Boise Cascade®
ENGINEERED WOOD PRODUCTS

Reorder #JOI-E1601

AJS® 24 Product Guide

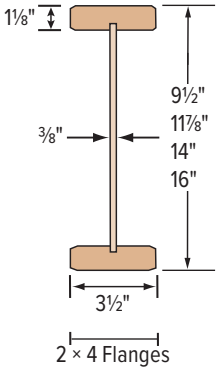
AJS® 24 PRODUCT GUIDE (US Version)

The information contained herein is for use in the UNITED STATES ONLY, Allowable Stress Design. Refer to the AJS Specifier Guide Canada for use in Canada, Limit States Design.

bc.com/ewp

Product Profiles

Longer spans exceed the competition



AJS® 24

Residential Floor Span Tables

About Floor Performance

Homeowner's expectations and opinions vary greatly due to the subjective nature of rating a new floor. Communication with the ultimate end user to determine their expectation is critical. ***Vibration*** is usually the cause of most complaints. Installing lateral bridging may help; however, squeaks may occur if not installed properly. Spacing the joists closer together does little to affect the perception of the floor's performance. The most common methods used to increase the performance and reduce vibration of wood floor systems is to ***increase the joist depth, limit joist deflections, glue and screw a thicker, tongue-and-groove subfloor, install the joists vertically plumb with level-bearing supports, and install a direct-attached ceiling to the bottom flanges of the joists.***

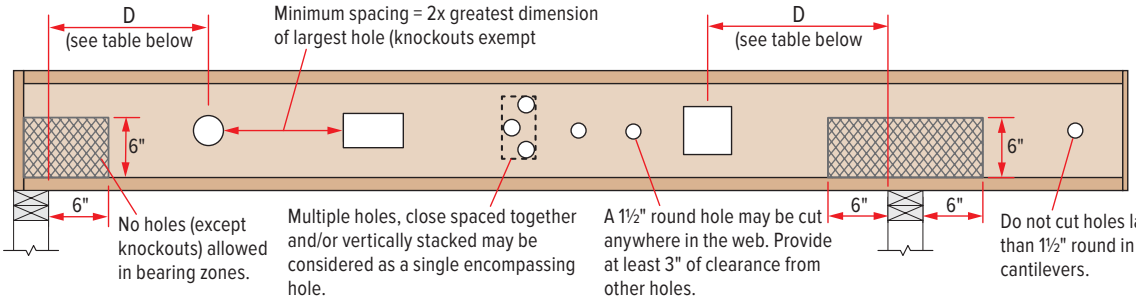
The floor span tables listed below offer three very different performance options, based on performance requirements of the homeowner.

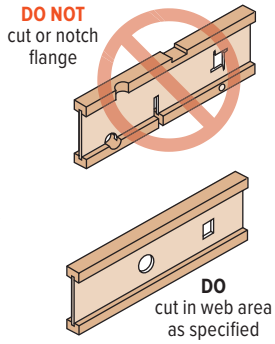
Joist Depth	AJS® Joist Series	★★★ THREE STAR ★★★				★★★★ FOUR STAR ★★★★				CAUTION	★ MINIMUM STIFFNESS ALLOWED BY CODE ★		CAUTION
		Live Load deflection limited to L/480: The common industry and design community standard for residential floor joists, 33% stiffer than L/360 code minimum. However, floor performance may still be an issue in certain applications, especially with 9½" and 11⅞" deep joists without a direct-attached ceiling.				Live Load deflection limited to L/960+: In addition to providing a floor that is 100% stiffer than the three star floor, field experience has been incorporated into the values to provide a floor with a premium performance level for the more discriminating homeowner.				Live Load deflection limited to L/360: Floors that meet the minimum building code L/360 criteria are structurally sound to carry the specified loads; however, there is a much higher risk of floor performance issues. This table should only be used for applications where floor performance is not a concern.			
		12" o.c.	16" o.c.	19.2" o.c.	24" o.c.	12" o.c.	16" o.c.	19.2" o.c.	24" o.c.	12" o.c.	16" o.c.	19.2" o.c.	24" o.c.
9½"	AJS® 24	19'-11"	18'-2"	17'-2"	16'-0"	15'-6"	14'-2"	13'-4"	12'-4"	22'-0"	20'-1"	19'-0"	17'-5"
11⅞"	AJS® 24	23'-8"	21'-7"	20'-5"	18'-3"	18'-6"	16'-10"	15'-10"	14'-8"	26'-2"	23'-11"	22'–3"	18'-3"
14"	AJS® 24	26'-11"	24'-6"	22'-11"	18'-4"	21'-0"	19'-1"	18'-0"	16'-8"	29'-9"	26'-9"	22'-11"	18'-4"
16"	AJS® 24	29'-9"	27'-2"	23'-2"	18'-6"	23'-3"	21'-2"	19'-11"	18'-6"	32'-11"	27'-10"	23'-2"	18'-6"

- Tables are based on
  - residential floor load of 40 psf live load and 12 psf dead load.
  - 23/32" minimum plywood/OSB rated sheathing glued and nailed to joists.
  - the most restrictive of simple or multiple span applications. Analyze multiple span joists with BC Calc® sizing software if the length of any span is less than half the length of an adjacent span.
  - maximum allowable clear distance between supports.
  - minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- Floor tile will increase dead load and may require specific deflection limits, contact Boise Cascade EWP Engineering for further information.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® sizing software.

Gold-shaded values may not satisfy the requirements of the North Carolina State Building Code. Refer to the THREE STAR table when spans exceed 20 feet.

Hole Location and Sizing





AJS® joists are manufactured with 1½" round perforated knockouts in the web at approximately 12" o.c. Minimum distance from support, listed in table below, is required for all holes greater than 1½".

Minimum Distance (D) From Any Support To The Centerline Of The Hole															
Round Hole Diameter			2"	3"	4"	5"	6"	6½"	7"	8"	8⅞"	9"	10"	11"	12"	13"
Rectangular Hole Side			–	–	2"	4"	6"	6"	–	–	–	–	–	–	–	–
Any 9½" Joist	**Span**	**8'**	2'-0"	2'-5"	2'-11"	3'-5"	3'-10"	4'-0"								
		12'	3'-0"	3'-8"	4'-5"	5'-1"	5'-10"	6'-0"								
		16'	4'-0"	4'-11"	5'-11"	6'-10"	7'-9"	8'-0"								
Round Hole Diameter			2"	3"	4"	5"	6"	6½"	7"	8"	8⅞"	9"	10"	11"	12"	13"
Rectangular Hole Side			–	–	–	2"	3"	4"	5"	7"	8"	–	–	–	–	–
Any 11⅞" Joist	**Span**	**8'**	1'-0"	1'-5"	1'-10"	2'-3"	2'-8"	2'-11"	3'-1"	3'-6"	3'-11"					
		12'	1'-5"	2'-1"	2'-9"	3'-5"	4'-0"	4'-4"	4'-8"	5'-4"	5'-11"					
		16'	1'-11"	2'-10"	3'-8"	4'-6"	5'-5"	5'-10"	6'-3"	7'-1"	7'-10"					
		20'	2'-5"	3'-6"	4'-7"	5'-8"	6'-9"	7'-3"	7'10"	8'-11	9'-10"					
Round Hole Diameter			2"	3"	4"	5"	6"	6½"	7"	8"	8⅞"	9"	10"	11"	12"	13"
Rectangular Hole Side			–	–	–	–	2"	3"	3"	5"	6"	6"	8"	9"	–	–
Any 14" Joist	**Span**	**8'**	1'-0"	1'-1"	1'-2"	1'-4"	1'-8"	1'-11"	2'-1"	2'-6"	2'-10"	2'-11"	3'-4"	3'-9"		
		12'	1'-0"	1'-1"	1'-4"	2'-0"	2'-7"	2'-11"	3'-2"	3'-10"	4'-4"	4'-5"	5'-0"	5'-7"		
		16'	1'-0"	1'-1"	1'-10"	2'-8"	3'-5"	3'-10"	4'-3"	5'-1"	5'-9"	5'-11"	6'-8"	7'-6"		
		20'	1'-0"	1'-3"	2'-4"	3'-4"	4'-4"	4'-10"	5'-4"	6'-4"	7'-3"	7'-4"	8'-5"	9'-5"		
		24'	1'-0"	1'-7"	2'-9"	4'-0"	5'-2"	5'-10"	6'-5"	7'-8"	8'-8"	8'-10"	10'-1"	11'-3"		
Round Hole Diameter			2"	3"	4"	5"	6"	6½"	7"	8"	8⅞"	9"	10"	11"	12"	13"
Rectangular Hole Side			–	–	–	–	–	–	2"	3"	5"	5"	6"	8"	9"	10"
Any 16" Joist	**Span**	**8'**	1'-0"	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-8"	2'-0"	2'-1"	2'-5"	2'-10"	3'-2"	3'-7"
		12'	1'-0"	1'-1"	1'-2"	1'-2"	1'-4"	1'-8"	1'-11"	2'-6"	3'-0"	3'-1"	3'-8"	4'-3"	4'-10"	5'-5"
		16'	1'-0"	1'-1"	1'-2"	1'-2"	1'-10"	2'-2"	2'-7"	3'-4"	4'-0"	4'-2"	4'-11"	5'-8"	6'-5"	7'-2"
		20'	1'-0"	1'-1"	1'-2"	1'-4"	2'-3"	2'-9"	3'-3"	4'-3"	5'-1"	5'-2"	6'-2"	7'-1"	8'-1"	9'-0"
		24'	1'-0"	1'-1"	1'-2"	1'-7"	2'-9"	3'-4"	3'-11"	5'-1"	6'-1"	6'-3"	7'-4"	8'-6"	9'-8"	10'-10"

HOW TO USE THIS TABLE

(1) Select a table row based on joist depth and the actual joist span rounded up to the nearest span shown in the table.

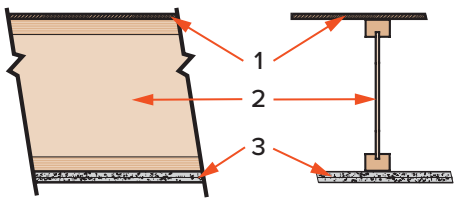
(2) Scan across the row to the column for the appropriate round hole diameter or rectangular hole side. Use the longest side of a rectangular hole.

(3) The table value shown is the closest that the centerline of the hole may be to the edge or face of the nearest support.

NOTES

- **DO NOT** cut joist flanges.
- Holes apply to either single or multiple joists in repetitive member conditions.
- For multiple holes, the amount of horizontal uncut web between holes must equal at least twice the diameter (or longest side) of the largest hole.
- Table assumes one hole per horizontal location. Holes located above or below another should be considered as a single hole that encompasses all the holes.
- 1½" round knockouts in the web may be removed by using a short piece of metal pipe and hammer.
- Single holes may be positioned anywhere vertically in the web, provided they do not extend into either flange.
- This table was designed to apply *only* to the design conditions covered by tables elsewhere in this publication (maximum uniform PLF load).
- Use the BC Calc® software to check other hole sizes or holes in other design conditions. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

One-Hour Fire Floor/Ceiling Assembly



See the US version of the *Boise Cascade Fire Design and Installation Guide* for specific assembly information and other fire resistance assemblies and details.

Fire Assembly Components

(1) Min. $^{23}/_{32}$" thick tongue and groove sheathing (exterior glue), installed with long edge perpendicular to joist length, staggered one joist spacing with adjacent sheets, and glued to joists with construction adhesive.

(2) AJS® joists at 24" o.c. or less.

(3) Two layers ⅝" Type X or two layers ½" Type C gypsum board, installed per Figures 2 or 3 of ICC-ES®/APA® ESR-1336.

Sound Assembly Components *(when constructed with resilient channels)*

Add carpet and pad to fire assembly	STC=54	IIC=68	*or*
Add 3½" glass fiber insulation to fire assembly	STC=55	IIC=46	*or*
Add an additional layer of minimum ⅝" sheathing and 9½" glass fiber insulation to fire assembly	STC=61	IIC=50	

AJS® Joist Design Properties

AJS® Joist Series	Joist Depth	Weight (PLF)	Moment (ft-lbs)	EI × 10⁶ (lb-in²)	K × 10⁶ (lbs)	Shear (lbs)	End Reaction [lbs]				Intermediate Reaction [lbs]			
							1½" Bearing		3½" Bearing		3½" Bearing		5¼" Bearing	
							No WS(1)	WS(2)	No WS(1)	WS(2)	No WS(1)	WS(2)	No WS(1)	WS(2)
AJS® 24	9½"	3.1	4,005	270	5.3	1,160	950	1,240	1,175	1,480	2,600	2,850	2,60	2,850
	11⅞"	3.4	5,190	457	6.7	1,490	955	1,335	1,215	1,595	2,690	3,190	2,690	3,190
	14"	3.7	6,250	670	7.9	1,790	960	1,420	1,250	1,700	2,770	3,500	2,770	3,500
	16"	3.9	7,245	911	9.1	2,065	970	1,500	1,285	1,800	2,850	3,800	2,850	3,800

(1) No web stiffeners required.
(2) Web stiffeners required.

NOTES

- Moment, shear and reaction values based upon a load duration of 100% and may be adjusted for other load durations.
- Design values listed are applicable for Allowable Stress Design (ASD).
- No additional repetitive member increase allowed.

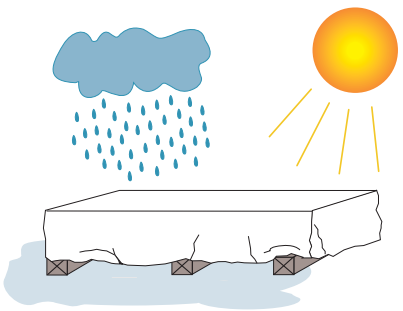
$$\Delta = \frac{5wl^4}{384\,EI} + \frac{wl^2}{K}$$

Δ = deflection (in)
w = uniform load (lb/in)
l = clear span (in)
EI = bending stiffness (lb-in²)
K = shear deformation coefficient (lb)

Code Evaluation Report: APA PR-L310

PRODUCT STORAGE AND HANDLING

Protect product from rain and sun.



- AJS® and BCI® joists and Versa-Lam® LVL
  - must be stored, installed and used in accordance with the Boise Cascade EWP Installation Guide, building codes and, to the extent not inconsistent with the Boise Cascade EWP Installation Guide, usual and customary building practices and standards.
  - must be wrapped, covered, and stored off of the ground on stickers at all times prior to installation.
  - are intended only for applications that ensure no exposure to weather or the elements and an environment that is free from moisture from any source, or any pest, organism or substance which degrades or damages wood or glue bonds.
- Unload products carefully and support to reduce excessive bowing. Use forklifts and cranes carefully to avoid damaging product
- Do not use a visibly damaged product. Contact your local Boise Cascade representative for assistance.
- Failure to correctly store, use, or install BCI® and AJS® joists or Versa-Lam® LVL in accordance with the Boise Cascade EWP Installation Guide will void the limited warranty.

Limited Lifetime Warranty

All Boise Cascade BCI® joist, Versa-Lam® LVL, and AJS® joist products are covered by a limited lifetime warranty for the expected life of the structure. View the complete warranty on our website.

bc.com/terms-conditions/sales-terms-and-conditions

NEED MORE INFORMATION?

Visit bc.com/ewp
or call 1-800-232-0788

Boise Cascade®
ENGINEERED WOOD PRODUCTS

Reorder #JOI-E1601 | Rev 07/23