0"	1'-0"	7'-0"	1'-0"	1'-0"	1'-0"	2'-6"	1'-0"	1'-0"	1'-0"	4'-6"	
18'	1'-0"	1'-0"	1'-0"	6'-0"	1'-0"	1'-0"	1'-6"	8'-6"	1'-0"	1'-0"	1'-0"	3'-6"	1'-0"	1'-0"	1'-0"	5'-6"	
20'	1'-0"	1'-0"	1'-0"	7'-0"	1'-0"	1'-0"	2'-6"	9'-6"	1'-0"	1'-0"	1'-0"	5'-0"	1'-0"	1'-0"	1'-0"	7'-0"	
22'	1'-0"	1'-0"	1'-6"	8'-6"	1'-0"	1'-0"	3'-6"	*	1'-0"	1'-0"	1'-0"	6'-0"	1'-0"	1'-0"	2'-0"	8'-0"	
24'	1'-0"	1'-0"	2'-6"	9'-6"	1'-0"	1'-0"	5'-0"	*	1'-0"	1'-0"	1'-0"	7'-0"	1'-0"	1'-0"	3'-6"	9'-6"	
26'	1'-0"	1'-0"	3'-6"	11'-0"	1'-0"	1'-0"	6'-0"	*	1'-0"	1'-0"	2'-6"	8'-6"	1'-0"	1'-0"	4'-6"	10'-6"	
28'	1'-0"	1'-0"	4'-6"	12'-0"	1'-0"	1'-0"	7'-0"	*	1'-0"	1'-0"	3'-6"	9'-6"	1'-0"	1'-0"	5'-6"	12'-0"	
30'	1'-0"	1'-0"	5'-6"	13'-6"	1'-0"	2'-0"	8'-6"	*	1'-0"	1'-0"	4'-6"	11'-0"	1'-0"	1'-0"	6'-6"	13'-0"	
32'	1'-0"	1'-0"	7'-0"	14'-6"	1'-0"	3'-0"	9'-6"	*	1'-0"	1'-0"	5'-6"	12'-0"	1'-0"	2'-6"	8'-0"	14'-6"	
34'	1'-0"	1'-6"	8'-0"	16'-0"	1'-0"	4'-6"	11'-0"	*	1'-0"	1'-0"	6'-6"	13'-6"	1'-0"	3'-6"	9'-0"	15'-6"	

TABLE 5

SQUARE HOLES

Span [ft]		Minimum distance from inside face of any support to the centerline of hole												JOIST DEPTH • HOLE SIZE [IN]			
		18"				20"				22"				24"			
		3"	6"	9"	12"	6"	9"	12"	15"	6"	9"	12"	15"	9"	12"	15"	18"
8'	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 6"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	3' - 0"
10'	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	3' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 6"	1' - 0"	1' - 0"	1' - 0"	4' - 6"
12'	1' - 0"	1' - 0"	1' - 0"	1' - 6"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	4' - 0"	1' - 0"	1' - 0"	1' - 0"	2' - 6"	1' - 0"	1' - 0"	1' - 6"	5' - 6"
14'	1' - 0"	1' - 0"	1' - 0"	3' - 0"	1' - 0"	1' - 0"	1' - 6"	5' - 6"	1' - 0"	1' - 0"	1' - 0"	1' - 0"	4' - 0"	1' - 0"	1' - 0"	2' - 6"	*
16'	1' - 0"	1' - 0"	1' - 0"	4' - 0"	1' - 0"	1' - 0"	2' - 6"	6' - 6"	1' - 0"	1' - 0"	1' - 6"	5' - 0"	1' - 0"	1' - 0"	1' - 0"	4' - 0"	*
18'	1' - 0"	1' - 0"	1' - 6"	5' - 0"	1' - 0"	1' - 0"	3' - 6"	8' - 0"	1' - 0"	1' - 0"	2' - 6"	6' - 6"	1' - 0"	1' - 6"	1' - 0"	5' - 0"	*
20'	1' - 0"	1' - 0"	2' - 6"	6' - 6"	1' - 0"	1' - 6"	5' - 0"	9' - 0"	1' - 0"	1' - 0"	3' - 6"	7' - 6"	1' - 0"	2' - 6"	6' - 0"	*	*
22'	1' - 0"	1' - 0"	3' - 6"	7' - 6"	1' - 0"	2' - 6"	6' - 0"	10' - 6"	1' - 0"	1' - 0"	4' - 6"	9' - 0"	1' - 0"	3' - 6"	7' - 6"	*	*
24'	1' - 0"	1' - 6"	5' - 0"	9' - 0"	1' - 0"	3' - 6"	7' - 0"	11' - 0"	1' - 0"	2' - 0"	6' - 0"	10' - 0"	1' - 0"	4' - 6"	8' - 6"	*	*
26'	1' - 0"	2' - 6"	6' - 0"	10' - 0"	1' - 0"	4' - 6"	8' - 6"	*	1' - 0"	3' - 0"	7' - 0"	11' - 6"	2' - 0"	5' - 6"	10' - 0"	*	*
28'	1' - 0"	3' - 6"	7' - 0"	11' - 6"	2' - 0"	5' - 6"	9' - 6"	*	1' - 0"	4' - 6"	8' - 0"	12' - 6"	3' - 0"	7' - 0"	11' - 0"	*	*
30'	1' - 0"	4' - 6"	8' - 6"	12' - 6"	3' - 0"	7' - 0"	11' - 0"	*	2' - 0"	5' - 6"	9' - 6"	14' - 0"	4' - 0"	8' - 0"	12' - 6"	*	*
32'	2' - 6"	5' - 6"	9' - 6"	14' - 0"	4' - 6"	8' - 0"	12' - 0"	*	3' - 0"	6' - 6"	10' - 6"	15' - 0"	5' - 6"	9' - 0"	13' - 6"	*	*
34'	3' - 6"	7' - 0"	10' - 6"	15' - 0"	5' - 6"	9' - 0"	13' - 6"	*	4' - 0"	7' - 6"	12' - 0"	16' - 6"	6' - 6"	10' - 6"	15' - 0"	*	*

TABLE 6

RECTANGULAR HOLES

Span [ft]		Minimum distance from inside face of any support to the centerline of hole												JOIST DEPTH • HOLE SIZE [IN]			
		18"				20"				22"				24"			
		10"x18"	12"x14"	12"x16"	12"x18"	12"x16"	12"x18"	14"x16"	14"x18"	12"x18"	14"x16"	14"x18"	16"x18"	14"x18"	14"x20"	16"x18"	16"x20"
8'	1' - 6"	1' - 0"	1' - 6"	3' - 0"	1' - 0"	1' - 6"	1' - 6"	3' - 0"	3' - 0"	1' - 0"	1' - 0"	2' - 0"	3' - 0"	1' - 0"	2' - 0"	2' - 0"	3' - 6"
10'	2' - 6"	1' - 6"	3' - 0"	3' - 0"	1' - 6"	3' - 0"	3' - 0"	4' - 6"	4' - 6"	2' - 0"	3' - 0"	3' - 0"	4' - 6"	2' - 0"	3' - 6"	3' - 0"	*
12'	4' - 0"	3' - 0"	4' - 0"	5' - 6"	2' - 6"	4' - 0"	4' - 0"	5' - 6"	5' - 6"	3' - 0"	3' - 0"	4' - 0"	5' - 6"	3' - 0"	4' - 6"	4' - 6"	*
14'	5' - 0"	4' - 0"	5' - 6"	6' - 6"	4' - 0"	5' - 6"	5' - 6"	*	4' - 0"	4' - 0"	5' - 6"	*	4' - 0"	6' - 0"	5' - 6"	*	*
16'	6' - 6"	5' - 0"	6' - 6"	*	5' - 0"	6' - 6"	6' - 6"	*	5' - 6"	5' - 0"	6' - 6"	*	5' - 6"	7' - 0"	7' - 0"	*	*
18'	7' - 6"	6' - 6"	8' - 0"	*	6' - 6"	8' - 0"	8' - 0"	*	6' - 6"	6' - 6"	8' - 0"	*	6' - 6"	8' - 6"	8' - 0"	*	*
20'	9' - 0"	7' - 6"	9' - 0"	*	7' - 6"	9' - 0"	9' - 0"	*	7' - 6"	7' - 6"	9' - 0"	*	8' - 0"	9' - 6"	9' - 6"	*	*
22'	10' - 0"	9' - 0"	10' - 6"	*	9' - 0"	10' - 6"	10' - 6"	*	9' - 0"	9' - 0"	10' - 6"	*	9' - 0"	*	10' - 6"	*	*
24'	11' - 6"	10' - 0"	11' - 6"	*	10' - 0"	11' - 6"	11' - 6"	*	10' - 6"	10' - 0"	*	*	10' - 6"	*	*	*	*
26'	12' - 6"	11' - 6"	*	*	11' - 6"	*	*	*	11' - 6"	11' - 6"	*	*	11' - 6"	*	*	*	*
28'	*	12' - 6"	*	*	12' - 6"	*	*	*	13' - 0"	12' - 6"	*	*	*	*	*	*	*
30'	*	14' - 0"	*	*	14' - 0"	*	*	*	14' - 0"	14' - 0"	*	*	14' - 6"	*	*	*	*
32'	*	15' - 6"	*	*	15' - 0"	*	*	*	15' - 6"	15' - 6"	*	*	15' - 6"	*	*	*	*
34'	*	16' - 6"	*	*	16' - 6"	*	*	*	16' - 6"	16' - 6"	*	*	*	*	*	*	*

NOTES:

- Hole may be positioned vertically anywhere in the web.
- Tables 1-6 are for uniformly loaded maximum loads of 40 psf live loads and 15 psf dead loads on simple span application.
- For other load conditions or hole sizes, contact your local distributor.
- It may be possible to exceed the limitations of those tables by analysing a specific situation with the BC CALC® Software.
- * = Holes may be acceptable, contact your local distributor.

Q: What is the Smoke Developed Classification?

A: The smoke developed classification is a measure of the concentration of smoke a material emits as it burns. VERSA-LAM® has a smoke index of 105, which is lower than most wood structural panels.

Q: What is the difference between Type X and Type C gypsum board?

A: Fire-rated gypsum board is typically available in two separate types, X and C. When exposed to heat, water evaporates from the gypsum and the particles shrink. This causes the gypsum particles to lose their bond and the board disintegrates. In Type X gypsum board, glass fiber is mixed with gypsum during the manufacturing process. The glass fiber acts as reinforcement, increasing the board's structural capacity for a longer period of time during exposure to fire. Vermiculite ore is added with glass fiber in the production of Type C gypsum board. The vermiculite ore expands with an increase in temperature, in effect counteracting the shrinkage of the gypsum particles. Thus, Type C provides greater fire resistance than Type X. It is very important that the design professional of record specifies the correct type of fire-rated gypsum board per the floor/ceiling assemblies shown on pages 7-13.

Q: Are the adhesives in EWP products fire rated?

A: The adhesives used in Boise Cascade EWP products have been extensively tested according to current American Society for Testing and Materials (ASTM) and Canadian Standards Association (CSA) specifications to ensure structural, moisture durability, and heat durability performance.

Q: What is a flame spread rating?

A: A flame spread rating is used to assess the surface flammability of building materials and interior finish products by measuring the rate that flame travels across the surface of a material. The level of NBCC requirements for flame-spread ratings is relative to the importance of a space as a means of escape. The more essential the space is as a link to safety for a greater number of occupants in the building, the more restrictive the requirements. It should be noted that flame spread is only a surface measurement and cannot be used to determine the fire resistance of a structural component. Most wood products including Boise Cascade VERSA-LAM®, BCI® and AJS® Joists, Rimboard and BOISE GLULAM® Beams have a flame-spread rating of less than 150 as required by the NBCC.

Q: Are Boise Cascade EWP products available with a fire-retardant treatment?

A: Boise Cascade does not manufacture any BCI®, AJS® or VERSA-LAM® with a fire-retardant treatment and does not allow the products to be pressure-treated by a third-party. Fire-retardant pressure treatments typically reduce the strength and stiffness of the wood. There are some topical treatments on the market for wood that claim to provide a reduced flame spread rating. Boise Cascade has not tested any of these products to substantiate any of the claims made by these treatments and the claims of flame spread rating for these treatments is the responsibility of the treatment manufacturer.

Q: Do Boise Cascade fire assemblies have a UL® listing?

A: Underwriters Laboratories® is one of several product certification bodies accredited by The Standards Council of Canada that provides certification for the fire-resistance of building materials and elements. The fire-endurance rated assemblies in this guide have been tested in accordance with ASTM E119 and CAN/ULC-S101 and certified by APA – The Engineered Wood Association; a Standards Council of Canada accredited certification body. A complete listing of Boise Cascade fire-endurance rated assemblies can be obtained from APA – The Engineered Wood Association at the following web address:

www.apawood.org/level_b.cfm?content=prd_rept_main.

Q: What is mineral fiber insulation and how is it specified?

A: Mineral fiber insulation is a fire resistive material composed principally of fibers manufactured from rock, slag, or glass, with or without binders. Mineral fiber insulation is typically used in one-hour floor ceiling assemblies that utilize a single layer of gypsum board (see details on pages 9-13). The mineral fiber insulation batts are basically a fire resistant substitute for the second layer of gypsum board, in order to maintain a one-hour fire rating. Mineral fiber insulation is specified in a thickness (inches) and density (pounds per cubic foot). Though the specified material dimensions should be followed in constructing assemblies, equivalent mineral fiber insulation may be substituted per approval of the project's design professional of record and Boise Cascade EWP Engineering. For example, if 2" thick - 3.5 pcf thick mineral wool is listed, a thicker but less dense product may be used if approved. An equivalent thickness for 2.8 pcf mineral wool would be 2.5" (equivalent thickness = 2" x (3.5 pcf / 2.8 pcf) = 2.5").

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