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Supplements to Girder and Header Span Tables for #2 Southern Pine

Code: 2018 Residential Code **Date:** April 25, 2018
Sections: Tables R602.7(1) and R602.7(2)

Question: Can the 2015 *Wood Frame Construction Manual (WFCM)* published by the American Wood Council (formerly AF&PA) be used prescriptively for No. 2 Southern Pine headers?

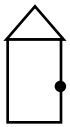
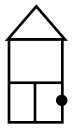
Answer:
Yes. Although Tables R602.7(1) and R602.7(2) do not prohibit the use of No. 2 Southern Pine for headers and girders as long as they are appropriately sized, the spans shown are inadequate for the new Southern Pine design values, except for No. 1 grade (and higher grade) Southern Pine lumber. These tables can still be used for No. 2 Douglas Fir-Larch, Hem-Fir, and Spruce-Pine-Fir lumber headers and girders. The American Wood Council (AWC) has published the 2015 Wood Frame Construction Manual (WFCM) which contains new tables for southern pine No.2 headers and girders that may be used as alternate materials as addressed by the NC Administrative Code and Policies, Section 105 and are subject to acceptance by the local code enforcement official (CEO). It is the general position of the Department of Insurance, Engineering Division that alternate materials may be accepted without an engineered design when the materials have been properly tested and evaluated and shown to be equivalent to those materials prescriptively included in the technical codes. The Engineering Division can recommend acceptance of the girder and header tables contained within the 2015 WFCM as an acceptable alternate to the prescriptive framing members addressed by the North Carolina Residential Code. Below is a link to those tables which begin on page 260.
http://www.awc.org/pdf/AWC_WFCM-2015_web-viewonly_1411.pdf
In lieu of the tables published in the 2015 Wood Frame Construction Manual, the tables below have been developed by the Department of Insurance and can be used for southern pine No.2 lumber headers and girders.

Keywords:

SUPPLEMENTAL TABLE R602.7(1) **EXTERIOR**

GIRDER SPANS AND HEADER SPANS FOR EXTERIOR BEARING WALLS a.b.c.d.e.f

(Maximum spans for southern pine No. @ and required number of jack studs)

Girders and Headers Supporting	Size	Ground Snow Load (psf)																	
		30						50						70					
		Building width (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ
Roof and ceiling 	2 – 2 x 4	3 – 3	1	2 – 10	1	2 – 7	1	2 – 9	1	2 – 5	1	2 – 2	1	2 – 6	1	2 – 2	1	1 – 11	1
	2 – 2 x 6	4 – 9	1	4 – 2	1	3 – 9	1	4 – 2	2	3 – 7	1	3 – 3	1	3 – 9	1	3 – 3	1	2 – 11	1
	2 – 2 x 8	5 – 10	1	5 – 2	1	4 – 8	1	5 – 0	2	4 – 5	2	4 – 0	2	4 – 7	2	4 – 0	2	3 – 7	1
	2 – 2 x 10	6 – 6	2	5 – 9	1	5 – 3	1	5 – 9	2	5 – 1	2	4 – 8	2	5 – 2	2	4 – 7	2	4 – 2	2
	2 – 2 x 12	7 – 0	2	6 - 3	2	5 – 10	1	6 – 3	2	5 – 8	2	5 – 2	2	5 – 9	2	5 – 2	2	4 – 9	2
	3 – 2 x 8	7 – 0	1	6 – 2	1	5 – 7	1	6 – 1	2	5 – 5	1	4 – 11	1	5 – 6	2	4 – 11	2	4 – 5	2
	3 – 2 x 10	7 – 8	1	6 – 10	1	6 – 3	1	6 – 9	2	6 – 0	2	5 – 6	1	6 – 2	2	5 – 6	2	5 – 0	2
	3 – 2 x 12	8 – 2	2	7 – 4	1	6 – 9	1	7 – 3	2	6 – 6	2	6 – 1	2	6 – 8	2	6 – 0	2	5 – 7	2
	4 – 2 x 8	7 – 9	1	6 – 11	1	6 – 4	1	6 – 11	1	6 – 1	1	5 – 7	1	6 – 3	2	5 – 6	1	5 – 0	1
	4 – 2 x 10	8 – 6	1	7 – 8	1	7 – 0	1	7 – 7	1	6 – 9	1	6 – 3	1	6 – 11	2	6 – 2	2	5 – 8	1
	4 – 2 x 12	9 – 2	1	8 – 2	1	7 – 6	1	8 – 2	2	7 – 4	1	6 – 9	1	7 – 6	2	6 – 8	2	6 – 2	2
Roof, ceiling and one center bearing floor 	2 – 2 x 4	2 – 8	1	2 – 4	1	2 – 2	1	2 – 6	1	2 – 2	1	2 – 0	1	2 – 3	1	2 – 0	1	1 – 10	1
	2 – 2 x 6	4 – 0	2	3 – 6	1	3 – 2	1	3 – 8	1	3 – 3	1	2 – 11	1	3 – 5	1	3 – 0	1	2 – 8	1
	2 – 2 x 8	4 – 11	2	4 – 4	2	3 – 11	1	4 – 6	2	4 – 0	2	3 – 8	1	4 – 2	2	3 – 9	1	3 – 5	1
	2 – 2 x 10	5 – 7	2	5 – 0	2	4 – 7	2	5 – 2	2	4 – 7	2	4 – 3	2	4 – 9	2	4 – 3	2	3 – 11	1
	2 – 2 x 12	6 – 1	3	5 – 6	2	5 – 1	2	5 – 9	2	5 – 2	2	4 – 9	2	5 – 5	2	4 – 10	2	4 – 6	2
	3 – 2 x 8	5 – 11	1	5 – 3	1	4 – 10	1	5 – 6	2	4 – 11	2	4 – 5	2	5 – 2	2	4 – 7	2	4 – 2	2
	3 – 2 x 10	6 – 6	2	5 – 11	1	5 – 5	1	6 – 2	2	5 – 6	2	5 – 1	2	5 – 9	2	5 – 2	2	4 – 9	2
	3 – 2 x 12	7 – 1	2	6 – 5	2	6 – 0	2	6 – 8	2	6 – 0	2	5 – 7	2	6 – 3	2	5 – 8	2	5 – 3	2
	4 – 2 x 8	6 – 8	2	6 – 0	2	5 – 6	1	6 – 3	2	5 – 6	1	5 – 1	1	5 – 9	1	5 – 2	1	4 – 9	1
	4 – 2 x 10	7 – 4	2	6 – 7	2	6 – 1	2	6 – 11	2	6 – 2	2	5 – 8	1	6 – 6	2	5 – 9	1	5 – 4	1
	4 – 2 x 12	7 – 11	2	7 – 1	2	6 – 7	2	7 – 5	2	6 – 8	2	6 – 2	2	7 – 0	2	6 – 3	2	5 – 10	1

a. Spans are given in feet and inches.

b. Spans are based on minimum design properties for No. 2 Grade lumber of southern pine only. For other species, see Table R602.7(1) in the 2018 NCRC.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ – Number of jack studs required to support each end. Where the number of jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

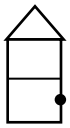
e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

f. One half of the studs interrupted by a wall opening shall be placed immediately outside the jack studs on each side of the opening as king studs to resist wind loads. King studs shall extend full height from sole plate to top plate of the wall.

SUPPLEMENTAL TABLE R602.7(1) – cont. **EXTERIOR**

GIRDER SPANS AND HEADER SPANS FOR EXTERIOR BEARING WALLS a.b.c.d.e.f

(Maximum spans for southern pine No. @ and required number of jack studs)

Girders and Headers Supporting	Size	Ground Snow Load (psf)																	
		30						50						70					
		Building width (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ
Roof, ceiling and one clear span floor 	2 – 2 x 4	2 – 5	1	2 – 1	1	1 – 10	1	2 – 3	2	1 – 11	2	1 – 9	2	2 – 2	2	1 – 10	2	1 – 8	2
	2 – 2 x 6	3 – 6	1	3 – 0	1	2 – 9	1	3 – 4	2	2 – 11	2	2 – 7	2	3 – 2	2	2 – 9	2	2 – 6	2
	2 – 2 x 8	4 – 5	2	3 – 10	1	3 – 6	1	4 – 2	3	3 – 7	2	3 – 3	2	3 – 11	2	3 – 5	2	3 – 1	2
	2 – 2 x 10	5 – 1	2	4 – 6	2	4 – 1	2	4 – 9	3	4 – 2	3	3 – 10	2	4 – 6	3	4 – 0	3	3 – 7	2
	2 – 2 x 12	5 – 7	2	5 – 0	2	4 – 7	2	5 – 4	3	4 – 9	3	4 – 4	3	5 – 1	3	4 – 6	3	4 – 1	3
	3 – 2 x 8	5 – 5	2	4 – 9	2	4 – 3	2	5 – 0	2	4 – 5	2	4 – 0	2	4 – 9	2	4 – 2	2	3 – 10	1
	3 – 2 x 10	6 – 0	2	5 – 5	2	4 – 11	2	5 – 9	2	5 – 1	2	4 – 8	2	5 – 5	2	4 – 10	2	4 – 5	2
	3 – 2 x 12	6 – 6	2	5 – 11	2	5 – 5	2	6 – 3	3	5 – 7	2	5 – 2	2	5 – 11	2	5 – 4	2	4 – 11	2
	4 – 2 x 8	6 – 1	2	5 – 5	1	4 – 11	1	5 – 9	2	5 – 0	2	4 – 7	2	5 – 6	2	4 – 9	2	4 – 4	2
	4 – 2 x 10	6 – 9	2	6 – 0	2	5 – 6	1	6 – 5	2	5 – 9	2	5 – 3	2	6 – 1	2	5 – 5	2	5 – 0	2
	4 – 2 x 12	7 – 3	2	6 – 6	2	6 – 0	2	6 – 11	2	6 – 3	2	5 – 9	2	6 – 7	2	5 – 11	2	5 – 6	2
Roof, ceiling and two center bearing floors 	2 – 2 x 4	2 – 3	1	1 – 11	1	1 – 9	1	2 – 2	2	1 – 10	2	1 – 8	2	2 – 0	2	1 – 9	2	1 – 7	2
	2 – 2 x 6	3 – 4	1	2 – 11	1	2 – 8	1	3 – 2	2	2 – 9	2	2 – 6	2	3 – 0	2	2 – 8	2	2 – 5	2
	2 – 2 x 8	4 – 2	2	3 – 8	1	3 – 4	1	3 – 11	2	3 – 6	2	3 – 2	2	3 – 9	2	3 – 3	2	3 – 0	2
	2 – 2 x 10	4 – 9	2	4 – 3	2	3 – 11	1	4 – 6	3	4 – 0	3	3 – 8	2	4 – 4	3	3 – 10	2	3 – 6	2
	2 – 2 x 12	5 – 4	2	4 – 10	2	4 – 5	2	5 – 1	3	4 – 7	3	4 – 3	3	4 – 10	3	4 – 4	3	4 – 0	3
	3 – 2 x 8	5 – 1	2	4 – 6	2	4 – 1	2	4 – 10	2	4 – 3	2	3 – 11	1	4 – 8	2	4 – 1	2	3 – 8	1
	3 – 2 x 10	5 – 9	2	5 – 2	2	4 – 9	2	5 – 6	2	4 – 11	2	4 – 6	2	5 – 3	2	4 – 8	2	4 – 3	2
	3 – 2 x 12	6 – 3	2	5 – 8	2	5 – 3	2	6 – 0	3	5 – 5	2	5 – 0	2	5 – 9	2	5 – 2	2	4 – 10	2
	4 – 2 x 8	5 – 9	1	5 – 2	1	4 – 9	1	5 – 6	2	4 – 11	2	4 – 5	2	5 – 3	2	4 – 8	2	4 – 3	2
	4 – 2 x 10	6 – 5	2	5 – 9	1	5 – 4	1	6 – 1	2	5 – 6	2	5 – 1	2	5 – 10	2	5 – 3	2	4 – 10	2
	4 – 2 x 12	6 – 11	2	6 – 3	2	5 – 10	1	6 – 7	2	6 – 0	2	5 – 7	2	6 – 4	2	5 – 9	2	5 – 4	2

a. Spans are given in feet and inches.

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		Building width (feet)																	
		20		28		36		20		28		36		20		28		36	
		Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ	Span	NJ
Roof, ceiling and one clear span floor 	2 – 2 x 4	1 – 10	2	1 – 6	2	1 – 4	2	1 – 10	2	1 – 6	2	1 – 4	2	1 – 9	2	1 – 6	2	1 – 4	2
	2 – 2 x 6	2 – 9	2	2 – 4	2	2 – 1	2	2 – 9	2	2 – 4	2	2 – 1	2	2 – 8	2	2 – 3	2	2 – 1	2
	2 – 2 x 8	3 – 5	2	3 – 0	2	2 – 8	2	3 – 5	2	3 – 0	2	2 – 8	2	3 – 4	2	2 – 11	2	2 – 7	2
	2 – 2 x 10	4 – 0	3	3 – 6	2	3 – 2	2	4 – 0	3	3 – 6	2	3 – 2	2	3 – 11	2	3 – 5	2	3 – 1	2
	2 – 2 x 12	4 – 7	3	4 – 0	3	3 – 8	2	4 – 6	3	4 – 0	3	3 – 8	2	4 – 5	4	3 – 10	2	3 – 6	2
	3 – 2 x 8	4 – 3	2	3 – 8	1	3 – 4	1	4 – 3	2	3 – 8	1	3 – 4	1	4 – 2	3	3 – 7	2	3 – 3	2
	3 – 2 x 10	4 – 11	2	4 – 3	2	3 – 10	1	4 – 11	2	4 – 3	2	3 – 10	1	4 – 9	3	4 – 2	3	3 – 9	2
	3 – 2 x 12	5 – 6	2	4 – 11	2	4 – 5	2	5 – 5	2	4 – 10	2	4 – 5	2	5 – 3	3	4 – 8	3	4 – 3	3
	4 – 2 x 8	4 – 11	2	4 – 3	2	3 – 10	1	4 – 10	2	4 – 3	2	3 – 10	1	4 – 8	2	4 – 1	2	3 – 9	1
	4 – 2 x 10	5 – 7	2	4 – 11	2	4 – 5	2	5 – 6	2	4 – 11	2	4 – 5	2	5 – 4	2	4 – 9	2	4 – 3	2
	4 – 2 x 12	6 – 2	3	5 – 6	2	5 – 0	2	6 – 0	3	5 – 5	2	5 – 0	2	5 – 10	2	5 – 3	2	4 – 10	2

a. Spans are given in feet and inches.

b. Spans are based on minimum design properties for No. 2 Grade lumber of southern pine only. For other species, see Table R602.7(1) in the 2018 NCRC.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ – Number of jack studs required to support each end. Where the number of jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

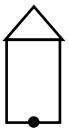
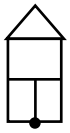
e. Use 30 psf ground snow load for cases in which ground snow load is less than 30 psf and the roof live load is equal to or less than 20 psf.

f. One half of the studs interrupted by a wall opening shall be placed immediately outside the jack studs on each side of the opening as king studs to resist wind loads. King studs shall extend full height from sole plate to top plate of the wall.

SUPPLEMENTAL TABLE R602.7(1) – cont. **EXTERIOR**

GIRDER SPANS AND HEADER SPANS FOR EXTERIOR BEARING WALLS a.b.c.d.e

(Maximum spans for southern pine No. @ and required number of jack studs)

Girders and Headers Supporting	Size	Building width (feet)					
		20		28		36	20
		Span	NJ	Span	NJ	Span	NJ
Roof, ceiling and one clear span floor 	2 – 2 x 4	3 – 2	1	2 – 8	1	2 – 4	1
	2 – 2 x 6	4 – 9	1	3 – 11	1	3 – 5	1
	2 – 2 x 8	5 – 9	1	4 – 10	1	4 – 4	1
	2 – 2 x 10	6 – 7	1	5 – 8	1	5 – 0	1
	2 – 2 x 12	7 – 2	1	6 – 3	2	5 – 7	1
	3 – 2 x 8	7 – 0	1	5 – 11	1	5 – 3	1
	3 – 2 x 10	7 – 9	1	6 – 8	1	6 – 0	1
	3 – 2 x 12	8 – 5	1	7 – 3	1	6 – 7	1
	4 – 2 x 8	7 – 11	1	6 – 9	1	6 – 0	1
	4 – 2 x 10	8 – 8	1	7 – 6	1	6 – 9	1
	4 – 2 x 12	9 – 4	1	8 – 2	1	7 – 4	1
Roof, ceiling and two center bearing floors 	2 – 2 x 4	2 – 1	1	1 – 9	2	1 – 7	2
	2 – 2 x 6	3 – 2	1	2 – 8	2	2 – 5	2
	2 – 2 x 8	3 – 11	1	3 – 4	2	3 – 0	2
	2 – 2 x 10	4 – 7	2	3 – 11	2	3 – 6	2
	2 – 2 x 12	5 – 2	2	4 – 6	3	4 – 1	3
	3 – 2 x 8	4 – 10	1	4 – 2	2	3 – 9	1
	3 – 2 x 10	5 – 6	1	4 – 9	2	4 – 4	2
	3 – 2 x 12	6 – 2	2	5 – 5	2	4 – 11	2
	4 – 2 x 8	5 – 6	1	4 – 9	2	4 – 3	2
	4 – 2 x 10	6 – 3	2	5 – 5	2	4 – 11	2
	4 – 2 x 12	6 – 10	2	6 – 0	2	5 – 6	2

a. Spans are given in feet and inches.

b. Spans are based on minimum design properties for No. 2 Grade lumber of southern pine only. For other species, see Table R602.7(2) in the 2018 NCRC.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ – Number of jack studs required to support each end. Where the number of jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

e. One half of the studs interrupted by a wall opening shall be placed immediately outside the jack studs on each side of the opening as king studs to resist wind loads. King studs shall extend full height from sole plate to top plate of the wall.