AMERICAN WOOD COUNCIL

April 2022

ERRATA

to the 2018 Edition of the *Design Values for Wood Construction*

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

(All print and electronic versions)

Page **Revision**

41 Modify the following reference design values in Table 4B for Mixed Southern Pine as shown below (footnotes remain unchanged):

Table 4B (Cont.) **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 $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
SOUTHERN PINE		(Surfaced Dry - Used in dry service condtions - 19% or less moisture content)								
Dense Structural 86	2" & wider	2,600	1,750	175	660	2,000	1,800,000	660,000	0.55	SPIB
Dense Structural 72		2,200	1,450	175	660	1,650	1,800,000	660,000		
Dense Structural 65		2,000	1,300	175	660	1,500	1,800,000	660,000		
SOUTHERN PINE		(Surfaced Green - Used in any service condtion)								
Dense Structural 86	2-1/2" & wider 2-1/2"-4" thick	2,100	1,400	165	440	1,300	1,600,000	580,000	0.55	SPIB
Dense Structural 72		1,750	1,200	165	440	1,100	1,600,000	580,000		
Dense Structural 65		1,600	1,050	165	440	1,000	1,600,000	580,000		
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		1,100	675	175	565	1,450	1,400,000	510,000		
No.3 and Stud		650	400	175	565	850	1,200,000	440,000		
Construction	4" wide	~~850~~ 875	500	175	565	1,600	1,300,000	470,000	0.51	
Standard		475	275	175	565	1,300	1,200,000	440,000		
Utility		225	125	175	565	850	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		1,000	600	175	565	1,400	1,400,000	510,000		
No.3 and Stud		575	350	175	565	~~775~~ 800	1,200,000	440,000		
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		925	550	175	565	1,350	1,400,000	510,000		
No.3 and Stud		525	325	175	565	~~800~~ 775	1,200,000	440,000		
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		800	475	175	565	1,300	1,400,000	510,000		
No.3 and Stud		475	275	175	565	750	1,200,000	440,000		
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		750	450	175	565	1,250	1,400,000	510,000		
No.3 and Stud		450	250	175	565	725	1,200,000	440,000		

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&
to the ADDENDUM (March 2019) to the *2018 NDS Supplement*

Modify the following design values for E_{min} as follows:

Table 4A Reference Design Values for Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]

(All species except Southern Pine – see table 4B) (Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4A ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)								Specific Gravity[4]	Grading Rules Agency
		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	E_{min}		G	
NORWAY SPRUCE (NORTH)											
Select Structural	2" & wider	950	600	190	410	1,100	1,500,000	~~1,000,000~~	550,000	0.40	NLGA
No. 1/No.2		650	425	190	410	900	1,300,000	~~800,000~~	470,000		
No.3		375	250	190	410	525	1,200,000	~~700,000~~	440,000		
Stud	2" & wider	500	325	190	410	575	1,200,000	~~700,000~~	440,000		
Construction	2" - 4" wide	725	475	190	410	1,100	1,200,000	~~700,000~~	440,000		
Standard		400	275	190	410	925	1,100,000	~~700,000~~	400,000		
Utility		200	125	190	410	600	1,100,000	~~600,000~~	400,000		

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Design Values for Wood Construction

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Modify the following bending design values for No. 1 Norway Spruce from Finland, and No. 2 Norway Spruce from Romania and Ukraine as shown:

Table 4F Reference Design Values for Non-North American Visually Graded Dimension Lumber (2" - 4" thick)[1,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4F ADJUSTMENT FACTORS

Species and commercial Grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity[5]	Grading Rules Agency
		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	E_{min}	G	
NORWAY SPRUCE - Finland										
Select Structural	2" & wider	1,350	600	125	220	1,200	1,500,000	550,000	0.42	WCLIB
No. 1		~~825~~ 850	375	125	220	1,000	1,400,000	510,000		
No. 2		625	275	125	220	875	1,200,000	440,000		
No. 3		375	175	125	220	500	1,100,000	400,000		
Stud	2" & wider	575	250	125	220	600	1,100,000	400,000		
Construction	2" - 4" wide	725	325	125	220	1,100	1,100,000	400,000		
Standard		400	175	125	220	900	1,000,000	370,000		
Utility		200	75	125	220	600	1,000,000	370,000		

Table 4F Reference Design Values for Non-North American Visually Graded Dimension Lumber (2" - 4" thick)[1,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4F ADJUSTMENT FACTORS

Species and commercial Grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity[5]	Grading Rules Agency
		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	E_{min}	G	
NORWAY SPRUCE - Romania & Ukraine										
Select Structural	2" & wider	1,250	575	100	275	1,200	1,500,000	550,000	0.38	WCLIB
No. 1		850	375	100	275	1,050	1,400,000	510,000		
No. 2		~~725~~ 750	325	100	275	950	1,200,000	440,000		
No. 3		425	200	100	275	550	1,100,000	400,000		
Stud	2" & wider	575	250	100	275	600	1,100,000	400,000		
Construction	2" - 4" wide	850	375	100	275	1,200	1,100,000	400,000		
Standard		475	200	100	275	1,000	1,000,000	370,000		
Utility		225	100	100	275	650	1,000,000	370,000		

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ADDENDUM
to the 2018 Edition of the
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Page	Revision
62	Add new Table 4G, Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2"- 4" thick) as shown on the following pages.

Repetitive Member Factor, C_r

Bending design values, F_b, for dimension lumber 2" to 4" thick shall be multiplied by the repetitive member factor, C_r = 1.15, when such members are used as joists, truss chords, rafters, studs, planks, decking, or similar members which are in contact or spaced not more than 24" on center, are not less than 3 in number and are joined by floor, roof, or other load distributing elements adequate to support the design load.

Wet Service Factor, C_M

When dimension lumber is used where moisture content will exceed 19% for an extended time period, design values shall be multiplied by the appropriate wet service factors from the following table:

Wet Service Factors, C_M

F_b	F_t	F_v	$F_{c\perp}$	F_c	E and E_{min}
0.85*	1.0	0.97	0.67	0.8**	0.9

* when $(F_b)(C_F) \le 1{,}150$ psi, $C_M = 1.0$

** when $(F_c)(C_F) \le 750$ psi, $C_M = 1.0$

Flat Use Factor, C_{fu}

Bending design values adjusted by size factors are based on edgewise use (load applied to narrow face). When dimension lumber is used flatwise (load applied to wide face), the bending design value, F_b, shall also be permitted to be multiplied by the following flat use factors:

Flat Use Factors, C_{fu}

Width (depth)	Thickness (breadth)	
	2" & 3"	4"
2" & 3"	1.0	—
4"	1.1	1.0
5"	1.1	1.05
6"	1.15	1.05
8"	1.15	1.05
10" & wider	1.2	1.1

NOTE

To facilitate the use of Table 4G, shading has been employed to distinguish design values based on a 4" nominal width (Construction, Standard, and Utility grades) or a 6" nominal width (Stud grade) from design values based on a 12" nominal width (Select Structural, No.1 & Btr, No.1, No.2, and No.3 grades).

Size Factor, C_F

Tabulated bending, tension, and compression parallel to grain design values for dimension lumber 2" to 4" thick shall be multiplied by the following size factors:

Size Factors, C_F

		F_b		F_t	F_c
		Thickness (breadth)			
Grades	Width (depth)	2" & 3"	4"		
Select Structural, No.1 & Btr, No.1, No.2, No.3	2", 3", & 4"	1.5	1.5	1.5	1.15
	5"	1.4	1.4	1.4	1.1
	6"	1.3	1.3	1.3	1.1
	8"	1.2	1.3	1.2	1.05
	10"	1.1	1.2	1.1	1.0
	12"	1.0	1.1	1.0	1.0
	14" & wider	0.9	1.0	0.9	0.9
Stud	2", 3", & 4"	1.1	1.1	1.1	1.05
	5" & 6"	1.0	1.0	1.0	1.0
	8" & wider	Use No.3 Grade tabulated design values and size factors			
Construction, Standard	2", 3", & 4"	1.0	1.0	1.0	1.0
Utility	4"	1.0	1.0	1.0	1.0
	2" & 3"	0.4	—	0.4	0.6

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
As-N Spr-Sc P (I) AUS ROM UKR		AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE & SCOTS PINE from AUSTRIA, ROMANIA, & UKRAINE									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from ROMANIA & UKRAINE; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE	Select Structural	2" & wider	1250	575	100	260	1200	1.5	0.55	0.38	
	No. 1		850	375	100	260	1050	1.4	0.51		
	No. 2		725	325	100	260	950	1.2	0.44		
	No. 3		425	200	100	260	550	1.1	0.40		
	Stud	2" & wider	575	250	100	260	600	1.1	0.40		
	Construction	2" - 4" wide	850	375	100	260	1200	1.1	0.40		
	Standard		475	200	100	260	1000	1	0.37		
	Utility		225	100	100	260	650	1	0.37		
AS-Sc P (I) AUS		AUSTRIAN SPRUCE & SCOTS PINE from AUSTRIA									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE	Select Structural	2" & wider	1300	600	135	260	1200	1.7	0.62	0.43	
	No. 1		900	400	135	260	1050	1.6	0.58		
	No. 2		775	350	135	260	1000	1.4	0.51		
	No. 3		450	200	135	260	575	1.3	0.47		
	Stud	2" & wider	600	275	135	260	625	1.3	0.47		
	Construction	2" - 4" wide	875	400	135	260	1200	1.3	0.47		
	Standard		500	225	135	260	1000	1.2	0.44		
	Utility		225	100	135	260	675	1.1	0.40		
AS/NSPR/SCOTP(I)AUS/GER		AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE & SCOTS PINE from AUSTRIA & GERMANY [5]									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY[5]	Select Structural	2" & wider	1200	550	135	260	1200	1.6	0.58	0.42	
	No. 1		800	375	135	260	1050	1.4	0.51		
	No. 2		700	325	135	260	950	1.1	0.40		
	No. 3		400	175	135	260	550	1	0.37		
	Stud	2" & wider	550	250	135	260	600	1	0.37		
	Construction	2" - 4" wide	800	375	135	260	1150	1.1	0.40		
	Standard		450	200	135	260	975	1	0.37		
	Utility		225	100	135	260	625	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
DF/DF-N			DOUGLAS FIR & DOUGLAS FIR (NORTH)								TP
DF-L/DF-L(N)			DOUGLAS FIR-LARCH & DOUGLAS FIR-LARCH (NORTH)								PLIB, WWPA
DF-L/DF(N)			DOUGLAS FIR-LARCH & DOUGLAS FIR (NORTH)								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH & DOUGLAS FIR-LARCH (NORTH)	Select Structural	2" & wider	1350	825	180	625	1700	1.9	0.69	0.49	
	No. 1 & Btr		1150	750	180	625	1550	1.8	0.66		
	No. 1		850	500	180	625	1400	1.6	0.58		
	No. 2		850	500	180	625	1350	1.6	0.58		
	No. 3		475	300	180	625	775	1.4	0.51		
	Stud	2" & wider	650	400	180	625	850	1.4	0.51		
	Construction	2" - 4" wide	950	575	180	625	1650	1.5	0.55		
	Standard		525	325	180	625	1400	1.4	0.51		
	Utility		250	150	180	625	900	1.3	0.47		
D Fir-L-HF			DOUGLAS FIR-LARCH & HEM-FIR from U.S.								PLIB
DF-HF			DOUGLAS FIR & HEM-FIR from U.S.								
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH; HEM-FIR	Select Structural	2" & wider	1400	925	150	405	1500	1.6	0.58	0.43	
	No. 1&Btr		1100	725	150	405	1350	1.5	0.55		
	No. 1		975	625	150	405	1350	1.5	0.55		
	No. 2		850	525	150	405	1300	1.3	0.47		
	No. 3		500	300	150	405	725	1.2	0.44		
	Stud	2" & wider	675	400	150	405	800	1.2	0.44		
	Construction	2" - 4" wide	975	600	150	405	1550	1.3	0.47		
	Standard		550	325	150	405	1300	1.2	0.44		
	Utility		250	150	150	405	850	1.1	0.40		
DF-HF-SPF			DOUGLAS FIR, HEM-FIR & SPRUCE-PINE-FIR from NORTH AMERICA								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH; HEM-FIR; SPRUCE-PINE-FIR	Select Structural	2" & wider	1250	700	135	405	1400	1.5	0.55	0.42	
	No. 1		875	450	135	405	1150	1.4	0.51		
	No. 2		850	450	135	405	1150	1.3	0.47		
	No. 3		500	250	135	405	650	1.2	0.44		
	Stud	2" & wider	675	350	135	405	725	1.2	0.44		
	Construction	2" - 4" wide	975	500	135	405	1400	1.3	0.47		
	Standard		550	275	135	405	1150	1.2	0.44		
	Utility		250	125	135	405	750	1.1	0.40		

Table 4G

Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			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	E_{min}	G	
DF-HF-SPF(S)			DOUGLAS FIR, HEM-FIR & SPRUCE-PINE-FIR (SOUTH) from U.S.								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH; HEM-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural	2" & wider	1300	575	135	335	1200	1.3	0.47	0.36	
	No. 1		875	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		
D Fir-SPF			DOUGLAS FIR & SPRUCE-PINE-FIR from NORTH AMERICA								PLIB
DF-L-SPF			DOUGLAS FIR-LARCH & SPRUCE-PINE-FIR from NORTH AMERICA								
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: DOUGLAS FIR-LARCH; SPRUCE-PINE-FIR	Select Structural	2" & wider	1250	700	135	425	1400	1.5	0.55	0.42	
	No. 1		875	450	135	425	1150	1.4	0.51		
	No. 2		875	450	135	425	1150	1.4	0.51		
	No. 3		500	250	135	425	650	1.2	0.44		
	Stud	2" & wider	675	350	135	425	725	1.2	0.44		
	Construction	2" - 4" wide	1000	500	135	425	1400	1.3	0.47		
	Standard		550	275	135	425	1150	1.2	0.44		
	Utility		275	125	135	425	750	1.1	0.40		
DF-N Spr (I) N FRA			DOUGLAS FIR & NORWAY SPRUCE from NORTHERN FRANCE								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: DOUGLAS FIR from FRANCE & GERMANY; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	1200	550	170	355	1200	1.6	0.58	0.42	
	No. 1		825	375	170	355	1050	1.4	0.51		
	No. 2		725	325	170	355	950	1.2	0.44		
	No. 3		425	200	170	355	550	1.1	0.40		
	Stud	2" & wider	575	250	170	355	600	1.1	0.40		
	Construction	2" - 4" wide	825	375	170	355	1200	1.1	0.40		
	Standard		475	200	170	355	975	1	0.37		
	Utility		225	100	170	355	650	0.9	0.33		
DF/NSPR/SCOTP(I)GER/ROM/SW/UKR			DOUGLAS FIR from GERMANY, NORWAY SPRUCE & SCOTS PINE from GERMANY [5], ROMANIA, SWEDEN, or UKRAINE								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: DOUGLAS FIR from FRANCE & GERMANY; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1200	550	100	270	1200	1.5	0.55	0.38	
	No. 1		800	375	100	270	1000	1.4	0.51		
	No. 2		575	250	100	270	825	1.1	0.40		
	No. 3		325	150	100	270	475	1	0.37		
	Stud	2" & wider	450	200	100	270	525	1	0.37		
	Construction	2" - 4" wide	650	300	100	270	1050	1.1	0.40		
	Standard		375	175	100	270	850	1	0.37		
	Utility		175	75	100	270	550	0.9	0.33		

Table 4G

Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
DF/NSPR/SCOTP(I)GER			DOUGLAS FIR, NORWAY SPRUCE, & SCOTS PINE from GERMANY[5]								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: DOUGLAS FIR from FRANCE & GERMANY; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]	Select Structural	2" & wider	1200	550	160	355	1200	1.6	0.58	0.42	
	No. 1		800	375	160	355	1050	1.4	0.51		
	No. 2		700	325	160	355	950	1.1	0.40		
	No. 3		400	175	160	355	550	1	0.37		
	Stud	2" & wider	550	250	160	355	600	1	0.37		
	Construction	2" - 4" wide	800	375	160	355	1150	1.1	0.40		
	Standard		450	200	160	355	975	1	0.37		
	Utility		225	100	160	355	625	0.9	0.33		
ES-LP			ENGELMANN SPRUCE & LODGEPOLE PINE from NORTH AMERICA								PLIB, WWPA
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR (SOUTH)	Select Structural	2" & wider	1300	575	135	335	1200	1.3	0.47	0.36	
	No. 1		875	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		
ES-LP-AF			ENGELMANN SPRUCE, LODGEPOLE PINE & SUBALPINE FIR from U.S.								PLIB, WWPA
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR (SOUTH); WESTERN WOODS	Select Structural	2" & wider	900	400	135	335	1050	1.2	0.44	0.36	
	No. 1		675	300	135	335	950	1.1	0.40		
	No. 2		675	300	135	335	900	1	0.37		
	No. 3		375	175	135	335	525	0.9	0.33		
	Stud	2" & wider	525	225	135	335	575	0.9	0.33		
	Construction	2" - 4" wide	775	350	135	335	1100	1	0.37		
	Standard		425	200	135	335	925	0.9	0.33		
	Utility		200	100	135	335	600	0.8	0.29		
HF/DF-N/SPF/SPF-S			HEM-FIR, DOUGLAS FIR (NORTH), SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; DOUGLAS FIR-LARCH (NORTH); SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural	2" & wider	1250	575	135	335	1200	1.3	0.47	0.36	
	No. 1		850	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
HF/HF(N)			HEM-FIR & HEM-FIR (NORTH) from NORTH AMERICA								PLIB, WWPA
HF/HF-N			HEM-FIR & HEM-FIR (NORTH) from NORTH AMERICA								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; HEM-FIR (NORTH)	Select Structural	2" & wider	1300	775	145	405	1500	1.6	0.58	0.43	
	No. 1 & Btr		1100	725	145	405	1350	1.5	0.55		
	No. 1		975	575	145	405	1350	1.5	0.55		
	No. 2		850	525	145	405	1300	1.3	0.47		
	No. 3		500	300	145	405	725	1.2	0.44		
	Stud	2" & wider	675	400	145	405	800	1.2	0.44		
	Construction	2" - 4" wide	975	600	145	405	1550	1.3	0.47		
	Standard		550	325	145	405	1300	1.2	0.44		
	Utility		250	150	145	405	850	1.1	0.40		
HF-SS			HEM-FIR & SITKA SPRUCE from U.S.								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; SITKA SPRUCE	Select Structural	2" & wider	1300	575	135	335	1200	1.3	0.47	0.36	
	No. 1		875	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		
N Spr (I) EST FIN GER LTH NOR SW			NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, NORWAY, & SWEDEN								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from NORWAY; NORWAY SPRUCE from SWEDEN	Select Structural	2" & wider	1200	550	115	220	1200	1.5	0.55	0.42	
	No. 1		825	375	115	220	1000	1.4	0.51		
	No. 2		625	275	115	220	875	1.2	0.44		
	No. 3		375	175	115	220	500	1.1	0.40		
	Stud	2" & wider	550	250	115	220	575	1.1	0.40		
	Construction	2" - 4" wide	725	325	115	220	1100	1.1	0.40		
	Standard		400	175	115	220	900	1	0.37		
	Utility		200	75	115	220	600	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
N Spr-Sc P(I) EST			NORWAY SPRUCE & SCOTS PINE from ESTONIA								PLIB
N Spr-Sc P(I) LAT			NORWAY SPRUCE & SCOTS PINE from LATVIA								PLIB
N Spr-Sc P(I) LTH			NORWAY SPRUCE & SCOTS PINE from LITHUANIA								PLIB
NSPR/SCOTP(I)LAT/LTH			NORWAY SPRUCE & SCOTS PINE from LATVIA & LITHUANIA								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA	Select Structural	2" & wider	1150	525	130	430	1150	1.5	0.55	0.42	
	No. 1		800	350	130	430	1050	1.4	0.51		
	No. 2		750	325	130	430	975	1.2	0.44		
	No. 3		425	200	130	430	550	1.1	0.40		
	Stud	2" & wider	575	275	130	430	625	1.1	0.40		
	Construction	2" - 4" wide	850	375	130	430	1200	1.1	0.40		
	Standard		475	225	130	430	1000	1	0.37		
	Utility		225	100	130	430	650	1	0.37		
N Spr-Sc P(I) FIN			NORWAY SPRUCE & SCOTS PINE from FINLAND								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from FINLAND; SCOTS PINE from FINLAND	Select Structural	2" & wider	1300	600	125	210	1200	1.5	0.55	0.42	
	No. 1		825	375	125	210	1000	1.4	0.51		
	No. 2		625	275	125	210	875	1.2	0.44		
	No. 3		375	175	125	210	500	1.1	0.40		
	Stud	2" & wider	575	250	125	210	600	1.1	0.40		
	Construction	2" - 4" wide	725	325	125	210	1100	1.1	0.40		
	Standard		400	175	125	210	900	1	0.37		
	Utility		200	75	125	210	600	1	0.37		
N Spr-Sc P(I) GER			NORWAY SPRUCE & SCOTS PINE from GERMANY[5]								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]	Select Structural	2" & wider	1200	550	160	355	1200	1.6	0.58	0.42	
	No. 1		800	375	160	355	1050	1.4	0.51		
	No. 2		700	325	160	355	950	1.1	0.40		
	No. 3		400	175	160	355	550	1	0.37		
	Stud	2" & wider	550	250	160	355	600	1	0.37		
	Construction	2" - 4" wide	800	375	160	355	1150	1.1	0.40		
	Standard		450	200	160	355	975	1	0.37		
	Utility		225	100	160	355	625	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
N Spr-Sc P(I) ROM			NORWAY SPRUCE & SCOTS PINE from ROMANIA								PLIB
N SPr-Sc P(I) ROM-UKR			NORWAY SPRUCE & SCOTS PINE from ROMANIA & UKRAINE								
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from ROMANIA & UKRAINE; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE	Select Structural	2" & wider	1250	575	100	270	1200	1.5	0.55	0.38	
	No. 1		850	375	100	270	1050	1.4	0.51		
	No. 2		725	325	100	270	950	1.2	0.44		
	No. 3		425	200	100	270	550	1.1	0.40		
	Stud	2" & wider	575	250	100	270	600	1.1	0.40		
	Construction	2" - 4" wide	850	375	100	270	1200	1.1	0.40		
	Standard		475	200	100	270	1000	1	0.37		
	Utility		225	100	100	270	650	1	0.37		
N Spr-Sc P(I) SW			NORWAY SPRUCE & SCOTS PINE from SWEDEN								PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from SWEDEN; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1250	550	120	285	1200	1.6	0.58	0.42	
	No. 1		825	375	120	285	1000	1.4	0.51		
	No. 2		575	250	120	285	825	1.2	0.44		
	No. 3		325	150	120	285	475	1.1	0.40		
	Stud	2" & wider	450	200	120	285	525	1.1	0.40		
	Construction	2" - 4" wide	650	300	120	285	1050	1.2	0.44		
	Standard		375	175	120	285	850	1.1	0.40		
	Utility		175	75	120	285	550	1	0.37		
N Spr-S Fir (I) GER			NORWAY SPRUCE & SILVER FIR from GERMANY								PLIB
N Spr-S Fir (I) N FRA			NORWAY SPRUCE & SILVER FIR from NORTHERN FRANCE								
N Spr-S Fir(I) GER N FRA			NORWAY SPRUCE & SILVER FIR from GERMANY & NORTHERN FRANCE								
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	125	355	1100	1.5	0.55	0.42	
	No. 1		725	325	125	355	975	1.4	0.51		
	No. 2		725	325	125	355	950	1.2	0.44		
	No. 3		425	200	125	355	550	1.1	0.40		
	Stud	2" & wider	575	250	125	355	600	1.1	0.40		
	Construction	2" - 4" wide	825	375	125	355	1150	1.1	0.40		
	Standard		475	200	125	355	975	1	0.37		
	Utility		225	100	125	355	650	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
N Spr-Sc P-DF (I) GER		NORWAY SPRUCE, SCOTS PINE & DOUGLAS FIR from GERMANY[5]									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]; DOUGLAS FIR from FRANCE & GERMANY	Select Structural	2" & wider	1200	550	160	355	1200	1.6	0.58	0.42	
	No. 1		800	375	160	355	1050	1.4	0.51		
	No. 2		700	325	160	355	950	1.1	0.40		
	No. 3		400	175	160	355	550	1	0.37		
	Stud	2" & wider	550	250	160	355	600	1	0.37		
	Construction		800	375	160	355	1150	1.1	0.40		
	Standard	2" - 4" wide	450	200	160	355	975	1	0.37		
	Utility		225	100	160	355	625	0.9	0.33		
N Spr-Sc P-DF-L (I) GER		NORWAY SPRUCE, SCOTS PINE & DOUGLAS FIR from GERMANY[5], EUROPEAN LARCH from AUSTRIA, THE CZECH REPUBLIC & BAVARIA (2x4, 3x4 and 4x4 only)									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]; DOUGLAS FIR from FRANCE & GERMANY; EUROPEAN LARCH from AUSTRIA, THE CZECH REPUBLIC & BAVARIA (This grademark only available in 2x4, 3x4 and 4x4 sizes)	Select Structural	2" & wider	1200	550	160	355	1200	1.6	0.58	0.42	
	No. 1		800	375	160	355	1050	1.4	0.51		
	No. 2		700	325	160	355	950	1.1	0.40		
	No. 3		400	175	160	355	550	1	0.37		
	Stud	2" & wider	550	250	160	355	600	1	0.37		
	Construction		800	375	160	355	1150	1.1	0.40		
	Standard	2" - 4" wide	450	200	160	355	975	1	0.37		
	Utility		225	100	160	355	625	0.9	0.33		
N Spr-Sc P-DF-S Fir (I) GER		NORWAY SPRUCE, SCOTS PINE, DOUGLAS FIR & SILVER FIR from GERMANY[5]									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]; DOUGLAS FIR from FRANCE & GERMANY; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	125	355	1100	1.5	0.55	0.42	
	No. 1		725	325	125	355	975	1.4	0.51		
	No. 2		700	325	125	355	950	1.1	0.40		
	No. 3		400	175	125	355	550	1	0.37		
	Stud	2" & wider	550	250	125	355	600	1	0.37		
	Construction		800	375	125	355	1150	1.1	0.40		
	Standard	2" - 4" wide	450	200	125	355	975	1	0.37		
	Utility		225	100	125	355	625	0.9	0.33		
NSPR/SCOTP(I)EST/FIN/GER/LIT/ROM/SW/UKR		NORWAY SPRUCE & SCOTS PINE from ESTONIA, FINLAND, GERMANY[5], LITHUANIA, ROMANIA, SWEDEN & UKRAINE									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from SWEDEN; NORWAY SPRUCE from ROMANIA & UKRAINE; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE	Select Structural	2" & wider	1150	525	100	210	1150	1.5	0.55	0.38	
	No. 1		800	350	100	210	1000	1.4	0.51		
	No. 2		575	250	100	210	825	1.1	0.40		
	No. 3		325	150	100	210	475	1	0.37		
	Stud	2" & wider	450	200	100	210	525	1	0.37		
	Construction		650	300	100	210	1050	1.1	0.40		
	Standard	2" - 4" wide	375	175	100	210	850	1	0.37		
	Utility		175	75	100	210	550	0.9	0.33		

Table 4G

Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
NSPR/SCOTP(I)GER/ROM/SW/UKR		NORWAY SPRUCE & SCOTS PINE from GERMANY[5], ROMANIA, SWEDEN or UKRAINE									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from SWEDEN; NORWAY SPRUCE from ROMANIA & UKRAINE; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN, SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE	Select Structural	2" & wider	1200	550	100	270	1200	1.5	0.55	0.38	
	No. 1		800	375	100	270	1000	1.4	0.51		
	No. 2		575	250	100	270	825	1.1	0.40		
	No. 3		325	150	100	270	475	1	0.37		
	Stud	2" & wider	450	200	100	270	525	1	0.37		
	Construction	2" - 4" wide	650	300	100	270	1050	1.1	0.40		
	Standard		375	175	100	270	850	1	0.37		
	Utility		175	75	100	270	550	0.9	0.33		
NSPR/SCOTP(I)GER/SW		NORWAY SPRUCE & SCOTS PINE from GERMANY[5] or SWEDEN									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from SWEDEN; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1200	550	120	285	1200	1.6	0.58	0.42	
	No. 1		800	375	120	285	1000	1.4	0.51		
	No. 2		575	250	120	285	825	1.1	0.40		
	No. 3		325	150	120	285	475	1	0.37		
	Stud	2" & wider	450	200	120	285	525	1	0.37		
	Construction	2" - 4" wide	650	300	120	285	1050	1.1	0.40		
	Standard		375	175	120	285	850	1	0.37		
	Utility		175	75	120	285	550	0.9	0.33		
NSPR/SCOTP(I)SW		NORWAY SPRUCE & SCOTS PINE from SWEDEN									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from SWEDEN; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1250	550	120	285	1200	1.6	0.58	0.42	
	No. 1		825	375	120	285	1000	1.4	0.51		
	No. 2		575	250	120	285	825	1.2	0.44		
	No. 3		325	150	120	285	475	1.1	0.40		
	Stud	2" & wider	450	200	120	285	525	1.1	0.40		
	Construction	2" - 4" wide	650	300	120	285	1050	1.2	0.44		
	Standard		375	175	120	285	850	1.1	0.40		
	Utility		175	75	120	285	550	1	0.37		
NSPR/SCOTP/SFIR(I)GER		NORWAY SPRUCE, SCOTS PINE & SILVER FIR from GERMANY[5]									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	125	355	1100	1.5	0.55	0.42	
	No. 1		725	325	125	355	975	1.4	0.51		
	No. 2		700	325	125	355	950	1.1	0.40		
	No. 3		400	175	125	355	550	1	0.37		
	Stud	2" & wider	550	250	125	355	600	1	0.37		
	Construction	2" - 4" wide	800	375	125	355	1150	1.1	0.40		
	Standard		450	200	125	355	975	1	0.37		
	Utility		225	100	125	355	625	0.9	0.33		

Table 4G

Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
PP-LP		PONDEROSA PINE & LODGEPOLE PINE from NORTH AMERICA									PLIB, WWPA
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR (SOUTH); WESTERN WOODS	Select Structural	2" & wider	900	400	135	335	1050	1.2	0.44	0.36	
	No. 1		675	300	135	335	950	1.1	0.40		
	No. 2		675	300	135	335	900	1	0.37		
	No. 3		375	175	135	335	525	0.9	0.33		
	Stud	2" & wider	525	225	135	335	575	0.9	0.33		
	Construction	2" - 4" wide	775	350	135	335	1100	1	0.37		
	Standard		425	200	135	335	925	0.9	0.33		
	Utility		200	100	135	335	600	0.8	0.29		
R. PINE/NSPR(N)/SPF/SPF(S)		RED PINE, NORWAY SPRUCE (NORTH), SPRUCE-PINE-FIR, & SPRUCE-PINE-FIR(S) from NORTH AMERICA									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: NORTHERN SPECIES; NORWAY SPRUCE (NORTH); SPRUCE-PINE-FIR; SPRUCE-PINE-FIR(S)	Select Structural	2" & wider	950	425	110	335	1100	1.1	0.40	0.35	
	No. 1		625	275	110	335	850	1.1	0.40		
	No. 2		625	275	110	335	850	1.1	0.40		
	No. 3		350	150	110	335	500	1	0.37		
	Stud	2" & wider	475	225	110	335	550	1	0.37		
	Construction	2" - 4" wide	700	325	110	335	1050	1	0.37		
	Standard		400	175	110	335	875	0.9	0.33		
	Utility		175	75	110	335	575	0.9	0.33		
Sc P (I) EST FIN GER LTH SW		SCOTS PINE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4F: SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1150	525	120	210	1150	1.5	0.55	0.45	
	No. 1		800	350	120	210	1000	1.4	0.51		
	No. 2		575	250	120	210	825	1.1	0.40		
	No. 3		325	150	120	210	475	1	0.37		
	Stud	2" & wider	450	200	120	210	525	1	0.37		
	Construction	2" - 4" wide	650	300	120	210	1050	1.1	0.40		
	Standard		375	175	120	210	850	1	0.37		
	Utility		175	75	120	210	550	0.9	0.33		
Sitka Sp/HF		SITKA SPRUCE & HEM-FIR from U.S.									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR; SITKA SPRUCE	Select Structural	2" & wider	1300	575	135	335	1200	1.3	0.47	0.36	
	No. 1		875	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
SPF/SPF-S			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								TP
SPF/SPF(S)			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								PLIB
SPF[S]/SPF			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								WWPA
SPF/SPF-s			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								NLGA
S-P-F/SPFs			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA								NLGA
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH)	Select Structural	2" & wider	1250	575	135	335	1200	1.3	0.47	0.36	
	No. 1		875	400	135	335	1050	1.2	0.44		
	No. 2		775	350	135	335	1000	1.1	0.40		
	No. 3		450	200	135	335	575	1	0.37		
	Stud	2" & wider	600	275	135	335	625	1	0.37		
	Construction	2" - 4" wide	875	400	135	335	1200	1	0.37		
	Standard		500	225	135	335	1000	0.9	0.33		
	Utility		225	100	135	335	675	0.9	0.33		
SPF/SPF-S AS/NSPR/SCOTP/SFIR(I)AUS/EST/FIN/GER/LTH/SW			SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY [5], LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY								TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY; SCOTS PINE from SWEDEN; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	120	210	1100	1.3	0.47	0.36	
	No. 1		725	325	120	210	975	1.2	0.44		
	No. 2		575	250	120	210	825	1.1	0.40		
	No. 3		325	150	120	210	475	1	0.37		
	Stud	2" & wider	450	200	120	210	525	1	0.37		
	Construction	2" - 4" wide	650	300	120	210	1050	1	0.37		
	Standard		375	175	120	210	850	0.9	0.33		
	Utility		175	75	120	210	550	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
SPF/SPF-S AS/NSPR/SCOTP/SFIR(I)AUS/FIN/GER/SW		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, FINLAND, GERMANY [5], LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	120	210	1100	1.3	0.47	0.36	
	No. 1		725	325	120	210	975	1.2	0.44		
	No. 2		575	250	120	210	825	1.1	0.40		
	No. 3		325	150	120	210	475	1	0.37		
	Stud	2" & wider	450	200	120	210	525	1	0.37		
	Construction	2" - 4" wide	650	300	120	210	1050	1	0.37		
	Standard		375	175	120	210	850	0.9	0.33		
	Utility		175	75	120	210	550	0.9	0.33		
SPF/SPF-S AS/NSPR/SCOTP/SFIR(I)AUS/GER/ROM/SW/UKR		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from GERMANY, ROMANIA, SWEDEN, or UKRAINE, SCOTS PINE from AUSTRIA, GERMANY [5], ROMANIA, SWEDEN, or UKRAINE, or SILVER FIR from GERMANY									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	100	260	1100	1.3	0.47	0.36	
	No. 1		725	325	100	260	975	1.2	0.44		
	No. 2		575	250	100	260	825	1.1	0.40		
	No. 3		325	150	100	260	475	1	0.37		
	Stud	2" & wider	450	200	100	260	525	1	0.37		
	Construction	2" - 4" wide	650	300	100	260	1050	1	0.37		
	Standard		375	175	100	260	850	0.9	0.33		
	Utility		175	75	100	260	550	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
SPF/SPF-S AS/NSPR/SCOTP/SFIR(I)AUS/EST/FIN/GER/LTH/ROM/SW/UKR		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, AUSTRIAN SPRUCE from AUSTRIA, NORWAY SPRUCE from ESTONIA, FINLAND, GERMANY, LITHUANIA, or SWEDEN, SCOTS PINE from AUSTRIA, ESTONIA, FINLAND, GERMANY [5], LITHUANIA, or SWEDEN, & SILVER FIR from GERMANY									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); AUSTRIAN SPRUCE from AUSTRIA & THE CZECH REPUBLIC; NORWAY SPRUCE from ESTONIA, LATVIA, & LITHUANIA; NORWAY SPRUCE from FINLAND; NORWAY SPRUCE from GERMANY, NE FRANCE & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from ESTONIA, LATVIA, & LITHUANIA; SCOTS PINE from FINLAND; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN; SILVER FIR (*Abies alba*) from GERMANY, NE FRANCE, & SWITZERLAND	Select Structural	2" & wider	950	425	100	210	1100	1.3	0.47	0.36	
	No. 1		725	325	100	210	975	1.2	0.44		
	No. 2		575	250	100	210	825	1.1	0.40		
	No. 3		325	150	100	210	475	1	0.37		
	Stud	2" & wider	450	200	100	210	525	1	0.37		
	Construction	2" - 4" wide	650	300	100	210	1050	1	0.37		
	Standard		375	175	100	210	850	0.9	0.33		
	Utility		175	75	100	210	550	0.9	0.33		
S-P-F/ NSpr(N)		SPRUCE-PINE-FIR & NORWAY SPRUCE (NORTH) from CANADA									NLGA
SPF/NSpr(N)		SPRUCE-PINE-FIR & NORWAY SPRUCE (NORTH) from CANADA									
Tabulated design values are the minimum values for from the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR; NORWAY SPRUCE (NORTH)	Select Structural	2" & wider	950	600	135	410	1100	1.5	0.55	0.40	
	No. 1		650	425	135	410	900	1.3	0.47		
	No. 2		650	425	135	410	900	1.3	0.47		
	No. 3		375	250	135	410	525	1.2	0.44		
	Stud	2" & wider	500	325	135	410	575	1.2	0.44		
	Construction	2" - 4" wide	725	475	135	410	1100	1.2	0.44		
	Standard		400	275	135	410	925	1.1	0.40		
	Utility		200	125	135	410	600	1.1	0.40		
S-P-F/ SPFs/NSpr(N)		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (S) From NORTH AMERICA, & NORWAY SPRUCE (NORTH) from NORTH AMERICA									NLGA
Tabulated desing values are the minimum values for the following species and commercial grades in Table 4A: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (S); NORWAY SPRUCE (NORTH)	Select Structural	2" & wider	950	575	135	335	1100	1.3	0.47	0.36	
	No. 1		650	400	135	335	900	1.2	0.44		
	No. 2		650	350	135	335	900	1.1	0.40		
	No. 3		375	200	135	335	525	1	0.37		
	Stud	2" & wider	500	275	135	335	575	1	0.37		
	Construction	2" - 4" wide	725	400	135	335	1100	1	0.37		
	Standard		400	225	135	335	925	0.9	0.33		
	Utility		200	100	135	335	600	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	G	
SPF/SPF-S NSPR/SCOTP(I)GER		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, & SCOTS PINE from GERMANY[5]									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; SCOTS PINE from GERMANY[5]	Select Structural	2" & wider	1200	550	135	335	1200	1.3	0.47	0.36	
	No. 1		800	375	135	335	1050	1.2	0.44		
	No. 2		700	325	135	335	950	1.1	0.40		
	No. 3		400	175	135	335	550	1	0.37		
	Stud	2" & wider	550	250	135	335	600	1	0.37		
	Construction	2" - 4" wide	800	375	135	335	1150	1	0.37		
	Standard		450	200	135	335	975	0.9	0.33		
	Utility		225	100	135	335	625	0.9	0.33		
SPF/SPF-S NSPR/SCOTP(I)GER/ROM/SW/UKR		SPRUCE-PINE-FIR & SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, SCOTS PINE from GERMANY[5], ROMANIA, SWEDEN, & UKRAINE									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY, NE FRANCE, & SWITZERLAND; NORWAY SPRUCE from ROMANIA & UKRAINE; NORWAY SPRUCE from SWEDEN; SCOTS PINE from AUSTRIA & THE CZECH REPUBLIC, ROMANIA, & UKRAINE; SCOTS PINE from GERMANY[5]; SCOTS PINE from SWEDEN	Select Structural	2" & wider	1200	550	100	270	1200	1.3	0.47	0.36	
	No. 1		800	375	100	270	1000	1.2	0.44		
	No. 2		575	250	100	270	825	1.1	0.40		
	No. 3		325	150	100	270	475	1	0.37		
	Stud	2" & wider	450	200	100	270	525	1	0.37		
	Construction	2" - 4" wide	650	300	100	270	1050	1	0.37		
	Standard		375	175	100	270	850	0.9	0.33		
	Utility		175	75	100	270	550	0.9	0.33		
SPF/SPF-S NSPR/SCOTP(I)GER/SW		SPRUCE-PINE-FIR, SPRUCE-PINE-FIR (SOUTH) from NORTH AMERICA, NORWAY SPRUCE, SCOTS PINE from GERMANY[5] & SWEDEN									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4F: SPRUCE-PINE-FIR; SPRUCE-PINE-FIR (SOUTH); NORWAY SPRUCE from GERMANY[5] & SWEDEN; SCOTS PINE from GERMANY[5] & SWEDEN	Select Structural	2" & wider	1200	550	120	285	1200	1.3	0.47	0.36	
	No. 1		800	375	120	285	1000	1.2	0.44		
	No. 2		575	250	120	285	825	1.1	0.40		
	No. 3		325	150	120	285	475	1	0.37		
	Stud	2" & wider	450	200	120	285	525	1	0.37		
	Construction	2" - 4" wide	650	300	120	285	1050	1	0.37		
	Standard		375	175	120	285	850	0.9	0.33		
	Utility		175	75	120	285	550	0.9	0.33		

Table 4G **Reference Design Values for Multi-Species and Country Grademarked Visually Graded Dimension Lumber (2" - 4" thick)[1,2,3]**

(Tabulated design values are for normal load duration and dry service conditions. See NDS 4.3 for a comprehensive description of design value adjustment factors.)

USE WITH TABLE 4G ADJUSTMENT FACTORS

Multi-Species and Country Label	Commercial Grade	Size Classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grade Stamping Agency
			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	E_{min}	G	
SYP/WEST WOODS/NORTH SPECIES		SOUTHERN PINE, WESTERN WOODS, & NORTHERN SPECIES from NORTH AMERICA									TP
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A & 4B: SOUTHERN PINE; WESTERN WOODS; NORTHERN SPECIES	Select Structural	2" & wider	900	400	110	335	1050	1.1	0.40	0.35	
	No. 1		625	275	110	335	850	1.1	0.40		
	No. 2		625	275	110	335	850	1	0.37		
	No. 3		350	150	110	335	500	0.9	0.33		
	Stud	2" & wider	475	225	110	335	550	0.9	0.33		
	Construction	2" - 4" wide	700	325	110	335	1050	1	0.37		
	Standard		400	175	110	335	875	0.9	0.33		
	Utility		175	75	110	335	575	0.8	0.29		
WH-S Fir		WESTERN HEMLOCK & PACIFIC SILVER FIR from U.S.									PLIB
Tabulated design values are the minimum values for the following species and commercial grades in Table 4A: HEM-FIR	Select Structural	2" & wider	1400	925	150	405	1500	1.6	0.58	0.43	
	No. 1 & Btr		1100	725	150	405	1350	1.5	0.55		
	No. 1		975	625	150	405	1350	1.5	0.55		
	No. 2		850	525	150	405	1300	1.3	0.47		
	No. 3		500	300	150	405	725	1.2	0.44		
	Stud	2" & wider	675	400	150	405	800	1.2	0.44		
	Construction	2" - 4" wide	975	600	150	405	1550	1.3	0.47		
	Standard		550	325	150	405	1300	1.2	0.44		
	Utility		250	150	150	405	850	1.1	0.40		

Table 4G Footnotes

1. Reference 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 the load carrying capacity due to increased strength and stiffness resulting from drying more than offsets the design effect of size reductions due to shrinkage.

2. The ALSC Board of Review permits the use of combination stamps in certain instances, provided that the associated Reference Design Value elements for such combination-stamped lumber be assigned based on the lowest value among the combined species/regions. For the Species and/or Countries combinations listed, each of the individual Reference Design Value (RDV) elements from Tables 4A, 4B, and 4F (i.e. - F_b, F_t, F_v, $F_{c\perp}$, F_c, E, E_{min}, and G) have been compared on its own merit for each species/regions listed on the stamp; the lowest value found and tabulated is the applicable value to be used for each Species and/or Countries, Region, and Agency category in the table. RDVs are only available for countries/regions that have completed ALSC Board of Review approved sampling and testing plans. Not all species group/grade/size combinations listed may be available at any given time.

3. The three entries on the black bar show in order: 1) The label stamped on the lumber; 2) The intended mix of species and countries; and 3) Agency stamping the lumber.

4. Specific gravity, G, based on weight and volume when oven-dry.

5. SCOTS PINE from GERMANY does not include states of Baden-Wurttemberg and Saarland.

AMERICAN WOOD COUNCIL

April 2019

Errata

to the 1991 to 2018 Editions of the *Design Values for Wood Construction*

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

Modify the following design value in Table 4D for No. 1 Eastern Hemlock Posts & Timbers:

Table 4D Reference Design Values for Visually Graded Timbers (5" x 5" and larger)[1,3]

(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 4D ADJUSTMENT FACTORS

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity[4]	Grading Rules Agency
		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	E_{min}	G	
EASTERN HEMLOCK										
Select Structural	Posts and Timbers	1,250	850	155	550	1,000	1,200,000	440,000	0.41	NELMA
No. 1		1,050	700	155	~~500~~ 550	875	1,200,000	440,000		
No.2		600	400	155	550	400	900,000	330,000		

AMERICAN WOOD COUNCIL

March 2013

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	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	E_{min}	G	
SOUTHERN PINE										
Dense Select Structural	2" - 4" wide	2,700	1,900	175	660	2,050	1,900,000	690,000	0.55	SPIB
Select Structural		2,350	1,650	175	565	1,900	1,800,000	660,000		
Non-Dense Select Structural		2,050	1,450	175	480	1,800	1,600,000	580,000		
No.1 Dense		1,650	1,100	175	660	1,750	1,800,000	660,000		
No.1		1,500	1,000	175	565	1,650	1,600,000	580,000		
No.1 Non-Dense		1,300	875	175	480	1,550	1,400,000	510,000		
No.2 Dense		1,200	750	175	660	1,500	1,600,000	580,000		
No.2		1,100	675	175	565	1,450	1,400,000	510,000		
No.2 Non-Dense		1,050	600	175	480	1,450	1,300,000	470,000		
No.3 and Stud		650	400	175	565	850	1,300,000	470,000		
Construction	4" wide	875	500	175	565	1,600	1,400,000	510,000	0.55	
Standard		475	275	175	565	1,300	1,200,000	440,000		
Utility		225	125	175	565	850	1,200,000	440,000		
Dense Select Structural	5" - 6" wide	2,400	1,650	175	660	1,900	1,900,000	690,000	0.55	SPIB
Select Structural		2,100	1,450	175	565	1,800	1,800,000	660,000		
Non-Dense Select Structural		1,850	1,300	175	480	1,700	1,600,000	580,000		
No.1 Dense		1,500	1,000	175	660	1,650	1,800,000	660,000		
No.1		1,350	875	175	565	1,550	1,600,000	580,000		
No.1 Non-Dense		1,200	775	175	480	1,450	1,400,000	510,000		
No.2 Dense		1,050	650	175	660	1,450	1,600,000	580,000		
No.2		1,000	600	175	565	1,400	1,400,000	510,000		
No.2 Non-Dense		950	525	175	480	1,350	1,300,000	470,000		
No.3 and Stud		575	350	175	565	800	1,300,000	470,000		
Dense Select Structural	8" wide	2,200	1,550	175	660	1,850	1,900,000	690,000	0.55	SPIB
Select Structural		1,950	1,350	175	565	1,700	1,800,000	660,000		
Non-Dense Select Structural		1,700	1,200	175	480	1,650	1,600,000	580,000		
No.1 Dense		1,350	900	175	660	1,600	1,800,000	660,000		
No.1		1,250	800	175	565	1,500	1,600,000	580,000		
No.1 Non-Dense		1,100	700	175	480	1,400	1,400,000	510,000		
No.2 Dense		975	600	175	660	1,400	1,600,000	580,000		
No.2		925	550	175	565	1,350	1,400,000	510,000		
No.2 Non-Dense		875	500	175	480	1,300	1,300,000	470,000		
No.3 and Stud		525	325	175	565	775	1,300,000	470,000		

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Specific Gravity[6]	Grading Rules Agency
		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	E_{min}	G	
SOUTHERN PINE (continued)										
Dense Select Structural	10" wide	1,950	1,300	175	660	1,800	1,900,000	690,000	0.55	SPIB
Select Structural		1,700	1,150	175	565	1,650	1,800,000	660,000		
Non-Dense Select Structural		1,500	1,050	175	480	1,600	1,600,000	580,000		
No.1 Dense		1,200	800	175	660	1,550	1,800,000	660,000		
No.1		1,050	700	175	565	1,450	1,600,000	580,000		
No.1 Non-Dense		950	625	175	480	1,400	1,400,000	510,000		
No.2 Dense		850	525	175	660	1,350	1,600,000	580,000		
No.2		800	475	175	565	1,300	1,400,000	510,000		
No.2 Non-Dense		750	425	175	480	1,250	1,300,000	470,000		
No.3 and Stud		475	275	175	565	750	1,300,000	470,000		
Dense Select Structural	12" wide	1,800	1,250	175	660	1,750	1,900,000	690,000	0.55	SPIB
Select Structural		1,600	1,100	175	565	1,650	1,800,000	660,000		
Non-Dense Select Structural		1,400	975	175	480	1,550	1,600,000	580,000		
No.1 Dense		1,100	750	175	660	1,500	1,800,000	660,000		
No.1		1,000	650	175	565	1,400	1,600,000	580,000		
No.1 Non-Dense		900	575	175	480	1,350	1,400,000	510,000		
No.2 Dense		800	500	175	660	1,300	1,600,000	580,000		
No.2		750	450	175	565	1,250	1,400,000	510,000		
No.2 Non-Dense		700	400	175	480	1,250	1,300,000	470,000		
No.3 and Stud		450	250	175	565	725	1,300,000	470,000		
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		1,100	675	175	565	1,450	1,400,000	510,000		
No.3 and Stud		650	400	175	565	850	1,200,000	440,000		
Construction	4" wide	850	500	175	565	1,600	1,300,000	470,000	0.51	
Standard		475	275	175	565	1,300	1,200,000	440,000		
Utility		225	125	175	565	850	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		1,000	600	175	565	1,400	1,400,000	510,000		
No.3 and Stud		575	350	175	565	775	1,200,000	440,000		
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		925	550	175	565	1,350	1,400,000	510,000		
No.3 and Stud		525	325	175	565	800	1,200,000	440,000		
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		800	475	175	565	1,300	1,400,000	510,000		
No.3 and Stud		475	275	175	565	750	1,200,000	440,000		
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		750	450	175	565	1,250	1,400,000	510,000		
No.3 and Stud		450	250	175	565	725	1,200,000	440,000		

1. **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.
2. **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.

AMERICAN WOOD COUNCIL

March 2012

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, 2012, design values for No. 2 Dense and lower grades of visually-graded Southern Pine and No. 2 and lower grades of visually-graded Mixed Southern Pine lumber, 2"- 4" thick, 2"- 4" wide, 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, 2012 are shown as underlined):

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	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	E_{min}	G	
SOUTHERN PINE										
No.2 Dense	2" - 4" wide	1,150	750	175	660	1,250	1,500,000	550,000	0.55	SPIB
No.2		1,050	650	175	565	1,100	1,400,000	510,000		
No.2 Non-Dense		975	575	175	480	1,050	1,200,000	440,000		
No.3 and Stud		600	375	175	565	625	1,200,000	440,000		
Construction	4" wide	800	500	175	565	1,150	1,300,000	470,000	0.55	
Standard		450	275	175	565	950	1,200,000	440,000		
Utility		200	125	175	565	625	1,100,000	400,000		
MIXED SOUTHERN PINE										
No.2	2" - 4" wide	1,050	650	175	565	1,100	1,400,000	510,000	0.51	SPIB
No.3 and Stud		600	375	175	565	625	1,200,000	440,000		
Construction	4" wide	800	500	175	565	1,150	1,300,000	470,000	0.51	
Standard		450	275	175	565	950	1,200,000	440,000		
Utility		200	125	175	565	625	1,100,000	400,000		

1. **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.
2. **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.

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

November 2009

2009 ERRATA
to the

2005 Edition of

the *ASD/LRFD STRUCTURAL WOOD DESIGN SOLVED EXAMPLE PROBLEMS*
included in the *2005 Wood Design Package*
(printed versions dated 08-06 5M, 02-07 10M, 02-08 10M)

Page(s)	**Revision**	
64	$Defl_{Max}$ = span · 12 in/ft / ~~240~~ 360	change 240 to 360 in the denominator
	$Defl_{Max}$ = ~~0.9~~ 0.6 in	
65	$Defl_{Max}$ = span · 12 in/ft / ~~240~~ 360	change 240 to 360 in the denominator
	$Defl_{Max}$ = ~~0.9~~ 0.6 in	
66	I_{reqd} = ~~1037~~ 1556 in^4	
	Minimum required I is ~~1037~~ 1556 in^4 for deflection	
67	I_{reqd} = ~~1037~~ 1556 in^4	
	Minimum required I is ~~1037~~ 1556 in^4 for deflection	

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

September 2009

2009 ERRATA/ADDENDUM
to the

2005 Edition of

the *National Design Specification® (NDS®) for Wood Construction Supplement:*
Design Values for Wood Construction
(printed versions dated 04-05 2M, 09-05 2M, 08-06 5M, and 02-08 10M)

Page	**Revision**
60	Revise footnote 4 of Table 5A, footnote 3 of Expanded Table 5A, and footnote 3 of Table 5B as follows:

The design value for shear, $\mathbf{F_{vx}}$ and $\mathbf{F_{vy}}$, shall be decreased by multiplying by a factor of 0.72 for non-prismatic members, notched members, and for all members subject to impact or cyclic loading. The reduced design value shall be used for design of members at connections (NDS 3.4.3.3 and 10.1.2) that transfer shear by mechanical fasteners. The reduced design value shall also be used for determination of design values for radial tension (NDS 5.2.2).

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

July 2009

2009 ERRATA/ADDENDUM
to the

2005 Edition of

the Commentary to the *National Design Specification® (NDS®) for Wood Construction*
(printed versions dated 04-05 2M, 09-05 2M, 08-06 5M, and 02-08 10M)

Page	**Revision**
249	Revise equation C15.1-1 as follows:

$$P_{14} = -180.7 + 140.5 \log(P_m)$$

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

November 2008

2008 ERRATA
to the

2005 Edition of

the *ASD/LRFD STRUCTURAL WOOD DESIGN SOLVED EXAMPLE PROBLEMS*
included in the *2005 Wood Design Package*
(printed versions dated 02-08-10M, 08-06 5M, and 02-07 10M)

Page(s)	**Revision**	
264	$M_{Total} = M_{load} + Weight \cdot Length^2 / 8 \cdot$ ~~12~~	delete "12" in the denominator
	$f_b =$ ~~1695~~ 1778 psi	
265	$M_{Total} = M_{load} + 1.2(Weight \cdot Length^2) / 8 \cdot$ ~~12~~	delete "12" in the denominator
	$f_b =$ ~~2575~~ 2674 psi	
274	$M_{Total} = M_{load} + Weight \cdot Length^2 / 8 \cdot$ ~~12~~	delete "12" in the denominator
	$f_b =$ ~~1352~~ 1401 psi	
275	$M_{Total} = M_{load} +$ 1.2$(Weight \cdot Length^2) / 8 \cdot$ ~~12~~	delete "12" in the denominator and incorporate 1.2 load factor
	$f_b =$ ~~2145~~ 2204 psi	

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

September 2008

2008 ERRATA/ADDENDUM
to the

2005 Edition of

the National Design Specification® (NDS®) for Wood Construction
(printed versions dated 04-05 2M, 09-05 2M, 08-06 5M, and 02-08 10M)

The 1991-2005 Editions of the *National Design Specification®(NDS®) for Wood Construction* have contained provisions for designing columns loaded simultaneously with axial, edgewise bending, and/or flatwise bending loads using a stress interaction equation. When a flatwise bending load is checked with the third term of the stress interaction equation, the axial and edgewise bending interaction in the denominator can become a negative value. The occurrence of the negative value indicates an overstress. Use of this negative term in the stress interaction equation overlooks the overstress in flatwise bending and incorrectly reduces the overall interaction.

While a check for overstress due to bending is a limiting condition of member design for bending per 3.3.1 of the *NDS*, an explicit limit is provided to clarify limitations on flatwise bending in *NDS* stress interaction equations as follows:

Page **Revision**
20-21 Add limitation to provisions in *NDS* 3.9.2:

$$\frac{f_c}{F_{cE2}} + \left(\frac{f_{b1}}{F_{bE}}\right)^2 < 1.0$$

Page **Revision**
190 Append to *NDS Commentary* C3.9.2:

The limits on f_c and f_{b1} (e.g. $f_c<F_{cE1}$, $f_c<F_{cE2}$, and $f_{b1}<F_{bE}$) do not address the case where the sum of the f_c/F_{cE2} stress ratio and the square of the f_{b1}/F_{bE} stress ratio in the denominator of the third term of Equation 3.9-3 exceeds 1.0. In this case, the third term becomes negative indicating overstress in flatwise bending due to combined loading effects. Inclusion of the third term as a negative value overlooks the overstress in flatwise bending and incorrectly reduces the interaction calculation. A limit on $(f_c/F_{cE2}) + (f_{b1}/F_{bE})^2$ is stated explicitly to clarify limitations on flatwise bending in the stress interaction equation and avoid accidental inclusion of a negative value in the stress interaction equation.

Page **Revision**
137 Add limitation to provisions in *NDS* 15.4.1:

$$\frac{f_c}{F_{cE2}} + \left(\frac{f_{b1} + f_c(6e_1/d_1)}{F_{bE}}\right)^2 < 1.0$$

Page **Revision**
253 Append to *NDS Commentary* C15.4.1:

The limits on f_c and f_{b1} (e.g. $f_c<F_{cE1}$, $f_c<F_{cE2}$, and $f_{b1}<F_{bE}$) do not address the case where the sum of the f_c/F_{cE2} stress ratio and the square of the f_{b1}/F_{bE} stress ratio or the $[f_{b1}+ f_c(6e_1/d_1)]/F_{bE}$ ratio in the denominator of the third term of Equations 15.4-1 and 15.4-2 exceeds 1.0. In this case, the third term becomes negative indicating overstress in flatwise bending due to combined loading effects. Inclusion of the third term as a negative value overlooks the overstress in flatwise bending and incorrectly reduces the interaction calculation. A limit on $(f_c/F_{cE2}) + ([f_{b1}+ 6f_ce_1/d_1]/F_{bE})^2$ is stated explicitly to clarify limitations on flatwise bending in the stress interaction equation and avoid accidental inclusion of a negative value in the stress interaction equations.

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

September 2008

2008 ERRATA
to the

2005 Edition of

the *SPECIAL DESIGN PROVISIONS FOR WIND AND SEISMIC, ANSI/AF&PA SDPWS-2005*
included in the *2005 Wood Design Package*
(printed versions dated 08-06 5M, 02-07 10M, and 02-08 10M)

Page(s)	**Revision**	
47	In Example C4.2.2-1 revise "Nail load/slip at 1.4 $\nu_{s(ASD)}$:"	Subscript (ASD)
	In Example C4.2.2-1 revise "= $(129.5/456)^{3.144}$ = 0.0191"	Superscript 3.144
50	In Equations C4.3.2-1 and C4.3.2-2 revise "(tie-down ~~nail~~ slip)"	Delete "nail"
	In the third paragraph of C4.3.2 (second column) revise "…or 3-term equation (SDPW~~D~~S)…"	Change "D" to "S"
53	In Example C4.3.2-1, text beginning with "C4.3.2.1" to the end should be moved to page 51 at the end of section C4.3.2.	

AMERICAN FOREST & PAPER ASSOCIATION
American Wood Council
Engineered and Traditional Wood Products

September 2008

2008 ERRATA/ADDENDUM
to the

2005 Edition of

the *ASD/LRFD MANUAL FOR ENGINEERED WOOD CONSTRUCTION*
included in the *2005 Wood Design Package*
(printed versions dated 08-06 5M, 02-07 10M, and 02-08 10M)

Page(s)	**Revision**
155	Revise Table M16.2-10 column headers for decking width as follows:

Rating	1-HOUR				1.5-HOUR			2-HOUR	
Decking Width	~~5~~1.5	~~7~~2.5	~~9~~3.5	~~11~~5.5	~~7~~2.5	~~9~~3.5	~~11~~5.5	~~9~~3.5	~~11~~5.5

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April 2008

2008 ERRATA
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Page(s)	**Revision**
64	Figure M9.2-4 should be renumbered M9.2-5 Figure M9.2-5 should be renumbered M9.2-4

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Page(s)	**Revision**	
72	C_{M_Fb} := ~~0.85~~ 1.0	Change wet service factor. According to the *NDS Supplement*, when $(F_b)(C_F) \leq 1150$ psi $C_M = 1.0$
	F'_{bx} = ~~1124~~ 1322 psi	This change does not affect the outcome - bending still checks.
73	C_{M_Fb} := ~~0.85~~ 1.0	Change wet service factor. According to the *NDS Supplement*, when $(F_b)(C_F) \leq 1150$ psi $C_M = 1.0$
	F'_{bx} = ~~2428~~ 2856 psi	This change does not affect the outcome - bending still checks.

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Page(s)	**Revision**	
91	λ = ~~1.0~~ 0.8	Time effect factor
93	$F'_{bS\_24\_0}$ = ~~648~~ 518 lbf·in	
	$F'_{bS\_24\_16}$ = ~~832~~ 665 lbf·in	
	$F'_{bS\_32\_16}$ = ~~961~~ 769 lbf·in	
	$F'_{bS\_40\_20}$ = ~~1620~~ 1296 lbf·in	
	$F'_{bS\_48\_24}$ = ~~2160~~ 1728 lbf·in	
	The maximum moment is 826 in-lb/ft, so the ~~24/16~~ 40/20 span rating works for flexure.	
95	Check the ~~24/16~~ 40/20 span rating for shear.	
	F_{s_IbQ} := ~~150~~ 205 lbf	
	F'_{s_IbQ} = ~~324~~ 354 lbf	
	The ~~24/16~~ 40/20 span rating is OK in shear.	
	EI_{40_20} := ~~78000~~ 225000 lbf·in^2	EI = 225000 ~~78000~~ lbf in^2 per foot of width for ~~24/16~~ 40/20 span rating. Table M9.2-1.
	EI'_{40_20} := ~~78000~~ 225000 lbf·in^2	~~24/16~~ 40/20 bending stiffness
96	$\Delta < L/240$ = ~~0.95~~ 0.095 in, thus deflection is OK	
97	$\Delta = 0.00677\ w_{load}\ span_{defl}^4 / EI'_{40\_20}$	
	Δ = ~~0.213~~ 0.074 in	

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Page(s)	**Revision**
376	$Weight_{curved} = \pi \cdot R_{center}$ ~~/2~~ $\cdot$ Depth $\cdot$ Width $\cdot$ 40 $\cdot$ lbf/ft^3 (delete "2" in the denominator)
	$Weight_{curved}$ = ~~353~~ 706 lbf
	M_{max} = ~~66244~~ 97288 in·lbf
377	$Weight_{curved} = \pi \cdot R_{center}$ ~~/2~~ $\cdot$ Depth $\cdot$ Width $\cdot$ 40 $\cdot$ lbf/ft^3 (delete "2" in the denominator)
	$Weight_{curved}$ = ~~353~~ 706 lbf
	M_{max} = ~~92742~~ 136204 in·lbf
380	f_b = ~~343~~ 504 psi
	V_{load} = ~~376~~ 553 lbf
	f_v = ~~5~~ 8 psi
	f_r = ~~10~~ 15 psi
381	f_b = ~~481~~ 706 psi
	V_{load} = ~~527~~ 774 lbf
	f_v = ~~7~~ 11 psi
	f_r = ~~14~~ 21 psi

384 $Weight_{curved} = \pi \cdot R_{center}$ ~~/2~~ $Depth \cdot Width \cdot 40 \cdot lbf/ft^3$ (delete "2" in the denominator)

$Weight_{curved}$ = ~~353~~ 706 lbf

M_{max} = ~~66244~~ 97288 in·lbf

P_{max} = ~~553~~ 906 lbf

385 $Weight_{curved} = \pi \cdot R_{center}$ ~~/2~~ $Depth \cdot Width \cdot 40 \cdot lbf/ft^3$ (delete "2" in the denominator)

$Weight_{curved}$ = ~~353~~ 706 lbf

M_{max} = ~~92742~~ 136204 in·lbf

P_{max} = ~~774~~ 1268 lbf

388 f_c = ~~5~~ 8 psi

389 f_c = ~~7~~ 11 psi

390 f_{b1} = ~~343~~ 504 psi

$$\left(\frac{f_c}{F_c'}\right)^2 + \frac{f_{b1}}{F_b'\left[1-\left(\frac{f_c}{F_{cE1}}\right)\right]} = \text{~~0.314~~ 0.469}$$

391 f_{b1} = ~~481~~ 706 psi

$$\left(\frac{f_c}{F_c'}\right)^2 + \frac{f_{b1}}{F_b'\left[1-\left(\frac{f_c}{F_{cE1}}\right)\right]} = \text{~~0.305~~ 0.454}$$

392 $\left(\frac{f_c}{F_c'}\right)^2$ = ~~0.00056~~ 0.00151 $\frac{f_{b1}}{F_b'\left[1-\left(\frac{f_c}{F_{cE1}}\right)\right]}$ = ~~0.313~~ 0.467

393 $\left(\frac{f_c}{F_c'}\right)^2$ = ~~0.00049~~ 0.00132 $\frac{f_{b1}}{F_b'\left[1-\left(\frac{f_c}{F_{cE1}}\right)\right]}$ = ~~0.304~~ 0.453

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2007 ERRATA
to the

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(printed versions dated 08-06 5M and 02-07 10M)

Page(s)	**Revision**
276	$F'_v = ~~2/3~~ F_{vx} C_D C_M C_{t\_Fv}$
	$F'_v = ~~200~~ \underline{300}$ psi
	This change does not affect the final results for shear calculations since $f_v < F'_v$.
277	$F'_v = ~~2/3~~ \lambda K_{F\_Fv} \phi_v F_{vx} C_M C_{t\_Fv}$
	$F'_v = ~~345.6~~ \underline{518.4}$ psi
	This change does not affect the final results for shear calculations since $f_v < F'_v$.

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Page(s)	**Revision**
126	Change the IIC rating for assemblies "Without Gypsum Concrete" with "Carpet & Pad" from ~~62~~ to 66.
129	Change the STC rating for assemblies "With Gypsum Concrete" with "Carpet & Pad" from~~ 68~~[c] to 58[c].

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2007 ERRATA/ADDENDUM
to the

2005 Edition of

the National Design Specification® (NDS®) for Wood Construction Supplement: Design Values for Wood Construction
(printed versions dated 04-05 2M, 09-05 2M, and 08-06 5M)

Page **Revision**

4 In Table 2.1, revise the following:

Species or Species Combination	Species That May Be Included in Combination	Grading Rules Agencies	Design Values Provided in Tables
Coast Sitka Spruce	Coast Sitka Spruce	NLGA	4A, 4D, 4E
Yellow Cedar	Yellow Cedar	NLGA	4A

32 In Table 4A, add the following design values for Coast Sitka Spruce

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Grading Rules Agency
		Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	
Coast Sitka Spruce[4]									
Select Structural	2" & wider	1300	950	125	455	1200	1,700,000	620,000	NLGA
No. 1 / No. 2		925	550	125	455	1100	1,500,000	550,000	
No. 3		525	325	125	455	625	1,400,000	510,000	
Stud	2" & wider	725	450	125	455	675	1,400,000	510,000	
Construction	2"-4" wide	1050	650	125	455	1300	1,400,000	510,000	
Standard		600	350	125	455	1100	1,300,000	470,000	
Utility		275	175	125	455	725	1,200,000	440,000	

34 In Table 4A, revise the following design values for Northern Species

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Grading Rules Agency
		Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	
Northern Species									
Select Structural	2" & wider	~~1,000~~ 975	~~450~~ 425	110	350	1,100	1,100,000	400,000	NLGA
No. 1 / No. 2		~~600~~ 625	275	110	350	850	1,100,000	400,000	
No. 3		350	150	110	350	500	1,000,000	370,000	
Stud	2" & wider	475	225	110	350	550	1,000,000	370,000	
Construction	2"-4" wide	700	~~300~~ 325	110	350	1,050	1,000,000	370,000	
Standard		400	175	110	350	875	900,000	330,000	
Utility		175	75	110	350	575	900,000	330,000	

Page **Revision**

36 In Table 4A, add the following design values for Yellow Cedar

Species and commercial grade	Size classification	Design values in pounds per square inch (psi)							Grading Rules Agency
		Bending F_b	Tension parallel to grain F_t	Shear parallel to grain F_v	Compression perpendicular to grain $F_{c\perp}$	Compression parallel to grain F_c	Modulus of Elasticity E	Modulus of Elasticity E_{min}	
Yellow Cedar[4]									
Select Structural	2" & wider	1200	725	175	540	1200	1,600,000	580,000	NLGA
No. 1 / No. 2		800	475	175	540	1000	1,400,000	510,000	
No. 3		475	275	175	540	575	1,200,000	440,000	
Stud	2" & wider	625	375	175	540	650	1,200,000	440,000	
Construction	2"-4" wide	925	550	175	540	1200	1,300,000	470,000	
Standard		525	300	175	540	1050	1,200,000	440,000	
Utility		250	150	175	540	675	1,100,000	400,000	

36 In Table 4A, add the following footnote:

4. **SPECIFIC GRAVITY, G.** Specific gravity values are provided below for visually graded dimension lumber. Note that the value for Coast Sitka Spruce is applicable only for visually graded dimension lumber (2" – 4" thick). See NDS Table 11.3.2A for the specific gravity value applicable to Coast Sitka Spruce used as visually graded timber (5"x5" and larger) and visually graded decking.

Species	**Specific Gravity, G**	**Grading Rules Agency**
Coast Sitka Spruce	0.43	NLGA
Yellow Cedar	0.46	NLGA

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included in the *2005 Wood Design Package*
(printed version dated 08-06 5M)

Page(s)	**Revision**
6	x = distance from chord splice to nearest support, ~~in.~~ ft
13	x = distance from chord splice to nearest support, ~~in.~~ ft
23	C_o = shear capacity adjustment factor from Table ~~4.3.2.1~~ 4.3.3.4
44	x = distance from chord splice to nearest support, ~~in.~~ ft
46	x = distance from chord splice to nearest support, ~~in.~~ ft

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(printed version dated 08-06 5M)

Page(s)	**Revision**

120-121 The third part (minor axis bending component) of the biaxial bending and compression interaction equation should be revised as follows:

$$\frac{f_{b2}+f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} \le 1.0$$

The square symbol in the denominator goes between the last 2 brackets in the equation.

132 The third part (minor axis bending component) of the biaxial bending and compression interaction equation should be revised as follows:

$$\left(\frac{f_c}{F_c'}\right)^2+\frac{f_{b1}+f_c(6e_1/d_1)[1+0.234(f_c/F_{cE1})]}{F_{b1}'\left[1-(f_c/F_{cE1})\right]}+\frac{f_{b2}+f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} = \text{~~0.945~~ } \underline{0.927}$$

The square symbol in the denominator goes between the last 2 brackets in the equation. This changes the overall result to 0.927 (above) and 0.101 for the minor axis bending term (below).

$$\frac{f_{b2}+f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} = \text{~~0.119~~ } \underline{0.101}$$

Page **Revision**

133 The third part (minor axis bending component) of the biaxial bending and compression interaction equation should be revised as follows:

$$\left(\frac{f_c}{F_c'}\right)^2 + \frac{f_{b1} + f_c(6e_1/d_1)[1+0.234(f_c/F_{cE1})]}{F_{b1}'\left[1-(f_c/F_{cE1})\right]} + \frac{f_{b2} + f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} \quad = \text{~~0.785~~ } \underline{0.772}$$

The square symbol in the denominator goes between the last 2 brackets in the equation. This changes the overall result to 0.772 (above) and 0.142 for the minor axis bending term (below).

$$\frac{f_{b2} + f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} \quad = \text{~~0.156~~ } \underline{0.142}$$

284-285 The third part (minor axis bending component) of the biaxial bending and compression interaction equation should be revised as follows:

$$\frac{f_{b2} + f_c(6e_2/d_2)\left\{1+0.234(f_c/F_{cE2})+0.234\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}}{F_{b2}'\left\{1-(f_c/F_{cE2})-\left[\frac{f_{b1}+f_c(6e_1/d_1)}{F_{bE}}\right]^2\right\}} \le 1.0$$

The square symbol in the denominator goes between the last 2 brackets in the equation.