

Southern Yellow Pine – Design Value Reduction

On June 1, 2013 new design values for Southern Yellow Pine (SYP) went into effect for all visually graded dimension lumber. These new values represent the findings of the Southern Pine Inspection Bureau's (SPIB) recent destructive testing of full size specimens. The new values are anywhere between a 20 to 30 percent reduction in four design values.

The new design values apply to all visually graded SYP lumber. The values affected are bending, tension parallel to grain, compression parallel to grain, and the modulus of elasticity. The National Design Specification (NDS) has published an addendum to the 2012 and all previous versions of the Design Values for Wood Construction to match the new design values published by the SPIB's Supplement 13 to the *Standard Grading Rules for Southern Pine Lumber*, 2002 Edition.

Since NDS has revised values, the International Building Code (IBC) is affected immediately. Currently the American Wood Council (AWC) is working with the International Code Council to incorporate the new design values into span tables in the 2015 International Residential Code (IRC). The span tables in the current IRC do not use the new design values, nor is there any addendum referring to the new values. Span tables have already been updated in the Southern Forrest Product Association's (SFPA) publication *Southern Pine Maximum Spans for Joist*. These tables differ from the IRC's span tables greatly. In some cases there is a difference of up to three feet in maximum span lengths. This is all dependent on lumber dimension and grade but in general the lesser the grade the greater the difference.

In conclusion all dimension SYP lumber has been reduced in four design parameters. In general there is a decrease of about 20 to 30 percent; with the larger reductions being in lesser grades and smaller dimensions. Span tables in the IRC have not been updated to adopt the new values. There are some major differences from the IRC and SFPA in maximum span lengths. For residential, one and two family, the IRC is still using the old values but from a design standpoint NDS has published new values.

For more information see the links below:

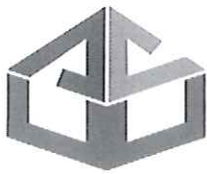
Complete Design Value Package:

http://www.southernpine.com/pdf/DV_COMPLETE%20PACKAGE_022513_L.pdf

Newly Published Span Tables:

http://www.southernpine.com/pdf/C1_Visual_NDVs_Max%20Spans_060113.pdf

Attached is the NDS addendum and comparisons to other species.



ADDENDUM

to the 2012 and previous versions of the *Design Values for Wood Construction*

(a supplement to the *National Design Specification® (NDS®) for Wood Construction*)

Effective June 1, 2013, design values for all grades of visually-graded Southern Pine and Mixed Southern Pine lumber, 2" - 4" thick will change. The design values to use with the *2012 NDS*, *2005 NDS*, and the *2001 NDS* are shown below (values that will change on June 1, 2013 are shown as underlined). These values supersede values published in the AWC March 2012 Addendum.

Table 4B Reference Design Values for Visually Graded Southern Pine Dimension Lumber (2" - 4" thick)^{1,2,3,4,5} (Tabulated design values are for normal load duration and dry service conditions, unless specified otherwise. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4B ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ⁶	Grading Rules Agency
		Bending F _b	Tension parallel to grain F _t	Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	Compression parallel to grain F _c	Modulus of Elasticity			
							E	E _{min}		
SOUTHERN PINE										
Dense Select Structural	2" - 4" wide	<u>2,700</u>	<u>1,900</u>	175	660	<u>2,050</u>	1,900,000	690,000	0.55	SPIB
Select Structural		<u>2,350</u>	<u>1,650</u>	175	565	<u>1,900</u>	1,800,000	660,000		
Non-Dense Select Structural		<u>2,050</u>	<u>1,450</u>	175	480	<u>1,800</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Dense		<u>1,650</u>	<u>1,100</u>	175	660	<u>1,750</u>	1,800,000	660,000		
No.1		<u>1,500</u>	<u>1,000</u>	175	565	<u>1,650</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Non-Dense		<u>1,300</u>	<u>875</u>	175	480	<u>1,550</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Dense		<u>1,200</u>	<u>750</u>	175	660	<u>1,500</u>	<u>1,600,000</u>	<u>580,000</u>		
No.2		<u>1,100</u>	<u>675</u>	175	565	<u>1,450</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Non-Dense		<u>1,050</u>	<u>600</u>	175	480	<u>1,450</u>	<u>1,300,000</u>	<u>470,000</u>		
No.3 and Stud		<u>650</u>	<u>400</u>	175	565	<u>850</u>	<u>1,300,000</u>	<u>470,000</u>		
Construction	4" wide	<u>875</u>	<u>500</u>	175	565	<u>1,600</u>	<u>1,400,000</u>	<u>510,000</u>	0.55	
Standard		<u>475</u>	<u>275</u>	175	565	<u>1,300</u>	<u>1,200,000</u>	<u>440,000</u>		
Utility		<u>225</u>	<u>125</u>	175	565	<u>850</u>	<u>1,200,000</u>	<u>440,000</u>		
Dense Select Structural	5" - 6" wide	<u>2,400</u>	<u>1,650</u>	175	660	<u>1,900</u>	1,900,000	690,000	0.55	SPIB
Select Structural		<u>2,100</u>	<u>1,450</u>	175	565	<u>1,800</u>	1,800,000	660,000		
Non-Dense Select Structural		<u>1,850</u>	<u>1,300</u>	175	480	<u>1,700</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Dense		<u>1,500</u>	<u>1,000</u>	175	660	<u>1,650</u>	1,800,000	660,000		
No.1		<u>1,350</u>	<u>875</u>	175	565	<u>1,550</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Non-Dense		<u>1,200</u>	<u>775</u>	175	480	<u>1,450</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Dense		<u>1,050</u>	<u>650</u>	175	660	<u>1,450</u>	<u>1,600,000</u>	<u>580,000</u>		
No.2		<u>1,000</u>	<u>600</u>	175	565	<u>1,400</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Non-Dense		<u>950</u>	<u>525</u>	175	480	<u>1,350</u>	<u>1,300,000</u>	<u>470,000</u>		
No.3 and Stud		<u>575</u>	<u>350</u>	175	565	<u>800</u>	<u>1,300,000</u>	<u>470,000</u>		
Dense Select Structural	8" wide	<u>2,200</u>	<u>1,550</u>	175	660	<u>1,850</u>	1,900,000	690,000	0.55	SPIB
Select Structural		<u>1,950</u>	<u>1,350</u>	175	565	<u>1,700</u>	1,800,000	660,000		
Non-Dense Select Structural		<u>1,700</u>	<u>1,200</u>	175	480	<u>1,650</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Dense		<u>1,350</u>	<u>900</u>	175	660	<u>1,600</u>	1,800,000	660,000		
No.1		<u>1,250</u>	<u>800</u>	175	565	<u>1,500</u>	<u>1,600,000</u>	<u>580,000</u>		
No.1 Non-Dense		<u>1,100</u>	<u>700</u>	175	480	<u>1,400</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Dense		<u>975</u>	<u>600</u>	175	660	<u>1,400</u>	<u>1,600,000</u>	<u>580,000</u>		
No.2		<u>925</u>	<u>550</u>	175	565	<u>1,350</u>	<u>1,400,000</u>	<u>510,000</u>		
No.2 Non-Dense		<u>875</u>	<u>500</u>	175	480	<u>1,300</u>	<u>1,300,000</u>	<u>470,000</u>		
No.3 and Stud		<u>525</u>	<u>325</u>	175	565	<u>775</u>	<u>1,300,000</u>	<u>470,000</u>		

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity ⁵ G	Grading Rules Agency
		Bending F _b	Tension parallel to grain F _t	Shear parallel to grain F _v	Compression perpendicular to grain F _{c⊥}	Compression parallel to grain F _c	Modulus of Elasticity			
							E	E _{min}		
SOUTHERN PINE (continued)										
Dense Select Structural	10" wide	<u>1,950</u>	<u>1,300</u>	175	660	<u>1,800</u>	1,900,000	690,000	0.55	SPIB
Select Structural		<u>1,700</u>	<u>1,150</u>	175	565	<u>1,650</u>	1,800,000	660,000		
Non-Dense Select Structural		<u>1,500</u>	<u>1,050</u>	175	480	<u>1,600</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 1 Dense		<u>1,200</u>	<u>800</u>	175	660	<u>1,550</u>	1,800,000	660,000		
No. 1		<u>1,050</u>	<u>700</u>	175	565	<u>1,450</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 1 Non-Dense		<u>950</u>	<u>625</u>	175	480	<u>1,400</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 2 Dense		<u>850</u>	<u>525</u>	175	660	<u>1,350</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 2		<u>800</u>	<u>475</u>	175	565	<u>1,300</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 2 Non-Dense		<u>750</u>	<u>425</u>	175	480	<u>1,250</u>	<u>1,300,000</u>	<u>470,000</u>		
No. 3 and Stud		<u>475</u>	<u>275</u>	175	565	<u>750</u>	<u>1,300,000</u>	<u>470,000</u>		
Dense Select Structural	12" wide	<u>1,800</u>	<u>1,250</u>	175	660	<u>1,750</u>	1,900,000	690,000	0.55	SPIB
Select Structural		<u>1,600</u>	<u>1,100</u>	175	565	<u>1,650</u>	1,800,000	660,000		
Non-Dense Select Structural		<u>1,400</u>	<u>975</u>	175	480	<u>1,550</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 1 Dense		<u>1,100</u>	<u>750</u>	175	660	<u>1,500</u>	1,800,000	660,000		
No. 1		<u>1,000</u>	<u>650</u>	175	565	<u>1,400</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 1 Non-Dense		<u>900</u>	<u>575</u>	175	480	<u>1,350</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 2 Dense		<u>800</u>	<u>500</u>	175	660	<u>1,300</u>	<u>1,600,000</u>	<u>580,000</u>		
No. 2		<u>750</u>	<u>450</u>	175	565	<u>1,250</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 2 Non-Dense		<u>700</u>	<u>400</u>	175	480	<u>1,250</u>	<u>1,300,000</u>	<u>470,000</u>		
No. 3 and Stud		<u>450</u>	<u>250</u>	175	565	<u>725</u>	<u>1,300,000</u>	<u>470,000</u>		
MIXED SOUTHERN PINE										
Select Structural	2" - 4" wide	2,050	1,200	175	565	1,800	1,600,000	580,000	0.51	SPIB
No. 1		1,450	875	175	565	1,650	1,500,000	550,000		
No. 2		<u>1,100</u>	<u>675</u>	175	565	<u>1,450</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 3 and Stud		<u>650</u>	<u>400</u>	175	565	<u>850</u>	<u>1,200,000</u>	<u>440,000</u>		
Construction Standard	4" wide	<u>850</u>	<u>500</u>	175	565	<u>1,600</u>	1,300,000	470,000	0.51	
Utility		<u>475</u>	<u>275</u>	175	565	<u>1,300</u>	1,200,000	440,000		
		<u>225</u>	<u>125</u>	175	565	<u>850</u>	1,100,000	400,000		
Select Structural	5" - 6" wide	1,850	1,100	175	565	1,700	1,600,000	580,000	0.51	
No. 1		1,300	750	175	565	1,550	1,500,000	550,000		
No. 2		<u>1,000</u>	<u>600</u>	175	565	<u>1,400</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 3 and Stud		<u>575</u>	<u>350</u>	175	565	<u>775</u>	<u>1,200,000</u>	<u>440,000</u>		
Select Structural	8" wide	1,750	1,000	175	565	1,600	1,600,000	580,000	0.51	
No. 1		1,200	700	175	565	1,450	1,500,000	550,000		
No. 2		<u>925</u>	<u>550</u>	175	565	<u>1,350</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 3 and Stud		<u>525</u>	<u>325</u>	175	565	<u>800</u>	<u>1,200,000</u>	<u>440,000</u>		
Select Structural	10" wide	1,500	875	175	565	1,600	1,600,000	580,000	0.51	
No. 1		1,050	600	175	565	1,450	1,500,000	550,000		
No. 2		<u>800</u>	<u>475</u>	175	565	<u>1,300</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 3 and Stud		<u>475</u>	<u>275</u>	175	565	<u>750</u>	<u>1,200,000</u>	<u>440,000</u>		
Select Structural	12" wide	1,400	825	175	565	1,550	1,600,000	580,000	0.51	
No. 1		975	575	175	565	1,400	1,500,000	550,000		
No. 2		<u>750</u>	<u>450</u>	175	565	<u>1,250</u>	<u>1,400,000</u>	<u>510,000</u>		
No. 3 and Stud		<u>450</u>	<u>250</u>	175	565	<u>725</u>	<u>1,200,000</u>	<u>440,000</u>		

- LUMBER DIMENSIONS.** Tabulated design values are applicable to lumber that will be used under dry conditions such as in most covered structures. For 2" to 4" thick lumber the DRY dressed sizes shall be used (see Table 1A) regardless of the moisture content at the time of manufacture or use. In calculating design values, the natural gain in strength and stiffness that occurs as lumber dries has been taken into consideration as well as the reduction in size that occurs when unseasoned lumber shrinks. The gain in load carrying capacity due to increased strength and stiffness resulting from drying more than offsets the design effect of size reductions due to shrinkage.
- STRESS-RATED BOARDS.** Information for various grades of Southern Pine stress-rated boards of nominal 1", 1¼", and 1½" thickness, 2" and wider is available from the Southern Pine Inspection Bureau (SPIB) in the *Standard Grading Rules for Southern Pine Lumber*.

3. **SPRUCE PINE.** To obtain recommended design values for Spruce Pine graded to SPIB rules, multiply the appropriate design values for Mixed Southern Pine by the corresponding conversion factor shown below and round to the nearest 100,000 psi for E; to the nearest 10,000 psi for E_{min} ; to the next lower multiple of 5 psi for F_v and $F_{c\perp}$; to the next lower multiple of 50 psi for F_b , F_t , and F_c if 1,000 psi or greater, 25 psi otherwise.

CONVERSION FACTORS FOR DETERMINING DESIGN VALUES FOR SPRUCE PINE

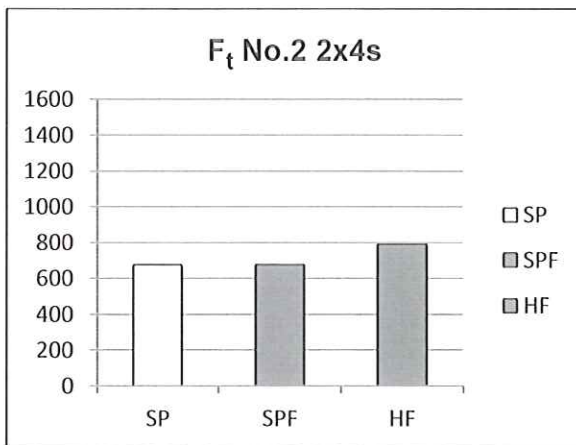
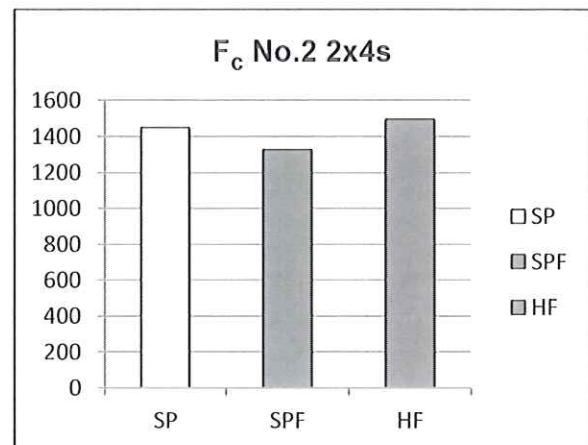
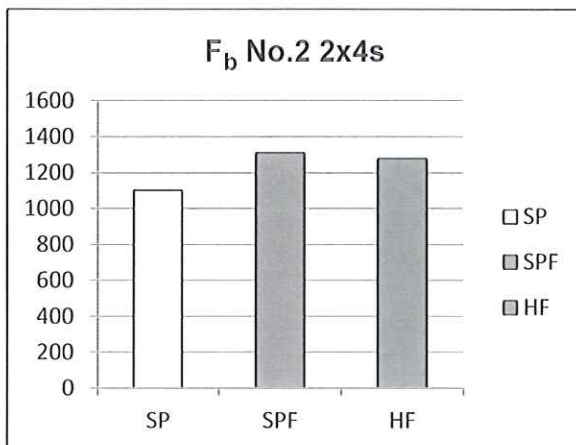
	Bending	Tension parallel to grain	Shear parallel to grain	Compression perpendicular to grain	Compression parallel to grain	Modulus of Elasticity
	F_b	F_t	F_v	$F_{c\perp}$	F_c	E and E_{min}
Conversion Factor	0.78	0.78	0.98	0.73	0.78	0.82

4. **SIZE FACTOR.** For sizes wider than 12", use size factors for F_b , F_t , and F_c specified for the 12" width. Use 100% of the F_v , $F_{c\perp}$, E, and E_{min} specified for the 12" width.
 5. When individual species or species groups are combined, the design values to be used for the combination shall be the lowest design values for each individual species or species group for each design property.
 6. Specific gravity, G, based on weight and volume when oven-dry.
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No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2 2x4s			
	SP	SPF	HF
Bending F _b	1100	1315	1275
Tension F _t	675	675	790
Compression F _c	1450	1325	1495

¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The new design values become effective June 1, 2013 to provide time for an orderly transition.

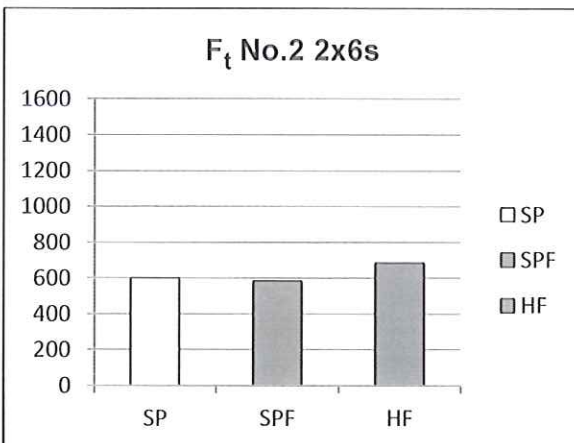
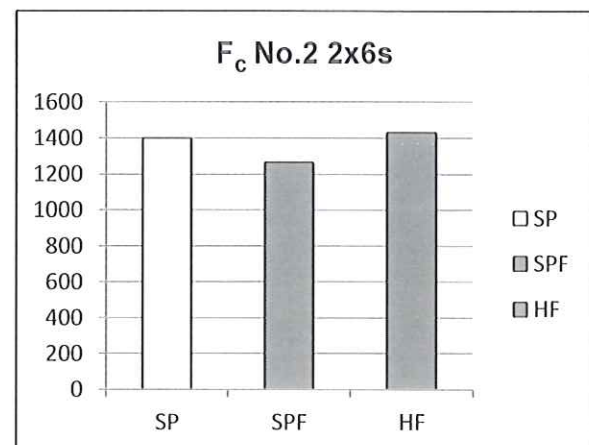
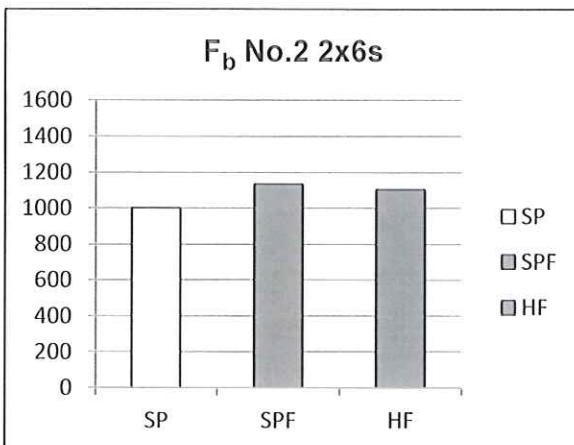
²Current design values for other species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

The Southern Forest Products Association (SFPA) does not test lumber or establish design values. Accordingly, neither SFPA, nor its members, warrant that design values are correct, and disclaim responsibility for injury or damage resulting from the use of such design values.

No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2 2x6s			
	SP	SPF	HF
Bending F _b	1000	1140	1105
Tension F _t	600	585	685
Compression F _c	1400	1265	1430

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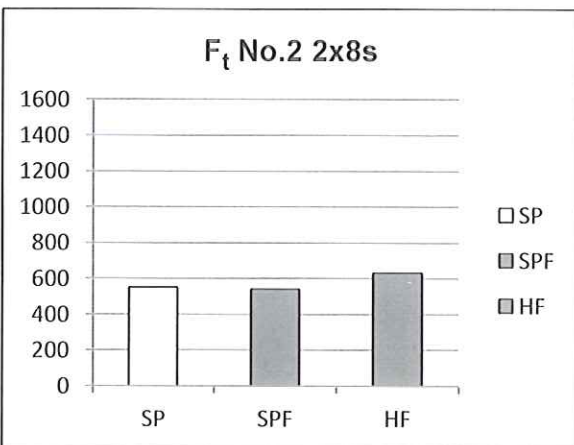
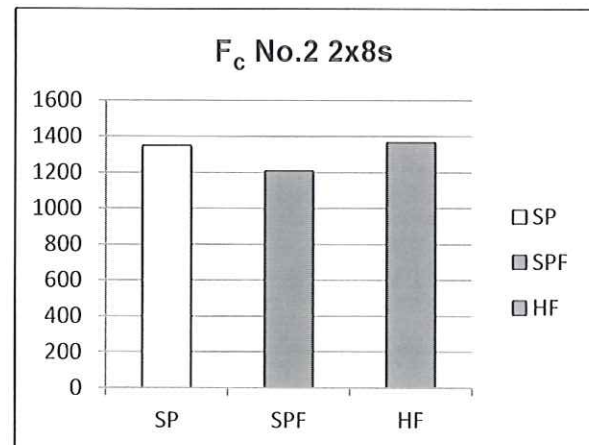
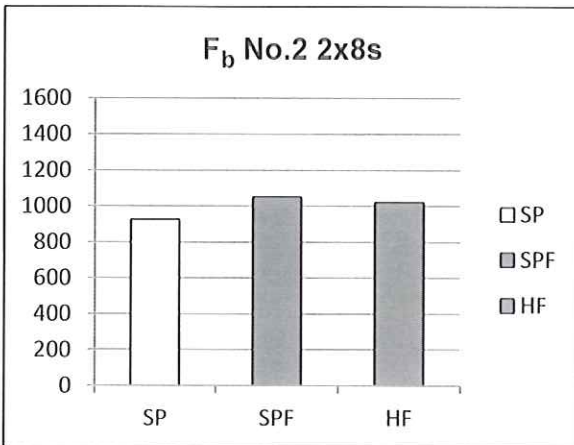
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No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2 2x8s			
	SP	SPF	HF
Bending F _b	925	1050	1020
Tension F _t	550	540	630
Compression F _c	1350	1210	1365

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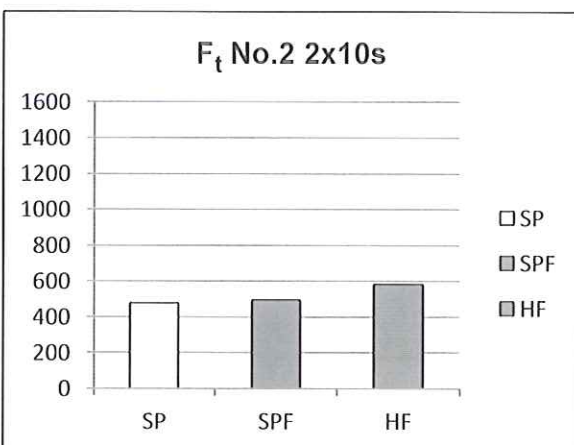
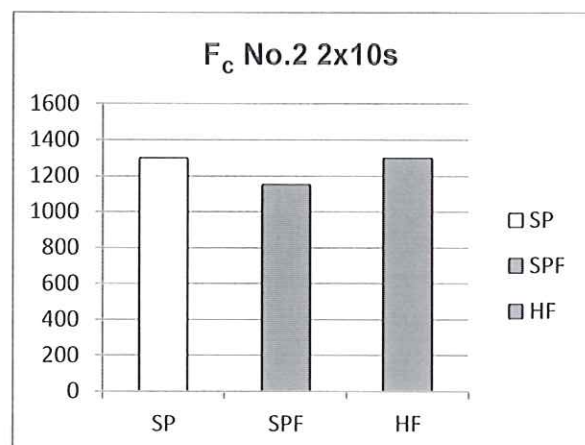
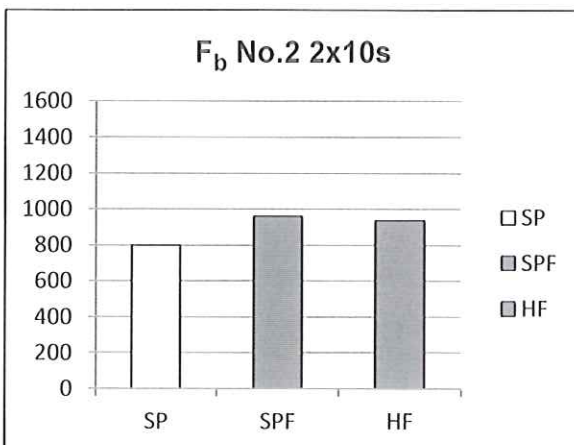
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No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2 2x10s			
	SP	SPF	HF
Bending F _b	800	965	935
Tension F _t	475	495	580
Compression F _c	1300	1150	1300

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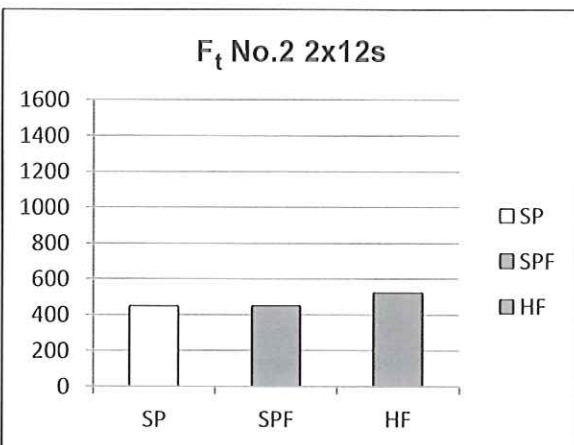
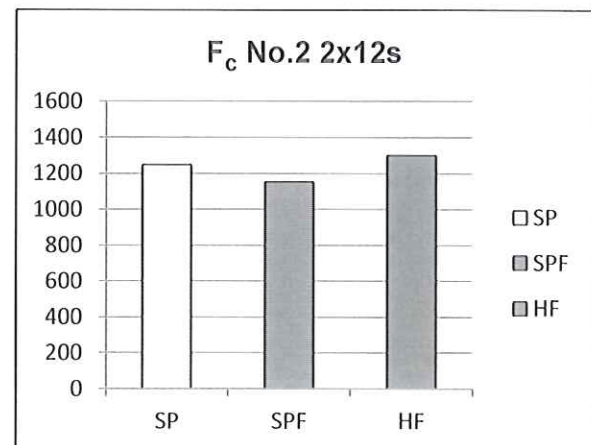
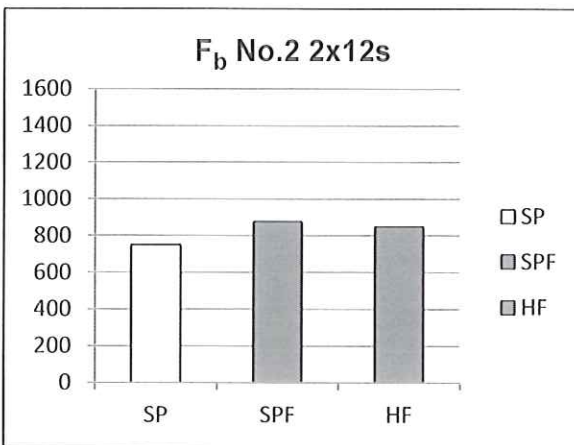
²Current design values for other species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2 2x12s			
	SP	SPF	HF
Bending F _b	750	875	850
Tension F _t	450	450	525
Compression F _c	1250	1150	1300

¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The new design values become effective June 1, 2013 to provide time for an orderly transition.

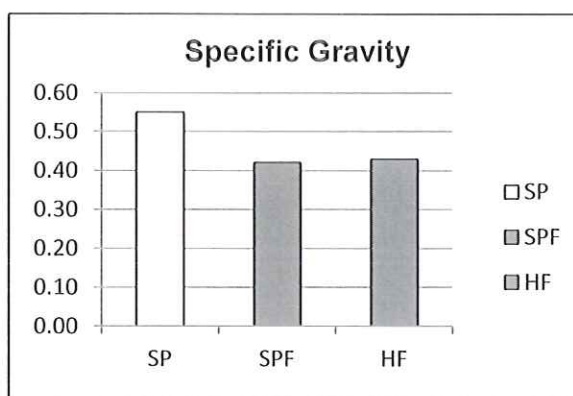
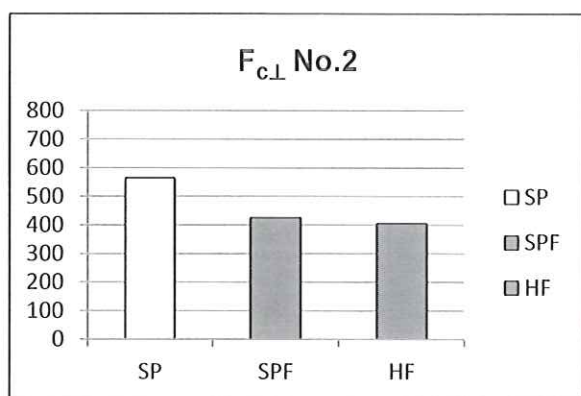
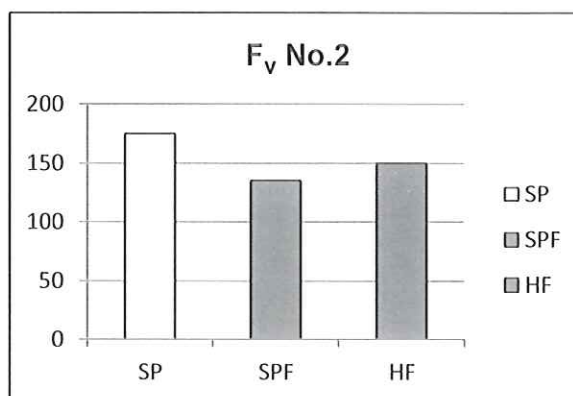
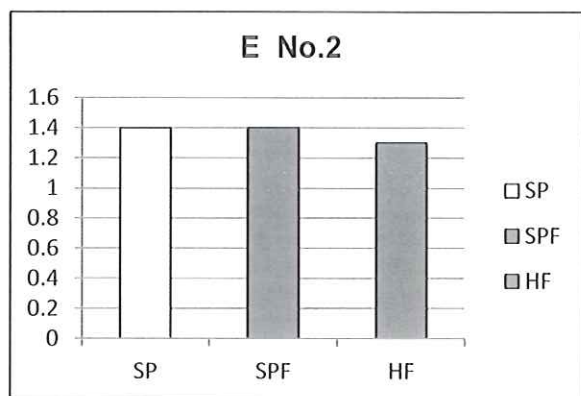
²Current design values for other species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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No.2 Design Value Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

values in psi (pounds per square inch)



No.2			
	SP	SPF	HF
Modulus of Elasticity E	1.4	1.4	1.3
Compression Perpendicular F _{c⊥}	565	425	405
Shear F _v	175	135	150
Specific Gravity	0.55	0.42	0.43

¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The new design values become effective June 1, 2013 to provide time for an orderly transition.

²Current design values for other species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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Maximum Span Comparisons by Species

New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

Maximum spans in feet-inches, spacing 16 inches on center

Table 1 FLOOR JOISTS – 30 psf Live Load, 10 psf Dead Load, 360 Deflection

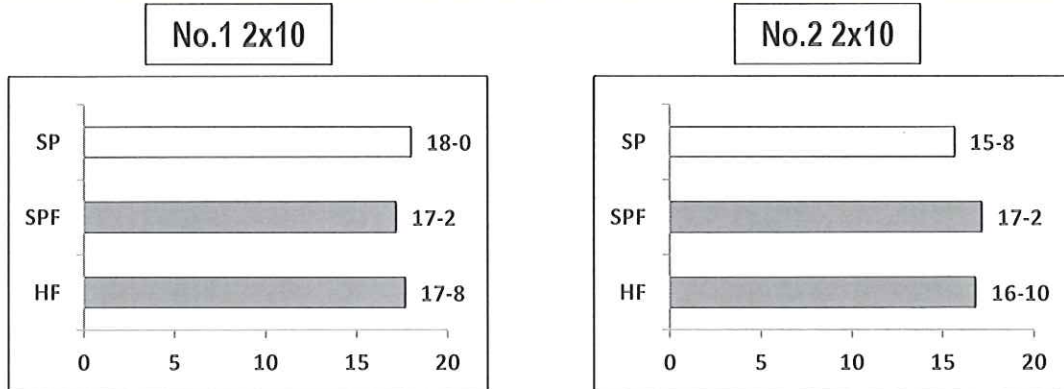
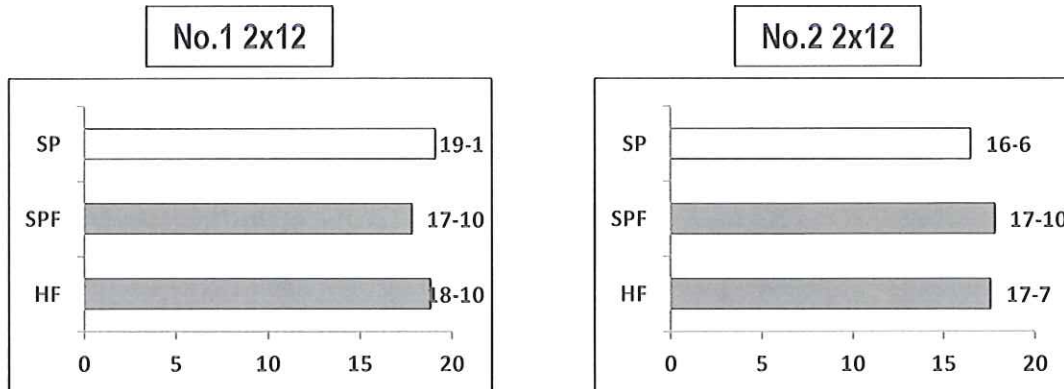


Table 2 FLOOR JOISTS – 40 psf Live Load, 10 psf Dead Load, 360 Deflection



¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The Southern Pine spans in these graphs were calculated using the new design values which become effective June 1, 2013.

²The spans for other species in these graphs were calculated using current design values for those species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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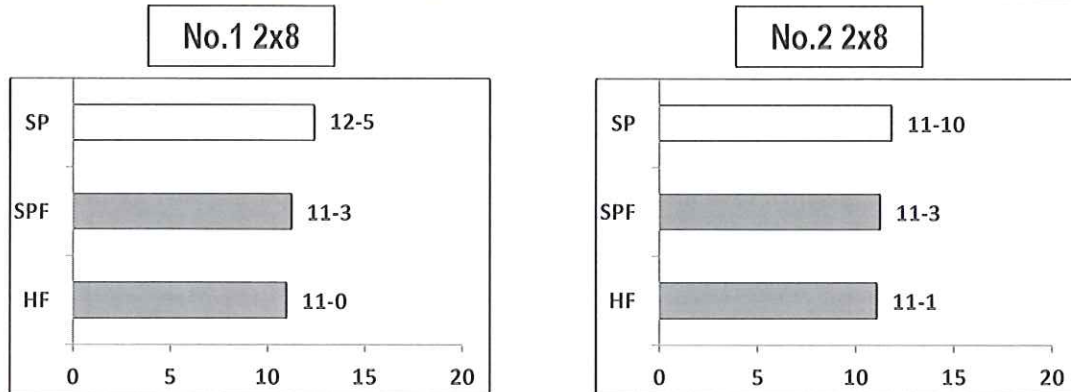
Maximum Span Comparisons by Species

New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

Maximum spans in feet-inches, spacing 16 inches on center

Table 12 WET-SERVICE FLOOR JOISTS – MC>19%
40 psf Live Load, 10 psf Dead Load, 360 Deflection



¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13* to the *2002 Standard Grading Rules for Southern Pine Lumber*. The Southern Pine spans in these graphs were calculated using the new design values which become effective June 1, 2013.

²The spans for other species in these graphs were calculated using current design values for those species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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Maximum Span Comparisons by Species New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

Maximum spans in feet-inches, spacing 16 inches on center

Table 15 CEILING JOISTS – 10 psf Live Load, 5 psf Dead Load, 240 Deflection

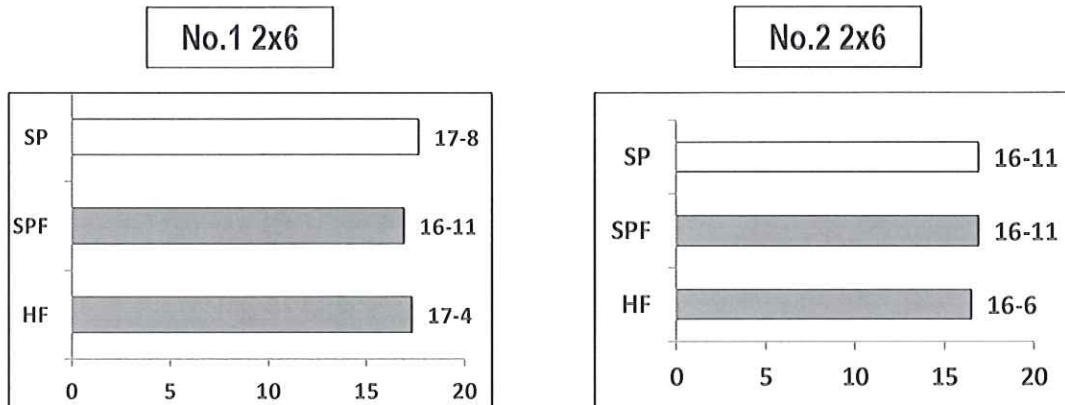
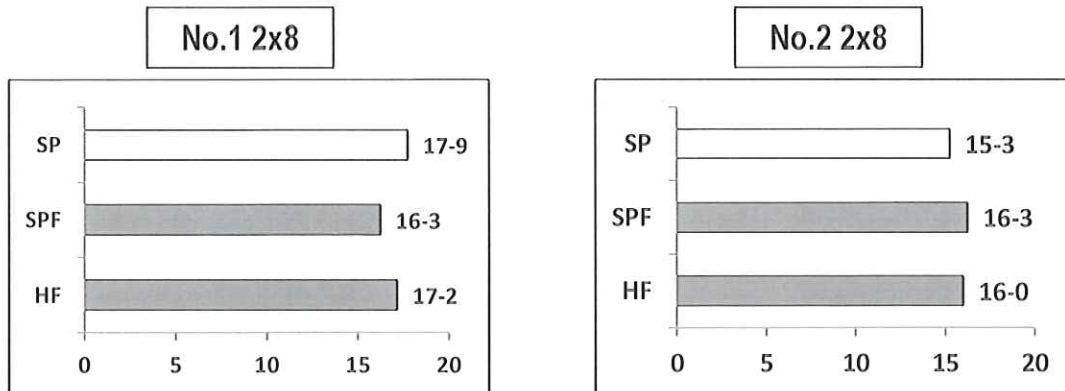


Table 16 CEILING JOISTS – 20 psf Live Load, 10 psf Dead Load, 240 Deflection



¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No.13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The Southern Pine spans in these graphs were calculated using the new design values which become effective June 1, 2013.

²The spans for other species in these graphs were calculated using current design values for those species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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Maximum Span Comparisons by Species

New Southern Pine¹ vs. Current Other Species²

¹Effective June 1, 2013

Maximum spans in feet-inches, spacing 16 inches on center

**Table 17 RAFTERS – 20 psf Live Load, 10 psf Dead Load, 240 Deflection
 $C_D = 1.15$ (snow load)**

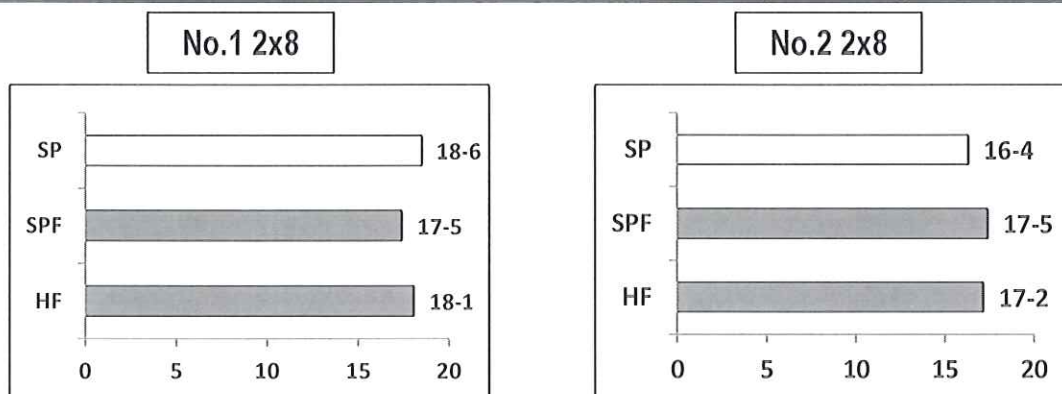
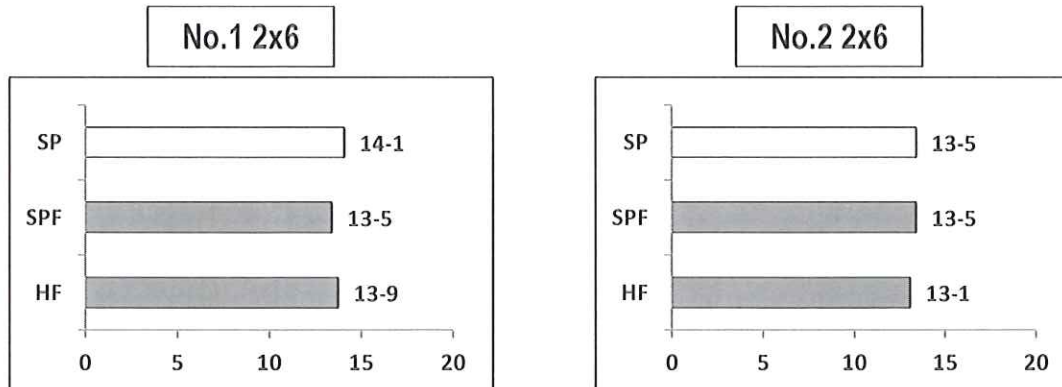


Table 41 RAFTERS – 20 psf Live Load, 10 psf Dead Load, 240 Deflection $C_D = 1.25$



¹On February 11, 2013, the Southern Pine Inspection Bureau published new design values for all sizes and grades of visually graded Southern Pine dimension lumber in *Supplement No. 13 to the 2002 Standard Grading Rules for Southern Pine Lumber*. The Southern Pine spans in these graphs were calculated using the new design values which become effective June 1, 2013.

²The spans for other species in these graphs were calculated using current design values for those species as of February 2013. SPF = Spruce-Pine-Fir, HF = Hem-fir.

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