

# ROOF SPANS 115% SNOW

## ALLOWABLE SPANS FOR PRI OR SSI JOISTS – 25 PSF LIVE LOAD – 15 PSF DEAD LOAD

| Joist Series | Joist Depth | Simple Span       |             |             |                   |             |             |                    |             |             |
|--------------|-------------|-------------------|-------------|-------------|-------------------|-------------|-------------|--------------------|-------------|-------------|
|              |             | Slopes to 4 in 12 |             |             | Slopes to 8 in 12 |             |             | Slopes to 12 in 12 |             |             |
|              |             | 16" o.c.          | 19.2" o.c.  | 24" o.c.    | 16" o.c.          | 19.2" o.c.  | 24" o.c.    | 16" o.c.           | 19.2" o.c.  | 24" o.c.    |
| PRI 20       | 9½"         | 19'-2" (1)        | 18'-0" (1)  | 16'-8" (2)  | 18'-0" (2)        | 16'-11" (2) | 15'-8" (2)  | 16'-8" (2)         | 15'-8" (3)  | 14'-6" (3)  |
|              | 11⅞"        | 23'-1" (2)        | 21'-3" (2)  | 19'-0" (2)  | 21'-9" (2)        | 20'-5" (3)  | 18'-6" (3)  | 20'-1" (3)         | 18'-11" (3) | 17'-6" (3)  |
| SSI 36X      | 14"         | 25'-5" (2)        | 23'-3" (2)  | 20'-9" (2)  | 24'-9" (3)        | 22'-7" (3)  | 20'-2" (3)  | 22'-11" (3)        | 21'-7" (3)  | 19'-6" (3)  |
|              | 9½"         | 21'-1" (1)        | 19'-5" (2)  | 17'-4" (2)  | 19'-10" (2)       | 18'-7" (2)  | 16'-11" (3) | 18'-4" (3)         | 17'-3" (3)  | 15'-11" (3) |
| PRI 40       | 11⅞"        | 24'-4" (2)        | 22'-2" (2)  | 19'-10" (2) | 23'-8" (2)        | 21'-7" (3)  | 19'-3" (3)  | 22'-0" (3)         | 20'-8" (3)  | 18'-7" (3)  |
|              | 14"         | 26'-8" (2)        | 24'-4" (2)  | 21'-9" (2)  | 26'-0" (3)        | 23'-8" (3)  | 21'-2" (3)  | 25'-0" (3)         | 22'-10" (3) | 20'-5" (3)  |
|              | 16"         | 28'-9" (2)        | 26'-3" (2)  | 23'-5" (2)  | 28'-0" (3)        | 25'-6" (3)  | 22'-10" (3) | 27'-0" (3)         | 24'-8" (3)  | 22'-0" (3)  |
|              | 9½"         | 22'-4" (2)        | 21'-0" (2)  | 19'-5" (2)  | 21'-0" (2)        | 19'-9" (3)  | 18'-3" (3)  | 19'-6" (3)         | 18'-4" (3)  | 16'-11" (3) |
| PRI 60       | 11⅞"        | 26'-9" (2)        | 25'-2" (2)  | 23'-3" (2)  | 25'-3" (3)        | 23'-8" (3)  | 21'-11" (3) | 23'-4" (3)         | 21'-11" (3) | 20'-4" (3)  |
|              | 14"         | 30'-6" (2)        | 28'-8" (2)  | 25'-7" (2)  | 28'-9" (3)        | 27'-0" (3)  | 24'-11" (3) | 26'-8" (3)         | 25'-0" (3)  | 23'-2" (3)  |
|              | 16"         | 33'-10" (2)       | 30'-10" (2) | 27'-7" (2)  | 31'-11" (3)       | 30'-0" (3)  | 26'-10" (3) | 29'-7" (3)         | 27'-10" (3) | 25'-9" (3)  |
|              | 9½"         | 22'-4" (2)        | 21'-0" (2)  | 19'-5" (2)  | 21'-0" (2)        | 19'-9" (3)  | 18'-3" (3)  | 19'-6" (3)         | 18'-4" (3)  | 16'-11" (3) |
| PRI 80       | 11⅞"        | 29'-10" (2)       | 28'-0" (2)  | 25'-11" (2) | 28'-1" (3)        | 26'-4" (3)  | 24'-5" (3)  | 26'-0" (3)         | 24'-5" (3)  | 22'-7" (3)  |
|              | 14"         | 33'-11" (2)       | 31'-10" (2) | 29'-5" (3)  | 31'-11" (3)       | 30'-0" (3)  | 27'-9" (3)  | 29'-7" (3)         | 27'-9" (3)  | 25'-9" (3)  |
|              | 16"         | 37'-7" (2)        | 35'-4" (2)  | 32'-8" (3)  | 35'-5" (3)        | 33'-3" (3)  | 30'-10" (3) | 32'-10" (3)        | 30'-10" (3) | 28'-7" (3)  |
|              | 9½"         | 22'-4" (2)        | 21'-0" (2)  | 19'-5" (2)  | 21'-0" (2)        | 19'-9" (3)  | 18'-3" (3)  | 19'-6" (3)         | 18'-4" (3)  | 16'-11" (3) |

### Notes:

- Table values apply to uniformly loaded roof joists that are sloped at least ¼" in 12".
- Span is measured on the horizontal from face to face of supports.
- Table values do not account for stiffness added by glued or nailed sheathing.
- Provide at least 1¾" of bearing length at end supports and 3½" at intermediate supports.
- The numbers in parentheses refer to the minimum connection required at each support.
  - Beveled plate and two nails (190 lbs. lateral capacity @ 115%), or joist hanger
  - Beveled plate and four nails (380 lbs. lateral capacity @ 115%), or (3)
  - Cussets at high support (1490 lbs. lateral capacity @ 115%), birdsmouth cut at low support, or (4)
  - Strap (1640 lbs. lateral capacity @ 115%) or pair of twist straps (950 lbs. lateral capacity each @ 115%) at high support, birdsmouth cut at low support
- Provide lateral restraint at supports (e.g. blocking panels, rim board) and along the compression flange of each joist (e.g. roof sheathing, gypsum board ceiling).
- Consult a professional engineer to analyze conditions outside the scope of this table (e.g. different bearing conditions, concentrated loads, multiple span joists).

## ALLOWABLE SPANS FOR PRI OR SSI JOISTS – 30 PSF LIVE LOAD – 15 PSF DEAD LOAD

| Joist Series | Joist Depth | Simple Span       |             |             |                   |             |            |                    |             |             |
|--------------|-------------|-------------------|-------------|-------------|-------------------|-------------|------------|--------------------|-------------|-------------|
|              |             | Slopes to 4 in 12 |             |             | Slopes to 8 in 12 |             |            | Slopes to 12 in 12 |             |             |
|              |             | 16" o.c.          | 19.2" o.c.  | 24" o.c.    | 16" o.c.          | 19.2" o.c.  | 24" o.c.   | 16" o.c.           | 19.2" o.c.  | 24" o.c.    |
| PRI 20       | 9½"         | 18'-5" (1)        | 17'-3" (2)  | 15'-9" (2)  | 17'-4" (2)        | 16'-3" (2)  | 15'-1" (3) | 16'-1" (3)         | 15'-1" (3)  | 14'-0" (3)  |
|              | 11⅞"        | 22'-0" (2)        | 20'-1" (2)  | 17'-11" (2) | 20'-11" (2)       | 19'-7" (3)  | 17'-6" (3) | 19'-5" (3)         | 18'-3" (3)  | 16'-11" (3) |
| SSI 36X      | 14"         | 24'-0" (2)        | 21'-11" (2) | 19'-7" (2)  | 23'-5" (3)        | 21'-5" (3)  | 19'-1" (3) | 22'-2" (3)         | 20'-9" (3)  | 18'-5" (3)  |
|              | 9½"         | 20'-1" (2)        | 18'-4" (2)  | 16'-5" (2)  | 19'-1" (2)        | 17'-11" (3) | 16'-0" (3) | 17'-9" (3)         | 16'-8" (3)  | 15'-5" (3)  |
| PRI 40       | 11⅞"        | 22'-11" (2)       | 20'-11" (2) | 18'-8" (2)  | 22'-5" (3)        | 20'-5" (3)  | 18'-3" (3) | 21'-3" (3)         | 19'-9" (3)  | 17'-8" (3)  |
|              | 14"         | 25'-2" (2)        | 23'-0" (2)  | 20'-6" (2)  | 24'-7" (3)        | 22'-5" (3)  | 20'-0" (3) | 23'-10" (3)        | 21'-8" (3)  | 19'-5" (3)  |
|              | 16"         | 27'-1" (2)        | 24'-9" (2)  | 22'-1" (2)  | 26'-6" (3)        | 24'-2" (3)  | 21'-7" (3) | 25'-8" (3)         | 23'-5" (3)  | 20'-11" (3) |
|              | 9½"         | 21'-6" (2)        | 20'-2" (2)  | 18'-8" (2)  | 20'-3" (2)        | 19'-0" (3)  | 17'-7" (3) | 18'-10" (3)        | 17'-8" (3)  | 16'-4" (3)  |
| PRI 60       | 11⅞"        | 25'-9" (2)        | 24'-2" (2)  | 22'-0" (2)  | 24'-3" (3)        | 22'-10" (3) | 21'-1" (3) | 22'-7" (3)         | 21'-2" (3)  | 19'-7" (3)  |
|              | 14"         | 29'-4" (2)        | 27'-0" (2)  | 24'-2" (2)  | 27'-8" (3)        | 26'-0" (3)  | 23'-7" (3) | 25'-8" (3)         | 24'-2" (3)  | 22'-4" (3)  |
|              | 16"         | 31'-11" (2)       | 29'-1" (2)  | 26'-0" (2)  | 30'-9" (3)        | 28'-5" (3)  | 25'-5" (3) | 28'-7" (3)         | 26'-10" (3) | 24'-7" (3)  |
|              | 9½"         | 21'-6" (2)        | 20'-2" (2)  | 18'-8" (2)  | 20'-3" (2)        | 19'-0" (3)  | 17'-7" (3) | 18'-10" (3)        | 17'-8" (3)  | 16'-4" (3)  |
| PRI 80       | 11⅞"        | 28'-8" (2)        | 26'-11" (2) | 24'-10" (2) | 27'-0" (3)        | 25'-5" (3)  | 23'-6" (3) | 25'-1" (3)         | 23'-7" (3)  | 21'-10" (3) |
|              | 14"         | 32'-7" (2)        | 30'-7" (2)  | 28'-4" (3)  | 30'-9" (3)        | 28'-11" (3) | 26'-9" (3) | 28'-7" (3)         | 26'-10" (3) | 24'-10" (3) |
|              | 16"         | 36'-2" (2)        | 33'-11" (3) | 31'-0" (3)  | 34'-1" (3)        | 32'-0" (3)  | 29'-8" (3) | 31'-8" (3)         | 29'-9" (3)  | 27'-7" (3)  |
|              | 9½"         | 22'-4" (2)        | 21'-0" (2)  | 19'-5" (2)  | 21'-0" (2)        | 19'-9" (3)  | 18'-3" (3) | 19'-6" (3)         | 18'-4" (3)  | 16'-11" (3) |

See notes above.

## HOW TO USE ROOF SPAN TABLES

- Check the local building code for deflection requirements. Table values are limited to L/180 at total load and L/240 at live load.
- Choose the appropriate load duration category – 100% for heavy snow, 115% for snow or 125% for non-snow. When in doubt, consult the local building department.
- Choose the appropriate live and dead load combination, roof slope and a joist spacing.
- Scan down the spacing column to find a span that exceeds the horizontal design span and the minimum connection required at each support.
- Scan to the left from that span to determine the joist size required.
- Web stiffeners are required at all supports for 22" and 24" joists. See *Web Stiffener Requirements* on page 81 for more details.

# ROOF SPANS 115% SNOW

## ALLOWABLE SPANS FOR PRI OR SSI JOISTS – 40 PSF LIVE LOAD – 15 PSF DEAD LOAD

| Joist Series | Joist Depth | Simple Span       |              |              |                   |              |              |                    |              |              |
|--------------|-------------|-------------------|--------------|--------------|-------------------|--------------|--------------|--------------------|--------------|--------------|
|              |             | Slopes to 4 in 12 |              |              | Slopes to 8 in 12 |              |              | Slopes to 12 in 12 |              |              |
|              |             | 16" o.c.          | 19.2" o.c.   | 24" o.c.     | 16" o.c.          | 19.2" o.c.   | 24" o.c.     | 16" o.c.           | 19.2" o.c.   | 24" o.c.     |
| PRI 20       | 9½"         | 17'- 2" (2)       | 15'- 11" (2) | 14'- 3" (2)  | 16'- 3" (2)       | 15'- 3" (3)  | 13'- 11" (3) | 15'- 2" (3)        | 14'- 3" (3)  | 13'- 2" (3)  |
|              | 11⅞"        | 19'- 11" (2)      | 18'- 2" (2)  | 16'- 3" (2)  | 19'- 6" (3)       | 17'- 10" (3) | 15'- 11" (3) | 18'- 3" (3)        | 17'- 2" (3)  | 15'- 5" (3)  |
| SSI 36X      | 14"         | 21'- 9" (2)       | 19'- 10" (2) | 16'- 11" (2) | 21'- 4" (3)       | 19'- 5" (3)  | 16'- 3" (3)  | 20'- 9" (3)        | 18'- 11" (3) | 15'- 5" (3)  |
| PRI 40       | 9½"         | 18'- 2" (2)       | 16'- 7" (2)  | 14'- 10" (2) | 17'- 10" (3)      | 16'- 3" (3)  | 14'- 6" (3)  | 16'- 8" (3)        | 15'- 8" (3)  | 14'- 2" (3)  |
|              | 11⅞"        | 20'- 9" (2)       | 18'- 11" (2) | 16'- 11" (2) | 20'- 4" (3)       | 18'- 7" (3)  | 16'- 7" (3)  | 19'- 10" (3)       | 18'- 1" (3)  | 16'- 2" (3)  |
|              | 14"         | 22'- 9" (2)       | 20'- 9" (2)  | 18'- 7" (2)  | 22'- 4" (3)       | 20'- 5" (3)  | 18'- 3" (3)  | 21'- 9" (3)        | 19'- 10" (3) | 17'- 9" (3)  |
|              | 16"         | 24'- 7" (2)       | 22'- 5" (2)  | 20'- 0" (2)  | 24'- 1" (3)       | 22'- 0" (3)  | 19'- 7" (3)  | 23'- 5" (3)        | 21'- 5" (3)  | 19'- 1" (3)  |
| PRI 60       | 9½"         | 20'- 0" (2)       | 18'- 10" (2) | 17'- 5" (2)  | 19'- 0" (3)       | 17'- 10" (3) | 16'- 6" (3)  | 17'- 8" (3)        | 16'- 7" (3)  | 15'- 4" (3)  |
|              | 11⅞"        | 24'- 0" (2)       | 22'- 3" (2)  | 19'- 11" (2) | 22'- 3" (3)       | 21'- 4" (3)  | 19'- 6" (3)  | 21'- 3" (3)        | 19'- 11" (3) | 18'- 5" (3)  |
|              | 14"         | 26'- 10" (2)      | 24'- 5" (2)  | 21'- 10" (3) | 25'- 11" (3)      | 24'- 0" (3)  | 21'- 5" (3)  | 24'- 2" (3)        | 22'- 9" (3)  | 20'- 10" (3) |
|              | 16"         | 28'- 11" (2)      | 26'- 4" (2)  | 23'- 7" (3)  | 28'- 4" (3)       | 25'- 10" (3) | 23'- 1" (3)  | 26'- 10" (3)       | 25'- 2" (3)  | 22'- 4" (3)  |
| PRI 80       | 11⅞"        | 26'- 9" (2)       | 25'- 1" (2)  | 23'- 2" (3)  | 25'- 4" (3)       | 23'- 9" (3)  | 22'- 0" (3)  | 23'- 7" (3)        | 22'- 2" (3)  | 20'- 6" (3)  |
|              | 14"         | 30'- 5" (2)       | 28'- 7" (3)  | 26'- 1" (3)  | 28'- 10" (3)      | 27'- 0" (3)  | 25'- 0" (3)  | 26'- 10" (3)       | 25'- 3" (3)  | 23'- 4" (3)  |
|              | 16"         | 33'- 9" (3)       | 31'- 5" (3)  | 26'- 2" (3)  | 32'- 0" (3)       | 30'- 0" (3)  | 25'- 2" (3)  | 29'- 10" (3)       | 28'- 0" (3)  | 23'- 10" (3) |

See notes on page 62

## ALLOWABLE SPANS FOR PRI OR SSI JOISTS – 50 PSF LIVE LOAD – 15 PSF DEAD LOAD

| Joist Series | Joist Depth | Simple Span       |              |             |                   |              |              |                    |              |              |
|--------------|-------------|-------------------|--------------|-------------|-------------------|--------------|--------------|--------------------|--------------|--------------|
|              |             | Slopes to 4 in 12 |              |             | Slopes to 8 in 12 |              |              | Slopes to 12 in 12 |              |              |
|              |             | 16" o.c.          | 19.2" o.c.   | 24" o.c.    | 16" o.c.          | 19.2" o.c.   | 24" o.c.     | 16" o.c.           | 19.2" o.c.   | 24" o.c.     |
| PRI 20       | 9½"         | 16'- 1" (2)       | 14'- 8" (2)  | 13'- 1" (2) | 15'- 5" (3)       | 14'- 5" (3)  | 12'- 10" (3) | 14'- 4" (3)        | 13'- 6" (3)  | 12'- 6" (3)  |
|              | 11⅞"        | 18'- 4" (2)       | 16'- 8" (2)  | 14'- 4" (2) | 18'- 0" (3)       | 16'- 5" (3)  | 13'- 10" (3) | 17'- 4" (3)        | 16'- 1" (3)  | 13'- 3" (3)  |
| SSI 36X      | 14"         | 20'- 0" (2)       | 17'- 11" (2) | 14'- 4" (2) | 19'- 8" (3)       | 17'- 4" (3)  | 13'- 10" (3) | 19'- 3" (3)        | 16'- 7" (3)  | 13'- 3" (3)  |
| PRI 40       | 9½"         | 16'- 9" (2)       | 15'- 3" (2)  | 13'- 8" (2) | 16'- 6" (3)       | 15'- 0" (3)  | 13'- 5" (3)  | 15'- 10" (3)       | 14'- 8" (3)  | 13'- 1" (3)  |
|              | 11⅞"        | 19'- 1" (2)       | 17'- 5" (2)  | 15'- 7" (2) | 18'- 9" (3)       | 17'- 1" (3)  | 15'- 4" (3)  | 18'- 4" (3)        | 16'- 9" (3)  | 14'- 11" (3) |
|              | 14"         | 21'- 0" (2)       | 19'- 2" (2)  | 17'- 1" (2) | 20'- 7" (3)       | 18'- 10" (3) | 16'- 10" (3) | 20'- 2" (3)        | 18'- 5" (3)  | 16'- 5" (3)  |
|              | 16"         | 22'- 7" (2)       | 20'- 7" (2)  | 18'- 5" (3) | 22'- 3" (3)       | 20'- 3" (3)  | 18'- 1" (3)  | 21'- 9" (3)        | 19'- 10" (3) | 17'- 8" (3)  |
| PRI 60       | 9½"         | 18'- 10" (2)      | 17'- 8" (2)  | 16'- 1" (2) | 17'- 11" (3)      | 16'- 10" (3) | 15'- 7" (3)  | 16'- 9" (3)        | 15'- 9" (3)  | 14'- 7" (3)  |
|              | 11⅞"        | 22'- 6" (2)       | 20'- 6" (2)  | 18'- 4" (3) | 21'- 6" (3)       | 20'- 2" (3)  | 18'- 0" (3)  | 20'- 2" (3)        | 18'- 11" (3) | 17'- 6" (3)  |
|              | 14"         | 24'- 8" (2)       | 22'- 6" (2)  | 20'- 1" (3) | 24'- 3" (3)       | 22'- 2" (3)  | 19'- 9" (3)  | 22'- 11" (3)       | 21'- 7" (3)  | 19'- 2" (3)  |
|              | 16"         | 26'- 7" (2)       | 24'- 3" (3)  | 20'- 9" (3) | 26'- 2" (3)       | 23'- 10" (3) | 20'- 1" (3)  | 25'- 6" (3)        | 23'- 4" (3)  | 19'- 2" (3)  |
| PRI 80       | 11⅞"        | 25'- 2" (2)       | 23'- 7" (3)  | 21'- 9" (3) | 24'- 0" (3)       | 22'- 6" (3)  | 20'- 9" (3)  | 22'- 5" (3)        | 21'- 0" (3)  | 19'- 6" (3)  |
|              | 14"         | 28'- 7" (3)       | 26'- 10" (3) | 22'- 2" (3) | 27'- 3" (3)       | 25'- 7" (3)  | 21'- 5" (3)  | 25'- 6" (3)        | 23'- 11" (3) | 20'- 6" (3)  |
|              | 16"         | 31'- 8" (3)       | 27'- 9" (3)  | 22'- 2" (3) | 30'- 3" (3)       | 26'- 10" (3) | 21'- 5" (3)  | 28'- 4" (3)        | 25'- 8" (3)  | 20'- 6" (3)  |

See notes on page 62