



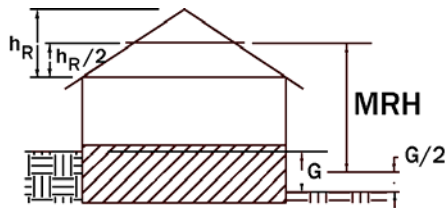
**2007 ERRATA/ADDENDUM**  
 to  
**ANSI/AF&PA WFCM-2001**  
**WOOD FRAME CONSTRUCTION MANUAL FOR ONE- AND TWO-FAMILY DWELLINGS**  
 (printing date 12-05 5M and earlier)

**Page            Revision**

51                Figure 2.12c Top Chord Bearing on ~~Exterior~~ Interior Wall  
 Figure 2.12d Top Chord Bearing on ~~Interior~~ Exterior Wall

107              3.1.3.1 Building Height  
 The building shall not exceed three stories nor a mean roof height of 33 feet, measured from average grade to average roof elevation. For purposes of determining uplift, gravity loads, and lateral bracing requirements, the attic shall be considered an additional story when the roof slope is greater than 6 in 12 ~~or greater~~ (see Figure 3.1a).

118              Revise Figure 3.1a to be consistent with Section 3.1.3.1 as follows:



DETERMINING NUMBER OF STORIES ABOVE THE FOUNDATION		
ONE STORY		
TWO STORY		
THREE STORY		
Foundation per section 1.1.4 MRH - Measured from average grade		



**AMERICAN FOREST & PAPER ASSOCIATION**

American Wood Council

*Engineered and Traditional Wood Products*

July 2003

**To:** Users of the 2001 *Wood Frame Construction Manual*

**From:** American Forest & Paper Association

**Subject: Errata - 2001 *Wood Frame Construction Manual***

The 2001 *Wood Frame Construction Manual (WFCM) for One- and Two-Family Dwellings* (printing date 01-02 4M) contains erroneous spans for some depths of #2 grade Southern pine and all depths of #3 grade Southern pine floor joists in Tables 3.18A and 3.18B and some depths of Southern pine studs in Tables 3.20A, 3.20B, A-3.20A, and A-3.20B.

The following pages contain errata/addendum for the *WFCM*. Please correct the information in your copy of the *WFCM* per the errata immediately. If you have a copy of the *WFCM* with a printing date of 09-03 or later (see the back cover of the *WFCM* to verify), these changes have already been incorporated into the document.

Full-page replacements for Tables 3.18A, 3.18B, 3.20A, 3.20B, A-3.20A, and A-3.20B are also available at <http://www.awc.org/Publications/update/WFCM2001FullPage.pdf>. If you would like to receive self-adhesive tables that can be permanently inserted in your copy of the 2001 *WFCM*, please contact us with your mailing address at [awcinfo@afandpa.org](mailto:awcinfo@afandpa.org) or by phone at (202) 463-4713.

We apologize for any inconvenience this may cause.



**2003 ERRATA/ADDENDUM**  
 to  
**ANSI/AF&PA WFCM-2001**  
**WOOD FRAME CONSTRUCTION MANUAL**  
**FOR ONE- AND TWO-FAMILY DWELLINGS**  
 (printing date 01-02 4M)

**Page Revision**

73 Table 2.5B Replace lateral loads for a 1:12 roof pitch as follows:

Three Second Gust Wind Speed (mph)	85	90	100	110	120	130	140	150	
Roof Pitch	Roof Span (ft.)	Unit Lateral Loads for Roof Diaphragm, $w_{roofll}$ , (plf) <sup>1,2,3,4</sup>							
1:12	24-60	<del>37</del> 43	<del>42</del> 48	<del>52</del> 60	<del>63</del> 72	<del>74</del> 86	<del>87</del> 101	<del>101</del> 117	<del>116</del> 134

87 Table 2.11 Replace unit header/girder beam loads as follows:

Ground Snow Load or Roof Live Load (psf)	RLL	GSL <sup>2</sup>				RLL	GSL <sup>3</sup>				RLL	GSL <sup>4</sup>			
	20	30	50	70	20	30	50	70	20	30	50	70			
Roof Span (ft.)	Unit Header/Girder Beam Loads (plf) <sup>1</sup>														
12	200	<del>285</del>	<del>408</del>	<del>531</del>	380	<del>451</del>	<del>575</del>	<del>698</del>	629	<del>656</del>	<del>741</del>	<del>864</del>			
24	320	<del>443</del>	<del>632</del>	<del>820</del>	609	<del>677</del>	<del>866</del>	<del>1054</del>	1008	<del>1046</del>	<del>1105</del>	<del>1288</del>			
36	440	<del>605</del>	<del>862</del>	<del>1118</del>	838	<del>907</del>	<del>1163</del>	<del>1420</del>	1387	<del>1438</del>	<del>1519</del>	<del>1721</del>			
60	680	<del>931</del>	<del>1326</del>	<del>1720</del>	1295	<del>1374</del>	<del>1762</del>	<del>2156</del>	2144	<del>2223</del>	<del>2346</del>	<del>2593</del>			

148-149 Table 3.4 Replace lateral required capacity of connection loads for 19.2" o.c. spacing as follows:

Three Second Gust Wind Speed (mph)	85	90	100	110	120	130	140	150	
Rafter/Truss Spacing (in.)	Roof Span (ft.)	Required Capacity of Connections (lbs.) <sup>1,2</sup>							
		L	L	L	L	L	L	L	L
19.2	12-36	<del>105</del>	<del>118</del>	<del>146</del>	<del>176</del>	<del>210</del>	<del>246</del>	<del>286</del>	<del>328</del>
		<del>126</del>	<del>142</del>	<del>175</del>	<del>212</del>	<del>252</del>	<del>296</del>	<del>343</del>	<del>394</del>

162 Table 3.12A Replace minimum panel thickness for 24" o.c. rafter/truss spacing as follows:

Three Second Gust Wind Speed (mph)	85	90	100	110	120	130	140	150
Rafter/Truss Spacing (in.)	Minimum Panel Thickness (in.)							
24	3/8	3/8	3/8	3/8	7/16	7/16	15/32	<del>15/32</del> 19/32

Page Revision

180 Table 3.20A Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		85			90			100			110		
Stud Spacing (in.)	Species/ Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #3	15 - 7	†	†	14 - 11	†	†	<del>13 - 11</del> 13 - 4	†	†	<del>13 - 0</del> 12 - 1	‡ 18 - 4	†
16	Southern Pine #3	<del>14 - 1</del> 13 - 7	†	†	<del>13 - 6</del> 12 - 10	‡ 19 - 6	†	<del>12 - 7</del> 11 - 5	‡ 17 - 5	†	<del>11 - 9</del> 10 - 4	<del>18 - 1</del> 15 - 8	†
24	Southern Pine #2	12 - 9	†	†	12 - 3	19 - 9	†	11 - 5	18 - 4	†	10 - 8	<del>17 - 2</del> 16 - 7	†
	Southern Pine #3	<del>12 - 2</del> 11 - 0	<del>19 - 2</del> 16 - 8	†	<del>11 - 9</del> 10 - 4	<del>18 - 0</del> 15 - 8	†	<del>10 - 11</del> 9 - 3	<del>16 - 1</del> 14 - 0	<del>20 - 0</del> 18 - 1	<del>10 - 2</del> 8 - 4	<del>14 - 6</del> 12 - 7	<del>18 - 0</del> 16 - 4

181 Table 3.20A Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		120			130			140			150		
Stud Spacing (in.)	Species/ Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #2	12 - 10	†	†	12 - 1	19 - 5	†	11 - 6	18 - 6	†	11 - 0	<del>17 - 7</del> 17 - 3	†
	Southern Pine #3	<del>12 - 3</del> 11 - 0	<del>19 - 2</del> 16 - 8	†	<del>11 - 7</del> 10 - 1	<del>17 - 7</del> 15 - 4	‡ 19 - 10	<del>11 - 0</del> 9 - 4	<del>16 - 3</del> 14 - 2	‡ 18 - 4	<del>10 - 6</del> 8 - 8	<del>15 - 1</del> 13 - 1	<del>18 - 9</del> 17 - 0
16	Southern Pine #2	11 - 7	18 - 7	†	11 - 0	<del>17 - 7</del> 17 - 3	†	10 - 5	<del>16 - 8</del> 15 - 11	†	9 - 11	<del>15 - 11</del> 14 - 9	‡ 19 - 6
	Southern Pine #3	<del>11 - 1</del> 9 - 5	<del>16 - 5</del> 14 - 3	‡ 18 - 6	<del>10 - 5</del> 8 - 8	<del>15 - 1</del> 13 - 1	<del>18 - 9</del> 17 - 0	<del>9 - 11</del> 8 - 0	<del>13 - 11</del> 12 - 1	<del>17 - 4</del> 15 - 8	<del>9 - 3</del> -	<del>12 - 11</del> 11 - 3	<del>16 - 1</del> 14 - 7
24	Southern Pine #1	10 - 3	16 - 6	†	9 - 9	15 - 7	†	9 - 3	14 - 10	<del>19 - 9</del> 19 - 0	8 - 9	<del>14 - 1</del> 13 - 10	<del>18 - 10</del> 17 - 8
	Southern Pine #2	10 - 1	<del>16 - 2</del> 15 - 1	‡ 19 - 11	<del>9 - 6</del> 9 - 5	<del>15 - 3</del> 13 - 10	‡ 18 - 3	<del>9 - 0</del> 8 - 9	<del>14 - 6</del> 12 - 10	<del>18 - 7</del> 16 - 10	<del>8 - 7</del> 8 - 1	<del>13 - 8</del> 11 - 11	<del>17 - 3</del> 15 - 8
	Southern Pine #3	<del>9 - 5</del> -	<del>13 - 3</del> 11 - 6	<del>16 - 5</del> 14 - 11	<del>8 - 8</del> -	<del>12 - 2</del> 10 - 7	<del>15 - 1</del> 13 - 8	<del>8 - 0</del> -	<del>11 - 3</del> 9 - 9	<del>13 - 11</del> 12 - 8	-	<del>10 - 5</del> 9 - 1	<del>12 - 11</del> 11 - 9

182 Table 3.20B Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		85			90			100			110		
Stud Spacing (in.)	Species/ Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #3	15 - 7	†	†	14 - 11	†	†	13 - 11	†	†	13 - 0	‡ 20 - 0	†
16	Southern Pine #3	14 - 1	†	†	13 - 6	†	†	12 - 7	‡ 18 - 11	†	11 - 9	<del>18 - 10</del> 17 - 1	†
24	Southern Pine #3	12 - 2	<del>19 - 7</del> 18 - 2	†	11 - 9	<del>18 - 10</del> 17 - 1	†	<del>10 - 11</del> 10 - 7	<del>17 - 6</del> 15 - 3	‡ 19 - 0	<del>10 - 2</del> 9 - 7	<del>15 - 10</del> 13 - 9	<del>18 - 10</del> 17 - 1

183 Table 3.20B Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		120			130			140			150		
Stud Spacing (in.)	Species/Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #3	12 - 3	<del>19-7</del> 18 - 2	†	11 - 7	<del>18-7</del> 16 - 8	†	<del>11-0</del> 10 - 9	<del>17-7</del> 15 - 5	‡	<del>10-6</del> 10 - 0	<del>16-6</del> 14 - 4	<del>19-7</del> 17 - 9
16	Southern Pine #3	<del>11-1</del> 10 - 10	<del>17-9</del> 15 - 7	‡	<del>10-5</del> 10 - 0	<del>16-5</del> 14 - 3	<del>19-7</del> 17 - 9	<del>9-11</del> 9 - 2	<del>15-2</del> 13 - 2	<del>18-1</del> 16 - 5	<del>9-6</del> 8 - 7	<del>14-1</del> 12 - 3	<del>16-10</del> 15 - 3
24	Southern Pine #1	10 - 3	16 - 6	†	9 - 9	15 - 7	†	9 - 3	14 - 10	19 - 9	8 - 9	14 - 1	<del>18-10</del> 18 - 6
	Southern Pine #2	10 - 1	16 - 2	†	9 - 6	<del>15-3</del> 15 - 1	‡	9 - 0	<del>14-6</del> 14 - 0	<del>19-4</del> 17 - 8	8 - 7	<del>13-10</del> 13 - 0	<del>18-1</del> 16 - 5
	Southern Pine #3	<del>9-7</del> 8 - 9	<del>14-5</del> 12 - 6	<del>17-2</del> 15 - 7	<del>9-1</del> 8 - 0	<del>13-3</del> 11 - 6	<del>15-9</del> 14 - 4	<del>8-7</del> -	<del>12-3</del> 10 - 7	<del>14-7</del> 13 - 2	<del>8-3</del> -	<del>11-4</del> 9 - 10	<del>13-6</del> 12 - 3

192 Table 3.23A Replace maximum header/girder spans for glued laminated beams as follows:

Three Second Gust Wind Speed (mph)	85	90	100	110	120	130	140	150
Maximum Header/Girder Spans for Glued Laminated Beams <sup>1,2,3,5,6</sup>								
Size	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)
3x5.500	<del>12-9</del>	<del>12-0</del>	<del>10-10</del>	<del>9-10</del>	<del>9-0</del>	<del>8-4</del>	<del>7-9</del>	<del>7-2</del>
3x6.875	<del>14-3</del>	<del>13-5</del>	<del>12-1</del>	<del>11-0</del>	<del>10-1</del>	<del>9-4</del>	<del>8-8</del>	<del>8-1</del>
3x8.250	<del>15-7</del>	<del>14-8</del>	<del>13-3</del>	<del>12-0</del>	<del>11-0</del>	<del>10-2</del>	<del>9-5</del>	<del>8-10</del>
3x9.625	‡	<del>15-11</del>	<del>14-4</del>	<del>13-0</del>	<del>11-11</del>	<del>11-0</del>	<del>10-3</del>	<del>9-6</del>
3x11.000	‡	‡	<del>15-3</del>	<del>13-11</del>	<del>12-9</del>	<del>11-9</del>	<del>10-11</del>	<del>10-2</del>
3x12.375	‡	‡	‡	<del>14-9</del>	<del>13-6</del>	<del>12-6</del>	<del>11-7</del>	<del>10-10</del>
3x13.750	‡	‡	‡	<del>15-6</del>	<del>14-3</del>	<del>13-2</del>	<del>12-2</del>	<del>11-5</del>
3x15.125	‡	‡	‡	‡	<del>14-11</del>	<del>13-9</del>	<del>12-10</del>	<del>11-11</del>
3x16.5000	‡	‡	‡	‡	<del>15-7</del>	<del>14-5</del>	<del>13-4</del>	<del>12-6</del>
3x17.875	‡	‡	‡	‡	‡	<del>15-0</del>	<del>13-11</del>	<del>13-0</del>
3x19.250	‡	‡	‡	‡	‡	<del>15-7</del>	<del>14-5</del>	<del>13-6</del>
3x20.625	‡	‡	‡	‡	‡	‡	<del>14-11</del>	<del>13-11</del>
3x22.000	‡	‡	‡	‡	‡	‡	<del>15-5</del>	<del>14-5</del>
3x23.375	‡	‡	‡	‡	‡	‡	<del>15-11</del>	<del>14-10</del>
3x24.750	‡	‡	‡	‡	‡	‡	‡	<del>15-3</del>
5x5.5000	‡	‡	‡	<del>15-11</del>	<del>14-7</del>	<del>13-6</del>	<del>12-6</del>	<del>11-8</del>
5x6.875	‡	‡	‡	‡	‡	<del>15-1</del>	<del>14-0</del>	<del>13-1</del>
5x8.250	‡	‡	‡	‡	‡	‡	<del>15-4</del>	<del>14-4</del>
5x9.625	‡	‡	‡	‡	‡	‡	‡	<del>15-6</del>

**Page Revision**

211 Table 3.29A Replace ridge beam span as follows:

Size	Roof Dead Load = 10 psf			Roof Dead Load = 20 psf		
	Building Width (ft.)			Building Width (ft.)		
	12	24	36	12	24	36
	Maximum Ridge Beam Spans (ft.-in.) for Glued Laminated Beams <sup>2</sup>					
5x20.625	<del>5-9</del> <u>44-10</u>	<del>4-6</del> <u>35-7</u>	<del>4-0</del> <u>31-1</u>	<del>5-2</del> <u>40-9</u>	<del>4-4</del> <u>32-4</u>	<del>3-7</del> <u>28-3</u>

212 Table 3.29B Replace ridge beam span as follows:

Size	Roof Dead Load = 10 psf			Roof Dead Load = 20 psf		
	Building Width (ft.)			Building Width (ft.)		
	12	24	36	12	24	36
	Maximum Ridge Beam Spans (ft.-in.) for Glued Laminated Beams <sup>2</sup>					
5x20.625	<del>5-6</del> <u>43-5</u>	<del>4-5</del> <u>34-5</u>	<del>3-10</del> <u>30-1</u>	<del>5-1</del> <u>39-9</u>	<del>4-0</del> <u>31-7</u>	<del>3-6</del> <u>27-7</u>

213 Table 3.29C Replace ridge beam span as follows:

Size	Roof Dead Load = 10 psf			Roof Dead Load = 20 psf		
	Building Width (ft.)			Building Width (ft.)		
	12	24	36	12	24	36
	Maximum Ridge Beam Spans (ft.-in.) for Glued Laminated Beams <sup>2</sup>					
5x20.625	<del>4-9</del> <u>37-6</u>	<del>3-9</del> <u>29-9</u>	<del>3-4</del> <u>26-0</u>	<del>4-7</del> <u>35-11</u>	<del>3-8</del> <u>28-6</u>	<del>3-1</del> <u>24-1</u>

214 Table 3.29D Replace ridge beam span as follows:

Size	Roof Dead Load = 10 psf			Roof Dead Load = 20 psf		
	Building Width (ft.)			Building Width (ft.)		
	12	24	36	12	24	36
	Maximum Ridge Beam Spans (ft.-in.) for Glued Laminated Beams <sup>2</sup>					
5x20.625	<del>4-3</del> <u>33-6</u>	<del>3-5</del> <u>26-7</u>	<del>2-11</del> <u>22-8</u>	<del>4-3</del> <u>33-3</u>	<del>3-4</del> <u>26-1</u>	<del>2-7</del> <u>20-1</u>

216-217 Table A-3.2 Replace required lateral wall bottom plate to foundation required capacities as follows:

Three Second Gust Wind Speed (mph)			85	90	100	110	120	130	140	150
Wall Bottom Plate to Foundation (Slab-on-Grade)	Number of Stories	Roof Span (ft.)	Required Capacity of Connection (plf) <sup>1,2</sup>							
			L	L	L	L	L	L	L	L
	2	20-36	<del>79</del> <u>110</u>	<del>89</del> <u>123</u>	<del>109</del> <u>152</u>	<del>132</del> <u>184</u>	<del>157</del> <u>219</u>	<del>185</del> <u>257</u>	<del>214</del> <u>298</u>	<del>246</del> <u>342</u>
			<del>79</del> <u>110</u>	<del>89</del> <u>123</u>	<del>109</del> <u>152</u>	<del>132</del> <u>184</u>	<del>157</del> <u>219</u>	<del>185</del> <u>257</u>	<del>214</del> <u>298</u>	<del>246</del> <u>342</u>
	3	28-36	<del>79</del> <u>110</u>	<del>89</del> <u>123</u>	<del>109</del> <u>152</u>	<del>132</del> <u>184</u>	<del>157</del> <u>219</u>	<del>185</del> <u>257</u>	<del>214</del> <u>298</u>	<del>246</del> <u>342</u>
			<del>79</del> <u>110</u>	<del>89</del> <u>123</u>	<del>109</del> <u>152</u>	<del>132</del> <u>184</u>	<del>157</del> <u>219</u>	<del>185</del> <u>257</u>	<del>214</del> <u>298</u>	<del>246</del> <u>342</u>

**Page Revision**

222-223 Table A-3.4 Replace required lateral connection requirements for 19.2" o.c. spacing as follows:

Three Second Gust Wind Speed (mph)		85	90	100	110	120	130	140	150
Rafter/Truss Spacing (in.)	Roof Span (ft.)	Required Capacity of Connection (lbs.)							
		L	L	L	L	L	L	L	L
19.2	12-36	<del>146</del>	<del>164</del>	<del>202</del>	<del>245</del>	<del>291</del>	<del>342</del>	<del>397</del>	<del>455</del>
		<u>175</u>	<u>197</u>	<u>243</u>	<u>294</u>	<u>350</u>	<u>411</u>	<u>476</u>	<u>547</u>

235 Table A-3.12A Replace minimum panel thickness for 24" o.c. rafter/truss spacing as follows:

Three Second Gust Wind Speed (mph)		85	90	100	110	120	130	140	150
Rafter/Truss Spacing (in.)		Minimum Panel Thickness (in.)							
		24		3/8	3/8	3/8	7/16	15/32	<del>15/32</del>
<u>19/32</u>	<u>19/32</u>			<u>19/32</u>					

244 Table A-3.20A Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		85			90			100			110		
Stud Spacing (in.)	Species/Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #3	<del>13-10</del> <u>13-4</u>	†	†	<del>13-4</del> <u>12-6</u>	‡ <u>19-0</u>	†	<del>12-5</del> <u>11-2</u>	<del>19-7</del> <u>17-0</u>	†	<del>11-7</del> <u>10-1</u>	<del>17-8</del> <u>15-4</u>	‡ <u>19-11</u>
	Southern Pine #2	13 - 2	†	†	12 - 7	†	†	11 - 9	18 - 10	†	11 - 0	<del>17-7</del> <u>17-4</u>	†
16	Southern Pine #3	<del>12-6</del> <u>11-5</u>	<del>20-0</del> <u>17-4</u>	†	<del>12-1</del> <u>10-9</u>	<del>18-9</del> <u>16-4</u>	†	<del>11-2</del> <u>9-7</u>	<del>16-9</del> <u>14-7</u>	‡ <u>18-11</u>	<del>10-6</del> <u>8-8</u>	<del>15-2</del> <u>13-2</u>	<del>18-10</del> <u>17-1</u>
	Southern Pine #2	11 - 5	18 - 4	†	11 - 0	<del>17-7</del> <u>17-3</u>	†	10 - 2	<del>16-4</del> <u>15-5</u>	†	<del>9-6</del> <u>9-5</u>	<del>15-3</del> <u>13-11</u>	‡ <u>18-4</u>
24	Southern Pine #3	<del>10-11</del> <u>9-2</u>	<del>16-1</del> <u>14-0</u>	<del>20-0</del> <u>18-1</u>	<del>10-6</del> <u>8-8</u>	<del>15-1</del> <u>13-1</u>	<del>18-9</del> <u>17-0</u>	9-7 :	<del>13-6</del> <u>11-9</u>	<del>16-9</del> <u>15-2</u>	8-8 :	<del>12-2</del> <u>10-7</u>	<del>15-1</del> <u>13-9</u>
	Southern Pine #2	11 - 5	18 - 4	†	11 - 0	<del>17-7</del> <u>17-3</u>	†	10 - 2	<del>16-4</del> <u>15-5</u>	†	<del>9-6</del> <u>9-5</u>	<del>15-3</del> <u>13-11</u>	‡ <u>18-4</u>

Page **Revision**

245 Table A-3.20A Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		120			130			140			150		
Stud Spacing (in.)	Species/Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #2	11 - 5	18 - 4	†	10 - 10	<del>17-4</del> <u>16-10</u>	†	10 - 3	<del>16-5</del> <u>15-7</u>	†	9 - 9	<del>15-8</del> <u>14-6</u>	‡
	Southern Pine #3	<del>10-11</del> <u>9-3</u>	<del>16-1</del> <u>14-0</u>	<del>20-0</del> <u>18-1</u>	<del>10-4</del> <u>8-6</u>	<del>14-9</del> <u>12-10</u>	<del>18-4</del> <u>16-8</u>	<del>9-8</del> <u>7-10</u>	<del>13-8</del> <u>11-10</u>	<del>16-11</del> <u>15-4</u>	<del>9-0</del> -	<del>12-8</del> <u>11-0</u>	<del>15-9</del> <u>14-3</u>
16	Southern Pine #1	10 - 7	16 - 11	†	10 - 0	16 - 0	†	9 - 6	15 - 2	‡ <u>19-10</u>	9 - 0	<del>14-6</del> <u>14-5</u>	<del>19-4</del> <u>18-5</u>
	Southern Pine #2	10 - 4	<del>16-7</del> <u>15-9</u>	†	9 - 9	<del>15-8</del> <u>14-6</u>	‡ <u>19-0</u>	<del>9-3</del> <u>9-1</u>	<del>14-11</del> <u>13-4</u>	<del>19-5</del> <u>17-7</u>	<del>8-10</del> <u>8-5</u>	<del>14-2</del> <u>12-5</u>	<del>18-0</del> <u>16-4</u>
	Southern Pine #3	<del>9-10</del> <u>7-11</u>	<del>13-9</del> <u>12-0</u>	<del>17-1</del> <u>15-6</u>	<del>9-0</del> -	<del>12-8</del> <u>11-0</u>	<del>15-9</del> <u>14-3</u>	<del>8-4</del> -	<del>11-8</del> <u>10-2</u>	<del>14-6</del> <u>13-2</u>	-	<del>10-10</del> <u>9-5</u>	<del>13-6</del> <u>12-3</u>
24	Southern Pine #1	9 - 2	14 - 8	<del>19-8</del> <u>18-10</u>	8 - 8	<del>13-11</del> <u>13-6</u>	<del>18-7</del> <u>17-3</u>	<del>8-3</del> <u>8-2</u>	<del>13-2</del> <u>12-6</u>	<del>17-7</del> <u>15-11</u>	<del>7-10</del> -	<del>12-7</del> <u>11-7</u>	<del>16-4</del> <u>14-10</u>
	Southern Pine #2	<del>9-0</del> <u>8-7</u>	<del>14-5</del> <u>12-8</u>	<del>18-5</del> <u>16-8</u>	<del>8-6</del> <u>7-11</u>	<del>13-5</del> <u>11-8</u>	<del>16-4</del> <u>15-4</u>	<del>8-1</del> -	<del>12-4</del> <u>10-9</u>	<del>15-7</del> <u>14-2</u>	-	<del>11-6</del> <u>10-0</u>	<del>14-6</del> <u>13-2</u>
	Southern Pine #3	<del>7-11</del> -	<del>11-1</del> <u>9-8</u>	<del>13-9</del> <u>12-6</u>	-	<del>10-2</del> <u>8-10</u>	<del>12-8</del> <u>11-6</u>	-	<del>9-5</del> <u>8-2</u>	<del>11-8</del> <u>10-7</u>	-	<del>8-9</del> -	<del>10-10</del> <u>9-10</u>

246 Table A-3.20B Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		85			90			100			110		
Stud Spacing (in.)	Species/Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #3	13 - 10	†	†	13 - 4	†	†	12 - 5	<del>19-10</del> <u>18-6</u>	†	11 - 7	<del>18-7</del> <u>16-9</u>	†
16	Southern Pine #3	12 - 6	‡ <u>18-11</u>	†	12 - 1	<del>19-4</del> <u>17-9</u>	†	<del>11-2</del> <u>11-1</u>	<del>18-0</del> <u>15-11</u>	‡ <u>19-9</u>	10 - 0	<del>16-6</del> <u>14-4</u>	<del>19-8</del> <u>17-10</u>
24	Southern Pine #2	11 - 5	18 - 4	†	11 - 0	17 - 7	†	10 - 2	16 - 4	†	9 - 6	<del>15-3</del> <u>15-2</u>	‡ <u>19-2</u>
	Southern Pine #3	<del>10-11</del> <u>10-7</u>	<del>17-6</del> <u>15-2</u>	‡ <u>18-11</u>	<del>10-6</del> <u>10-0</u>	<del>16-6</del> <u>14-4</u>	<del>19-7</del> <u>17-9</u>	<del>9-9</del> <u>8-11</u>	<del>14-8</del> <u>12-9</u>	<del>17-6</del> <u>15-11</u>	<del>9-1</del> <u>8-1</u>	<del>13-3</del> <u>11-6</u>	<del>15-10</del> <u>14-4</u>

247 Table A-3.20B Replace Southern Pine maximum stud lengths as follows:

Three Second Gust Wind Speed (mph)		120			130			141			150		
Stud Spacing (in.)	Species/Grade	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8	2x4	2x6	2x8
		Maximum Allowable Stud Length (ft.-in.) <sup>1</sup>											
12	Southern Pine #2	11 - 5	18 - 4	†	10 - 10	17 - 4	†	10 - 3	16 - 5	†	9 - 9	15 - 8	† <del>19 - 11</del>
	Southern Pine #3	<del>10 - 11</del> 10 - 7	<del>17 - 6</del> 15 - 3	† <del>19 - 0</del>	<del>10 - 4</del> 9 - 9	<del>16 - 1</del> 14 - 0	<del>19 - 2</del> 17 - 5	<del>9 - 9</del> 9 - 0	<del>14 - 10</del> 12 - 11	<del>17 - 9</del> 16 - 1	<del>9 - 4</del> 8 - 4	<del>13 - 10</del> 12 - 0	<del>16 - 5</del> 14 - 11
16	Southern Pine #1	10 - 7	16 - 11	†	10 - 0	16 - 0	†	9 - 6	15 - 2	†	9 - 0	14 - 6	<del>19 - 4</del> 19 - 3
	Southern Pine #2	10 - 4	16 - 7	†	9 - 9	15 - 8	19 - 11	9 - 3	<del>14 - 11</del> 14 - 7	<del>19 - 11</del> 18 - 5	8 - 10	<del>14 - 2</del> 13 - 6	<del>18 - 10</del> 17 - 1
	Southern Pine #3	<del>9 - 10</del> 9 - 1	<del>15 - 0</del> 13 - 1	<del>17 - 11</del> 16 - 3	<del>9 - 4</del> 8 - 4	<del>13 - 10</del> 12 - 0	<del>16 - 5</del> 14 - 11	<del>8 - 10</del> -	<del>12 - 9</del> 11 - 1	<del>15 - 2</del> 13 - 9	<del>8 - 5</del> -	<del>11 - 10</del> 10 - 3	<del>14 - 1</del> 12 - 9
24	Southern Pine #1	9 - 2	14 - 8	19 - 8	8 - 8	13 - 11	<del>18 - 7</del> 18 - 1	8 - 3	13 - 2	<del>17 - 8</del> 16 - 8	7 - 10	12 - 7	<del>16 - 10</del> 15 - 6
	Southern Pine #2	9 - 0	<del>14 - 5</del> 13 - 10	<del>19 - 3</del> 17 - 5	8 - 6	<del>13 - 7</del> 12 - 8	<del>17 - 8</del> 16 - 0	8 - 1	<del>12 - 11</del> 11 - 9	<del>16 - 4</del> 14 - 9	-	<del>12 - 4</del> 10 - 11	<del>15 - 2</del> 13 - 9
	Southern Pine #3	<del>8 - 7</del> -	<del>12 - 1</del> 10 - 6	<del>14 - 5</del> 13 - 1	<del>8 - 1</del> -	<del>11 - 1</del> 9 - 8	<del>13 - 3</del> 12 - 0	-	<del>10 - 3</del> 8 - 11	<del>12 - 3</del> 11 - 1	-	<del>9 - 6</del> 8 - 3	<del>11 - 4</del> 10 - 3

249 Table A-3.23A Replace maximum header/girder spans for glued laminated beams as follows:

Three Second Gust Wind Speed (mph)	85	90	100	110	120	130	140	150
Maximum Header/Girder Spans for Glued Laminated Beams <sup>1,2,3,5,6</sup>								
Size	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)
3x5.500	<del>10 - 9</del>	<del>10 - 2</del>	<del>9 - 2</del>	<del>8 - 4</del>	<del>7 - 8</del>	<del>7 - 1</del>	<del>6 - 7</del>	<del>6 - 1</del>
3x6.875	<del>12 - 1</del>	<del>11 - 5</del>	<del>10 - 3</del>	<del>9 - 4</del>	<del>8 - 7</del>	<del>7 - 11</del>	<del>7 - 4</del>	<del>6 - 10</del>
3x8.250	<del>13 - 2</del>	<del>12 - 6</del>	<del>11 - 3</del>	<del>10 - 2</del>	<del>9 - 4</del>	<del>8 - 8</del>	<del>8 - 0</del>	<del>7 - 6</del>
3x9.625	<del>14 - 3</del>	<del>13 - 6</del>	<del>12 - 2</del>	<del>11 - 0</del>	<del>10 - 1</del>	<del>9 - 4</del>	<del>8 - 8</del>	<del>8 - 1</del>
3x11.000	<del>15 - 3</del>	<del>14 - 5</del>	<del>13 - 0</del>	<del>11 - 9</del>	<del>10 - 10</del>	<del>10 - 0</del>	<del>9 - 3</del>	<del>8 - 8</del>
3x12.375	<del>□</del>	<del>15 - 3</del>	<del>13 - 9</del>	<del>12 - 6</del>	<del>11 - 6</del>	<del>10 - 7</del>	<del>9 - 10</del>	<del>9 - 2</del>
3x13.750	<del>□</del>	<del>□</del>	<del>14 - 6</del>	<del>13 - 2</del>	<del>12 - 1</del>	<del>11 - 2</del>	<del>10 - 4</del>	<del>9 - 8</del>
3x15.125	<del>□</del>	<del>□</del>	<del>15 - 2</del>	<del>13 - 10</del>	<del>12 - 8</del>	<del>11 - 8</del>	<del>10 - 10</del>	<del>10 - 2</del>
3x16.5000	<del>□</del>	<del>□</del>	<del>15 - 11</del>	<del>14 - 5</del>	<del>13 - 3</del>	<del>12 - 3</del>	<del>11 - 4</del>	<del>10 - 7</del>
3x17.875	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 0</del>	<del>13 - 9</del>	<del>12 - 9</del>	<del>11 - 10</del>	<del>11 - 0</del>
3x19.250	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 7</del>	<del>14 - 4</del>	<del>13 - 2</del>	<del>12 - 3</del>	<del>11 - 5</del>
3x20.625	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>14 - 10</del>	<del>13 - 8</del>	<del>12 - 8</del>	<del>11 - 10</del>
3x22.000	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 3</del>	<del>14 - 1</del>	<del>13 - 1</del>	<del>12 - 3</del>
3x23.375	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 9</del>	<del>14 - 6</del>	<del>13 - 6</del>	<del>12 - 7</del>
3x24.750	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 0</del>	<del>13 - 11</del>	<del>13 - 0</del>
5x5.5000	<del>□</del>	<del>□</del>	<del>14 - 11</del>	<del>13 - 6</del>	<del>12 - 5</del>	<del>11 - 5</del>	<del>10 - 8</del>	<del>9 - 11</del>
5x6.875	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 1</del>	<del>13 - 10</del>	<del>12 - 10</del>	<del>11 - 11</del>	<del>11 - 1</del>
5x8.250	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 2</del>	<del>14 - 0</del>	<del>13 - 0</del>	<del>12 - 2</del>
5x9.625	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>□</del>	<del>15 - 2</del>	<del>14 - 1</del>	<del>13 - 1</del>

**Page                    Revision**

273                    Supplement Table 3A Replace allowable total uniform loads as follows:

Sheathing Type	Span Rating or Grade	Minimum Thickness (in.)	Sheathing Long Dimension Orientation							
			⊥ to Supports				to Supports			
			Maximum Stud Spacing (in.)	Actual Stud Spacing			Maximum Stud Spacing (in.)	Actual Stud Spacing		
				12	16	24		12	16	24
Allowable Total Uniform Loads (psf)			Allowable Total Uniform Loads (psf)			Allowable Total Uniform Loads (psf)				
Hardboard Siding (Direct to Studs)	Shiplap Edge Panel Siding	7/16	24	226	127	57	24	<del>390</del> <u>226</u>	<del>220</del> <u>127</u>	<del>78</del> <u>57</u>
	Square Edge Panel Siding	7/16	24	226	127	57	24	<del>390</del> <u>226</u>	<del>220</del> <u>127</u>	<del>78</del> <u>57</u>
Lumber Board Sheathing <sup>3</sup>	#4 Common or Utility	5/8	24	130	<del>60</del>	<del>0</del> <u>30</u>	-	-	-	-



**AMERICAN FOREST & PAPER ASSOCIATION**

American Wood Council  
Engineered and Traditional Wood Products

April 2003

**2003 ERRATA/ADDENDUM  
to  
ANSI/AF&PA WFCM-2001**

**WOOD FRAME CONSTRUCTION MANUAL  
FOR ONE- AND TWO-FAMILY DWELLINGS**

**Page(s) Revision(s)**

177 Replace Southern Pine Grade #2 and #3 Maximum Floor Joist Spans in Table 3.18A with:

		Dead Load = 10 psf				Dead Load = 20 psf			
		2x6	2x8	2x10	2x12	2x6	2x8	2x10	2x12
Maximum Floor Joist Spans									
Joist Spacing	Species and Grade	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)
12 in.	Southern Pine #2	11 - 10	15 - 7	19 - 10	24 - 2	11 - 10	15 - 7	<del>19 - 6</del> 18 - 7	21 - 9
	Southern Pine #3	<del>11 - 3</del> 10 - 5	<del>14 - 7</del> 13 - 3	<del>16 - 5</del> 15 - 8	18 - 8	<del>10 - 8</del> 9 - 4	<del>13 - 0</del> 11 - 11	<del>14 - 9</del> 14 - 0	16 - 8
16 in.	Southern Pine #2	10 - 9	14 - 2	18 - 0	21 - 1	<del>10 - 9</del> 10 - 5	<del>14 - 2</del> 13 - 6	<del>16 - 10</del> 16 - 1	18 - 10
	Southern Pine #3	<del>10 - 3</del> 9 - 0	<del>12 - 7</del> 11 - 6	<del>14 - 3</del> 13 - 7	16 - 2	<del>9 - 3</del> 8 - 1	<del>11 - 3</del> 10 - 3	<del>12 - 9</del> 12 - 2	14 - 6
19.2 in.	Southern Pine #2	10 - 1	13 - 4	<del>17 - 0</del> 16 - 5	19 - 3	<del>10 - 1</del> 9 - 6	<del>13 - 4</del> 12 - 4	<del>15 - 5</del> 14 - 8	17 - 2
	Southern Pine #3	<del>9 - 5</del> 8 - 3	<del>11 - 6</del> 10 - 6	<del>13 - 0</del> 12 - 5	14 - 9	<del>8 - 5</del> 7 - 4	<del>10 - 3</del> 9 - 5	<del>11 - 8</del> 11 - 1	13 - 2
24 in.	Southern Pine #2	9 - 4	12 - 4	<del>15 - 5</del> 14 - 8	17 - 2	<del>9 - 4</del> 8 - 6	<del>12 - 1</del> 11 - 0	<del>13 - 9</del> 13 - 1	15 - 5
	Southern Pine #3	<del>8 - 5</del> 7 - 4	<del>10 - 3</del> 9 - 5	<del>11 - 8</del> 11 - 1	13 - 2	<del>7 - 6</del> 6 - 7	<del>9 - 2</del> 8 - 5	<del>10 - 5</del> 9 - 11	11 - 10

178 Replace Southern Pine Grade #2 and #3 Maximum Floor Joist Spans in Table 3.18B with:

		Dead Load = 10 psf				Dead Load = 20 psf			
		2x6	2x8	2x10	2x12	2x6	2x8	2x10	2x12
Maximum Floor Joist Spans									
Joist Spacing	Species and Grade	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)	(ft.-in.)
12 in.	Southern Pine #2	10 - 9	14 - 2	18 - 0	21 - 9	10 - 9	14 - 2	<del>17 - 9</del> 16 - 11	19 - 10
	Southern Pine #3	<del>10 - 3</del> 9 - 4	<del>13 - 0</del> 11 - 11	<del>14 - 9</del> 14 - 0	16 - 8	<del>9 - 8</del> 8 - 6	<del>11 - 11</del> 10 - 10	<del>13 - 5</del> 12 - 10	15 - 3
16 in.	Southern Pine #2	9 - 9	12 - 10	<del>16 - 5</del> 16 - 1	18 - 10	<del>9 - 9</del> 9 - 6	<del>12 - 10</del> 12 - 4	<del>15 - 5</del> 14 - 8	17 - 2
	Southern Pine #3	<del>9 - 3</del> 8 - 1	<del>11 - 3</del> 10 - 3	<del>12 - 9</del> 12 - 2	14 - 6	<del>8 - 5</del> 7 - 4	<del>10 - 3</del> 9 - 5	<del>11 - 8</del> 11 - 1	13 - 2
19.2 in.	Southern Pine #2	9 - 2	12 - 1	<del>15 - 5</del> 14 - 8	17 - 2	<del>9 - 2</del> 8 - 8	<del>12 - 1</del> 11 - 3	<del>14 - 1</del> 13 - 5	15 - 8
	Southern Pine #3	<del>8 - 5</del> 7 - 4	<del>10 - 3</del> 9 - 5	<del>11 - 8</del> 11 - 1	13 - 2	<del>7 - 8</del> 6 - 9	<del>9 - 5</del> 8 - 7	<del>10 - 7</del> 10 - 1	12 - 1
24 in.	Southern Pine #2	8 - 6	<del>11 - 3</del> 11 - 0	<del>13 - 9</del> 13 - 1	15 - 5	<del>8 - 6</del> 7 - 9	<del>11 - 0</del> 10 - 0	<del>12 - 7</del> 12 - 0	14 - 0
	Southern Pine #3	<del>7 - 6</del> 6 - 7	<del>9 - 2</del> 8 - 5	<del>10 - 5</del> 9 - 11	11 - 10	<del>6 - 10</del> 6 - 0	<del>8 - 5</del> 7 - 8	<del>9 - 6</del> 9 - 1	10 - 9

Alternatively, cut and paste the following onto pages 177-178 of the 2001 WFCM to replace Tables 3.18A and 3.18B. If you would like to receive a self-adhesive version of the following pages that can be permanently inserted in your document, please contact AWC with your mailing address.



**AMERICAN FOREST & PAPER ASSOCIATION**

American Wood Council  
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October 2002

**2002 ERRATA/ADDENDUM**

to

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**WOOD FRAME CONSTRUCTION MANUAL  
 FOR ONE- AND TWO-FAMILY DWELLINGS**

**Page(s) Revision(s)**

- 146 In footnotes 3, 4, and 5 replace the phrase “percent full-height sheathing” with “required shear capacity”.
- 147 In Seismic Category C for ½" anchor bolts at the sill plate to foundation of a 1 story structure, the maximum anchor bolt spacing should be 72, not 668.
- 154 Footnote 4 should be added as follows: Per general construction requirements a minimum of 2 nails shall be used for the stud to plate connection.
- 161 Under the column titled "sheathing location" modify as follows:  
Delete “4”” and replace with “Perimeter”.
- 168 Replace Table 3.16B with:

Three Second Gust Wind Speed (mph)		85		90		100		110	
Foundation Supporting	Building Endwall Width (ft.)	Allowable Building Sidewall Length (ft.)							
		Min	max	min	max	min	max	min	max
1-3 Stories	12	10	<del>48</del> 36	10	<del>48</del> 36	10	<del>45</del> 36	10	<del>38</del> 36
	16	10	<del>64</del> 48	10	<del>64</del> 48	10	<del>61</del> 48	10	<del>50</del> 48
	20	10	<del>80</del> 60	10	<del>80</del> 60	10	<del>76</del> 60	10	<del>63</del> 60
	24	10	<del>80</del> 72	10	<del>80</del> 72	10	<del>80</del> 72	10	<del>75</del> 72
	28	10	80	10	80	10	80	10	80
	32	<del>10</del> 11	80	<del>10</del> 11	80	<del>10</del> 11	80	<del>10</del> 11	80
	36	<del>10</del> 12	80	<del>10</del> 12	80	<del>10</del> 12	80	<del>10</del> 12	80
	40	<del>10</del> 13	80	<del>10</del> 13	80	<del>10</del> 13	80	<del>12</del> 13	80
	50	<del>13</del> 17	80	<del>13</del> 17	80	<del>13</del> 17	80	<del>14</del> 17	80
	60	<del>15</del> 20	80	<del>15</del> 20	80	<del>15</del> 20	80	<del>17</del> 20	80
	70	<del>18</del> 23	80	<del>18</del> 23	80	<del>18</del> 23	80	<del>20</del> 23	80
	80	<del>20</del> 27	80	<del>20</del> 27	80	<del>20</del> 27	80	<del>27</del>	80

- 172 In footnote 6 add the word "of" between the words "length" and "sheathing"
- 173 Remove the reference to footnote 1 from Table 3.17D as follows:

No Sheathing or Non-Rated Sheathing		Wind	Seismic	Wind	Seismic	Wind	Seismic
1/2" Gypsum Wallboard (Unblocked)	5d cooler nails - 7" edge spacing	100	100 <sup>1,2</sup>	2:1	2:1	4.36	7.20

**Page(s) Revision(s)**

- 176 Footnote 1 should be modified as follows:  
The word "multiplied" should be deleted and replaced with the word "divided".
- 178 In the title to Table 3.18B delete the word "sleeping" and add the word "living" from the information in parentheses.
- 185 Footnote 2 of both tables should read as follows:  
Tabulated splice lengths assume a building located in Exposure B or C.
- 196 Under the column titled "Header Supporting" modify the wording as follows:  
~~Two~~One Floors Only
- 198 The first row of Table 3.25A should be modified as follows:  
Dead Load = ~~510~~ psf
- 208 The first row of Footnote 3 should be modified as follows:
- |                          |   |
|--------------------------|---|
| 20 psf Live, 10 psf Dead | 20 psf Live, <del>10</del> <u>20</u> psf Dead |
|--------------------------|---|
- 228 Footnote 4 should be added as follows:  
Per general construction requirements a minimum of 2 nails shall be used for the stud to plate connection.

**2002 ERRATA/ADDENDUM**  
to  
**AF&PA WFCM COMMENTARY-2001**

**WOOD FRAME CONSTRUCTION MANUAL**  
**FOR ONE- AND TWO-FAMILY DWELLINGS COMMENTARY**

**Page(s) Revision(s)**

- 43 The equation for "p" at the top of the right hand column should be modified as follows:  
$$p = [51.4] / [(\cos(\del{6.12} \u26.6))(\cos(\del{6.12} \u26.6)) / (16/12)]$$