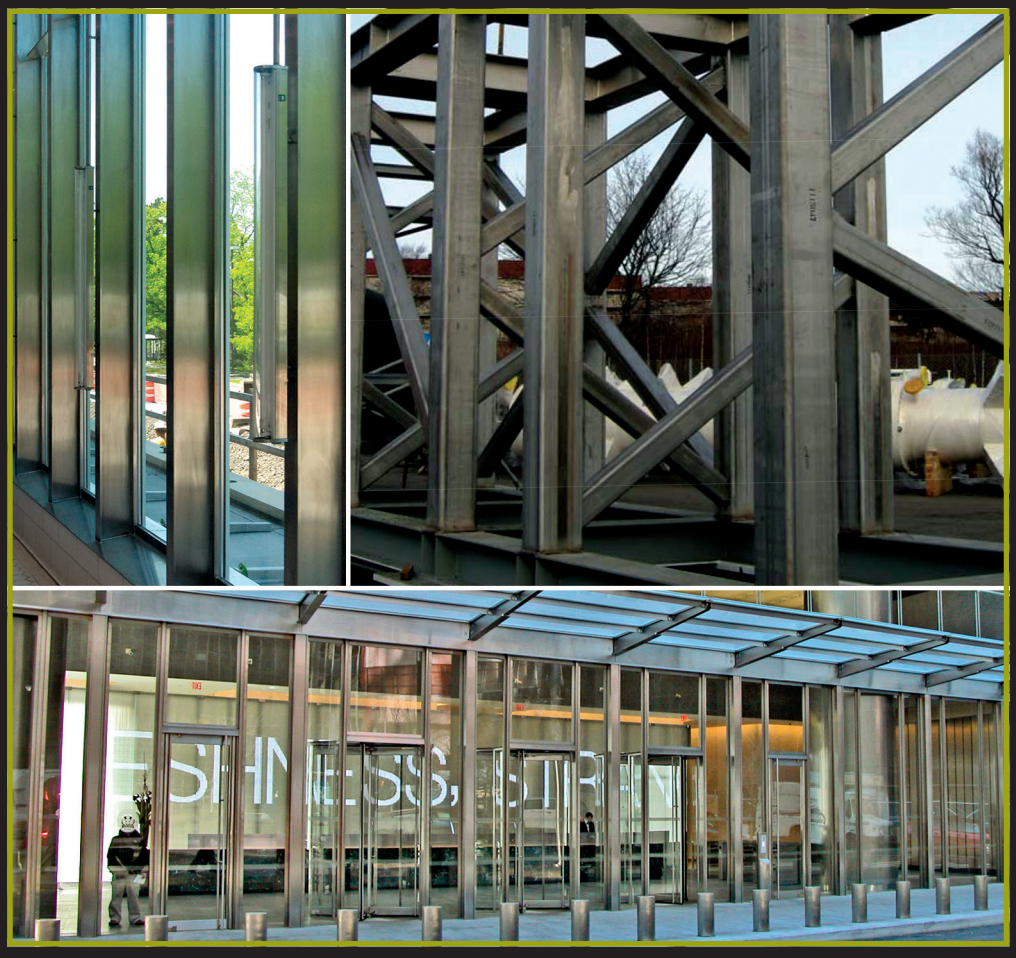
# STRUCTURAL STAINLESS STEEL DESIGN TABLES

## IN ACCORDANCE WITH AISC DG27: STRUCTURAL STAINLESS STEEL



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Skid for offshore regasification plant
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Bottom:
Stainless steel entrance structure,
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Courtesy: Catherine Houska



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# PART 2: DESIGN OF FLEXURAL MEMBERS ($F_y$ = 30 ksi)

$Z_x$

# Table 2-1
# W-Shapes (Welded)
## Selection by $Z_x$

$F_y$ = 30 ksi

| Shape | $Z_x$ | $M_{px}/\Omega_b$ | $\varphi_b M_{px}$ | $M_{rx}/\Omega_b$ | $\varphi_b M_{rx}$ | $BF/\Omega_b$ | $\varphi_b BF$ | $L_p$ | $L_r$ | $I_x$ | $V_{nx}/\Omega_v$ | $\varphi_v V_{nx}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | kip-ft | kip-ft | kip-ft | kip-ft | kips | kips | | | | kips | kips |
| | in.$^3$ | ASD | LRFD | ASD | LRFD | ASD | LRFD | ft | ft | in.$^4$ | ASD | LRFD |
| **W24×131** | **367** | **549** | **826** | **220** | **330** | **8.54** | **12.8** | **6.07** | **44.7** | **3990** | **160** | **240** |
| **W24×117** | **325** | **487** | **731** | **195** | **293** | **8.13** | **12.2** | **6.01** | **41.9** | **3510** | **144** | **217** |
| W21×122 | 305 | 457 | 686 | 183 | 274 | 6.71 | 10.1 | 5.95 | 46.8 | 2940 | 140 | 211 |
| **W24×104** | **287** | **430** | **646** | **172** | **259** | **7.64** | **11.5** | **5.95** | **39.6** | **3080** | **130** | **195** |
| W21×111 | 276 | 413 | 621 | 166 | 250 | 6.48 | 9.74 | 5.93 | 44.0 | 2650 | 127 | 192 |
| **W24×94** | **251** | **376** | **565** | **148** | **223** | **9.04** | **13.6** | **4.05** | **29.2** | **2670** | **135** | **203** |
| W21×101 | 251 | 376 | 565 | 152 | 228 | 6.25 | 9.39 | 5.91 | 41.8 | 2400 | 115 | 173 |
| W18×106 | 229 | 343 | 515 | 137 | 206 | 5.02 | 7.55 | 5.44 | 46.5 | 1900 | 119 | 179 |
| **W24×84** | **222** | **332** | **500** | **131** | **196** | **8.56** | **12.9** | **3.99** | **27.6** | **2340** | **122** | **183** |
| W21×93 | 219 | 328 | 493 | 128 | 192 | 7.55 | 11.4 | 3.77 | 30.2 | 2050 | 135 | 203 |
| W18×97 | 210 | 314 | 473 | 126 | 189 | 4.91 | 7.38 | 5.42 | 43.8 | 1740 | 107 | 161 |
| W14×120 | 210 | 314 | 473 | 127 | 190 | 2.63 | 3.96 | 7.66 | 79.0 | 1360 | 92.2 | 139 |
| **W24×76** | **198** | **296** | **446** | **117** | **175** | **8.04** | **12.1** | **3.93** | **26.3** | **2070** | **113** | **170** |
| W16×100 | 197 | 295 | 443 | 117 | 176 | 4.06 | 6.10 | 5.13 | 48.9 | 1480 | 107 | 161 |
| W21×83 | 194 | 290 | 437 | 114 | 171 | 7.24 | 10.9 | 3.73 | 28.1 | 1810 | 119 | 179 |
| W14×109 | 190 | 284 | 428 | 115 | 173 | 2.61 | 3.92 | 7.64 | 72.5 | 1230 | 80.9 | 122 |
| W18×86 | 185 | 277 | 416 | 111 | 167 | 4.73 | 7.11 | 5.38 | 40.4 | 1520 | 95.2 | 143 |
| **W24×68** | **174** | **260** | **392** | **102** | **154** | **7.44** | **11.2** | **3.83** | **25.1** | **1800** | **106** | **159** |
| W16×89 | 174 | 260 | 392 | 104 | 156 | 3.99 | 5.99 | 5.09 | 44.4 | 1290 | 95.1 | 143 |
| W14×99 | 171 | 256 | 385 | 104 | 157 | 2.55 | 3.84 | 7.60 | 67.0 | 1100 | 74.2 | 112 |
| W21×73 | 170 | 254 | 383 | 100 | 151 | 6.78 | 10.2 | 3.71 | 26.4 | 1580 | 104 | 156 |
| W18×76 | 162 | 243 | 365 | 97.7 | 147 | 4.47 | 6.72 | 5.34 | 37.7 | 1320 | 83.4 | 125 |
| W12×106 | 162 | 243 | 365 | 96.3 | 145 | 2.04 | 3.06 | 6.37 | 78.2 | 925 | 84.8 | 127 |
| **W21×68** | **158** | **237** | **356** | **93.0** | **140** | **6.56** | **9.86** | **3.69** | **25.6** | **1460** | **97.8** | **147** |
| W14×90 [f1] | 155 | 229 | 345 | 95.0 | 143 | 2.52 | 3.78 | 8.59 | 62.0 | 987 | 66.4 | 99.8 |
| **W24x62** | **151** | **226** | **340** | **86.2** | **130** | **8.49** | **12.8** | **2.81** | **19.3** | **1520** | **110** | **165** |
| W16×77 | 149 | 223 | 335 | 89.6 | 135 | 3.82 | 5.75 | 5.05 | 39.9 | 1100 | 80.9 | 122 |
| W12×96 | 146 | 219 | 329 | 87.6 | 132 | 2.03 | 3.05 | 6.33 | 70.9 | 824 | 75.3 | 113 |
| W18×71 | 144 | 216 | 324 | 84.9 | 128 | 5.36 | 8.05 | 3.48 | 27.9 | 1160 | 98.7 | 148 |
| **W21×62** | **142** | **213** | **320** | **84.2** | **127** | **6.17** | **9.28** | **3.63** | **24.4** | **1310** | **90.5** | **136** |
| W14×82 | 137 | 205 | 308 | 82.2 | 124 | 2.80 | 4.21 | 5.09 | 49.0 | 870 | 78.6 | 118 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

## Table 2-1 (continued)
# W-Shapes (Welded)
### Selection by $Z_x$

$Z_x$

| Shape | $Z_x$ | $M_{px}/\Omega_b$ | $\varphi_b M_{px}$ | $M_{rx}/\Omega_b$ | $\varphi_b M_{rx}$ | $BF/\Omega_b$ | $\varphi_b BF$ | $L_p$ | $L_r$ | $I_x$ | $V_{nx}/\Omega_v$ | $\varphi_v V_{nx}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | kip-ft | kip-ft | kip-ft | kip-ft | kips | kips | | | | kips | kips |
| | in.$^3$ | ASD | LRFD | ASD | LRFD | ASD | LRFD | ft | ft | in.$^4$ | ASD | LRFD |
| **W24×55** | **132** | **198** | **297** | **75.4** | **113** | **7.83** | **11.8** | **2.75** | **18.4** | **1320** | **100** | **151** |
| W18×65 | 132 | 198 | 297 | 78.1 | 117 | 5.20 | 7.82 | 3.46 | 26.4 | 1060 | 89.2 | 134 |
| W12×87 | 130 | 195 | 293 | 78.8 | 118 | 1.98 | 2.98 | 6.29 | 64.7 | 731 | 69.4 | 104 |
| W16×67 | 129 | 193 | 290 | 78.1 | 117 | 3.64 | 5.47 | 5.03 | 36.6 | 947 | 69.4 | 104 |
| W21×57 | 126 | 189 | 284 | 73.4 | 110 | 6.93 | 10.4 | 2.77 | 19.4 | 1150 | 92.1 | 138 |
| W14×74 | 124 | 186 | 279 | 74.8 | 112 | 2.75 | 4.13 | 5.07 | 45.4 | 784 | 68.9 | 104 |
| W18×60 | 122 | 183 | 275 | 72.1 | 108 | 5.06 | 7.60 | 3.44 | 25.3 | 974 | 81.4 | 122 |
| W12×79 | 117 | 175 | 263 | 71.4 | 107 | 1.96 | 2.94 | 6.25 | 59.3 | 654 | 62.8 | 94.4 |
| W14×68 | 113 | 169 | 254 | 68.0 | 102 | 2.69 | 4.04 | 5.05 | 42.6 | 711 | 62.6 | 94.1 |
| W10×88 | 112 | 168 | 252 | 65.8 | 98.9 | 1.37 | 2.06 | 5.38 | 79.5 | 530 | 70.4 | 106 |
| **W18×55** | **111** | **166** | **250** | **65.5** | **98.4** | **4.87** | **7.31** | **3.40** | **24.1** | **881** | **76.1** | **114** |
| **W21×50** | **108** | **162** | **243** | **62.4** | **93.8** | **6.43** | **9.66** | **2.67** | **18.1** | **964** | **85.2** | **128** |
| W12×72 | 106 | 159 | 239 | 64.7 | 97.2 | 1.93 | 2.90 | 6.23 | 55.0 | 588 | 57.0 | 85.7 |
| W16×57 | 104 | 156 | 234 | 61.5 | 92.4 | 4.15 | 6.24 | 3.28 | 26.0 | 750 | 76.0 | 114 |
| W14×61 | 100 | 150 | 225 | 61.0 | 91.6 | 2.59 | 3.89 | 5.03 | 39.3 | 628 | 56.2 | 84.4 |
| **W18×50** | **99.6** | **149** | **224** | **59.1** | **88.9** | **4.58** | **6.88** | **3.38** | **23.0** | **790** | **68.9** | **104** |
| W10×77 | 96.7 | 145 | 218 | 57.4 | 86.3 | 1.35 | 2.03 | 5.34 | 69.9 | 451 | 60.6 | 91.0 |
| W12×65 | 95.2 | 143 | 214 | 58.3 | 87.6 | 1.89 | 2.84 | 6.21 | 50.8 | 524 | 50.9 | 76.4 |
| **W21×44** | **93.3** | **140** | **210** | **53.6** | **80.6** | **5.87** | **8.82** | **2.59** | **17.2** | **822** | **78.1** | **117** |
| W16×50 | 91.0 | 136 | 205 | 54.0 | 81.1 | 3.96 | 5.95 | 3.26 | 24.0 | 651 | 66.8 | 100 |
| W18×46 | 89.5 | 134 | 201 | 52.4 | 78.8 | 5.10 | 7.66 | 2.65 | 18.7 | 702 | 70.2 | 106 |
| W14×53 | 85.2 | 128 | 192 | 51.3 | 77.1 | 2.75 | 4.13 | 3.95 | 31.7 | 530 | 55.4 | 83.3 |
| W12×58 | 84.7 | 127 | 191 | 51.6 | 77.6 | 1.96 | 2.95 | 5.15 | 43.5 | 467 | 47.3 | 71.2 |
| W10×68 | 84.3 | 126 | 190 | 50.5 | 75.8 | 1.34 | 2.01 | 5.30 | 62.0 | 390 | 52.7 | 79.2 |
| W16×45 | 81.3 | 122 | 183 | 48.4 | 72.7 | 3.77 | 5.67 | 3.22 | 22.7 | 579 | 59.9 | 90.0 |
| **W18×40** | **77.2** | **116** | **174** | **45.3** | **68.1** | **4.68** | **7.04** | **2.61** | **17.6** | **602** | **60.8** | **91.3** |
| W14×48 | 76.5 | 115 | 172 | 46.2 | 69.5 | 2.66 | 3.99 | 3.93 | 29.7 | 473 | 50.6 | 76.0 |
| W12×53 | 76.3 | 114 | 172 | 46.5 | 70.0 | 1.92 | 2.88 | 5.09 | 40.4 | 417 | 45.0 | 67.6 |
| W10×60 | 73.6 | 110 | 166 | 44.4 | 66.7 | 1.32 | 1.98 | 5.25 | 55.3 | 337 | 46.2 | 69.4 |
| **W16×40** | **71.9** | **108** | **162** | **43.0** | **64.6** | **3.53** | **5.30** | **3.20** | **21.5** | **511** | **52.6** | **79.1** |
| W12×50 | 70.7 | 106 | 159 | 42.6 | 64.0 | 2.06 | 3.10 | 4.03 | 34.7 | 385 | 48.7 | 73.1 |
| W8×67 | 69.7 | 104 | 157 | 40.4 | 60.8 | 0.910 | 1.37 | 4.34 | 74.6 | 270 | 55.3 | 83.1 |
| W14×43 | 67.7 | 101 | 152 | 41.1 | 61.8 | 2.53 | 3.80 | 3.89 | 27.7 | 416 | 45.0 | 67.7 |
| W10×54 | 65.7 | 98.4 | 148 | 39.9 | 59.9 | 1.30 | 1.95 | 5.23 | 50.3 | 299 | 40.3 | 60.5 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$Z_x$

## Table 2-1 (continued)
# W-Shapes (Welded)
### Selection by $Z_x$

$F_y$ = 30 ksi

| Shape | $Z_x$ | $M_{px}/\Omega_b$ | $\varphi_b M_{px}$ | $M_{rx}/\Omega_b$ | $\varphi_b M_{rx}$ | $BF/\Omega_b$ | $\varphi_b BF$ | $L_p$ | $L_r$ | $I_x$ | $V_{nx}/\Omega_v$ | $\varphi_v V_{nx}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | kip-ft | kip-ft | kip-ft | kip-ft | kips | kips | | | | kips | kips |
| | in.$^3$ | ASD | LRFD | ASD | LRFD | ASD | LRFD | ft | ft | in.$^4$ | ASD | LRFD |
| **W18×35** | **65.3** | **97.8** | **147** | **38.1** | **57.2** | **4.28** | **6.43** | **2.51** | **16.5** | **500** | **57.2** | **86.0** |
| W12×45 | 63.1 | 94.5 | 142 | 38.1 | 57.3 | 2.00 | 3.01 | 4.01 | 32.2 | 342 | 43.7 | 65.7 |
| W16×36 | 62.9 | 94.2 | 142 | 37.5 | 56.3 | 3.28 | 4.93 | 3.12 | 20.4 | 441 | 50.6 | 76.0 |
| W14×38 | 60.6 | 90.7 | 136 | 36.2 | 54.5 | 2.83 | 4.25 | 3.18 | 22.4 | 380 | 47.1 | 70.8 |
| W10×49 | 59.4 | 88.9 | 134 | 36.2 | 54.5 | 1.27 | 1.92 | 5.21 | 46.5 | 268 | 36.6 | 55.0 |
| W8×58 | 59.3 | 88.8 | 133 | 34.8 | 52.3 | 0.893 | 1.34 | 4.28 | 64.7 | 226 | 48.1 | 72.3 |
| W12×40 | 56.1 | 84.0 | 126 | 34.2 | 51.3 | 1.92 | 2.88 | 4.01 | 30.0 | 303 | 37.8 | 56.9 |
| W10×45 | 54.0 | 80.8 | 122 | 32.5 | 48.9 | 1.34 | 2.02 | 4.11 | 40.0 | 244 | 38.1 | 57.3 |
| **W14×34** | **53.7** | **80.4** | **121** | **32.2** | **48.4** | **2.66** | **4.00** | **3.14** | **21.2** | **334** | **43.0** | **64.6** |
| **W16×31** | **53.0** | **79.3** | **119** | **31.1** | **46.8** | **3.56** | **5.35** | **2.38** | **15.9** | **367** | **47.1** | **70.8** |
| W12×35 | 50.7 | 75.9 | 114 | 30.4 | 45.8 | 2.23 | 3.35 | 3.14 | 23.5 | 283 | 40.4 | 60.8 |
| W8×48 | 48.5 | 72.6 | 109 | 28.9 | 43.4 | 0.874 | 1.31 | 4.26 | 54.3 | 182 | 36.6 | 55.1 |
| **W14×30** | **46.4** | **69.5** | **104** | **27.8** | **41.7** | **2.47** | **3.71** | **3.06** | **19.9** | **285** | **40.2** | **60.4** |
| W10×39 | 45.9 | 68.7 | 103 | 27.8 | 41.8 | 1.31 | 1.97 | 4.07 | 35.3 | 205 | 33.7 | 50.6 |
| **W16×26** | **43.2** | **64.7** | **97.2** | **25.2** | **37.9** | **3.15** | **4.73** | **2.30** | **14.8** | **294** | **42.3** | **63.6** |
| W12×30 | 42.7 | 63.9 | 96.1 | 25.7 | 38.7 | 2.08 | 3.12 | 3.12 | 21.5 | 236 | 34.5 | 51.8 |
| **W14×26** | **39.4** | **59.0** | **88.7** | **23.2** | **34.8** | **2.81** | **4.22** | **2.22** | **15.0** | **240** | **38.2** | **57.4** |
| W8×40 | 39.3 | 58.8 | 88.4 | 23.6 | 35.5 | 0.858 | 1.29 | 4.20 | 45.2 | 145 | 32.0 | 48.1 |
| W10×33 | 37.9 | 56.7 | 85.3 | 23.0 | 34.6 | 1.25 | 1.88 | 3.99 | 30.9 | 166 | 30.4 | 45.7 |
| **W12×26** | **36.8** | **55.1** | **82.8** | **22.2** | **33.4** | **1.92** | **2.89** | **3.08** | **20.2** | **202** | **30.2** | **45.5** |
| W10×30 | 36.2 | 54.2 | 81.5 | 21.6 | 32.5 | 1.58 | 2.38 | 2.81 | 23.4 | 168 | 34.0 | 51.0 |
| W8×35 | 34.2 | 51.2 | 77.0 | 20.7 | 31.2 | 0.841 | 1.26 | 4.18 | 40.4 | 125 | 27.1 | 40.8 |
| **W14×22** | **32.3** | **48.4** | **72.7** | **18.9** | **28.5** | **2.50** | **3.76** | **2.14** | **13.9** | **193** | **34.0** | **51.0** |
| W10×26 | 30.9 | 46.3 | 69.5 | 18.6 | 27.9 | 1.51 | 2.27 | 2.79 | 21.1 | 143 | 28.9 | 43.4 |
| W8×31 | 29.9 | 44.8 | 67.3 | 18.3 | 27.4 | 0.823 | 1.24 | 4.13 | 36.3 | 108 | 24.6 | 36.9 |
| **W12×22** | **28.9** | **43.3** | **65.0** | **16.8** | **25.3** | **2.44** | **3.67** | **1.74** | **12.6** | **154** | **34.5** | **51.8** |
| W8×28 | 26.7 | 40.0 | 60.1 | 16.1 | 24.2 | 0.863 | 1.30 | 3.32 | 31.0 | 96.4 | 24.8 | 37.2 |
| **W10×22** | **25.7** | **38.5** | **57.8** | **15.4** | **23.2** | **1.41** | **2.12** | **2.71** | **19.0** | **117** | **26.4** | **39.7** |
| **W12×19** | **24.3** | **36.4** | **54.7** | **14.1** | **21.2** | **2.24** | **3.37** | **1.68** | **11.6** | **127** | **30.9** | **46.4** |
| W8×24 | 22.7 | 34.0 | 51.1 | 13.8 | 20.8 | 0.837 | 1.26 | 3.30 | 27.4 | 81.1 | 20.9 | 31.5 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

## Table 2-1 (continued)
# W-Shapes (Welded)
### Selection by $Z_x$

$Z_x$

| Shape | $Z_x$ | $M_{px}/\Omega_b$ | $\varphi_b M_{px}$ | $M_{rx}/\Omega_b$ | $\varphi_b M_{rx}$ | $BF/\Omega_b$ | $\varphi_b BF$ | $L_p$ | $L_r$ | $I_x$ | $V_{nx}/\Omega_v$ | $\varphi_v V_{nx}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | kip-ft | kip-ft | kip-ft | kip-ft | kips | kips | | | | kips | kips |
| | in.$^3$ | ASD | LRFD | ASD | LRFD | ASD | LRFD | ft | ft | in.$^4$ | ASD | LRFD |
| **W10×19** | **21.2** | **31.7** | **47.7** | **12.5** | **18.7** | **1.64** | **2.47** | **1.79** | **13.5** | **94.6** | **27.5** | **41.3** |
| W8×21 | 20.1 | 30.1 | 45.2 | 12.1 | 18.1 | 0.962 | 1.45 | 2.59 | 21.3 | 74.2 | 22.3 | 33.5 |
| **W12×16** | **19.6** | **29.3** | **44.1** | **11.3** | **16.9** | **1.99** | **2.99** | **1.59** | **10.7** | **100** | **28.5** | **42.8** |
| W6×25 | 18.8 | 28.1 | 42.3 | 11.2 | 16.8 | 0.510 | 0.767 | 3.12 | 36.4 | 53.0 | 22.0 | 33.1 |
| W10×17 | 18.3 | 27.4 | 41.2 | 10.7 | 16.1 | 1.55 | 2.33 | 1.73 | 12.5 | 80.2 | 26.1 | 39.3 |
| **W12×14** | **17.0** | **25.4** | **38.3** | **9.77** | **14.7** | **1.81** | **2.72** | **1.55** | **10.2** | **86.1** | **25.7** | **38.6** |
| W8×18 | 16.7 | 25.0 | 37.6 | 10.1 | 15.2 | 0.911 | 1.37 | 2.53 | 18.9 | 60.9 | 20.2 | 30.3 |
| W10×15 | 15.6 | 23.4 | 35.1 | 9.09 | 13.7 | 1.43 | 2.16 | 1.66 | 11.6 | 67.2 | 24.8 | 37.2 |
| W6×20 | 14.8 | 22.2 | 33.3 | 8.89 | 13.4 | 0.498 | 0.748 | 3.08 | 29.7 | 41.0 | 17.4 | 26.1 |
| W8×15 | 13.3 | 19.9 | 29.9 | 7.81 | 11.7 | 0.988 | 1.48 | 1.80 | 14.0 | 47.0 | 21.4 | 32.2 |
| **W10×12** | **12.3** | **18.4** | **27.7** | **7.14** | **10.7** | **1.24** | **1.87** | **1.62** | **10.7** | **52.2** | **20.2** | **30.4** |
| W6×16 | 11.5 | 17.2 | 25.9 | 6.80 | 10.2 | 0.542 | 0.815 | 1.98 | 21.2 | 31.8 | 17.6 | 26.5 |
| W5×19 | 11.5 | 17.2 | 25.9 | 6.80 | 10.2 | 0.320 | 0.481 | 2.63 | 35.2 | 25.9 | 15.0 | 22.5 |
| W8×13 | 11.1 | 16.6 | 25.0 | 6.50 | 9.77 | 0.915 | 1.37 | 1.74 | 12.8 | 38.5 | 19.8 | 29.8 |
| W5×18.9 | 10.9 | 16.3 | 24.5 | 6.42 | 9.65 | 0.297 | 0.446 | 2.57 | 35.9 | 23.8 | 17.0 | 25.6 |
| W6x15 [f1] | 10.6 | 13.9 | 20.9 | 6.46 | 9.71 | 0.457 | 0.687 | 7.26 | 23.6 | 28.7 | 14.8 | 22.3 |
| W5×16 | 9.47 | 14.2 | 21.3 | 5.67 | 8.52 | 0.311 | 0.467 | 2.59 | 30.0 | 21.1 | 13.0 | 19.5 |
| **W8×10** | **8.59** | **12.9** | **19.3** | **5.09** | **7.64** | **0.798** | **1.20** | **1.73** | **11.5** | **29.8** | **14.5** | **21.7** |
| W6×12 | 8.16 | 12.2 | 18.4 | 4.84 | 7.28 | 0.514 | 0.773 | 1.88 | 16.2 | 21.7 | 14.9 | 22.5 |
| W4×13 | 6.19 | 9.27 | 13.9 | 3.62 | 5.45 | 0.207 | 0.311 | 2.06 | 29.3 | 11.2 | 12.6 | 18.9 |
| **W6×9** | **6.09** | **9.12** | **13.7** | **3.66** | **5.50** | **0.470** | **0.706** | **1.86** | **13.5** | **16.0** | **10.8** | **16.2** |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

# $Z_y$

## Table 2-2
## W-Shapes (Welded)
### Selection by $Z_y$

$F_y$ = 30 ksi

| Shape | $Z_y$ | $M_{ny}/\Omega_b$ | $\varphi_b M_{ny}$ | Shape | $Z_y$ | $M_{ny}/\Omega_b$ | $\varphi_b M_{ny}$ | Shape | $Z_y$ | $M_{ny}/\Omega_b$ | $\varphi_b M_{ny}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | kip-ft | kip-ft | | | kip-ft | kip-ft | | | kip-ft | kip-ft | |
| | in.$^3$ | ASD | LRFD | | in.$^3$ | ASD | LRFD | | in.$^3$ | ASD | LRFD |
| **W14×120** | **102** | **153** | **230** | **W10×60** | **34.9** | **52.2** | **78.5** | **W10×39** | **17.1** | **25.6** | **38.5** |
| | | | | W21×93 | 34.6 | 51.8 | 77.9 | W12×40 | 16.9 | 25.3 | 38.0 |
| **W14×109** | **92.6** | **139** | **208** | W14×61 | 32.7 | 49.0 | 73.6 | W18×50 | 16.5 | 24.7 | 37.1 |
| | | | | W24×84 | 32.6 | 48.8 | 73.4 | W16×50 | 16.3 | 24.4 | 36.7 |
| **W14×99** | **83.5** | **125** | **188** | W8×67 | 32.6 | 48.8 | 73.4 | | | | |
| W24×131 | 81.4 | 122 | 183 | | | | | **W8×35** | **16.1** | **24.1** | **36.2** |
| W21×122 | 75.5 | 113 | 170 | **W12×58** | **32.4** | **48.5** | **72.9** | W24x62 | 15.7 | 23.4 | 35.2 |
| | | | | | | | | W21×57 | 14.8 | 22.2 | 33.3 |
| **W14×90** [f1] | **75.5** | **111** | **167** | **W10×54** | **31.2** | **46.7** | **70.2** | W16×45 | 14.4 | 21.6 | 32.4 |
| W12×106 | 74.9 | 112 | 169 | W21×83 | 30.3 | 45.4 | 68.2 | | | | |
| W24×117 | 71.3 | 107 | 160 | | | | | **W10×33** | **14.0** | **21.0** | **31.5** |
| W21×111 | 68.1 | 102 | 153 | **W12×53** | **29.0** | **43.4** | **65.3** | | | | |
| W12×96 | 67.4 | 101 | 152 | W24×76 | 28.6 | 42.8 | 64.4 | **W8×31** | **14.0** | **21.0** | **31.5** |
| W24×104 | 62.4 | 93.4 | 140 | | | | | W24×55 | 13.3 | 19.9 | 29.8 |
| W21×101 | 61.7 | 92.4 | 139 | **W10×49** | **28.3** | **42.4** | **63.7** | W16×40 | 12.7 | 19.0 | 28.6 |
| W18×106 | 60.4 | 90.4 | 136 | W8×58 | 27.8 | 41.6 | 62.6 | W21×50 | 12.1 | 18.1 | 27.2 |
| | | | | W21×73 | 26.5 | 39.7 | 59.6 | W14×38 | 12.1 | 18.1 | 27.2 |
| **W12×87** | **60.3** | **90.3** | **136** | W18×71 | 24.6 | 36.8 | 55.4 | W18×46 | 11.7 | 17.5 | 26.3 |
| W18×97 | 55.2 | 82.6 | 124 | W24×68 | 24.5 | 36.7 | 55.1 | W12×35 | 11.4 | 17.1 | 25.7 |
| W16×100 | 54.8 | 82.0 | 123 | W21×68 | 24.3 | 36.4 | 54.7 | W16×36 | 10.8 | 16.2 | 24.3 |
| | | | | | | | | W14×34 | 10.6 | 15.9 | 23.9 |
| **W12×79** | **54.2** | **81.1** | **122** | **W8×48** | **22.8** | **34.1** | **51.3** | W21×44 | 10.1 | 15.1 | 22.7 |
| W10×88 | 53.0 | 79.3 | 119 | W18×65 | 22.5 | 33.7 | 50.6 | | | | |
| | | | | W14×53 | 21.9 | 32.8 | 49.3 | **W8×28** | **10.1** | **15.1** | **22.7** |
| **W12×72** | **49.1** | **73.5** | **110** | W21×62 | 21.7 | 32.5 | 48.8 | W18×40 | 9.92 | 14.9 | 22.3 |
| W18×86 | 48.3 | 72.3 | 109 | W12×50 | 21.3 | 31.9 | 47.9 | W12×30 | 9.55 | 14.3 | 21.5 |
| W16×89 | 48.0 | 71.9 | 108 | W18×60 | 20.6 | 30.8 | 46.4 | W14×30 | 8.96 | 13.4 | 20.2 |
| W10×77 | 45.8 | 68.6 | 103 | | | | | W10×30 | 8.82 | 13.2 | 19.8 |
| W14×82 | 44.7 | 66.9 | 101 | **W10×45** | **20.2** | **30.2** | **45.5** | | | | |
| | | | | W14×48 | 19.5 | 29.2 | 43.9 | **W6×25** | **8.55** | **12.8** | **19.2** |
| **W12×65** | **44.0** | **65.9** | **99.0** | | | | | | | | |
| W18×76 | 42.2 | 63.2 | 95.0 | **W12×45** | **18.9** | **28.3** | **42.5** | **W8×24** | **8.54** | **12.8** | **19.2** |
| W16×77 | 41.1 | 61.5 | 92.5 | W16×57 | 18.8 | 28.1 | 42.3 | W12×26 | 8.15 | 12.2 | 18.3 |
| W14×74 | 40.4 | 60.5 | 90.9 | W18×55 | 18.5 | 27.7 | 41.6 | W18×35 | 8.03 | 12.0 | 18.1 |
| W10×68 | 40.0 | 59.9 | 90.0 | | | | | W10×26 | 7.48 | 11.2 | 16.8 |
| W24×94 | 37.4 | 56.0 | 84.2 | **W8×40** | **18.5** | **27.7** | **41.6** | W16×31 | 7.00 | 10.5 | 15.8 |
| W14×68 | 36.8 | 55.1 | 82.8 | W14×43 | 17.2 | 25.7 | 38.7 | | | | |
| W16×67 | 35.4 | 53.0 | 79.7 | | | | | **W6×20** | **6.71** | **10.0** | **15.1** |
| | | | | | | | | W10×22 | 6.09 | 9.12 | 13.7 |
| | | | | | | | | W8×21 | 5.67 | 8.49 | 12.8 |
| | | | | | | | | W14×26 | 5.52 | 8.26 | 12.4 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

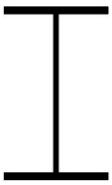
## Table 2-2 (continued)
# W-Shapes (Welded)
### Selection by $Z_y$

$Z_y$

| Shape | $Z_y$ | $M_{ny}/\Omega_b$ | $\varphi_b M_{ny}$ |
|---|---|---|---|
| | *kip-ft* | *kip-ft* | |
| | in.$^3$ | ASD | LRFD |
| **W5×19** | **5.52** | **8.26** | **12.4** |
| W16×26 | 5.45 | 8.16 | 12.3 |
| **W5×18.9** | **5.31** | **7.95** | **11.9** |
| **W6x15** [f1] | **4.74** | **5.81** | **8.73** |
| W8×18 | 4.65 | 6.96 | 10.5 |
| W5×16 | 4.56 | 6.83 | 10.3 |
| W14×22 | 4.36 | 6.53 | 9.81 |
| W12×22 | 3.64 | 5.45 | 8.19 |
| W6×16 | 3.38 | 5.06 | 7.61 |
| W10×19 | 3.34 | 5.00 | 7.52 |
| W12×19 | 2.97 | 4.45 | 6.68 |
| **W4×13** | **2.91** | **4.36** | **6.55** |
| W10×17 | 2.79 | 4.18 | 6.28 |
| W8×15 | 2.65 | 3.97 | 5.96 |
| **W6×12** | **2.31** | **3.46** | **5.20** |
| W10×15 | 2.28 | 3.41 | 5.13 |
| W12×16 | 2.25 | 3.37 | 5.06 |
| W8×13 | 2.14 | 3.20 | 4.82 |
| W12×14 | 1.89 | 2.83 | 4.25 |
| **W10×12** | **1.73** | **2.59** | **3.89** |
| **W6×9** | **1.71** | **2.56** | **3.85** |
| W8×10 | 1.65 | 2.47 | 3.71 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.



W24

# Table 2-3
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W24× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 131 | | 117 | | 104 | | 94 | | 84 | | 76 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | |
| | 10 | | | | | | | | | 244 | 366 | 226 | 340 |
| | 11 | | | | | | | 270 | 406 | 242 | 363 | 216 | 324 |
| | 12 | | | | | | | 250 | 377 | 222 | 333 | 198 | 297 |
| | 13 | 320 | 480 | 288 | 434 | 260 | 390 | 231 | 348 | 205 | 307 | 182 | 274 |
| | 14 | 314 | 472 | 278 | 418 | 246 | 369 | 215 | 323 | 190 | 285 | 169 | 255 |
| | 15 | 293 | 440 | 259 | 390 | 229 | 344 | 200 | 301 | 177 | 266 | 158 | 238 |
| | 16 | 275 | 413 | 243 | 366 | 215 | 323 | 188 | 282 | 166 | 250 | 148 | 223 |
| | 17 | 259 | 389 | 229 | 344 | 202 | 304 | 177 | 266 | 156 | 235 | 139 | 210 |
| | 18 | 244 | 367 | 216 | 325 | 191 | 287 | 167 | 251 | 148 | 222 | 132 | 198 |
| | 19 | 231 | 348 | 205 | 308 | 181 | 272 | 158 | 238 | 140 | 210 | 125 | 188 |
| | 20 | 220 | 330 | 195 | 293 | 172 | 258 | 150 | 226 | 133 | 200 | 119 | 178 |
| | 21 | 209 | 315 | 185 | 279 | 164 | 246 | 143 | 215 | 127 | 190 | 113 | 170 |
| | 22 | 200 | 300 | 177 | 266 | 156 | 235 | 137 | 205 | 121 | 182 | 108 | 162 |
| | 23 | 191 | 287 | 169 | 254 | 149 | 225 | 131 | 196 | 116 | 174 | 103 | 155 |
| | 24 | 183 | 275 | 162 | 244 | 143 | 215 | 125 | 188 | 111 | 167 | 98.8 | 149 |
| | 25 | 176 | 264 | 156 | 234 | 137 | 207 | 120 | 181 | 106 | 160 | 94.9 | 143 |
| | 26 | 169 | 254 | 150 | 225 | 132 | 199 | 116 | 174 | 102 | 154 | 91.2 | 137 |
| | 27 | 163 | 245 | 144 | 217 | 127 | 191 | 111 | 167 | 98.5 | 148 | 87.8 | 132 |
| | 28 | 157 | 236 | 139 | 209 | 123 | 185 | 107 | 161 | 95.0 | 143 | 84.7 | 127 |
| | 29 | 152 | 228 | 134 | 202 | 119 | 178 | 104 | 156 | 91.7 | 138 | 81.8 | 123 |
| | 30 | 147 | 220 | 130 | 195 | 115 | 172 | 100 | 151 | 88.6 | 133 | 79.0 | 119 |
| | 32 | 137 | 206 | 122 | 183 | 107 | 161 | 93.9 | 141 | 83.1 | 125 | 74.1 | 111 |
| | 34 | 129 | 194 | 114 | 172 | 101 | 152 | 88.4 | 133 | 78.2 | 118 | 69.7 | 105 |
| | 36 | 122 | 184 | 108 | 163 | 95.5 | 144 | 83.5 | 126 | 73.9 | 111 | 65.9 | 99.0 |
| | 38 | 116 | 174 | 102 | 154 | 90.5 | 136 | 79.1 | 119 | 70.0 | 105 | 62.4 | 93.8 |
| | 40 | 110 | 165 | 97.3 | 146 | 85.9 | 129 | 75.1 | 113 | 66.5 | 99.9 | 59.3 | 89.1 |
| | 42 | 105 | 157 | 92.7 | 139 | 81.8 | 123 | 71.6 | 108 | 63.3 | 95.1 | 56.5 | 84.9 |
| | 44 | 99.9 | 150 | 88.5 | 133 | 78.1 | 117 | 68.3 | 103 | 60.4 | 90.8 | 53.9 | 81.0 |
| | 46 | 95.5 | 144 | 84.6 | 127 | 74.7 | 112 | 65.3 | 98.2 | 57.8 | 86.9 | 51.5 | 77.5 |
| | 48 | 91.6 | 138 | 81.1 | 122 | 71.6 | 108 | 62.6 | 94.1 | 55.4 | 83.3 | 49.4 | 74.3 |
| | 50 | 87.9 | 132 | 77.8 | 117 | 68.7 | 103 | 60.1 | 90.4 | 53.2 | 79.9 | 47.4 | 71.3 |
| | 52 | 84.5 | 127 | 74.9 | 113 | 66.1 | 99.3 | 57.8 | 86.9 | 51.1 | 76.8 | 45.6 | 68.5 |
| | 54 | 81.4 | 122 | 72.1 | 108 | 63.7 | 95.7 | 55.7 | 83.7 | 49.2 | 74.0 | 43.9 | 66.0 |
| | 56 | 78.5 | 118 | 69.5 | 104 | 61.4 | 92.3 | 53.7 | 80.7 | 47.5 | 71.4 | 42.3 | 63.6 |
| | 58 | 75.8 | 114 | 67.1 | 101 | 59.3 | 89.1 | 51.8 | 77.9 | 45.8 | 68.9 | 40.9 | 61.4 |
| | 60 | 73.3 | 110 | 64.9 | 97.5 | 57.3 | 86.1 | 50.1 | 75.3 | 44.3 | 66.6 | 39.5 | 59.4 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 4400 | 6610 | 3890 | 5850 | 3440 | 5170 | 3010 | 4520 | 2660 | 4000 | 2370 | 3560 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 549 | 826 | 487 | 731 | 430 | 646 | 376 | 565 | 332 | 500 | 296 | 446 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 220 | 330 | 195 | 293 | 172 | 259 | 148 | 223 | 131 | 196 | 117 | 175 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 8.54 | 12.8 | 8.13 | 12.2 | 7.64 | 11.5 | 9.04 | 13.6 | 8.56 | 12.9 | 8.04 | 12.1 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 160 | 240 | 144 | 217 | 130 | 195 | 135 | 203 | 122 | 183 | 113 | 170 |
| $Z_x$, in.$^3$ | | 367 | | 325 | | 287 | | 251 | | 222 | | 198 | |
| $L_p$, ft | | 6.07 | | 6.01 | | 5.95 | | 4.05 | | 3.99 | | 3.93 | |
| $L_r$, ft | | 44.7 | | 41.9 | | 39.6 | | 29.2 | | 27.6 | | 26.3 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

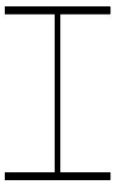
[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)



W24-W21

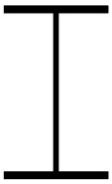
| Shape | | W24× | | | | | | W21× | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 68 | | 62 | | 55 | | 122 | | 111 | | 101 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | 200 | 302 | | | | | | |
| | 8 | | | 220 | 330 | 198 | 297 | | | | | | |
| | 9 | 212 | 318 | 201 | 302 | 176 | 264 | | | | | | |
| | 10 | 208 | 313 | 181 | 272 | 158 | 238 | | | | | | |
| | 11 | 189 | 285 | 164 | 247 | 144 | 216 | | | | | | |
| | 12 | 174 | 261 | 151 | 227 | 132 | 198 | | | | | | |
| | 13 | 160 | 241 | 139 | 209 | 122 | 183 | 280 | 422 | 254 | 384 | 230 | 346 |
| | 14 | 149 | 224 | 129 | 194 | 113 | 170 | 261 | 392 | 236 | 355 | 215 | 323 |
| | 15 | 139 | 209 | 121 | 181 | 105 | 158 | 244 | 366 | 220 | 331 | 200 | 301 |
| | 16 | 130 | 196 | 113 | 170 | 98.8 | 149 | 228 | 343 | 207 | 311 | 188 | 282 |
| | 17 | 123 | 184 | 106 | 160 | 93.0 | 140 | 215 | 323 | 194 | 292 | 177 | 266 |
| | 18 | 116 | 174 | 100 | 151 | 87.8 | 132 | 203 | 305 | 184 | 276 | 167 | 251 |
| | 19 | 110 | 165 | 95.2 | 143 | 83.2 | 125 | 192 | 289 | 174 | 261 | 158 | 238 |
| | 20 | 104 | 157 | 90.4 | 136 | 79.0 | 119 | 183 | 275 | 165 | 248 | 150 | 226 |
| | 21 | 99.2 | 149 | 86.1 | 129 | 75.3 | 113 | 174 | 261 | 157 | 237 | 143 | 215 |
| | 22 | 94.7 | 142 | 82.2 | 124 | 71.9 | 108 | 166 | 250 | 150 | 226 | 137 | 205 |
| | 23 | 90.6 | 136 | 78.6 | 118 | 68.7 | 103 | 159 | 239 | 144 | 216 | 131 | 196 |
| | 24 | 86.8 | 131 | 75.3 | 113 | 65.9 | 99.0 | 152 | 229 | 138 | 207 | 125 | 188 |
| | 25 | 83.4 | 125 | 72.3 | 109 | 63.2 | 95.0 | 146 | 220 | 132 | 199 | 120 | 181 |
| | 26 | 80.1 | 120 | 69.6 | 105 | 60.8 | 91.4 | 140 | 211 | 127 | 191 | 116 | 174 |
| | 27 | 77.2 | 116 | 67.0 | 101 | 58.5 | 88.0 | 135 | 203 | 122 | 184 | 111 | 167 |
| | 28 | 74.4 | 112 | 64.6 | 97.1 | 56.5 | 84.9 | 130 | 196 | 118 | 177 | 107 | 161 |
| | 29 | 71.9 | 108 | 62.4 | 93.7 | 54.5 | 81.9 | 126 | 189 | 114 | 171 | 104 | 156 |
| | 30 | 69.5 | 104 | 60.3 | 90.6 | 52.7 | 79.2 | 122 | 183 | 110 | 166 | 100 | 151 |
| | 32 | 65.1 | 97.9 | 56.5 | 84.9 | 49.4 | 74.3 | 114 | 172 | 103 | 155 | 93.9 | 141 |
| | 34 | 61.3 | 92.1 | 53.2 | 79.9 | 46.5 | 69.9 | 107 | 161 | 97.2 | 146 | 88.4 | 133 |
| | 36 | 57.9 | 87.0 | 50.2 | 75.5 | 43.9 | 66.0 | 101 | 153 | 91.8 | 138 | 83.5 | 126 |
| | 38 | 54.8 | 82.4 | 47.6 | 71.5 | 41.6 | 62.5 | 96.1 | 144 | 87.0 | 131 | 79.1 | 119 |
| | 40 | 52.1 | 78.3 | 45.2 | 68.0 | 39.5 | 59.4 | 91.3 | 137 | 82.6 | 124 | 75.1 | 113 |
| | 42 | 49.6 | 74.6 | 43.1 | 64.7 | 37.6 | 56.6 | 87.0 | 131 | 78.7 | 118 | 71.6 | 108 |
| | 44 | 47.4 | 71.2 | 41.1 | 61.8 | 35.9 | 54.0 | 83.0 | 125 | 75.1 | 113 | 68.3 | 103 |
| | 46 | 45.3 | 68.1 | 39.3 | 59.1 | 34.4 | 51.7 | 79.4 | 119 | 71.9 | 108 | 65.3 | 98.2 |
| | 48 | 43.4 | 65.3 | 37.7 | 56.6 | 32.9 | 49.5 | 76.1 | 114 | 68.9 | 104 | 62.6 | 94.1 |
| | 50 | 41.7 | 62.6 | 36.2 | 54.4 | 31.6 | 47.5 | 73.1 | 110 | 66.1 | 99.4 | 60.1 | 90.4 |
| | 52 | 40.1 | 60.2 | 34.8 | 52.3 | 30.4 | 45.7 | 70.2 | 106 | 63.6 | 95.5 | 57.8 | 86.9 |
| | 54 | 38.6 | 58.0 | 33.5 | 50.3 | 29.3 | 44.0 | 67.6 | 102 | 61.2 | 92.0 | 55.7 | 83.7 |
| | 56 | 37.2 | 55.9 | 32.3 | 48.5 | 28.2 | 42.4 | 65.2 | 98.0 | 59.0 | 88.7 | 53.7 | 80.7 |
| | 58 | 35.9 | 54.0 | 31.2 | 46.9 | 27.3 | 41.0 | 63.0 | 94.7 | 57.0 | 85.7 | 51.8 | 77.9 |
| | 60 | 34.7 | 52.2 | 30.1 | 45.3 | 26.3 | 39.6 | 60.9 | 91.5 | 55.1 | 82.8 | 50.1 | 75.3 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 2080 | 3130 | 1810 | 2720 | 1580 | 2380 | 3650 | 5490 | 3310 | 4970 | 3010 | 4520 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 260 | 392 | 226 | 340 | 198 | 297 | 457 | 686 | 413 | 621 | 376 | 565 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 102 | 154 | 86.2 | 130 | 75.4 | 113 | 183 | 274 | 166 | 250 | 152 | 228 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 7.44 | 11.2 | 8.49 | 12.8 | 7.83 | 11.8 | 6.71 | 10.1 | 6.48 | 9.74 | 6.25 | 9.39 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 106 | 159 | 110 | 165 | 100 | 151 | 140 | 211 | 127 | 192 | 115 | 173 |
| $Z_x$, in.$^3$ | | 174 | | 151 | | 132 | | 305 | | 276 | | 251 | |
| $L_p$, ft | | 3.83 | | 2.81 | | 2.75 | | 5.95 | | 5.93 | | 5.91 | |
| $L_r$, ft | | 25.1 | | 19.3 | | 18.4 | | 46.8 | | 44.0 | | 41.8 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W21

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W21× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 93 | | 83 | | 73 | | 68 | | 62 | | 57 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | 184 | 276 |
| | 9 | 270 | 406 | 238 | 358 | 208 | 312 | 196 | 294 | 181 | 272 | 168 | 252 |
| | 10 | 262 | 394 | 232 | 349 | 204 | 306 | 189 | 284 | 170 | 256 | 151 | 227 |
| | 11 | 238 | 358 | 211 | 317 | 185 | 278 | 172 | 259 | 155 | 232 | 137 | 206 |
| | 12 | 219 | 329 | 194 | 291 | 170 | 255 | 158 | 237 | 142 | 213 | 126 | 189 |
| | 13 | 202 | 303 | 179 | 269 | 157 | 235 | 146 | 219 | 131 | 197 | 116 | 174 |
| | 14 | 187 | 282 | 166 | 249 | 145 | 219 | 135 | 203 | 121 | 183 | 108 | 162 |
| | 15 | 175 | 263 | 155 | 233 | 136 | 204 | 126 | 190 | 113 | 170 | 101 | 151 |
| | 16 | 164 | 246 | 145 | 218 | 127 | 191 | 118 | 178 | 106 | 160 | 94.3 | 142 |
| | 17 | 154 | 232 | 137 | 205 | 120 | 180 | 111 | 167 | 100 | 150 | 88.8 | 133 |
| | 18 | 146 | 219 | 129 | 194 | 113 | 170 | 105 | 158 | 94.5 | 142 | 83.8 | 126 |
| | 19 | 138 | 207 | 122 | 184 | 107 | 161 | 99.6 | 150 | 89.5 | 135 | 79.4 | 119 |
| | 20 | 131 | 197 | 116 | 175 | 102 | 153 | 94.6 | 142 | 85.0 | 128 | 75.4 | 113 |
| | 21 | 125 | 188 | 111 | 166 | 96.9 | 146 | 90.1 | 135 | 81.0 | 122 | 71.9 | 108 |
| | 22 | 119 | 179 | 106 | 159 | 92.5 | 139 | 86.0 | 129 | 77.3 | 116 | 68.6 | 103 |
| | 23 | 114 | 171 | 101 | 152 | 88.5 | 133 | 82.3 | 124 | 73.9 | 111 | 65.6 | 98.6 |
| | 24 | 109 | 164 | 96.8 | 146 | 84.8 | 128 | 78.8 | 119 | 70.9 | 107 | 62.9 | 94.5 |
| | 25 | 105 | 158 | 92.9 | 140 | 81.4 | 122 | 75.7 | 114 | 68.0 | 102 | 60.4 | 90.7 |
| | 26 | 101 | 152 | 89.4 | 134 | 78.3 | 118 | 72.8 | 109 | 65.4 | 98.3 | 58.0 | 87.2 |
| | 27 | 97.1 | 146 | 86.1 | 129 | 75.4 | 113 | 70.1 | 105 | 63.0 | 94.7 | 55.9 | 84.0 |
| | 28 | 93.7 | 141 | 83.0 | 125 | 72.7 | 109 | 67.6 | 102 | 60.7 | 91.3 | 53.9 | 81.0 |
| | 29 | 90.4 | 136 | 80.1 | 120 | 70.2 | 106 | 65.2 | 98.1 | 58.6 | 88.1 | 52.0 | 78.2 |
| | 30 | 87.4 | 131 | 77.4 | 116 | 67.9 | 102 | 63.1 | 94.8 | 56.7 | 85.2 | 50.3 | 75.6 |
| | 32 | 82.0 | 123 | 72.6 | 109 | 63.6 | 95.6 | 59.1 | 88.9 | 53.1 | 79.9 | 47.2 | 70.9 |
| | 34 | 77.1 | 116 | 68.3 | 103 | 59.9 | 90.0 | 55.7 | 83.6 | 50.0 | 75.2 | 44.4 | 66.7 |
| | 36 | 72.9 | 110 | 64.5 | 97.0 | 56.6 | 85.0 | 52.6 | 79.0 | 47.2 | 71.0 | 41.9 | 63.0 |
| | 38 | 69.0 | 104 | 61.1 | 91.9 | 53.6 | 80.5 | 49.8 | 74.8 | 44.8 | 67.3 | 39.7 | 59.7 |
| | 40 | 65.6 | 98.6 | 58.1 | 87.3 | 50.9 | 76.5 | 47.3 | 71.1 | 42.5 | 63.9 | 37.7 | 56.7 |
| | 42 | 62.4 | 93.9 | 55.3 | 83.1 | 48.5 | 72.9 | 45.1 | 67.7 | 40.5 | 60.9 | 35.9 | 54.0 |
| | 44 | 59.6 | 89.6 | 52.8 | 79.4 | 46.3 | 69.5 | 43.0 | 64.6 | 38.6 | 58.1 | 34.3 | 51.5 |
| | 46 | 57.0 | 85.7 | 50.5 | 75.9 | 44.3 | 66.5 | 41.1 | 61.8 | 37.0 | 55.6 | 32.8 | 49.3 |
| | 48 | 54.6 | 82.1 | 48.4 | 72.8 | 42.4 | 63.8 | 39.4 | 59.3 | 35.4 | 53.3 | 31.4 | 47.3 |
| | 50 | 52.5 | 78.8 | 46.5 | 69.8 | 40.7 | 61.2 | 37.8 | 56.9 | 34.0 | 51.1 | 30.2 | 45.4 |
| | 52 | 50.4 | 75.8 | 44.7 | 67.2 | 39.2 | 58.8 | 36.4 | 54.7 | 32.7 | 49.2 | 29.0 | 43.6 |
| | 54 | 48.6 | 73.0 | 43.0 | 64.7 | 37.7 | 56.7 | 35.0 | 52.7 | 31.5 | 47.3 | 27.9 | 42.0 |
| | 56 | 46.8 | 70.4 | 41.5 | 62.4 | 36.4 | 54.6 | 33.8 | 50.8 | 30.4 | 45.6 | 26.9 | 40.5 |
| | 58 | 45.2 | 68.0 | 40.1 | 60.2 | 35.1 | 52.8 | 32.6 | 49.0 | 29.3 | 44.1 | 26.0 | 39.1 |
| | 60 | 43.7 | 65.7 | 38.7 | 58.2 | 33.9 | 51.0 | 31.5 | 47.4 | 28.3 | 42.6 | 25.1 | 37.8 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 2620 | 3940 | 2320 | 3490 | 2040 | 3060 | 1890 | 2840 | 1700 | 2560 | 1510 | 2270 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 328 | 493 | 290 | 437 | 254 | 383 | 237 | 356 | 213 | 320 | 189 | 284 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 128 | 192 | 114 | 171 | 100 | 151 | 93.0 | 140 | 84.2 | 127 | 73.4 | 110 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 7.55 | 11.4 | 7.24 | 10.9 | 6.78 | 10.2 | 6.56 | 9.86 | 6.17 | 9.28 | 6.93 | 10.4 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 135 | 203 | 119 | 179 | 104 | 156 | 97.8 | 147 | 90.5 | 136 | 92.1 | 138 |
| $Z_x$, in.$^3$ | | 219 | | 194 | | 170 | | 158 | | 142 | | 126 | |
| $L_p$, ft | | 3.77 | | 3.73 | | 3.71 | | 3.69 | | 3.63 | | 2.77 | |
| $L_r$, ft | | 30.2 | | 28.1 | | 26.4 | | 25.6 | | 24.4 | | 19.4 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

W21-W18

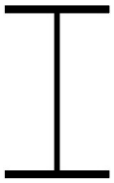
| Shape | | W21× | | | | W18× | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 50 | | 44 | | 106 | | 97 | | 86 | | 76 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | 170 | 256 | 156 | 234 | | | | | | | | |
| | 8 | 162 | 243 | 140 | 210 | | | | | | | | |
| | 9 | 144 | 216 | 124 | 187 | | | | | | | | |
| | 10 | 129 | 194 | 112 | 168 | | | | | | | | |
| | 11 | 118 | 177 | 102 | 153 | 238 | 358 | 214 | 322 | 190 | 286 | 167 | 250 |
| | 12 | 108 | 162 | 93.1 | 140 | 229 | 344 | 210 | 315 | 185 | 278 | 162 | 243 |
| | 13 | 99.5 | 150 | 86.0 | 129 | 211 | 317 | 193 | 291 | 170 | 256 | 149 | 224 |
| | 14 | 92.4 | 139 | 79.8 | 120 | 196 | 294 | 180 | 270 | 158 | 238 | 139 | 208 |
| | 15 | 86.2 | 130 | 74.5 | 112 | 183 | 275 | 168 | 252 | 148 | 222 | 129 | 194 |
| | 16 | 80.8 | 122 | 69.8 | 105 | 171 | 258 | 157 | 236 | 138 | 208 | 121 | 182 |
| | 17 | 76.1 | 114 | 65.7 | 98.8 | 161 | 242 | 148 | 222 | 130 | 196 | 114 | 172 |
| | 18 | 71.9 | 108 | 62.1 | 93.3 | 152 | 229 | 140 | 210 | 123 | 185 | 108 | 162 |
| | 19 | 68.1 | 102 | 58.8 | 88.4 | 144 | 217 | 132 | 199 | 117 | 175 | 102 | 153 |
| | 20 | 64.7 | 97.2 | 55.9 | 84.0 | 137 | 206 | 126 | 189 | 111 | 167 | 97.0 | 146 |
| | 21 | 61.6 | 92.6 | 53.2 | 80.0 | 131 | 196 | 120 | 180 | 106 | 159 | 92.4 | 139 |
| | 22 | 58.8 | 88.4 | 50.8 | 76.3 | 125 | 187 | 114 | 172 | 101 | 151 | 88.2 | 133 |
| | 23 | 56.2 | 84.5 | 48.6 | 73.0 | 119 | 179 | 109 | 164 | 96.3 | 145 | 84.4 | 127 |
| | 24 | 53.9 | 81.0 | 46.6 | 70.0 | 114 | 172 | 105 | 158 | 92.3 | 139 | 80.8 | 122 |
| | 25 | 51.7 | 77.8 | 44.7 | 67.2 | 110 | 165 | 101 | 151 | 88.6 | 133 | 77.6 | 117 |
| | 26 | 49.7 | 74.8 | 43.0 | 64.6 | 105 | 159 | 96.7 | 145 | 85.2 | 128 | 74.6 | 112 |
| | 27 | 47.9 | 72.0 | 41.4 | 62.2 | 102 | 153 | 93.1 | 140 | 82.1 | 123 | 71.9 | 108 |
| | 28 | 46.2 | 69.4 | 39.9 | 60.0 | 97.9 | 147 | 89.8 | 135 | 79.1 | 119 | 69.3 | 104 |
| | 29 | 44.6 | 67.0 | 38.5 | 57.9 | 94.6 | 142 | 86.7 | 130 | 76.4 | 115 | 66.9 | 101 |
| | 30 | 43.1 | 64.8 | 37.2 | 56.0 | 91.4 | 137 | 83.8 | 126 | 73.9 | 111 | 64.7 | 97.2 |
| | 32 | 40.4 | 60.8 | 34.9 | 52.5 | 85.7 | 129 | 78.6 | 118 | 69.2 | 104 | 60.6 | 91.1 |
| | 34 | 38.0 | 57.2 | 32.9 | 49.4 | 80.7 | 121 | 74.0 | 111 | 65.2 | 97.9 | 57.1 | 85.8 |
| | 36 | 35.9 | 54.0 | 31.0 | 46.7 | 76.2 | 115 | 69.9 | 105 | 61.5 | 92.5 | 53.9 | 81.0 |
| | 38 | 34.0 | 51.2 | 29.4 | 44.2 | 72.2 | 108 | 66.2 | 99.5 | 58.3 | 87.6 | 51.1 | 76.7 |
| | 40 | 32.3 | 48.6 | 27.9 | 42.0 | 68.6 | 103 | 62.9 | 94.5 | 55.4 | 83.3 | 48.5 | 72.9 |
| | 42 | 30.8 | 46.3 | 26.6 | 40.0 | 65.3 | 98.1 | 59.9 | 90.0 | 52.8 | 79.3 | 46.2 | 69.4 |
| | 44 | 29.4 | 44.2 | 25.4 | 38.2 | 62.3 | 93.7 | 57.2 | 85.9 | 50.4 | 75.7 | 44.1 | 66.3 |
| | 46 | 28.1 | 42.3 | 24.3 | 36.5 | 59.6 | 89.6 | 54.7 | 82.2 | 48.2 | 72.4 | 42.2 | 63.4 |
| | 48 | 26.9 | 40.5 | 23.3 | 35.0 | 57.1 | 85.9 | 52.4 | 78.8 | 46.2 | 69.4 | 40.4 | 60.8 |
| | 50 | 25.9 | 38.9 | 22.3 | 33.6 | 54.9 | 82.4 | 50.3 | 75.6 | 44.3 | 66.6 | 38.8 | 58.3 |
| | 52 | 24.9 | 37.4 | 21.5 | 32.3 | 52.7 | 79.3 | 48.4 | 72.7 | 42.6 | 64.0 | 37.3 | 56.1 |
| | 54 | 24.0 | 36.0 | 20.7 | 31.1 | 50.8 | 76.3 | 46.6 | 70.0 | 41.0 | 61.7 | 35.9 | 54.0 |
| | 56 | 23.1 | 34.7 | 20.0 | 30.0 | 49.0 | 73.6 | 44.9 | 67.5 | 39.6 | 59.5 | 34.6 | 52.1 |
| | 58 | 22.3 | 33.5 | 19.3 | 29.0 | 47.3 | 71.1 | 43.4 | 65.2 | 38.2 | 57.4 | 33.5 | 50.3 |
| | 60 | 21.6 | 32.4 | 18.6 | 28.0 | 45.7 | 68.7 | 41.9 | 63.0 | 36.9 | 55.5 | 32.3 | 48.6 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1290 | 1940 | 1120 | 1680 | 2740 | 4120 | 2510 | 3780 | 2220 | 3330 | 1940 | 2920 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 162 | 243 | 140 | 210 | 343 | 515 | 314 | 473 | 277 | 416 | 243 | 365 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 62.4 | 93.8 | 53.6 | 80.6 | 137 | 206 | 126 | 189 | 111 | 167 | 97.7 | 147 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 6.43 | 9.66 | 5.87 | 8.82 | 5.02 | 7.55 | 4.91 | 7.38 | 4.73 | 7.11 | 4.47 | 6.72 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 85.2 | 128 | 78.1 | 117 | 119 | 179 | 107 | 161 | 95.2 | 143 | 83.4 | 125 |
| $Z_x$, in.$^3$ | | 108 | | 93.3 | | 229 | | 210 | | 185 | | 162 | |
| $L_p$, ft | | 2.67 | | 2.59 | | 5.44 | | 5.42 | | 5.38 | | 5.34 | |
| $L_r$, ft | | 18.1 | | 17.2 | | 46.5 | | 43.8 | | 40.4 | | 37.7 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W18

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W18× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 71 | | 65 | | 60 | | 55 | | 50 | | 46 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | 140 | 212 |
| | 8 | 197 | 296 | 178 | 268 | 163 | 244 | 152 | 228 | 138 | 208 | 134 | 201 |
| | 9 | 192 | 288 | 176 | 264 | 162 | 244 | 148 | 222 | 133 | 199 | 119 | 179 |
| | 10 | 172 | 259 | 158 | 238 | 146 | 220 | 133 | 200 | 119 | 179 | 107 | 161 |
| | 11 | 157 | 236 | 144 | 216 | 133 | 200 | 121 | 182 | 108 | 163 | 97.4 | 146 |
| | 12 | 144 | 216 | 132 | 198 | 122 | 183 | 111 | 167 | 99.4 | 149 | 89.3 | 134 |
| | 13 | 133 | 199 | 122 | 183 | 112 | 169 | 102 | 154 | 91.8 | 138 | 82.5 | 124 |
| | 14 | 123 | 185 | 113 | 170 | 104 | 157 | 95.0 | 143 | 85.2 | 128 | 76.6 | 115 |
| | 15 | 115 | 173 | 105 | 158 | 97.4 | 146 | 88.6 | 133 | 79.5 | 120 | 71.5 | 107 |
| | 16 | 108 | 162 | 98.8 | 149 | 91.3 | 137 | 83.1 | 125 | 74.6 | 112 | 67.0 | 101 |
| | 17 | 101 | 152 | 93.0 | 140 | 85.9 | 129 | 78.2 | 118 | 70.2 | 105 | 63.1 | 94.8 |
| | 18 | 95.8 | 144 | 87.8 | 132 | 81.2 | 122 | 73.9 | 111 | 66.3 | 99.6 | 59.5 | 89.5 |
| | 19 | 90.8 | 136 | 83.2 | 125 | 76.9 | 116 | 70.0 | 105 | 62.8 | 94.4 | 56.4 | 84.8 |
| | 20 | 86.2 | 130 | 79.0 | 119 | 73.1 | 110 | 66.5 | 99.9 | 59.6 | 89.6 | 53.6 | 80.6 |
| | 21 | 82.1 | 123 | 75.3 | 113 | 69.6 | 105 | 63.3 | 95.1 | 56.8 | 85.4 | 51.0 | 76.7 |
| | 22 | 78.4 | 118 | 71.9 | 108 | 66.4 | 99.8 | 60.4 | 90.8 | 54.2 | 81.5 | 48.7 | 73.2 |
| | 23 | 75.0 | 113 | 68.7 | 103 | 63.5 | 95.5 | 57.8 | 86.9 | 51.9 | 77.9 | 46.6 | 70.0 |
| | 24 | 71.9 | 108 | 65.9 | 99.0 | 60.9 | 91.5 | 55.4 | 83.3 | 49.7 | 74.7 | 44.7 | 67.1 |
| | 25 | 69.0 | 104 | 63.2 | 95.0 | 58.4 | 87.8 | 53.2 | 79.9 | 47.7 | 71.7 | 42.9 | 64.4 |
| | 26 | 66.3 | 99.7 | 60.8 | 91.4 | 56.2 | 84.5 | 51.1 | 76.8 | 45.9 | 69.0 | 41.2 | 62.0 |
| | 27 | 63.9 | 96.0 | 58.5 | 88.0 | 54.1 | 81.3 | 49.2 | 74.0 | 44.2 | 66.4 | 39.7 | 59.7 |
| | 28 | 61.6 | 92.6 | 56.5 | 84.9 | 52.2 | 78.4 | 47.5 | 71.4 | 42.6 | 64.0 | 38.3 | 57.5 |
| | 29 | 59.5 | 89.4 | 54.5 | 81.9 | 50.4 | 75.7 | 45.8 | 68.9 | 41.1 | 61.8 | 37.0 | 55.6 |
| | 30 | 57.5 | 86.4 | 52.7 | 79.2 | 48.7 | 73.2 | 44.3 | 66.6 | 39.8 | 59.8 | 35.7 | 53.7 |
| | 32 | 53.9 | 81.0 | 49.4 | 74.3 | 45.7 | 68.6 | 41.5 | 62.4 | 37.3 | 56.0 | 33.5 | 50.3 |
| | 34 | 50.7 | 76.2 | 46.5 | 69.9 | 43.0 | 64.6 | 39.1 | 58.8 | 35.1 | 52.7 | 31.5 | 47.4 |
| | 36 | 47.9 | 72.0 | 43.9 | 66.0 | 40.6 | 61.0 | 36.9 | 55.5 | 33.1 | 49.8 | 29.8 | 44.8 |
| | 38 | 45.4 | 68.2 | 41.6 | 62.5 | 38.4 | 57.8 | 35.0 | 52.6 | 31.4 | 47.2 | 28.2 | 42.4 |
| | 40 | 43.1 | 64.8 | 39.5 | 59.4 | 36.5 | 54.9 | 33.2 | 50.0 | 29.8 | 44.8 | 26.8 | 40.3 |
| | 42 | 41.1 | 61.7 | 37.6 | 56.6 | 34.8 | 52.3 | 31.7 | 47.6 | 28.4 | 42.7 | 25.5 | 38.4 |
| | 44 | 39.2 | 58.9 | 35.9 | 54.0 | 33.2 | 49.9 | 30.2 | 45.4 | 27.1 | 40.7 | 24.4 | 36.6 |
| | 46 | 37.5 | 56.3 | 34.4 | 51.7 | 31.8 | 47.7 | 28.9 | 43.4 | 25.9 | 39.0 | 23.3 | 35.0 |
| | 48 | 35.9 | 54.0 | 32.9 | 49.5 | 30.4 | 45.8 | 27.7 | 41.6 | 24.9 | 37.4 | 22.3 | 33.6 |
| | 50 | 34.5 | 51.8 | 31.6 | 47.5 | 29.2 | 43.9 | 26.6 | 40.0 | 23.9 | 35.9 | 21.4 | 32.2 |
| | 52 | 33.2 | 49.8 | 30.4 | 45.7 | 28.1 | 42.2 | 25.6 | 38.4 | 22.9 | 34.5 | 20.6 | 31.0 |
| | 54 | 31.9 | 48.0 | 29.3 | 44.0 | 27.1 | 40.7 | 24.6 | 37.0 | 22.1 | 33.2 | 19.8 | 29.8 |
| | 56 | 30.8 | 46.3 | 28.2 | 42.4 | 26.1 | 39.2 | 23.7 | 35.7 | 21.3 | 32.0 | 19.1 | 28.8 |
| | 58 | 29.7 | 44.7 | 27.3 | 41.0 | 25.2 | 37.9 | 22.9 | 34.4 | 20.6 | 30.9 | 18.5 | 27.8 |
| | 60 | 28.7 | 43.2 | 26.3 | 39.6 | 24.4 | 36.6 | 22.2 | 33.3 | 19.9 | 29.9 | 17.9 | 26.9 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1720 | 2590 | 1580 | 2380 | 1460 | 2200 | 1330 | 2000 | 1190 | 1790 | 1070 | 1610 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 216 | 324 | 198 | 297 | 183 | 275 | 166 | 250 | 149 | 224 | 134 | 201 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 84.9 | 128 | 78.1 | 117 | 72.1 | 108 | 65.5 | 98.4 | 59.1 | 88.9 | 52.4 | 78.8 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 5.36 | 8.05 | 5.20 | 7.82 | 5.06 | 7.60 | 4.87 | 7.31 | 4.58 | 6.88 | 5.10 | 7.66 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 98.7 | 148 | 89.2 | 134 | 81.4 | 122 | 76.1 | 114 | 68.9 | 104 | 70.2 | 106 |
| $Z_x$, in.$^3$ | | 144 | | 132 | | 122 | | 111 | | 99.6 | | 89.5 | |
| $L_p$, ft | | 3.48 | | 3.46 | | 3.44 | | 3.40 | | 3.38 | | 2.65 | |
| $L_r$, ft | | 27.9 | | 26.4 | | 25.3 | | 24.1 | | 23.0 | | 18.7 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

W18-W16

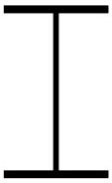
| Shape | | W18× | | | | W16× | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 40 | | 35 | | 100 | | 89 | | 77 | | 67 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | 114 | 172 | | | | | | | | |
| | 7 | 122 | 183 | 112 | 168 | | | | | | | | |
| | 8 | 116 | 174 | 97.8 | 147 | | | | | | | | |
| | 9 | 103 | 154 | 86.9 | 131 | | | | | | | | |
| | 10 | 92.5 | 139 | 78.2 | 118 | | | 190 | 286 | | | | |
| | 11 | 84.1 | 126 | 71.1 | 107 | 214 | 322 | 189 | 285 | 162 | 244 | 139 | 208 |
| | 12 | 77.0 | 116 | 65.2 | 98.0 | 197 | 296 | 174 | 261 | 149 | 224 | 129 | 194 |
| | 13 | 71.1 | 107 | 60.2 | 90.4 | 181 | 273 | 160 | 241 | 137 | 206 | 119 | 179 |
| | 14 | 66.0 | 99.3 | 55.9 | 84.0 | 169 | 253 | 149 | 224 | 127 | 192 | 110 | 166 |
| | 15 | 61.6 | 92.6 | 52.1 | 78.4 | 157 | 236 | 139 | 209 | 119 | 179 | 103 | 155 |
| | 16 | 57.8 | 86.9 | 48.9 | 73.5 | 147 | 222 | 130 | 196 | 112 | 168 | 96.6 | 145 |
| | 17 | 54.4 | 81.7 | 46.0 | 69.1 | 139 | 209 | 123 | 184 | 105 | 158 | 90.9 | 137 |
| | 18 | 51.4 | 77.2 | 43.4 | 65.3 | 131 | 197 | 116 | 174 | 99.1 | 149 | 85.8 | 129 |
| | 19 | 48.7 | 73.1 | 41.2 | 61.9 | 124 | 187 | 110 | 165 | 93.9 | 141 | 81.3 | 122 |
| | 20 | 46.2 | 69.5 | 39.1 | 58.8 | 118 | 177 | 104 | 157 | 89.2 | 134 | 77.2 | 116 |
| | 21 | 44.0 | 66.2 | 37.2 | 56.0 | 112 | 169 | 99.2 | 149 | 85.0 | 128 | 73.6 | 111 |
| | 22 | 42.0 | 63.2 | 35.5 | 53.4 | 107 | 161 | 94.7 | 142 | 81.1 | 122 | 70.2 | 106 |
| | 23 | 40.2 | 60.4 | 34.0 | 51.1 | 103 | 154 | 90.6 | 136 | 77.6 | 117 | 67.2 | 101 |
| | 24 | 38.5 | 57.9 | 32.6 | 49.0 | 98.3 | 148 | 86.8 | 131 | 74.4 | 112 | 64.4 | 96.8 |
| | 25 | 37.0 | 55.6 | 31.3 | 47.0 | 94.4 | 142 | 83.4 | 125 | 71.4 | 107 | 61.8 | 92.9 |
| | 26 | 35.6 | 53.4 | 30.1 | 45.2 | 90.7 | 136 | 80.1 | 120 | 68.6 | 103 | 59.4 | 89.3 |
| | 27 | 34.2 | 51.5 | 29.0 | 43.5 | 87.4 | 131 | 77.2 | 116 | 66.1 | 99.3 | 57.2 | 86.0 |
| | 28 | 33.0 | 49.6 | 27.9 | 42.0 | 84.3 | 127 | 74.4 | 112 | 63.7 | 95.8 | 55.2 | 82.9 |
| | 29 | 31.9 | 47.9 | 27.0 | 40.5 | 81.4 | 122 | 71.9 | 108 | 61.5 | 92.5 | 53.3 | 80.1 |
| | 30 | 30.8 | 46.3 | 26.1 | 39.2 | 78.6 | 118 | 69.5 | 104 | 59.5 | 89.4 | 51.5 | 77.4 |
| | 32 | 28.9 | 43.4 | 24.4 | 36.7 | 73.7 | 111 | 65.1 | 97.9 | 55.8 | 83.8 | 48.3 | 72.6 |
| | 34 | 27.2 | 40.9 | 23.0 | 34.6 | 69.4 | 104 | 61.3 | 92.1 | 52.5 | 78.9 | 45.4 | 68.3 |
| | 36 | 25.7 | 38.6 | 21.7 | 32.7 | 65.5 | 98.5 | 57.9 | 87.0 | 49.6 | 74.5 | 42.9 | 64.5 |
| | 38 | 24.3 | 36.6 | 20.6 | 30.9 | 62.1 | 93.3 | 54.8 | 82.4 | 47.0 | 70.6 | 40.7 | 61.1 |
| | 40 | 23.1 | 34.7 | 19.6 | 29.4 | 59.0 | 88.7 | 52.1 | 78.3 | 44.6 | 67.1 | 38.6 | 58.1 |
| | 42 | 22.0 | 33.1 | 18.6 | 28.0 | 56.2 | 84.4 | 49.6 | 74.6 | 42.5 | 63.9 | 36.8 | 55.3 |
| | 44 | 21.0 | 31.6 | 17.8 | 26.7 | 53.6 | 80.6 | 47.4 | 71.2 | 40.6 | 61.0 | 35.1 | 52.8 |
| | 46 | 20.1 | 30.2 | 17.0 | 25.6 | 51.3 | 77.1 | 45.3 | 68.1 | 38.8 | 58.3 | 33.6 | 50.5 |
| | 48 | 19.3 | 29.0 | 16.3 | 24.5 | 49.2 | 73.9 | 43.4 | 65.3 | 37.2 | 55.9 | 32.2 | 48.4 |
| | 50 | 18.5 | 27.8 | 15.6 | 23.5 | 47.2 | 70.9 | 41.7 | 62.6 | 35.7 | 53.6 | 30.9 | 46.4 |
| | 52 | 17.8 | 26.7 | 15.0 | 22.6 | 45.4 | 68.2 | 40.1 | 60.2 | 34.3 | 51.6 | 29.7 | 44.7 |
| | 54 | 17.1 | 25.7 | 14.5 | 21.8 | 43.7 | 65.7 | 38.6 | 58.0 | 33.0 | 49.7 | 28.6 | 43.0 |
| | 56 | 16.5 | 24.8 | 14.0 | 21.0 | 42.1 | 63.3 | 37.2 | 55.9 | 31.9 | 47.9 | 27.6 | 41.5 |
| | 58 | 15.9 | 24.0 | 13.5 | 20.3 | 40.7 | 61.1 | 35.9 | 54.0 | 30.8 | 46.2 | 26.6 | 40.0 |
| | 60 | 15.4 | 23.2 | 13.0 | 19.6 | 39.3 | 59.1 | 34.7 | 52.2 | 29.7 | 44.7 | 25.7 | 38.7 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 925 | 1390 | 782 | 1180 | 2360 | 3550 | 2080 | 3130 | 1780 | 2680 | 1540 | 2320 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 116 | 174 | 97.8 | 147 | 295 | 443 | 260 | 392 | 223 | 335 | 193 | 290 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 45.3 | 68.1 | 38.1 | 57.2 | 117 | 176 | 104 | 156 | 89.6 | 135 | 78.1 | 117 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 4.68 | 7.04 | 4.28 | 6.43 | 4.06 | 6.10 | 3.99 | 5.99 | 3.82 | 5.75 | 3.64 | 5.47 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 60.8 | 91.3 | 57.2 | 86.0 | 107 | 161 | 95.1 | 143 | 80.9 | 122 | 69.4 | 104 |
| $Z_x$, in.$^3$ | | 77.2 | | 65.3 | | 197 | | 174 | | 149 | | 129 | |
| $L_p$, ft | | 2.61 | | 2.51 | | 5.13 | | 5.09 | | 5.05 | | 5.03 | |
| $L_r$, ft | | 17.6 | | 16.5 | | 48.9 | | 44.4 | | 39.9 | | 36.6 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W16

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W16× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 57 | | 50 | | 45 | | 40 | | 36 | | 31 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | 94.2 | 142 |
| | 7 | | | | | | | | | 101 | 152 | 90.7 | 136 |
| | 8 | 152 | 228 | 134 | 200 | 120 | 180 | 105 | 158 | 94.2 | 142 | 79.3 | 119 |
| | 9 | 138 | 208 | 121 | 182 | 108 | 163 | 95.7 | 144 | 83.7 | 126 | 70.5 | 106 |
| | 10 | 125 | 187 | 109 | 164 | 97.4 | 146 | 86.1 | 129 | 75.3 | 113 | 63.5 | 95.4 |
| | 11 | 113 | 170 | 99.1 | 149 | 88.5 | 133 | 78.3 | 118 | 68.5 | 103 | 57.7 | 86.7 |
| | 12 | 104 | 156 | 90.8 | 137 | 81.1 | 122 | 71.8 | 108 | 62.8 | 94.4 | 52.9 | 79.5 |
| | 13 | 95.8 | 144 | 83.8 | 126 | 74.9 | 113 | 66.2 | 99.6 | 57.9 | 87.1 | 48.8 | 73.4 |
| | 14 | 89.0 | 134 | 77.8 | 117 | 69.5 | 105 | 61.5 | 92.4 | 53.8 | 80.9 | 45.3 | 68.1 |
| | 15 | 83.0 | 125 | 72.7 | 109 | 64.9 | 97.6 | 57.4 | 86.3 | 50.2 | 75.5 | 42.3 | 63.6 |
| | 16 | 77.8 | 117 | 68.1 | 102 | 60.9 | 91.5 | 53.8 | 80.9 | 47.1 | 70.8 | 39.7 | 59.6 |
| | 17 | 73.3 | 110 | 64.1 | 96.4 | 57.3 | 86.1 | 50.7 | 76.1 | 44.3 | 66.6 | 37.3 | 56.1 |
| | 18 | 69.2 | 104 | 60.5 | 91.0 | 54.1 | 81.3 | 47.8 | 71.9 | 41.8 | 62.9 | 35.3 | 53.0 |
| | 19 | 65.6 | 98.5 | 57.4 | 86.2 | 51.2 | 77.0 | 45.3 | 68.1 | 39.6 | 59.6 | 33.4 | 50.2 |
| | 20 | 62.3 | 93.6 | 54.5 | 81.9 | 48.7 | 73.2 | 43.1 | 64.7 | 37.7 | 56.6 | 31.7 | 47.7 |
| | 21 | 59.3 | 89.1 | 51.9 | 78.0 | 46.4 | 69.7 | 41.0 | 61.6 | 35.9 | 53.9 | 30.2 | 45.4 |
| | 22 | 56.6 | 85.1 | 49.5 | 74.5 | 44.3 | 66.5 | 39.1 | 58.8 | 34.2 | 51.5 | 28.9 | 43.4 |
| | 23 | 54.2 | 81.4 | 47.4 | 71.2 | 42.3 | 63.6 | 37.4 | 56.3 | 32.8 | 49.2 | 27.6 | 41.5 |
| | 24 | 51.9 | 78.0 | 45.4 | 68.3 | 40.6 | 61.0 | 35.9 | 53.9 | 31.4 | 47.2 | 26.4 | 39.8 |
| | 25 | 49.8 | 74.9 | 43.6 | 65.5 | 38.9 | 58.5 | 34.4 | 51.8 | 30.1 | 45.3 | 25.4 | 38.2 |
| | 26 | 47.9 | 72.0 | 41.9 | 63.0 | 37.4 | 56.3 | 33.1 | 49.8 | 29.0 | 43.5 | 24.4 | 36.7 |
| | 27 | 46.1 | 69.3 | 40.4 | 60.7 | 36.1 | 54.2 | 31.9 | 47.9 | 27.9 | 41.9 | 23.5 | 35.3 |
| | 28 | 44.5 | 66.9 | 38.9 | 58.5 | 34.8 | 52.3 | 30.8 | 46.2 | 26.9 | 40.4 | 22.7 | 34.1 |
| | 29 | 42.9 | 64.6 | 37.6 | 56.5 | 33.6 | 50.5 | 29.7 | 44.6 | 26.0 | 39.0 | 21.9 | 32.9 |
| | 30 | 41.5 | 62.4 | 36.3 | 54.6 | 32.5 | 48.8 | 28.7 | 43.1 | 25.1 | 37.7 | 21.2 | 31.8 |
| | 32 | 38.9 | 58.5 | 34.1 | 51.2 | 30.4 | 45.7 | 26.9 | 40.4 | 23.5 | 35.4 | 19.8 | 29.8 |
| | 34 | 36.6 | 55.1 | 32.1 | 48.2 | 28.6 | 43.0 | 25.3 | 38.1 | 22.2 | 33.3 | 18.7 | 28.1 |
| | 36 | 34.6 | 52.0 | 30.3 | 45.5 | 27.0 | 40.7 | 23.9 | 36.0 | 20.9 | 31.5 | 17.6 | 26.5 |
| | 38 | 32.8 | 49.3 | 28.7 | 43.1 | 25.6 | 38.5 | 22.7 | 34.1 | 19.8 | 29.8 | 16.7 | 25.1 |
| | 40 | 31.1 | 46.8 | 27.2 | 41.0 | 24.3 | 36.6 | 21.5 | 32.4 | 18.8 | 28.3 | 15.9 | 23.9 |
| | 42 | 29.7 | 44.6 | 25.9 | 39.0 | 23.2 | 34.8 | 20.5 | 30.8 | 17.9 | 27.0 | 15.1 | 22.7 |
| | 44 | 28.3 | 42.5 | 24.8 | 37.2 | 22.1 | 33.3 | 19.6 | 29.4 | 17.1 | 25.7 | 14.4 | 21.7 |
| | 46 | 27.1 | 40.7 | 23.7 | 35.6 | 21.2 | 31.8 | 18.7 | 28.1 | 16.4 | 24.6 | 13.8 | 20.7 |
| | 48 | 25.9 | 39.0 | 22.7 | 34.1 | 20.3 | 30.5 | 17.9 | 27.0 | 15.7 | 23.6 | 13.2 | 19.9 |
| | 50 | 24.9 | 37.4 | 21.8 | 32.8 | 19.5 | 29.3 | 17.2 | 25.9 | 15.1 | 22.6 | 12.7 | 19.1 |
| | 52 | 24.0 | 36.0 | 21.0 | 31.5 | 18.7 | 28.1 | 16.6 | 24.9 | 14.5 | 21.8 | 12.2 | 18.3 |
| | 54 | 23.1 | 34.7 | 20.2 | 30.3 | 18.0 | 27.1 | 15.9 | 24.0 | 13.9 | 21.0 | 11.8 | 17.7 |
| | 56 | 22.2 | 33.4 | 19.5 | 29.3 | 17.4 | 26.1 | 15.4 | 23.1 | 13.5 | 20.2 | 11.3 | 17.0 |
| | 58 | 21.5 | 32.3 | 18.8 | 28.2 | 16.8 | 25.2 | 14.8 | 22.3 | 13.0 | 19.5 | 10.9 | 16.4 |
| | 60 | 20.8 | 31.2 | 18.2 | 27.3 | 16.2 | 24.4 | 14.4 | 21.6 | 12.6 | 18.9 | 10.6 | 15.9 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1250 | 1870 | 1090 | 1640 | 974 | 1460 | 861 | 1290 | 753 | 1130 | 635 | 954 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 156 | 234 | 136 | 205 | 122 | 183 | 108 | 162 | 94.2 | 142 | 79.3 | 119 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 61.5 | 92.4 | 54.0 | 81.1 | 48.4 | 72.7 | 43.0 | 64.6 | 37.5 | 56.3 | 31.1 | 46.8 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 4.15 | 6.24 | 3.96 | 5.95 | 3.77 | 5.67 | 3.53 | 5.30 | 3.28 | 4.93 | 3.56 | 5.35 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 76.0 | 114 | 66.8 | 100 | 59.9 | 90.0 | 52.6 | 79.1 | 50.6 | 76.0 | 47.1 | 70.8 |
| $Z_x$, in.$^3$ | | 104 | | 91.0 | | 81.3 | | 71.9 | | 62.9 | | 53.0 | |
| $L_p$, ft | | 3.28 | | 3.26 | | 3.22 | | 3.20 | | 3.12 | | 2.38 | |
| $L_r$, ft | | 26.0 | | 24.0 | | 22.7 | | 21.5 | | 20.4 | | 15.9 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

W16-W14

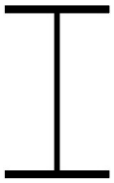
| Shape | | W16× | | W14× | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 26 | | 120 | | 109 | | 99 | | 90 [f1] | | 82 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | 84.6 | 127 | | | | | | | | | | |
| | 7 | 73.9 | 111 | | | | | | | | | | |
| | 8 | 64.7 | 97.2 | | | | | | | | | | |
| | 9 | 57.5 | 86.4 | | | | | | | | | | |
| | 10 | 51.7 | 77.8 | | | | | | | | | 157 | 236 |
| | 11 | 47.0 | 70.7 | | | | | | | | | 149 | 224 |
| | 12 | 43.1 | 64.8 | | | | | | | | | 137 | 206 |
| | 13 | 39.8 | 59.8 | 184 | 278 | | | 148 | 224 | 133 | 200 | 126 | 190 |
| | 14 | 37.0 | 55.5 | 180 | 270 | 162 | 244 | 146 | 220 | 131 | 197 | 117 | 176 |
| | 15 | 34.5 | 51.8 | 168 | 252 | 152 | 228 | 137 | 205 | 122 | 184 | 109 | 164 |
| | 16 | 32.3 | 48.6 | 157 | 236 | 142 | 214 | 128 | 192 | 115 | 172 | 103 | 154 |
| | 17 | 30.4 | 45.7 | 148 | 222 | 134 | 201 | 120 | 181 | 108 | 162 | 96.5 | 145 |
| | 18 | 28.7 | 43.2 | 140 | 210 | 126 | 190 | 114 | 171 | 102 | 153 | 91.2 | 137 |
| | 19 | 27.2 | 40.9 | 132 | 199 | 120 | 180 | 108 | 162 | 96.6 | 145 | 86.4 | 130 |
| | 20 | 25.9 | 38.9 | 126 | 189 | 114 | 171 | 102 | 154 | 91.8 | 138 | 82.0 | 123 |
| | 21 | 24.6 | 37.0 | 120 | 180 | 108 | 163 | 97.5 | 147 | 87.4 | 131 | 78.1 | 117 |
| | 22 | 23.5 | 35.3 | 114 | 172 | 103 | 155 | 93.1 | 140 | 83.4 | 125 | 74.6 | 112 |
| | 23 | 22.5 | 33.8 | 109 | 164 | 98.9 | 149 | 89.0 | 134 | 79.8 | 120 | 71.3 | 107 |
| | 24 | 21.6 | 32.4 | 105 | 158 | 94.8 | 143 | 85.3 | 128 | 76.5 | 115 | 68.4 | 103 |
| | 25 | 20.7 | 31.1 | 101 | 151 | 91.0 | 137 | 81.9 | 123 | 73.4 | 110 | 65.6 | 98.6 |
| | 26 | 19.9 | 29.9 | 96.7 | 145 | 87.5 | 132 | 78.8 | 118 | 70.6 | 106 | 63.1 | 94.8 |
| | 27 | 19.2 | 28.8 | 93.1 | 140 | 84.3 | 127 | 75.8 | 114 | 68.0 | 102 | 60.8 | 91.3 |
| | 28 | 18.5 | 27.8 | 89.8 | 135 | 81.3 | 122 | 73.1 | 110 | 65.6 | 98.5 | 58.6 | 88.1 |
| | 29 | 17.8 | 26.8 | 86.7 | 130 | 78.5 | 118 | 70.6 | 106 | 63.3 | 95.1 | 56.6 | 85.0 |
| | 30 | 17.2 | 25.9 | 83.8 | 126 | 75.8 | 114 | 68.3 | 103 | 61.2 | 92.0 | 54.7 | 82.2 |
| | 32 | 16.2 | 24.3 | 78.6 | 118 | 71.1 | 107 | 64.0 | 96.2 | 57.4 | 86.2 | 51.3 | 77.1 |
| | 34 | 15.2 | 22.9 | 74.0 | 111 | 66.9 | 101 | 60.2 | 90.5 | 54.0 | 81.2 | 48.3 | 72.5 |
| | 36 | 14.4 | 21.6 | 69.9 | 105 | 63.2 | 95.0 | 56.9 | 85.5 | 51.0 | 76.6 | 45.6 | 68.5 |
| | 38 | 13.6 | 20.5 | 66.2 | 99.5 | 59.9 | 90.0 | 53.9 | 81.0 | 48.3 | 72.6 | 43.2 | 64.9 |
| | 40 | 12.9 | 19.4 | 62.9 | 94.5 | 56.9 | 85.5 | 51.2 | 77.0 | 45.9 | 69.0 | 41.0 | 61.7 |
| | 42 | 12.3 | 18.5 | 59.9 | 90.0 | 54.2 | 81.4 | 48.8 | 73.3 | 43.7 | 65.7 | 39.1 | 58.7 |
| | 44 | 11.8 | 17.7 | 57.2 | 85.9 | 51.7 | 77.7 | 46.5 | 70.0 | 41.7 | 62.7 | 37.3 | 56.0 |
| | 46 | 11.2 | 16.9 | 54.7 | 82.2 | 49.5 | 74.3 | 44.5 | 66.9 | 39.9 | 60.0 | 35.7 | 53.6 |
| | 48 | 10.8 | 16.2 | 52.4 | 78.8 | 47.4 | 71.3 | 42.7 | 64.1 | 38.2 | 57.5 | 34.2 | 51.4 |
| | 50 | 10.3 | 15.6 | 50.3 | 75.6 | 45.5 | 68.4 | 41.0 | 61.6 | 36.7 | 55.2 | 32.8 | 49.3 |
| | 52 | 10.0 | 15.0 | 48.4 | 72.7 | 43.8 | 65.8 | 39.4 | 59.2 | 35.3 | 53.1 | 31.6 | 47.4 |
| | 54 | 9.58 | 14.4 | 46.6 | 70.0 | 42.1 | 63.3 | 37.9 | 57.0 | 34.0 | 51.1 | 30.4 | 45.7 |
| | 56 | 9.24 | 13.9 | 44.9 | 67.5 | 40.6 | 61.1 | 36.6 | 55.0 | 32.8 | 49.3 | 29.3 | 44.0 |
| | 58 | 8.92 | 13.4 | 43.4 | 65.2 | 39.2 | 59.0 | 35.3 | 53.1 | 31.7 | 47.6 | 28.3 | 42.5 |
| | 60 | 8.62 | 13.0 | 41.9 | 63.0 | 37.9 | 57.0 | 34.1 | 51.3 | 30.6 | 46.0 | 27.3 | 41.1 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 517 | 778 | 2510 | 3780 | 2280 | 3420 | 2050 | 3080 | 1840 | 2760 | 1640 | 2470 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 64.7 | 97.2 | 314 | 473 | 284 | 428 | 256 | 385 | 229 | 345 | 205 | 308 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 25.2 | 37.9 | 127 | 190 | 115 | 173 | 104 | 157 | 95.0 | 143 | 82.2 | 124 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 3.15 | 4.73 | 2.63 | 3.96 | 2.61 | 3.92 | 2.55 | 3.84 | 2.52 | 3.78 | 2.80 | 4.21 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 42.3 | 63.6 | 92.2 | 139 | 80.9 | 122 | 74.2 | 112 | 66.4 | 99.8 | 78.6 | 118 |
| $Z_x$, in.$^3$ | | 43.2 | | 210 | | 190 | | 171 | | 155 | | 137 | |
| $L_p$, ft | | 2.30 | | 7.66 | | 7.64 | | 7.60 | | 8.59 | | 5.09 | |
| $L_r$, ft | | 14.8 | | 79.0 | | 72.5 | | 67.0 | | 62.0 | | 49.0 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W14

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W14× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 74 | | 68 | | 61 | | 53 | | 48 | | 43 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | |
| | 9 | | | | | | | 111 | 167 | 101 | 152 | 90.0 | 135 |
| | 10 | 138 | 208 | 125 | 188 | 112 | 169 | 102 | 153 | 91.6 | 138 | 81.1 | 122 |
| | 11 | 135 | 203 | 123 | 185 | 109 | 164 | 92.8 | 139 | 83.3 | 125 | 73.7 | 111 |
| | 12 | 124 | 186 | 113 | 170 | 99.8 | 150 | 85.0 | 128 | 76.3 | 115 | 67.6 | 102 |
| | 13 | 114 | 172 | 104 | 156 | 92.1 | 138 | 78.5 | 118 | 70.5 | 106 | 62.4 | 93.7 |
| | 14 | 106 | 159 | 96.7 | 145 | 85.5 | 129 | 72.9 | 110 | 65.4 | 98.4 | 57.9 | 87.0 |
| | 15 | 99.0 | 149 | 90.2 | 136 | 79.8 | 120 | 68.0 | 102 | 61.1 | 91.8 | 54.1 | 81.2 |
| | 16 | 92.8 | 140 | 84.6 | 127 | 74.9 | 113 | 63.8 | 95.9 | 57.3 | 86.1 | 50.7 | 76.2 |
| | 17 | 87.4 | 131 | 79.6 | 120 | 70.4 | 106 | 60.0 | 90.2 | 53.9 | 81.0 | 47.7 | 71.7 |
| | 18 | 82.5 | 124 | 75.2 | 113 | 66.5 | 100 | 56.7 | 85.2 | 50.9 | 76.5 | 45.0 | 67.7 |
| | 19 | 78.2 | 117 | 71.2 | 107 | 63.0 | 94.7 | 53.7 | 80.7 | 48.2 | 72.5 | 42.7 | 64.1 |
| | 20 | 74.3 | 112 | 67.7 | 102 | 59.9 | 90.0 | 51.0 | 76.7 | 45.8 | 68.9 | 40.5 | 60.9 |
| | 21 | 70.7 | 106 | 64.4 | 96.9 | 57.0 | 85.7 | 48.6 | 73.0 | 43.6 | 65.6 | 38.6 | 58.0 |
| | 22 | 67.5 | 101 | 61.5 | 92.5 | 54.4 | 81.8 | 46.4 | 69.7 | 41.6 | 62.6 | 36.9 | 55.4 |
| | 23 | 64.6 | 97.0 | 58.8 | 88.4 | 52.1 | 78.3 | 44.4 | 66.7 | 39.8 | 59.9 | 35.3 | 53.0 |
| | 24 | 61.9 | 93.0 | 56.4 | 84.8 | 49.9 | 75.0 | 42.5 | 63.9 | 38.2 | 57.4 | 33.8 | 50.8 |
| | 25 | 59.4 | 89.3 | 54.1 | 81.4 | 47.9 | 72.0 | 40.8 | 61.3 | 36.6 | 55.1 | 32.4 | 48.7 |
| | 26 | 57.1 | 85.8 | 52.0 | 78.2 | 46.1 | 69.2 | 39.2 | 59.0 | 35.2 | 53.0 | 31.2 | 46.9 |
| | 27 | 55.0 | 82.7 | 50.1 | 75.3 | 44.4 | 66.7 | 37.8 | 56.8 | 33.9 | 51.0 | 30.0 | 45.1 |
| | 28 | 53.0 | 79.7 | 48.3 | 72.6 | 42.8 | 64.3 | 36.4 | 54.8 | 32.7 | 49.2 | 29.0 | 43.5 |
| | 29 | 51.2 | 77.0 | 46.7 | 70.1 | 41.3 | 62.1 | 35.2 | 52.9 | 31.6 | 47.5 | 28.0 | 42.0 |
| | 30 | 49.5 | 74.4 | 45.1 | 67.8 | 39.9 | 60.0 | 34.0 | 51.1 | 30.5 | 45.9 | 27.0 | 40.6 |
| | 32 | 46.4 | 69.8 | 42.3 | 63.6 | 37.4 | 56.3 | 31.9 | 47.9 | 28.6 | 43.0 | 25.3 | 38.1 |
| | 34 | 43.7 | 65.6 | 39.8 | 59.8 | 35.2 | 52.9 | 30.0 | 45.1 | 26.9 | 40.5 | 23.8 | 35.8 |
| | 36 | 41.3 | 62.0 | 37.6 | 56.5 | 33.3 | 50.0 | 28.3 | 42.6 | 25.4 | 38.3 | 22.5 | 33.9 |
| | 38 | 39.1 | 58.7 | 35.6 | 53.5 | 31.5 | 47.4 | 26.9 | 40.4 | 24.1 | 36.2 | 21.3 | 32.1 |
| | 40 | 37.1 | 55.8 | 33.8 | 50.9 | 29.9 | 45.0 | 25.5 | 38.3 | 22.9 | 34.4 | 20.3 | 30.5 |
| | 42 | 35.4 | 53.1 | 32.2 | 48.4 | 28.5 | 42.9 | 24.3 | 36.5 | 21.8 | 32.8 | 19.3 | 29.0 |
| | 44 | 33.8 | 50.7 | 30.8 | 46.2 | 27.2 | 40.9 | 23.2 | 34.9 | 20.8 | 31.3 | 18.4 | 27.7 |
| | 46 | 32.3 | 48.5 | 29.4 | 44.2 | 26.0 | 39.1 | 22.2 | 33.3 | 19.9 | 29.9 | 17.6 | 26.5 |
| | 48 | 30.9 | 46.5 | 28.2 | 42.4 | 25.0 | 37.5 | 21.3 | 32.0 | 19.1 | 28.7 | 16.9 | 25.4 |
| | 50 | 29.7 | 44.6 | 27.1 | 40.7 | 24.0 | 36.0 | 20.4 | 30.7 | 18.3 | 27.5 | 16.2 | 24.4 |
| | 52 | 28.6 | 42.9 | 26.0 | 39.1 | 23.0 | 34.6 | 19.6 | 29.5 | 17.6 | 26.5 | 15.6 | 23.4 |
| | 54 | 27.5 | 41.3 | 25.1 | 37.7 | 22.2 | 33.3 | 18.9 | 28.4 | 17.0 | 25.5 | 15.0 | 22.6 |
| | 56 | 26.5 | 39.9 | 24.2 | 36.3 | 21.4 | 32.1 | 18.2 | 27.4 | 16.4 | 24.6 | 14.5 | 21.8 |
| | 58 | 25.6 | 38.5 | 23.3 | 35.1 | 20.6 | 31.0 | 17.6 | 26.4 | 15.8 | 23.7 | 14.0 | 21.0 |
| | 60 | 24.8 | 37.2 | 22.6 | 33.9 | 20.0 | 30.0 | 17.0 | 25.6 | 15.3 | 23.0 | 13.5 | 20.3 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1490 | 2230 | 1350 | 2030 | 1200 | 1800 | 1020 | 1530 | 916 | 1380 | 811 | 1220 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 186 | 279 | 169 | 254 | 150 | 225 | 128 | 192 | 115 | 172 | 101 | 152 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 74.8 | 112 | 68.0 | 102 | 61.0 | 91.6 | 51.3 | 77.1 | 46.2 | 69.5 | 41.1 | 61.8 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 2.75 | 4.13 | 2.69 | 4.04 | 2.59 | 3.89 | 2.75 | 4.13 | 2.66 | 3.99 | 2.53 | 3.80 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 68.9 | 104 | 62.6 | 94.1 | 56.2 | 84.4 | 55.4 | 83.3 | 50.6 | 76.0 | 45.0 | 67.7 |
| $Z_x$, in.$^3$ | | 124 | | 113 | | 100 | | 85.2 | | 76.5 | | 67.7 | |
| $L_p$, ft | | 5.07 | | 5.05 | | 5.03 | | 3.95 | | 3.93 | | 3.89 | |
| $L_r$, ft | | 45.4 | | 42.6 | | 39.3 | | 31.7 | | 29.7 | | 27.7 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

W14-W12

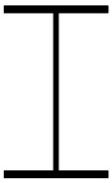
| Shape | | W14× | | | | | | | | | | W12× | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 38 | | 34 | | 30 | | 26 | | 22 | | 106 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | 68.0 | 102 | | |
| | 6 | | | | | 80.4 | 121 | 76.4 | 115 | 64.5 | 96.9 | | |
| | 7 | 94.2 | 142 | 86.0 | 129 | 79.4 | 119 | 67.4 | 101 | 55.3 | 83.1 | | |
| | 8 | 90.7 | 136 | 80.4 | 121 | 69.5 | 104 | 59.0 | 88.7 | 48.4 | 72.7 | | |
| | 9 | 80.6 | 121 | 71.5 | 107 | 61.7 | 92.8 | 52.4 | 78.8 | 43.0 | 64.6 | | |
| | 10 | 72.6 | 109 | 64.3 | 96.7 | 55.6 | 83.5 | 47.2 | 70.9 | 38.7 | 58.1 | | |
| | 11 | 66.0 | 99.2 | 58.5 | 87.9 | 50.5 | 75.9 | 42.9 | 64.5 | 35.2 | 52.9 | 170 | 254 |
| | 12 | 60.5 | 90.9 | 53.6 | 80.6 | 46.3 | 69.6 | 39.3 | 59.1 | 32.2 | 48.5 | 162 | 243 |
| | 13 | 55.8 | 83.9 | 49.5 | 74.4 | 42.7 | 64.2 | 36.3 | 54.6 | 29.8 | 44.7 | 149 | 224 |
| | 14 | 51.8 | 77.9 | 45.9 | 69.0 | 39.7 | 59.7 | 33.7 | 50.7 | 27.6 | 41.5 | 139 | 208 |
| | 15 | 48.4 | 72.7 | 42.9 | 64.4 | 37.0 | 55.7 | 31.5 | 47.3 | 25.8 | 38.8 | 129 | 194 |
| | 16 | 45.4 | 68.2 | 40.2 | 60.4 | 34.7 | 52.2 | 29.5 | 44.3 | 24.2 | 36.3 | 121 | 182 |
| | 17 | 42.7 | 64.2 | 37.8 | 56.9 | 32.7 | 49.1 | 27.8 | 41.7 | 22.8 | 34.2 | 114 | 172 |
| | 18 | 40.3 | 60.6 | 35.7 | 53.7 | 30.9 | 46.4 | 26.2 | 39.4 | 21.5 | 32.3 | 108 | 162 |
| | 19 | 38.2 | 57.4 | 33.8 | 50.9 | 29.2 | 44.0 | 24.8 | 37.3 | 20.4 | 30.6 | 102 | 153 |
| | 20 | 36.3 | 54.5 | 32.2 | 48.3 | 27.8 | 41.8 | 23.6 | 35.5 | 19.3 | 29.1 | 97.0 | 146 |
| | 21 | 34.6 | 51.9 | 30.6 | 46.0 | 26.5 | 39.8 | 22.5 | 33.8 | 18.4 | 27.7 | 92.4 | 139 |
| | 22 | 33.0 | 49.6 | 29.2 | 43.9 | 25.3 | 38.0 | 21.4 | 32.2 | 17.6 | 26.4 | 88.2 | 133 |
| | 23 | 31.6 | 47.4 | 28.0 | 42.0 | 24.2 | 36.3 | 20.5 | 30.8 | 16.8 | 25.3 | 84.4 | 127 |
| | 24 | 30.2 | 45.5 | 26.8 | 40.3 | 23.2 | 34.8 | 19.7 | 29.6 | 16.1 | 24.2 | 80.8 | 122 |
| | 25 | 29.0 | 43.6 | 25.7 | 38.7 | 22.2 | 33.4 | 18.9 | 28.4 | 15.5 | 23.3 | 77.6 | 117 |
| | 26 | 27.9 | 42.0 | 24.7 | 37.2 | 21.4 | 32.1 | 18.1 | 27.3 | 14.9 | 22.4 | 74.6 | 112 |
| | 27 | 26.9 | 40.4 | 23.8 | 35.8 | 20.6 | 30.9 | 17.5 | 26.3 | 14.3 | 21.5 | 71.9 | 108 |
| | 28 | 25.9 | 39.0 | 23.0 | 34.5 | 19.8 | 29.8 | 16.9 | 25.3 | 13.8 | 20.8 | 69.3 | 104 |
| | 29 | 25.0 | 37.6 | 22.2 | 33.3 | 19.2 | 28.8 | 16.3 | 24.5 | 13.3 | 20.0 | 66.9 | 101 |
| | 30 | 24.2 | 36.4 | 21.4 | 32.2 | 18.5 | 27.8 | 15.7 | 23.6 | 12.9 | 19.4 | 64.7 | 97.2 |
| | 32 | 22.7 | 34.1 | 20.1 | 30.2 | 17.4 | 26.1 | 14.7 | 22.2 | 12.1 | 18.2 | 60.6 | 91.1 |
| | 34 | 21.3 | 32.1 | 18.9 | 28.4 | 16.3 | 24.6 | 13.9 | 20.9 | 11.4 | 17.1 | 57.1 | 85.8 |
| | 36 | 20.2 | 30.3 | 17.9 | 26.9 | 15.4 | 23.2 | 13.1 | 19.7 | 10.7 | 16.2 | 53.9 | 81.0 |
| | 38 | 19.1 | 28.7 | 16.9 | 25.4 | 14.6 | 22.0 | 12.4 | 18.7 | 10.2 | 15.3 | 51.1 | 76.7 |
| | 40 | 18.1 | 27.3 | 16.1 | 24.2 | 13.9 | 20.9 | 11.8 | 17.7 | 9.67 | 14.5 | 48.5 | 72.9 |
| | 42 | 17.3 | 26.0 | 15.3 | 23.0 | 13.2 | 19.9 | 11.2 | 16.9 | 9.21 | 13.8 | 46.2 | 69.4 |
| | 44 | 16.5 | 24.8 | 14.6 | 22.0 | 12.6 | 19.0 | 10.7 | 16.1 | 8.79 | 13.2 | 44.1 | 66.3 |
| | 46 | 15.8 | 23.7 | 14.0 | 21.0 | 12.1 | 18.2 | 10.3 | 15.4 | 8.41 | 12.6 | 42.2 | 63.4 |
| | 48 | 15.1 | 22.7 | 13.4 | 20.1 | 11.6 | 17.4 | 9.83 | 14.8 | 8.06 | 12.1 | 40.4 | 60.8 |
| | 50 | 14.5 | 21.8 | 12.9 | 19.3 | 11.1 | 16.7 | 9.44 | 14.2 | 7.74 | 11.6 | 38.8 | 58.3 |
| | 52 | 14.0 | 21.0 | 12.4 | 18.6 | 10.7 | 16.1 | 9.07 | 13.6 | 7.44 | 11.2 | 37.3 | 56.1 |
| | 54 | 13.4 | 20.2 | 11.9 | 17.9 | 10.3 | 15.5 | 8.74 | 13.1 | 7.16 | 10.8 | 35.9 | 54.0 |
| | 56 | 13.0 | 19.5 | 11.5 | 17.3 | 9.92 | 14.9 | 8.43 | 12.7 | 6.91 | 10.4 | 34.6 | 52.1 |
| | 58 | 12.5 | 18.8 | 11.1 | 16.7 | 9.58 | 14.4 | 8.14 | 12.2 | 6.67 | 10.0 | 33.5 | 50.3 |
| | 60 | 12.1 | 18.2 | 10.7 | 16.1 | 9.26 | 13.9 | 7.86 | 11.8 | 6.45 | 9.69 | 32.3 | 48.6 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 726 | 1090 | 643 | 967 | 556 | 835 | 472 | 709 | 387 | 581 | 1940 | 2920 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 90.7 | 136 | 80.4 | 121 | 69.5 | 104 | 59.0 | 88.7 | 48.4 | 72.7 | 243 | 365 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 36.2 | 54.5 | 32.2 | 48.4 | 27.8 | 41.7 | 23.2 | 34.8 | 18.9 | 28.5 | 96.3 | 145 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 2.83 | 4.25 | 2.66 | 4.00 | 2.47 | 3.71 | 2.81 | 4.22 | 2.50 | 3.76 | 2.04 | 3.06 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 47.1 | 70.8 | 43.0 | 64.6 | 40.2 | 60.4 | 38.2 | 57.4 | 34.0 | 51.0 | 84.8 | 127 |
| $Z_x$, in.$^3$ | | 60.6 | | 53.7 | | 46.4 | | 39.4 | | 32.3 | | 162 | |
| $L_p$, ft | | 3.18 | | 3.14 | | 3.06 | | 2.22 | | 2.14 | | 6.37 | |
| $L_r$, ft | | 22.4 | | 21.2 | | 19.9 | | 15.0 | | 13.9 | | 78.2 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W12

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W12× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 96 | | 87 | | 79 | | 72 | | 65 | | 58 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | 94.6 | 142 |
| | 11 | 151 | 226 | 139 | 208 | 126 | 189 | 114 | 171 | 102 | 153 | 92.2 | 139 |
| | 12 | 146 | 219 | 130 | 195 | 117 | 176 | 106 | 159 | 95.0 | 143 | 84.5 | 127 |
| | 13 | 135 | 202 | 120 | 180 | 108 | 162 | 97.7 | 147 | 87.7 | 132 | 78.0 | 117 |
| | 14 | 125 | 188 | 111 | 167 | 100 | 150 | 90.7 | 136 | 81.4 | 122 | 72.5 | 109 |
| | 15 | 117 | 175 | 104 | 156 | 93.4 | 140 | 84.6 | 127 | 76.0 | 114 | 67.6 | 102 |
| | 16 | 109 | 164 | 97.3 | 146 | 87.6 | 132 | 79.3 | 119 | 71.3 | 107 | 63.4 | 95.3 |
| | 17 | 103 | 155 | 91.6 | 138 | 82.4 | 124 | 74.7 | 112 | 67.1 | 101 | 59.7 | 89.7 |
| | 18 | 97.1 | 146 | 86.5 | 130 | 77.8 | 117 | 70.5 | 106 | 63.3 | 95.2 | 56.4 | 84.7 |
| | 19 | 92.0 | 138 | 81.9 | 123 | 73.7 | 111 | 66.8 | 100 | 60.0 | 90.2 | 53.4 | 80.2 |
| | 20 | 87.4 | 131 | 77.8 | 117 | 70.1 | 105 | 63.5 | 95.4 | 57.0 | 85.7 | 50.7 | 76.2 |
| | 21 | 83.3 | 125 | 74.1 | 111 | 66.7 | 100 | 60.5 | 90.9 | 54.3 | 81.6 | 48.3 | 72.6 |
| | 22 | 79.5 | 119 | 70.8 | 106 | 63.7 | 95.7 | 57.7 | 86.7 | 51.8 | 77.9 | 46.1 | 69.3 |
| | 23 | 76.0 | 114 | 67.7 | 102 | 60.9 | 91.6 | 55.2 | 83.0 | 49.6 | 74.5 | 44.1 | 66.3 |
| | 24 | 72.9 | 110 | 64.9 | 97.5 | 58.4 | 87.8 | 52.9 | 79.5 | 47.5 | 71.4 | 42.3 | 63.5 |
| | 25 | 69.9 | 105 | 62.3 | 93.6 | 56.0 | 84.2 | 50.8 | 76.3 | 45.6 | 68.5 | 40.6 | 61.0 |
| | 26 | 67.3 | 101 | 59.9 | 90.0 | 53.9 | 81.0 | 48.8 | 73.4 | 43.9 | 65.9 | 39.0 | 58.6 |
| | 27 | 64.8 | 97.3 | 57.7 | 86.7 | 51.9 | 78.0 | 47.0 | 70.7 | 42.2 | 63.5 | 37.6 | 56.5 |
| | 28 | 62.4 | 93.9 | 55.6 | 83.6 | 50.0 | 75.2 | 45.3 | 68.1 | 40.7 | 61.2 | 36.2 | 54.5 |
| | 29 | 60.3 | 90.6 | 53.7 | 80.7 | 48.3 | 72.6 | 43.8 | 65.8 | 39.3 | 59.1 | 35.0 | 52.6 |
| | 30 | 58.3 | 87.6 | 51.9 | 78.0 | 46.7 | 70.2 | 42.3 | 63.6 | 38.0 | 57.1 | 33.8 | 50.8 |
| | 32 | 54.6 | 82.1 | 48.7 | 73.1 | 43.8 | 65.8 | 39.7 | 59.6 | 35.6 | 53.6 | 31.7 | 47.6 |
| | 34 | 51.4 | 77.3 | 45.8 | 68.8 | 41.2 | 61.9 | 37.3 | 56.1 | 33.5 | 50.4 | 29.8 | 44.8 |
| | 36 | 48.6 | 73.0 | 43.2 | 65.0 | 38.9 | 58.5 | 35.3 | 53.0 | 31.7 | 47.6 | 28.2 | 42.4 |
| | 38 | 46.0 | 69.2 | 41.0 | 61.6 | 36.9 | 55.4 | 33.4 | 50.2 | 30.0 | 45.1 | 26.7 | 40.1 |
| | 40 | 43.7 | 65.7 | 38.9 | 58.5 | 35.0 | 52.7 | 31.7 | 47.7 | 28.5 | 42.8 | 25.4 | 38.1 |
| | 42 | 41.6 | 62.6 | 37.1 | 55.7 | 33.4 | 50.1 | 30.2 | 45.4 | 27.1 | 40.8 | 24.2 | 36.3 |
| | 44 | 39.7 | 59.7 | 35.4 | 53.2 | 31.8 | 47.9 | 28.9 | 43.4 | 25.9 | 38.9 | 23.1 | 34.7 |
| | 46 | 38.0 | 57.1 | 33.8 | 50.9 | 30.5 | 45.8 | 27.6 | 41.5 | 24.8 | 37.3 | 22.1 | 33.1 |
| | 48 | 36.4 | 54.8 | 32.4 | 48.8 | 29.2 | 43.9 | 26.4 | 39.8 | 23.8 | 35.7 | 21.1 | 31.8 |
| | 50 | 35.0 | 52.6 | 31.1 | 46.8 | 28.0 | 42.1 | 25.4 | 38.2 | 22.8 | 34.3 | 20.3 | 30.5 |
| | 52 | 33.6 | 50.5 | 29.9 | 45.0 | 26.9 | 40.5 | 24.4 | 36.7 | 21.9 | 33.0 | 19.5 | 29.3 |
| | 54 | 32.4 | 48.7 | 28.8 | 43.3 | 25.9 | 39.0 | 23.5 | 35.3 | 21.1 | 31.7 | 18.8 | 28.2 |
| | 56 | 31.2 | 46.9 | 27.8 | 41.8 | 25.0 | 37.6 | 22.7 | 34.1 | 20.4 | 30.6 | 18.1 | 27.2 |
| | 58 | 30.1 | 45.3 | 26.8 | 40.3 | 24.2 | 36.3 | 21.9 | 32.9 | 19.7 | 29.5 | 17.5 | 26.3 |
| | 60 | 29.1 | 43.8 | 25.9 | 39.0 | 23.4 | 35.1 | 21.2 | 31.8 | 19.0 | 28.6 | 16.9 | 25.4 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1750 | 2630 | 1560 | 2340 | 1400 | 2110 | 1270 | 1910 | 1140 | 1710 | 1010 | 1520 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 219 | 329 | 195 | 293 | 175 | 263 | 159 | 239 | 143 | 214 | 127 | 191 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 87.6 | 132 | 78.8 | 118 | 71.4 | 107 | 64.7 | 97.2 | 58.3 | 87.6 | 51.6 | 77.6 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 2.03 | 3.05 | 1.98 | 2.98 | 1.96 | 2.94 | 1.93 | 2.90 | 1.89 | 2.84 | 1.96 | 2.95 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 75.3 | 113 | 69.4 | 104 | 62.8 | 94.4 | 57.0 | 85.7 | 50.9 | 76.4 | 47.3 | 71.2 |
| $Z_x$, in.$^3$ | | 146 | | 130 | | 117 | | 106 | | 95.2 | | 84.7 | |
| $L_p$, ft | | 6.33 | | 6.29 | | 6.25 | | 6.23 | | 6.21 | | 5.15 | |
| $L_r$, ft | | 70.9 | | 64.7 | | 59.3 | | 55.0 | | 50.8 | | 43.5 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

W12

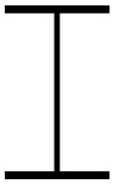
| Shape | | W12× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 53 | | 50 | | 45 | | 40 | | 35 | | 30 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | 80.8 | 122 | 69.0 | 104 |
| | 8 | | | 97.4 | 146 | 87.4 | 131 | 75.6 | 114 | 75.9 | 114 | 63.9 | 96.1 |
| | 9 | | | 94.1 | 141 | 84.0 | 126 | 74.7 | 112 | 67.5 | 101 | 56.8 | 85.4 |
| | 10 | 90.0 | 135 | 84.7 | 127 | 75.6 | 114 | 67.2 | 101 | 60.7 | 91.3 | 51.1 | 76.9 |
| | 11 | 83.1 | 125 | 77.0 | 116 | 68.7 | 103 | 61.1 | 91.8 | 55.2 | 83.0 | 46.5 | 69.9 |
| | 12 | 76.1 | 114 | 70.6 | 106 | 63.0 | 94.7 | 56.0 | 84.2 | 50.6 | 76.1 | 42.6 | 64.1 |
| | 13 | 70.3 | 106 | 65.1 | 97.9 | 58.1 | 87.4 | 51.7 | 77.7 | 46.7 | 70.2 | 39.3 | 59.1 |
| | 14 | 65.3 | 98.1 | 60.5 | 90.9 | 54.0 | 81.1 | 48.0 | 72.1 | 43.4 | 65.2 | 36.5 | 54.9 |
| | 15 | 60.9 | 91.6 | 56.4 | 84.8 | 50.4 | 75.7 | 44.8 | 67.3 | 40.5 | 60.8 | 34.1 | 51.2 |
| | 16 | 57.1 | 85.8 | 52.9 | 79.5 | 47.2 | 71.0 | 42.0 | 63.1 | 37.9 | 57.0 | 32.0 | 48.0 |
| | 17 | 53.8 | 80.8 | 49.8 | 74.9 | 44.5 | 66.8 | 39.5 | 59.4 | 35.7 | 53.7 | 30.1 | 45.2 |
| | 18 | 50.8 | 76.3 | 47.0 | 70.7 | 42.0 | 63.1 | 37.3 | 56.1 | 33.7 | 50.7 | 28.4 | 42.7 |
| | 19 | 48.1 | 72.3 | 44.6 | 67.0 | 39.8 | 59.8 | 35.4 | 53.1 | 32.0 | 48.0 | 26.9 | 40.5 |
| | 20 | 45.7 | 68.7 | 42.3 | 63.6 | 37.8 | 56.8 | 33.6 | 50.5 | 30.4 | 45.6 | 25.6 | 38.4 |
| | 21 | 43.5 | 65.4 | 40.3 | 60.6 | 36.0 | 54.1 | 32.0 | 48.1 | 28.9 | 43.5 | 24.4 | 36.6 |
| | 22 | 41.5 | 62.4 | 38.5 | 57.8 | 34.3 | 51.6 | 30.5 | 45.9 | 27.6 | 41.5 | 23.2 | 34.9 |
| | 23 | 39.7 | 59.7 | 36.8 | 55.3 | 32.9 | 49.4 | 29.2 | 43.9 | 26.4 | 39.7 | 22.2 | 33.4 |
| | 24 | 38.1 | 57.2 | 35.3 | 53.0 | 31.5 | 47.3 | 28.0 | 42.1 | 25.3 | 38.0 | 21.3 | 32.0 |
| | 25 | 36.6 | 54.9 | 33.9 | 50.9 | 30.2 | 45.4 | 26.9 | 40.4 | 24.3 | 36.5 | 20.5 | 30.7 |
| | 26 | 35.1 | 52.8 | 32.6 | 48.9 | 29.1 | 43.7 | 25.8 | 38.8 | 23.4 | 35.1 | 19.7 | 29.6 |
| | 27 | 33.8 | 50.9 | 31.4 | 47.1 | 28.0 | 42.1 | 24.9 | 37.4 | 22.5 | 33.8 | 18.9 | 28.5 |
| | 28 | 32.6 | 49.1 | 30.2 | 45.5 | 27.0 | 40.6 | 24.0 | 36.1 | 21.7 | 32.6 | 18.3 | 27.5 |
| | 29 | 31.5 | 47.4 | 29.2 | 43.9 | 26.1 | 39.2 | 23.2 | 34.8 | 20.9 | 31.5 | 17.6 | 26.5 |
| | 30 | 30.5 | 45.8 | 28.2 | 42.4 | 25.2 | 37.9 | 22.4 | 33.7 | 20.2 | 30.4 | 17.0 | 25.6 |
| | 32 | 28.6 | 42.9 | 26.5 | 39.8 | 23.6 | 35.5 | 21.0 | 31.6 | 19.0 | 28.5 | 16.0 | 24.0 |
| | 34 | 26.9 | 40.4 | 24.9 | 37.4 | 22.2 | 33.4 | 19.8 | 29.7 | 17.9 | 26.8 | 15.0 | 22.6 |
| | 36 | 25.4 | 38.2 | 23.5 | 35.4 | 21.0 | 31.6 | 18.7 | 28.1 | 16.9 | 25.4 | 14.2 | 21.4 |
| | 38 | 24.0 | 36.1 | 22.3 | 33.5 | 19.9 | 29.9 | 17.7 | 26.6 | 16.0 | 24.0 | 13.5 | 20.2 |
| | 40 | 22.8 | 34.3 | 21.2 | 31.8 | 18.9 | 28.4 | 16.8 | 25.2 | 15.2 | 22.8 | 12.8 | 19.2 |
| | 42 | 21.8 | 32.7 | 20.2 | 30.3 | 18.0 | 27.0 | 16.0 | 24.0 | 14.5 | 21.7 | 12.2 | 18.3 |
| | 44 | 20.8 | 31.2 | 19.2 | 28.9 | 17.2 | 25.8 | 15.3 | 23.0 | 13.8 | 20.7 | 11.6 | 17.5 |
| | 46 | 19.9 | 29.9 | 18.4 | 27.7 | 16.4 | 24.7 | 14.6 | 22.0 | 13.2 | 19.8 | 11.1 | 16.7 |
| | 48 | 19.0 | 28.6 | 17.6 | 26.5 | 15.7 | 23.7 | 14.0 | 21.0 | 12.6 | 19.0 | 10.7 | 16.0 |
| | 50 | 18.3 | 27.5 | 16.9 | 25.5 | 15.1 | 22.7 | 13.4 | 20.2 | 12.1 | 18.3 | 10.2 | 15.4 |
| | 52 | 17.6 | 26.4 | 16.3 | 24.5 | 14.5 | 21.8 | 12.9 | 19.4 | 11.7 | 17.6 | 9.83 | 14.8 |
| | 54 | 16.9 | 25.4 | 15.7 | 23.6 | 14.0 | 21.0 | 12.4 | 18.7 | 11.2 | 16.9 | 9.47 | 14.2 |
| | 56 | 16.3 | 24.5 | 15.1 | 22.7 | 13.5 | 20.3 | 12.0 | 18.0 | 10.8 | 16.3 | 9.13 | 13.7 |
| | 58 | 15.8 | 23.7 | 14.6 | 21.9 | 13.0 | 19.6 | 11.6 | 17.4 | 10.5 | 15.7 | 8.82 | 13.3 |
| | 60 | 15.2 | 22.9 | 14.1 | 21.2 | 12.6 | 18.9 | 11.2 | 16.8 | 10.1 | 15.2 | 8.52 | 12.8 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 914 | 1370 | 847 | 1270 | 756 | 1140 | 672 | 1010 | 607 | 913 | 511 | 769 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 114 | 172 | 106 | 159 | 94.5 | 142 | 84.0 | 126 | 75.9 | 114 | 63.9 | 96.1 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 46.5 | 70.0 | 42.6 | 64.0 | 38.1 | 57.3 | 34.2 | 51.3 | 30.4 | 45.8 | 25.7 | 38.7 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.92 | 2.88 | 2.06 | 3.10 | 2.00 | 3.01 | 1.92 | 2.88 | 2.23 | 3.35 | 2.08 | 3.12 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 45.0 | 67.6 | 48.7 | 73.1 | 43.7 | 65.7 | 37.8 | 56.9 | 40.4 | 60.8 | 34.5 | 51.8 |
| $Z_x$, in.$^3$ | | 76.3 | | 70.7 | | 63.1 | | 56.1 | | 50.7 | | 42.7 | |
| $L_p$, ft | | 5.09 | | 4.03 | | 4.01 | | 4.01 | | 3.14 | | 3.12 | |
| $L_r$, ft | | 40.4 | | 34.7 | | 32.2 | | 30.0 | | 23.5 | | 21.5 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W12-W10

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W12× | | | | | | | | | | W10× | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 26 | | 22 | | 19 | | 16 | | 14 | | 88 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | 61.8 | 92.8 | 57.0 | 85.6 | 50.9 | 76.5 | | |
| | 5 | | | 69.0 | 104 | 58.2 | 87.5 | 46.9 | 70.6 | 40.7 | 61.2 | | |
| | 6 | | | 57.7 | 86.7 | 48.5 | 72.9 | 39.1 | 58.8 | 33.9 | 51.0 | | |
| | 7 | 60.4 | 91.0 | 49.4 | 74.3 | 41.6 | 62.5 | 33.5 | 50.4 | 29.1 | 43.7 | | |
| | 8 | 55.1 | 82.8 | 43.3 | 65.0 | 36.4 | 54.7 | 29.3 | 44.1 | 25.4 | 38.3 | | |
| | 9 | 49.0 | 73.6 | 38.5 | 57.8 | 32.3 | 48.6 | 26.1 | 39.2 | 22.6 | 34.0 | 141 | 212 |
| | 10 | 44.1 | 66.2 | 34.6 | 52.0 | 29.1 | 43.7 | 23.5 | 35.3 | 20.4 | 30.6 | 134 | 202 |
| | 11 | 40.1 | 60.2 | 31.5 | 47.3 | 26.5 | 39.8 | 21.3 | 32.1 | 18.5 | 27.8 | 122 | 183 |
| | 12 | 36.7 | 55.2 | 28.8 | 43.4 | 24.3 | 36.5 | 19.6 | 29.4 | 17.0 | 25.5 | 112 | 168 |
| | 13 | 33.9 | 51.0 | 26.6 | 40.0 | 22.4 | 33.6 | 18.1 | 27.1 | 15.7 | 23.5 | 103 | 155 |
| | 14 | 31.5 | 47.3 | 24.7 | 37.2 | 20.8 | 31.2 | 16.8 | 25.2 | 14.5 | 21.9 | 95.8 | 144 |
| | 15 | 29.4 | 44.2 | 23.1 | 34.7 | 19.4 | 29.2 | 15.6 | 23.5 | 13.6 | 20.4 | 89.4 | 134 |
| | 16 | 27.5 | 41.4 | 21.6 | 32.5 | 18.2 | 27.3 | 14.7 | 22.1 | 12.7 | 19.1 | 83.8 | 126 |
| | 17 | 25.9 | 39.0 | 20.4 | 30.6 | 17.1 | 25.7 | 13.8 | 20.8 | 12.0 | 18.0 | 78.9 | 119 |
| | 18 | 24.5 | 36.8 | 19.2 | 28.9 | 16.2 | 24.3 | 13.0 | 19.6 | 11.3 | 17.0 | 74.5 | 112 |
| | 19 | 23.2 | 34.9 | 18.2 | 27.4 | 15.3 | 23.0 | 12.4 | 18.6 | 10.7 | 16.1 | 70.6 | 106 |
| | 20 | 22.0 | 33.1 | 17.3 | 26.0 | 14.6 | 21.9 | 11.7 | 17.6 | 10.2 | 15.3 | 67.1 | 101 |
| | 21 | 21.0 | 31.5 | 16.5 | 24.8 | 13.9 | 20.8 | 11.2 | 16.8 | 9.69 | 14.6 | 63.9 | 96.0 |
| | 22 | 20.0 | 30.1 | 15.7 | 23.6 | 13.2 | 19.9 | 10.7 | 16.0 | 9.25 | 13.9 | 61.0 | 91.6 |
| | 23 | 19.2 | 28.8 | 15.0 | 22.6 | 12.7 | 19.0 | 10.2 | 15.3 | 8.85 | 13.3 | 58.3 | 87.7 |
| | 24 | 18.4 | 27.6 | 14.4 | 21.7 | 12.1 | 18.2 | 9.78 | 14.7 | 8.48 | 12.8 | 55.9 | 84.0 |
| | 25 | 17.6 | 26.5 | 13.8 | 20.8 | 11.6 | 17.5 | 9.39 | 14.1 | 8.14 | 12.2 | 53.7 | 80.6 |
| | 26 | 17.0 | 25.5 | 13.3 | 20.0 | 11.2 | 16.8 | 9.03 | 13.6 | 7.83 | 11.8 | 51.6 | 77.5 |
| | 27 | 16.3 | 24.5 | 12.8 | 19.3 | 10.8 | 16.2 | 8.69 | 13.1 | 7.54 | 11.3 | 49.7 | 74.7 |
| | 28 | 15.7 | 23.7 | 12.4 | 18.6 | 10.4 | 15.6 | 8.38 | 12.6 | 7.27 | 10.9 | 47.9 | 72.0 |
| | 29 | 15.2 | 22.8 | 11.9 | 17.9 | 10.0 | 15.1 | 8.09 | 12.2 | 7.02 | 10.6 | 46.3 | 69.5 |
| | 30 | 14.7 | 22.1 | 11.5 | 17.3 | 9.70 | 14.6 | 7.82 | 11.8 | 6.79 | 10.2 | 44.7 | 67.2 |
| | 32 | 13.8 | 20.7 | 10.8 | 16.3 | 9.09 | 13.7 | 7.34 | 11.0 | 6.36 | 9.56 | 41.9 | 63.0 |
| | 34 | 13.0 | 19.5 | 10.2 | 15.3 | 8.56 | 12.9 | 6.90 | 10.4 | 5.99 | 9.00 | 39.5 | 59.3 |
| | 36 | 12.2 | 18.4 | 9.61 | 14.5 | 8.08 | 12.2 | 6.52 | 9.80 | 5.66 | 8.50 | 37.3 | 56.0 |
| | 38 | 11.6 | 17.4 | 9.11 | 13.7 | 7.66 | 11.5 | 6.18 | 9.28 | 5.36 | 8.05 | 35.3 | 53.1 |
| | 40 | 11.0 | 16.6 | 8.65 | 13.0 | 7.28 | 10.9 | 5.87 | 8.82 | 5.09 | 7.65 | 33.5 | 50.4 |
| | 42 | 10.5 | 15.8 | 8.24 | 12.4 | 6.93 | 10.4 | 5.59 | 8.40 | 4.85 | 7.29 | 31.9 | 48.0 |
| | 44 | 10.0 | 15.1 | 7.87 | 11.8 | 6.61 | 9.94 | 5.33 | 8.02 | 4.63 | 6.95 | 30.5 | 45.8 |
| | 46 | 9.58 | 14.4 | 7.52 | 11.3 | 6.33 | 9.51 | 5.10 | 7.67 | 4.43 | 6.65 | 29.2 | 43.8 |
| | 48 | 9.18 | 13.8 | 7.21 | 10.8 | 6.06 | 9.11 | 4.89 | 7.35 | 4.24 | 6.38 | 27.9 | 42.0 |
| | 50 | 8.81 | 13.2 | 6.92 | 10.4 | 5.82 | 8.75 | 4.69 | 7.06 | 4.07 | 6.12 | 26.8 | 40.3 |
| | 52 | 8.48 | 12.7 | 6.66 | 10.0 | 5.60 | 8.41 | 4.51 | 6.78 | 3.92 | 5.88 | 25.8 | 38.8 |
| | 54 | 8.16 | 12.3 | 6.41 | 9.63 | 5.39 | 8.10 | 4.35 | 6.53 | 3.77 | 5.67 | 24.8 | 37.3 |
| | 56 | 7.87 | 11.8 | 6.18 | 9.29 | 5.20 | 7.81 | 4.19 | 6.30 | 3.64 | 5.46 | 24.0 | 36.0 |
| | 58 | 7.60 | 11.4 | 5.97 | 8.97 | 5.02 | 7.54 | 4.05 | 6.08 | 3.51 | 5.28 | 23.1 | 34.8 |
| | 60 | 7.35 | 11.0 | 5.77 | 8.67 | 4.85 | 7.29 | 3.91 | 5.88 | 3.39 | 5.10 | 22.4 | 33.6 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 441 | 662 | 346 | 520 | 291 | 437 | 235 | 353 | 204 | 306 | 1340 | 2020 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 55.1 | 82.8 | 43.3 | 65.0 | 36.4 | 54.7 | 29.3 | 44.1 | 25.4 | 38.3 | 168 | 252 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 22.2 | 33.4 | 16.8 | 25.3 | 14.1 | 21.2 | 11.3 | 16.9 | 9.77 | 14.7 | 65.8 | 98.9 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.92 | 2.89 | 2.44 | 3.67 | 2.24 | 3.37 | 1.99 | 2.99 | 1.81 | 2.72 | 1.37 | 2.06 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 30.2 | 45.5 | 34.5 | 51.8 | 30.9 | 46.4 | 28.5 | 42.8 | 25.7 | 38.6 | 70.4 | 106 |
| $Z_x$, in.$^3$ | | 36.8 | | 28.9 | | 24.3 | | 19.6 | | 17.0 | | 112 | |
| $L_p$, ft | | 3.08 | | 1.74 | | 1.68 | | 1.59 | | 1.55 | | 5.38 | |
| $L_r$, ft | | 20.2 | | 12.6 | | 11.6 | | 10.7 | | 10.2 | | 79.5 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

W10

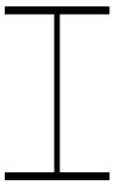
| Shape | | W10× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 77 | | 68 | | 60 | | 54 | | 49 | | 45 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | 76.2 | 115 |
| | 9 | 121 | 182 | 105 | 158 | 92.4 | 139 | 80.6 | 121 | 73.2 | 110 | 71.9 | 108 |
| | 10 | 116 | 174 | 101 | 152 | 88.1 | 132 | 78.7 | 118 | 71.1 | 107 | 64.7 | 97.2 |
| | 11 | 105 | 158 | 91.8 | 138 | 80.1 | 120 | 71.5 | 108 | 64.7 | 97.2 | 58.8 | 88.4 |
| | 12 | 96.5 | 145 | 84.1 | 126 | 73.5 | 110 | 65.6 | 98.6 | 59.3 | 89.1 | 53.9 | 81.0 |
| | 13 | 89.1 | 134 | 77.7 | 117 | 67.8 | 102 | 60.5 | 91.0 | 54.7 | 82.2 | 49.7 | 74.8 |
| | 14 | 82.7 | 124 | 72.1 | 108 | 63.0 | 94.6 | 56.2 | 84.5 | 50.8 | 76.4 | 46.2 | 69.4 |
| | 15 | 77.2 | 116 | 67.3 | 101 | 58.8 | 88.3 | 52.5 | 79 | 47.4 | 71.3 | 43.1 | 64.8 |
| | 16 | 72.4 | 109 | 63.1 | 94.8 | 55.1 | 82.8 | 49.2 | 73.9 | 44.5 | 66.8 | 40.4 | 60.8 |
| | 17 | 68.1 | 102 | 59.4 | 89.3 | 51.8 | 77.9 | 46.3 | 69.6 | 41.8 | 62.9 | 38.0 | 57.2 |
| | 18 | 64.3 | 96.7 | 56.1 | 84.3 | 49.0 | 73.6 | 43.7 | 65.7 | 39.5 | 59.4 | 35.9 | 54.0 |
| | 19 | 61.0 | 91.6 | 53.1 | 79.9 | 46.4 | 69.7 | 41.4 | 62.2 | 37.4 | 56.3 | 34.0 | 51.2 |
| | 20 | 57.9 | 87.0 | 50.5 | 75.9 | 44.1 | 66.2 | 39.3 | 59.1 | 35.6 | 53.5 | 32.3 | 48.6 |
| | 21 | 55.1 | 82.9 | 48.1 | 72.3 | 42.0 | 63.1 | 37.5 | 56.3 | 33.9 | 50.9 | 30.8 | 46.3 |
| | 22 | 52.6 | 79.1 | 45.9 | 69.0 | 40.1 | 60.2 | 35.8 | 53.8 | 32.3 | 48.6 | 29.4 | 44.2 |
| | 23 | 50.4 | 75.7 | 43.9 | 66.0 | 38.3 | 57.6 | 34.2 | 51.4 | 30.9 | 46.5 | 28.1 | 42.3 |
| | 24 | 48.3 | 72.5 | 42.1 | 63.2 | 36.7 | 55.2 | 32.8 | 49.3 | 29.6 | 44.6 | 26.9 | 40.5 |
| | 25 | 46.3 | 69.6 | 40.4 | 60.7 | 35.3 | 53.0 | 31.5 | 47.3 | 28.5 | 42.8 | 25.9 | 38.9 |
| | 26 | 44.5 | 66.9 | 38.8 | 58.4 | 33.9 | 51.0 | 30.3 | 45.5 | 27.4 | 41.1 | 24.9 | 37.4 |
| | 27 | 42.9 | 64.5 | 37.4 | 56.2 | 32.6 | 49.1 | 29.1 | 43.8 | 26.3 | 39.6 | 24.0 | 36.0 |
| | 28 | 41.4 | 62.2 | 36.1 | 54.2 | 31.5 | 47.3 | 28.1 | 42.2 | 25.4 | 38.2 | 23.1 | 34.7 |
| | 29 | 39.9 | 60.0 | 34.8 | 52.3 | 30.4 | 45.7 | 27.1 | 40.8 | 24.5 | 36.9 | 22.3 | 33.5 |
| | 30 | 38.6 | 58.0 | 33.7 | 50.6 | 29.4 | 44.2 | 26.2 | 39.4 | 23.7 | 35.6 | 21.6 | 32.4 |
| | 32 | 36.2 | 54.4 | 31.5 | 47.4 | 27.5 | 41.4 | 24.6 | 37.0 | 22.2 | 33.4 | 20.2 | 30.4 |
| | 34 | 34.1 | 51.2 | 29.7 | 44.6 | 25.9 | 39.0 | 23.1 | 34.8 | 20.9 | 31.4 | 19.0 | 28.6 |
| | 36 | 32.2 | 48.4 | 28.0 | 42.2 | 24.5 | 36.8 | 21.9 | 32.9 | 19.8 | 29.7 | 18.0 | 27.0 |
| | 38 | 30.5 | 45.8 | 26.6 | 39.9 | 23.2 | 34.9 | 20.7 | 31.1 | 18.7 | 28.1 | 17.0 | 25.6 |
| | 40 | 29.0 | 43.5 | 25.2 | 37.9 | 22.0 | 33.1 | 19.7 | 29.6 | 17.8 | 26.7 | 16.2 | 24.3 |
| | 42 | 27.6 | 41.4 | 24.0 | 36.1 | 21.0 | 31.5 | 18.7 | 28.2 | 16.9 | 25.5 | 15.4 | 23.1 |
| | 44 | 26.3 | 39.6 | 22.9 | 34.5 | 20.0 | 30.1 | 17.9 | 26.9 | 16.2 | 24.3 | 14.7 | 22.1 |
| | 46 | 25.2 | 37.8 | 21.9 | 33.0 | 19.2 | 28.8 | 17.1 | 25.7 | 15.5 | 23.2 | 14.1 | 21.1 |
| | 48 | 24.1 | 36.3 | 21.0 | 31.6 | 18.4 | 27.6 | 16.4 | 24.6 | 14.8 | 22.3 | 13.5 | 20.3 |
| | 50 | 23.2 | 34.8 | 20.2 | 30.3 | 17.6 | 26.5 | 15.7 | 23.7 | 14.2 | 21.4 | 12.9 | 19.4 |
| | 52 | 22.3 | 33.5 | 19.4 | 29.2 | 17.0 | 25.5 | 15.1 | 22.7 | 13.7 | 20.6 | 12.4 | 18.7 |
| | 54 | 21.4 | 32.2 | 18.7 | 28.1 | 16.3 | 24.5 | 14.6 | 21.9 | 13.2 | 19.8 | 12.0 | 18.0 |
| | 56 | 20.7 | 31.1 | 18.0 | 27.1 | 15.7 | 23.7 | 14.1 | 21.1 | 12.7 | 19.1 | 11.5 | 17.4 |
| | 58 | 20.0 | 30.0 | 17.4 | 26.2 | 15.2 | 22.8 | 13.6 | 20.4 | 12.3 | 18.4 | 11.2 | 16.8 |
| | 60 | 19.3 | 29.0 | 16.8 | 25.3 | 14.7 | 22.1 | 13.1 | 19.7 | 11.9 | 17.8 | 10.8 | 16.2 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 1160 | 1740 | 1010 | 1520 | 881 | 1320 | 787 | 1180 | 711 | 1070 | 647 | 972 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 145 | 218 | 126 | 190 | 110 | 166 | 98.4 | 148 | 88.9 | 134 | 80.8 | 122 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 57.4 | 86.3 | 50.5 | 75.8 | 44.4 | 66.7 | 39.9 | 59.9 | 36.2 | 54.5 | 32.5 | 48.9 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.35 | 2.03 | 1.34 | 2.01 | 1.32 | 1.98 | 1.30 | 1.95 | 1.27 | 1.92 | 1.34 | 2.02 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 60.6 | 91.0 | 52.7 | 79.2 | 46.2 | 69.4 | 40.3 | 60.5 | 36.6 | 55.0 | 38.1 | 57.3 |
| $Z_x$, in.$^3$ | | 96.7 | | 84.3 | | 73.6 | | 65.7 | | 59.4 | | 54.0 | |
| $L_p$, ft | | 5.34 | | 5.30 | | 5.25 | | 5.23 | | 5.21 | | 4.11 | |
| $L_r$, ft | | 69.9 | | 62.0 | | 55.3 | | 50.3 | | 46.5 | | 40.0 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W10

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
### W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W10× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 39 | | 33 | | 30 | | 26 | | 22 | | 19 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | 55.0 | 82.6 |
| | 5 | | | | | | | | | 52.8 | 79.4 | 50.8 | 76.3 |
| | 6 | | | | | 68.0 | 102 | 57.8 | 86.8 | 51.3 | 77.1 | 42.3 | 63.6 |
| | 7 | | | 60.8 | 91.4 | 61.9 | 93.1 | 52.9 | 79.5 | 44.0 | 66.1 | 36.3 | 54.5 |
| | 8 | 67.4 | 101 | 56.7 | 85.3 | 54.2 | 81.5 | 46.3 | 69.5 | 38.5 | 57.8 | 31.7 | 47.7 |
| | 9 | 61.1 | 91.8 | 50.4 | 75.8 | 48.2 | 72.4 | 41.1 | 61.8 | 34.2 | 51.4 | 28.2 | 42.4 |
| | 10 | 55.0 | 82.6 | 45.4 | 68.2 | 43.4 | 65.2 | 37.0 | 55.6 | 30.8 | 46.3 | 25.4 | 38.2 |
| | 11 | 50.0 | 75.1 | 41.3 | 62.0 | 39.4 | 59.2 | 33.6 | 50.6 | 28.0 | 42.1 | 23.1 | 34.7 |
| | 12 | 45.8 | 68.9 | 37.8 | 56.9 | 36.1 | 54.3 | 30.8 | 46.4 | 25.6 | 38.6 | 21.2 | 31.8 |
| | 13 | 42.3 | 63.6 | 34.9 | 52.5 | 33.3 | 50.1 | 28.5 | 42.8 | 23.7 | 35.6 | 19.5 | 29.4 |
| | 14 | 39.3 | 59.0 | 32.4 | 48.7 | 31.0 | 46.5 | 26.4 | 39.7 | 22.0 | 33.0 | 18.1 | 27.3 |
| | 15 | 36.6 | 55.1 | 30.3 | 45.5 | 28.9 | 43.4 | 24.7 | 37.1 | 20.5 | 30.8 | 16.9 | 25.4 |
| | 16 | 34.4 | 51.6 | 28.4 | 42.6 | 27.1 | 40.7 | 23.1 | 34.8 | 19.2 | 28.9 | 15.9 | 23.9 |
| | 17 | 32.3 | 48.6 | 26.7 | 40.1 | 25.5 | 38.3 | 21.8 | 32.7 | 18.1 | 27.2 | 14.9 | 22.4 |
| | 18 | 30.5 | 45.9 | 25.2 | 37.9 | 24.1 | 36.2 | 20.6 | 30.9 | 17.1 | 25.7 | 14.1 | 21.2 |
| | 19 | 28.9 | 43.5 | 23.9 | 35.9 | 22.8 | 34.3 | 19.5 | 29.3 | 16.2 | 24.3 | 13.4 | 20.1 |
| | 20 | 27.5 | 41.3 | 22.7 | 34.1 | 21.7 | 32.6 | 18.5 | 27.8 | 15.4 | 23.1 | 12.7 | 19.1 |
| | 21 | 26.2 | 39.3 | 21.6 | 32.5 | 20.6 | 31.0 | 17.6 | 26.5 | 14.7 | 22.0 | 12.1 | 18.2 |
| | 22 | 25.0 | 37.6 | 20.6 | 31.0 | 19.7 | 29.6 | 16.8 | 25.3 | 14.0 | 21.0 | 11.5 | 17.3 |
| | 23 | 23.9 | 35.9 | 19.7 | 29.7 | 18.8 | 28.3 | 16.1 | 24.2 | 13.4 | 20.1 | 11.0 | 16.6 |
| | 24 | 22.9 | 34.4 | 18.9 | 28.4 | 18.1 | 27.2 | 15.4 | 23.2 | 12.8 | 19.3 | 10.6 | 15.9 |
| | 25 | 22.0 | 33.0 | 18.2 | 27.3 | 17.3 | 26.1 | 14.8 | 22.2 | 12.3 | 18.5 | 10.2 | 15.3 |
| | 26 | 21.1 | 31.8 | 17.5 | 26.2 | 16.7 | 25.1 | 14.2 | 21.4 | 11.8 | 17.8 | 9.77 | 14.7 |
| | 27 | 20.4 | 30.6 | 16.8 | 25.3 | 16.1 | 24.1 | 13.7 | 20.6 | 11.4 | 17.1 | 9.40 | 14.1 |
| | 28 | 19.6 | 29.5 | 16.2 | 24.4 | 15.5 | 23.3 | 13.2 | 19.9 | 11.0 | 16.5 | 9.07 | 13.6 |
| | 29 | 19.0 | 28.5 | 15.7 | 23.5 | 14.9 | 22.5 | 12.8 | 19.2 | 10.6 | 16.0 | 8.75 | 13.2 |
| | 30 | 18.3 | 27.5 | 15.1 | 22.7 | 14.5 | 21.7 | 12.3 | 18.5 | 10.3 | 15.4 | 8.46 | 12.7 |
| | 32 | 17.2 | 25.8 | 14.2 | 21.3 | 13.5 | 20.4 | 11.6 | 17.4 | 9.62 | 14.5 | 7.93 | 11.9 |
| | 34 | 16.2 | 24.3 | 13.3 | 20.1 | 12.8 | 19.2 | 10.9 | 16.4 | 9.05 | 13.6 | 7.47 | 11.2 |
| | 36 | 15.3 | 23.0 | 12.6 | 19.0 | 12.0 | 18.1 | 10.3 | 15.5 | 8.55 | 12.9 | 7.05 | 10.6 |
| | 38 | 14.5 | 21.7 | 11.9 | 18.0 | 11.4 | 17.1 | 9.74 | 14.6 | 8.10 | 12.2 | 6.68 | 10.0 |
| | 40 | 13.7 | 20.7 | 11.3 | 17.1 | 10.8 | 16.3 | 9.25 | 13.9 | 7.69 | 11.6 | 6.35 | 9.54 |
| | 42 | 13.1 | 19.7 | 10.8 | 16.2 | 10.3 | 15.5 | 8.81 | 13.2 | 7.33 | 11.0 | 6.05 | 9.09 |
| | 44 | 12.5 | 18.8 | 10.3 | 15.5 | 9.85 | 14.8 | 8.41 | 12.6 | 7.00 | 10.5 | 5.77 | 8.67 |
| | 46 | 12.0 | 18.0 | 9.87 | 14.8 | 9.42 | 14.2 | 8.04 | 12.1 | 6.69 | 10.1 | 5.52 | 8.30 |
| | 48 | 11.5 | 17.2 | 9.46 | 14.2 | 9.03 | 13.6 | 7.71 | 11.6 | 6.41 | 9.64 | 5.29 | 7.95 |
| | 50 | 11.0 | 16.5 | 9.08 | 13.6 | 8.67 | 13.0 | 7.40 | 11.1 | 6.16 | 9.25 | 5.08 | 7.63 |
| | 52 | 10.6 | 15.9 | 8.73 | 13.1 | 8.34 | 12.5 | 7.12 | 10.7 | 5.92 | 8.90 | 4.88 | 7.34 |
| | 54 | 10.2 | 15.3 | 8.41 | 12.6 | 8.03 | 12.1 | 6.85 | 10.3 | 5.70 | 8.57 | 4.70 | 7.07 |
| | 56 | 9.82 | 14.8 | 8.11 | 12.2 | 7.74 | 11.6 | 6.61 | 9.93 | 5.50 | 8.26 | 4.53 | 6.81 |
| | 58 | 9.48 | 14.2 | 7.83 | 11.8 | 7.47 | 11.2 | 6.38 | 9.59 | 5.31 | 7.98 | 4.38 | 6.58 |
| | 60 | 9.16 | 13.8 | 7.56 | 11.4 | 7.23 | 10.9 | 6.17 | 9.27 | 5.13 | 7.71 | 4.23 | 6.36 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 550 | 826 | 454 | 682 | 434 | 652 | 370 | 556 | 308 | 463 | 254 | 382 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 68.7 | 103 | 56.7 | 85.3 | 54.2 | 81.5 | 46.3 | 69.5 | 38.5 | 57.8 | 31.7 | 47.7 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 27.8 | 41.8 | 23.0 | 34.6 | 21.6 | 32.5 | 18.6 | 27.9 | 15.4 | 23.2 | 12.5 | 18.7 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.31 | 1.97 | 1.25 | 1.88 | 1.58 | 2.38 | 1.51 | 2.27 | 1.41 | 2.12 | 1.64 | 2.47 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 33.7 | 50.6 | 30.4 | 45.7 | 34.0 | 51.0 | 28.9 | 43.4 | 26.4 | 39.7 | 27.5 | 41.3 |
| $Z_x$, in.$^3$ | | 45.9 | | 37.9 | | 36.2 | | 30.9 | | 25.7 | | 21.2 | |
| $L_p$, ft | | 4.07 | | 3.99 | | 2.81 | | 2.79 | | 2.71 | | 1.79 | |
| $L_r$, ft | | 35.3 | | 30.9 | | 23.4 | | 21.1 | | 19.0 | | 13.5 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

W10-W8

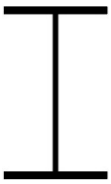
| Shape | | W10× | | | | | | W8× | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 17 | | 15 | | 12 | | 67 | | 58 | | 48 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | 52.2 | 78.6 | 46.7 | 70.2 | 36.8 | 55.4 | | | | | | |
| | 5 | 43.8 | 65.9 | 37.4 | 56.2 | 29.5 | 44.3 | | | | | | |
| | 6 | 36.5 | 54.9 | 31.1 | 46.8 | 24.6 | 36.9 | | | | | | |
| | 7 | 31.3 | 47.1 | 26.7 | 40.1 | 21.0 | 31.6 | 111 | 166 | 96.2 | 145 | 73.2 | 110 |
| | 8 | 27.4 | 41.2 | 23.4 | 35.1 | 18.4 | 27.7 | 104 | 157 | 88.8 | 133 | 72.6 | 109 |
| | 9 | 24.4 | 36.6 | 20.8 | 31.2 | 16.4 | 24.6 | 92.7 | 139 | 78.9 | 119 | 64.5 | 97.0 |
| | 10 | 21.9 | 32.9 | 18.7 | 28.1 | 14.7 | 22.1 | 83.5 | 125 | 71.0 | 107 | 58.1 | 87.3 |
| | 11 | 19.9 | 29.9 | 17.0 | 25.5 | 13.4 | 20.1 | 75.9 | 114 | 64.6 | 97.0 | 52.8 | 79.4 |
| | 12 | 18.3 | 27.5 | 15.6 | 23.4 | 12.3 | 18.5 | 69.6 | 105 | 59.2 | 89.0 | 48.4 | 72.8 |
| | 13 | 16.9 | 25.3 | 14.4 | 21.6 | 11.3 | 17.0 | 64.2 | 96.5 | 54.6 | 82.1 | 44.7 | 67.2 |
| | 14 | 15.7 | 23.5 | 13.3 | 20.1 | 10.5 | 15.8 | 59.6 | 89.6 | 50.7 | 76.2 | 41.5 | 62.4 |
| | 15 | 14.6 | 22.0 | 12.5 | 18.7 | 9.82 | 14.8 | 55.6 | 83.6 | 47.3 | 71.2 | 38.7 | 58.2 |
| | 16 | 13.7 | 20.6 | 11.7 | 17.6 | 9.21 | 13.8 | 52.2 | 78.4 | 44.4 | 66.7 | 36.3 | 54.6 |
| | 17 | 12.9 | 19.4 | 11.0 | 16.5 | 8.67 | 13.0 | 49.1 | 73.8 | 41.8 | 62.8 | 34.2 | 51.4 |
| | 18 | 12.2 | 18.3 | 10.4 | 15.6 | 8.18 | 12.3 | 46.4 | 69.7 | 39.5 | 59.3 | 32.3 | 48.5 |
| | 19 | 11.5 | 17.3 | 9.83 | 14.8 | 7.75 | 11.7 | 43.9 | 66.0 | 37.4 | 56.2 | 30.6 | 45.9 |
| | 20 | 11.0 | 16.5 | 9.34 | 14.0 | 7.37 | 11.1 | 41.7 | 62.7 | 35.5 | 53.4 | 29.0 | 43.7 |
| | 21 | 10.4 | 15.7 | 8.90 | 13.4 | 7.01 | 10.5 | 39.7 | 59.7 | 33.8 | 50.8 | 27.7 | 41.6 |
| | 22 | 10.0 | 15.0 | 8.49 | 12.8 | 6.70 | 10.1 | 37.9 | 57.0 | 32.3 | 48.5 | 26.4 | 39.7 |
| | 23 | 9.53 | 14.3 | 8.12 | 12.2 | 6.40 | 9.63 | 36.3 | 54.5 | 30.9 | 46.4 | 25.3 | 38.0 |
| | 24 | 9.13 | 13.7 | 7.78 | 11.7 | 6.14 | 9.23 | 34.8 | 52.3 | 29.6 | 44.5 | 24.2 | 36.4 |
| | 25 | 8.77 | 13.2 | 7.47 | 11.2 | 5.89 | 8.86 | 33.4 | 50.2 | 28.4 | 42.7 | 23.2 | 34.9 |
| | 26 | 8.43 | 12.7 | 7.19 | 10.8 | 5.67 | 8.52 | 32.1 | 48.3 | 27.3 | 41.1 | 22.3 | 33.6 |
| | 27 | 8.12 | 12.2 | 6.92 | 10.4 | 5.46 | 8.20 | 30.9 | 46.5 | 26.3 | 39.5 | 21.5 | 32.3 |
| | 28 | 7.83 | 11.8 | 6.67 | 10.0 | 5.26 | 7.91 | 29.8 | 44.8 | 25.4 | 38.1 | 20.7 | 31.2 |
| | 29 | 7.56 | 11.4 | 6.44 | 9.68 | 5.08 | 7.63 | 28.8 | 43.3 | 24.5 | 36.8 | 20.0 | 30.1 |
| | 30 | 7.31 | 11.0 | 6.23 | 9.36 | 4.91 | 7.38 | 27.8 | 41.8 | 23.7 | 35.6 | 19.4 | 29.1 |
| | 32 | 6.85 | 10.3 | 5.84 | 8.78 | 4.60 | 6.92 | 26.1 | 39.2 | 22.2 | 33.4 | 18.2 | 27.3 |
| | 34 | 6.45 | 9.69 | 5.49 | 8.26 | 4.33 | 6.51 | 24.6 | 36.9 | 20.9 | 31.4 | 17.1 | 25.7 |
| | 36 | 6.09 | 9.15 | 5.19 | 7.80 | 4.09 | 6.15 | 23.2 | 34.9 | 19.7 | 29.7 | 16.1 | 24.3 |
| | 38 | 5.77 | 8.67 | 4.92 | 7.39 | 3.88 | 5.83 | 22.0 | 33.0 | 18.7 | 28.1 | 15.3 | 23.0 |
| | 40 | 5.48 | 8.24 | 4.67 | 7.02 | 3.68 | 5.54 | 20.9 | 31.4 | 17.8 | 26.7 | 14.5 | 21.8 |
| | 42 | 5.22 | 7.84 | 4.45 | 6.69 | 3.51 | 5.27 | 19.9 | 29.9 | 16.9 | 25.4 | 13.8 | 20.8 |
| | 44 | 4.98 | 7.49 | 4.25 | 6.38 | 3.35 | 5.03 | 19.0 | 28.5 | 16.1 | 24.3 | 13.2 | 19.8 |
| | 46 | 4.76 | 7.16 | 4.06 | 6.10 | 3.20 | 4.81 | 18.1 | 27.3 | 15.4 | 23.2 | 12.6 | 19.0 |
| | 48 | 4.57 | 6.86 | 3.89 | 5.85 | 3.07 | 4.61 | 17.4 | 26.1 | 14.8 | 22.2 | 12.1 | 18.2 |
| | 50 | 4.38 | 6.59 | 3.74 | 5.62 | 2.95 | 4.43 | 16.7 | 25.1 | 14.2 | 21.3 | 11.6 | 17.5 |
| | 52 | 4.21 | 6.33 | 3.59 | 5.40 | 2.83 | 4.26 | 16.1 | 24.1 | 13.7 | 20.5 | 11.2 | 16.8 |
| | 54 | 4.06 | 6.10 | 3.46 | 5.20 | 2.73 | 4.10 | 15.5 | 23.2 | 13.2 | 19.8 | 10.8 | 16.2 |
| | 56 | 3.91 | 5.88 | 3.34 | 5.01 | 2.63 | 3.95 | 14.9 | 22.4 | 12.7 | 19.1 | 10.4 | 15.6 |
| | 58 | 3.78 | 5.68 | 3.22 | 4.84 | 2.54 | 3.82 | 14.4 | 21.6 | 12.2 | 18.4 | 10.0 | 15.1 |
| | 60 | 3.65 | 5.49 | 3.11 | 4.68 | 2.46 | 3.69 | 13.9 | 20.9 | 11.8 | 17.8 | 9.68 | 14.6 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 219 | 329 | 187 | 281 | 147 | 221 | 835 | 1250 | 710 | 1070 | 581 | 873 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 27.4 | 41.2 | 23.4 | 35.1 | 18.4 | 27.7 | 104 | 157 | 88.8 | 133 | 72.6 | 109 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 10.7 | 16.1 | 9.09 | 13.7 | 7.14 | 10.7 | 40.4 | 60.8 | 34.8 | 52.3 | 28.9 | 43.4 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.55 | 2.33 | 1.43 | 2.16 | 1.24 | 1.87 | 0.910 | 1.37 | 0.893 | 1.34 | 0.874 | 1.31 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 26.1 | 39.3 | 24.8 | 37.2 | 20.2 | 30.4 | 55.3 | 83.1 | 48.1 | 72.3 | 36.6 | 55.1 |
| $Z_x$, in.$^3$ | | 18.3 | | 15.6 | | 12.3 | | 69.7 | | 59.3 | | 48.5 | |
| $L_p$, ft | | 1.73 | | 1.66 | | 1.62 | | 4.34 | | 4.28 | | 4.26 | |
| $L_r$, ft | | 12.5 | | 11.6 | | 10.7 | | 74.6 | | 64.7 | | 54.3 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W8

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W8× | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 40 | | 35 | | 31 | | 28 | | 24 | | 21 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | 44.6 | 67.0 |
| | 6 | | | | | | | 49.6 | 74.4 | 41.8 | 63.0 | 40.1 | 60.3 |
| | 7 | 64.0 | 96.2 | 54.2 | 81.6 | 49.2 | 73.8 | 45.7 | 68.7 | 38.8 | 58.4 | 34.4 | 51.7 |
| | 8 | 58.8 | 88.4 | 51.2 | 77.0 | 44.8 | 67.3 | 40.0 | 60.1 | 34.0 | 51.1 | 30.1 | 45.2 |
| | 9 | 52.3 | 78.6 | 45.5 | 68.4 | 39.8 | 59.8 | 35.5 | 53.4 | 30.2 | 45.4 | 26.7 | 40.2 |
| | 10 | 47.1 | 70.7 | 41.0 | 61.6 | 35.8 | 53.8 | 32.0 | 48.1 | 27.2 | 40.9 | 24.1 | 36.2 |
| | 11 | 42.8 | 64.3 | 37.2 | 56.0 | 32.6 | 48.9 | 29.1 | 43.7 | 24.7 | 37.1 | 21.9 | 32.9 |
| | 12 | 39.2 | 59.0 | 34.1 | 51.3 | 29.8 | 44.9 | 26.6 | 40.1 | 22.7 | 34.1 | 20.1 | 30.2 |
| | 13 | 36.2 | 54.4 | 31.5 | 47.4 | 27.5 | 41.4 | 24.6 | 37.0 | 20.9 | 31.4 | 18.5 | 27.8 |
| | 14 | 33.6 | 50.5 | 29.3 | 44.0 | 25.6 | 38.4 | 22.8 | 34.3 | 19.4 | 29.2 | 17.2 | 25.8 |
| | 15 | 31.4 | 47.2 | 27.3 | 41.0 | 23.9 | 35.9 | 21.3 | 32.0 | 18.1 | 27.2 | 16.0 | 24.1 |
| | 16 | 29.4 | 44.2 | 25.6 | 38.5 | 22.4 | 33.6 | 20.0 | 30.0 | 17.0 | 25.5 | 15.0 | 22.6 |
| | 17 | 27.7 | 41.6 | 24.1 | 36.2 | 21.1 | 31.7 | 18.8 | 28.3 | 16.0 | 24.0 | 14.2 | 21.3 |
| | 18 | 26.1 | 39.3 | 22.8 | 34.2 | 19.9 | 29.9 | 17.8 | 26.7 | 15.1 | 22.7 | 13.4 | 20.1 |
| | 19 | 24.8 | 37.2 | 21.6 | 32.4 | 18.8 | 28.3 | 16.8 | 25.3 | 14.3 | 21.5 | 12.7 | 19.0 |
| | 20 | 23.5 | 35.4 | 20.5 | 30.8 | 17.9 | 26.9 | 16.0 | 24.0 | 13.6 | 20.4 | 12.0 | 18.1 |
| | 21 | 22.4 | 33.7 | 19.5 | 29.3 | 17.1 | 25.6 | 15.2 | 22.9 | 12.9 | 19.5 | 11.5 | 17.2 |
| | 22 | 21.4 | 32.2 | 18.6 | 28.0 | 16.3 | 24.5 | 14.5 | 21.8 | 12.4 | 18.6 | 10.9 | 16.4 |
| | 23 | 20.5 | 30.8 | 17.8 | 26.8 | 15.6 | 23.4 | 13.9 | 20.9 | 11.8 | 17.8 | 10.5 | 15.7 |
| | 24 | 19.6 | 29.5 | 17.1 | 25.7 | 14.9 | 22.4 | 13.3 | 20.0 | 11.3 | 17.0 | 10.0 | 15.1 |
| | 25 | 18.8 | 28.3 | 16.4 | 24.6 | 14.3 | 21.5 | 12.8 | 19.2 | 10.9 | 16.3 | 9.63 | 14.5 |
| | 26 | 18.1 | 27.2 | 15.8 | 23.7 | 13.8 | 20.7 | 12.3 | 18.5 | 10.5 | 15.7 | 9.26 | 13.9 |
| | 27 | 17.4 | 26.2 | 15.2 | 22.8 | 13.3 | 19.9 | 11.8 | 17.8 | 10.1 | 15.1 | 8.92 | 13.4 |
| | 28 | 16.8 | 25.3 | 14.6 | 22.0 | 12.8 | 19.2 | 11.4 | 17.2 | 9.71 | 14.6 | 8.60 | 12.9 |
| | 29 | 16.2 | 24.4 | 14.1 | 21.2 | 12.3 | 18.6 | 11.0 | 16.6 | 9.37 | 14.1 | 8.30 | 12.5 |
| | 30 | 15.7 | 23.6 | 13.7 | 20.5 | 11.9 | 17.9 | 10.7 | 16.0 | 9.06 | 13.6 | 8.02 | 12.1 |
| | 32 | 14.7 | 22.1 | 12.8 | 19.2 | 11.2 | 16.8 | 10.0 | 15.0 | 8.50 | 12.8 | 7.52 | 11.3 |
| | 34 | 13.8 | 20.8 | 12.0 | 18.1 | 10.5 | 15.8 | 9.40 | 14.1 | 8.00 | 12.0 | 7.08 | 10.6 |
| | 36 | 13.1 | 19.7 | 11.4 | 17.1 | 10.0 | 15.0 | 8.88 | 13.4 | 7.55 | 11.4 | 6.69 | 10.1 |
| | 38 | 12.4 | 18.6 | 10.8 | 16.2 | 9.42 | 14.2 | 8.41 | 12.6 | 7.15 | 10.8 | 6.33 | 9.52 |
| | 40 | 11.8 | 17.7 | 10.2 | 15.4 | 8.95 | 13.5 | 7.99 | 12.0 | 6.80 | 10.2 | 6.02 | 9.05 |
| | 42 | 11.2 | 16.8 | 9.75 | 14.7 | 8.53 | 12.8 | 7.61 | 11.4 | 6.47 | 9.73 | 5.73 | 8.61 |
| | 44 | 10.7 | 16.1 | 9.31 | 14.0 | 8.14 | 12.2 | 7.27 | 10.9 | 6.18 | 9.29 | 5.47 | 8.22 |
| | 46 | 10.2 | 15.4 | 8.90 | 13.4 | 7.78 | 11.7 | 6.95 | 10.4 | 5.91 | 8.88 | 5.23 | 7.87 |
| | 48 | 9.81 | 14.7 | 8.53 | 12.8 | 7.46 | 11.2 | 6.66 | 10.0 | 5.66 | 8.51 | 5.01 | 7.54 |
| | 50 | 9.41 | 14.1 | 8.19 | 12.3 | 7.16 | 10.8 | 6.40 | 9.61 | 5.44 | 8.17 | 4.81 | 7.24 |
| | 52 | 9.05 | 13.6 | 7.88 | 11.8 | 6.89 | 10.4 | 6.15 | 9.24 | 5.23 | 7.86 | 4.63 | 6.96 |
| | 54 | 8.72 | 13.1 | 7.58 | 11.4 | 6.63 | 10.0 | 5.92 | 8.90 | 5.03 | 7.57 | 4.46 | 6.70 |
| | 56 | 8.40 | 12.6 | 7.31 | 11.0 | 6.39 | 9.61 | 5.71 | 8.58 | 4.85 | 7.30 | 4.30 | 6.46 |
| | 58 | 8.11 | 12.2 | 7.06 | 10.6 | 6.17 | 9.28 | 5.51 | 8.29 | 4.69 | 7.04 | 4.15 | 6.24 |
| | 60 | 7.84 | 11.8 | 6.83 | 10.3 | 5.97 | 8.97 | 5.33 | 8.01 | 4.53 | 6.81 | 4.01 | 6.03 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 471 | 707 | 410 | 616 | 358 | 538 | 320 | 481 | 272 | 409 | 241 | 362 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 58.8 | 88.4 | 51.2 | 77.0 | 44.8 | 67.3 | 40.0 | 60.1 | 34.0 | 51.1 | 30.1 | 45.2 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 23.6 | 35.5 | 20.7 | 31.2 | 18.3 | 27.4 | 16.1 | 24.2 | 13.8 | 20.8 | 12.1 | 18.1 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.858 | 1.29 | 0.841 | 1.26 | 0.823 | 1.24 | 0.863 | 1.30 | 0.837 | 1.26 | 0.962 | 1.45 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 32.0 | 48.1 | 27.1 | 40.8 | 24.6 | 36.9 | 24.8 | 37.2 | 20.9 | 31.5 | 22.3 | 33.5 |
| $Z_x$, in.$^3$ | | 39.3 | | 34.2 | | 29.9 | | 26.7 | | 22.7 | | 20.1 | |
| $L_p$, ft | | 4.20 | | 4.18 | | 4.13 | | 3.32 | | 3.30 | | 2.59 | |
| $L_r$, ft | | 45.2 | | 40.4 | | 36.3 | | 31.0 | | 27.4 | | 21.3 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

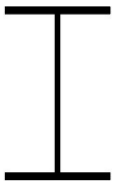
[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)



W8-W6

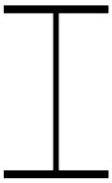
| Shape | | W8× | | | | | | | | W6× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 18 | | 15 | | 13 | | 10 | | 25 | | 20 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | 40.4 | 60.6 | 39.8 | 59.9 | 33.2 | 50.0 | 25.7 | 38.7 | | | | |
| | 5 | 40.0 | 60.1 | 31.9 | 47.9 | 26.6 | 40.0 | 20.6 | 30.9 | 44.0 | 66.2 | 34.8 | 52.2 |
| | 6 | 33.3 | 50.1 | 26.5 | 39.9 | 22.2 | 33.3 | 17.1 | 25.8 | 37.5 | 56.4 | 29.5 | 44.4 |
| | 7 | 28.6 | 42.9 | 22.8 | 34.2 | 19.0 | 28.5 | 14.7 | 22.1 | 32.2 | 48.3 | 25.3 | 38.1 |
| | 8 | 25.0 | 37.6 | 19.9 | 29.9 | 16.6 | 25.0 | 12.9 | 19.3 | 28.1 | 42.3 | 22.2 | 33.3 |
| | 9 | 22.2 | 33.4 | 17.7 | 26.6 | 14.8 | 22.2 | 11.4 | 17.2 | 25.0 | 37.6 | 19.7 | 29.6 |
| | 10 | 20.0 | 30.1 | 15.9 | 23.9 | 13.3 | 20.0 | 10.3 | 15.5 | 22.5 | 33.8 | 17.7 | 26.6 |
| | 11 | 18.2 | 27.3 | 14.5 | 21.8 | 12.1 | 18.2 | 9.35 | 14.1 | 20.5 | 30.8 | 16.1 | 24.2 |
| | 12 | 16.7 | 25.1 | 13.3 | 20.0 | 11.1 | 16.7 | 8.57 | 12.9 | 18.8 | 28.2 | 14.8 | 22.2 |
| | 13 | 15.4 | 23.1 | 12.3 | 18.4 | 10.2 | 15.4 | 7.91 | 11.9 | 17.3 | 26.0 | 13.6 | 20.5 |
| | 14 | 14.3 | 21.5 | 11.4 | 17.1 | 9.50 | 14.3 | 7.35 | 11.0 | 16.1 | 24.2 | 12.7 | 19.0 |
| | 15 | 13.3 | 20.0 | 10.6 | 16.0 | 8.86 | 13.3 | 6.86 | 10.3 | 15.0 | 22.6 | 11.8 | 17.8 |
| | 16 | 12.5 | 18.8 | 10.0 | 15.0 | 8.31 | 12.5 | 6.43 | 9.66 | 14.1 | 21.2 | 11.1 | 16.7 |
| | 17 | 11.8 | 17.7 | 9.37 | 14.1 | 7.82 | 11.8 | 6.05 | 9.10 | 13.2 | 19.9 | 10.4 | 15.7 |
| | 18 | 11.1 | 16.7 | 8.85 | 13.3 | 7.39 | 11.1 | 5.72 | 8.59 | 12.5 | 18.8 | 9.85 | 14.8 |
| | 19 | 10.5 | 15.8 | 8.38 | 12.6 | 7.00 | 10.5 | 5.41 | 8.14 | 11.8 | 17.8 | 9.33 | 14.0 |
| | 20 | 10.0 | 15.0 | 7.96 | 12.0 | 6.65 | 10.0 | 5.14 | 7.73 | 11.3 | 16.9 | 8.86 | 13.3 |
| | 21 | 9.52 | 14.3 | 7.58 | 11.4 | 6.33 | 9.51 | 4.90 | 7.36 | 10.7 | 16.1 | 8.44 | 12.7 |
| | 22 | 9.09 | 13.7 | 7.24 | 10.9 | 6.04 | 9.08 | 4.68 | 7.03 | 10.2 | 15.4 | 8.06 | 12.1 |
| | 23 | 8.70 | 13.1 | 6.93 | 10.4 | 5.78 | 8.69 | 4.47 | 6.72 | 9.79 | 14.7 | 7.71 | 11.6 |
| | 24 | 8.33 | 12.5 | 6.64 | 10.0 | 5.54 | 8.33 | 4.29 | 6.44 | 9.38 | 14.1 | 7.39 | 11.1 |
| | 25 | 8.00 | 12.0 | 6.37 | 9.58 | 5.32 | 7.99 | 4.11 | 6.18 | 9.01 | 13.5 | 7.09 | 10.7 |
| | 26 | 7.69 | 11.6 | 6.13 | 9.21 | 5.11 | 7.68 | 3.96 | 5.95 | 8.66 | 13.0 | 6.82 | 10.2 |
| | 27 | 7.41 | 11.1 | 5.90 | 8.87 | 4.92 | 7.40 | 3.81 | 5.73 | 8.34 | 12.5 | 6.56 | 9.87 |
| | 28 | 7.14 | 10.7 | 5.69 | 8.55 | 4.75 | 7.14 | 3.67 | 5.52 | 8.04 | 12.1 | 6.33 | 9.51 |
| | 29 | 6.90 | 10.4 | 5.49 | 8.26 | 4.58 | 6.89 | 3.55 | 5.33 | 7.76 | 11.7 | 6.11 | 9.19 |
| | 30 | 6.67 | 10.0 | 5.31 | 7.98 | 4.43 | 6.66 | 3.43 | 5.15 | 7.50 | 11.3 | 5.91 | 8.88 |
| | 32 | 6.25 | 9.39 | 4.98 | 7.48 | 4.15 | 6.24 | 3.21 | 4.83 | 7.04 | 10.6 | 5.54 | 8.33 |
| | 34 | 5.88 | 8.84 | 4.68 | 7.04 | 3.91 | 5.88 | 3.03 | 4.55 | 6.62 | 10.0 | 5.21 | 7.84 |
| | 36 | 5.56 | 8.35 | 4.42 | 6.65 | 3.69 | 5.55 | 2.86 | 4.30 | 6.25 | 9.40 | 4.92 | 7.40 |
| | 38 | 5.26 | 7.91 | 4.19 | 6.30 | 3.50 | 5.26 | 2.71 | 4.07 | 5.92 | 8.91 | 4.66 | 7.01 |
| | 40 | 5.00 | 7.52 | 3.98 | 5.99 | 3.32 | 5.00 | 2.57 | 3.87 | 5.63 | 8.46 | 4.43 | 6.66 |
| | 42 | 4.76 | 7.16 | 3.79 | 5.70 | 3.17 | 4.76 | 2.45 | 3.68 | 5.36 | 8.06 | 4.22 | 6.34 |
| | 44 | 4.55 | 6.83 | 3.62 | 5.44 | 3.02 | 4.54 | 2.34 | 3.51 | 5.12 | 7.69 | 4.03 | 6.05 |
| | 46 | 4.35 | 6.53 | 3.46 | 5.20 | 2.89 | 4.34 | 2.24 | 3.36 | 4.89 | 7.36 | 3.85 | 5.79 |
| | 48 | 4.17 | 6.26 | 3.32 | 4.99 | 2.77 | 4.16 | 2.14 | 3.22 | 4.69 | 7.05 | 3.69 | 5.55 |
| | 50 | 4.00 | 6.01 | 3.19 | 4.79 | 2.66 | 4.00 | 2.06 | 3.09 | 4.50 | 6.77 | 3.54 | 5.33 |
| | 52 | 3.85 | 5.78 | 3.06 | 4.60 | 2.56 | 3.84 | 1.98 | 2.97 | 4.33 | 6.51 | 3.41 | 5.12 |
| | 54 | 3.70 | 5.57 | 2.95 | 4.43 | 2.46 | 3.70 | 1.91 | 2.86 | 4.17 | 6.27 | 3.28 | 4.93 |
| | 56 | 3.57 | 5.37 | 2.84 | 4.28 | 2.37 | 3.57 | 1.84 | 2.76 | 4.02 | 6.04 | 3.17 | 4.76 |
| | 58 | 3.45 | 5.18 | 2.75 | 4.13 | 2.29 | 3.44 | 1.77 | 2.67 | 3.88 | 5.83 | 3.06 | 4.59 |
| | 60 | 3.33 | 5.01 | 2.65 | 3.99 | 2.22 | 3.33 | 1.71 | 2.58 | 3.75 | 5.64 | 2.95 | 4.44 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 200 | 301 | 159 | 239 | 133 | 200 | 103 | 155 | 225 | 338 | 177 | 266 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 25.0 | 37.6 | 19.9 | 29.9 | 16.6 | 25.0 | 12.9 | 19.3 | 28.1 | 42.3 | 22.2 | 33.3 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 10.1 | 15.2 | 7.81 | 11.7 | 6.50 | 9.77 | 5.09 | 7.64 | 11.2 | 16.8 | 8.89 | 13.4 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.911 | 1.37 | 0.988 | 1.48 | 0.915 | 1.37 | 0.798 | 1.20 | 0.510 | 0.767 | 0.498 | 0.748 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 20.2 | 30.3 | 21.4 | 32.2 | 19.8 | 29.8 | 14.5 | 21.7 | 22.0 | 33.1 | 17.4 | 26.1 |
| $Z_x$, in.$^3$ | | 16.7 | | 13.3 | | 11.1 | | 8.59 | | 18.8 | | 14.8 | |
| $L_p$, ft | | 2.53 | | 1.80 | | 1.74 | | 1.73 | | 3.12 | | 3.08 | |
| $L_r$, ft | | 18.9 | | 14.0 | | 12.8 | | 11.5 | | 36.4 | | 29.7 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



W6-W5

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | W6× | | | | | | | | W5× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 16 | | 15 [f1] | | 12 | | 9 | | 19 | | 18.9 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | 34.4 | 51.8 | 27.8 | 41.8 | 24.4 | 36.7 | 18.2 | 27.4 | 30.0 | 45.0 | 32.6 | 49.1 |
| | 5 | 27.5 | 41.4 | 22.3 | 33.5 | 19.5 | 29.4 | 14.6 | 21.9 | 27.5 | 41.4 | 26.1 | 39.2 |
| | 6 | 23.0 | 34.5 | 18.5 | 27.9 | 16.3 | 24.5 | 12.2 | 18.3 | 23.0 | 34.5 | 21.8 | 32.7 |
| | 7 | 19.7 | 29.6 | 15.9 | 23.9 | 14.0 | 21.0 | 10.4 | 15.7 | 19.7 | 29.6 | 18.6 | 28.0 |
| | 8 | 17.2 | 25.9 | 13.9 | 20.9 | 12.2 | 18.4 | 9.12 | 13.7 | 17.2 | 25.9 | 16.3 | 24.5 |
| | 9 | 15.3 | 23.0 | 12.4 | 18.6 | 10.9 | 16.3 | 8.10 | 12.2 | 15.3 | 23.0 | 14.5 | 21.8 |
| | 10 | 13.8 | 20.7 | 11.1 | 16.7 | 9.77 | 14.7 | 7.29 | 11.0 | 13.8 | 20.7 | 13.1 | 19.6 |
| | 11 | 12.5 | 18.8 | 10.1 | 15.2 | 8.88 | 13.4 | 6.63 | 9.97 | 12.5 | 18.8 | 11.9 | 17.8 |
| | 12 | 11.5 | 17.3 | 9.27 | 13.9 | 8.14 | 12.2 | 6.08 | 9.14 | 11.5 | 17.3 | 10.9 | 16.4 |
| | 13 | 10.6 | 15.9 | 8.56 | 12.9 | 7.52 | 11.3 | 5.61 | 8.43 | 10.6 | 15.9 | 10.0 | 15.1 |
| | 14 | 9.84 | 14.8 | 7.95 | 11.9 | 6.98 | 10.5 | 5.21 | 7.83 | 9.84 | 14.8 | 9.32 | 14.0 |
| | 15 | 9.18 | 13.8 | 7.42 | 11.2 | 6.51 | 9.79 | 4.86 | 7.31 | 9.18 | 13.8 | 8.70 | 13.1 |
| | 16 | 8.61 | 12.9 | 6.96 | 10.5 | 6.11 | 9.18 | 4.56 | 6.85 | 8.61 | 12.9 | 8.16 | 12.3 |
| | 17 | 8.10 | 12.2 | 6.55 | 9.84 | 5.75 | 8.64 | 4.29 | 6.45 | 8.10 | 12.2 | 7.68 | 11.5 |
| | 18 | 7.65 | 11.5 | 6.18 | 9.29 | 5.43 | 8.16 | 4.05 | 6.09 | 7.65 | 11.5 | 7.25 | 10.9 |
| | 19 | 7.25 | 10.9 | 5.86 | 8.80 | 5.14 | 7.73 | 3.84 | 5.77 | 7.25 | 10.9 | 6.87 | 10.3 |
| | 20 | 6.89 | 10.4 | 5.56 | 8.36 | 4.89 | 7.34 | 3.65 | 5.48 | 6.89 | 10.4 | 6.53 | 9.81 |
| | 21 | 6.56 | 9.86 | 5.30 | 7.97 | 4.65 | 6.99 | 3.47 | 5.22 | 6.56 | 9.86 | 6.22 | 9.34 |
| | 22 | 6.26 | 9.41 | 5.06 | 7.60 | 4.44 | 6.68 | 3.32 | 4.98 | 6.26 | 9.41 | 5.93 | 8.92 |
| | 23 | 5.99 | 9.00 | 4.84 | 7.27 | 4.25 | 6.39 | 3.17 | 4.77 | 5.99 | 9.00 | 5.68 | 8.53 |
| | 24 | 5.74 | 8.63 | 4.64 | 6.97 | 4.07 | 6.12 | 3.04 | 4.57 | 5.74 | 8.63 | 5.44 | 8.18 |
| | 25 | 5.51 | 8.28 | 4.45 | 6.69 | 3.91 | 5.88 | 2.92 | 4.38 | 5.51 | 8.28 | 5.22 | 7.85 |
| | 26 | 5.30 | 7.96 | 4.28 | 6.43 | 3.76 | 5.65 | 2.81 | 4.22 | 5.30 | 7.96 | 5.02 | 7.55 |
| | 27 | 5.10 | 7.67 | 4.12 | 6.20 | 3.62 | 5.44 | 2.70 | 4.06 | 5.10 | 7.67 | 4.83 | 7.27 |
| | 28 | 4.92 | 7.39 | 3.97 | 5.97 | 3.49 | 5.25 | 2.60 | 3.92 | 4.92 | 7.39 | 4.66 | 7.01 |
| | 29 | 4.75 | 7.14 | 3.84 | 5.77 | 3.37 | 5.06 | 2.51 | 3.78 | 4.75 | 7.14 | 4.50 | 6.77 |
| | 30 | 4.59 | 6.90 | 3.71 | 5.58 | 3.26 | 4.90 | 2.43 | 3.65 | 4.59 | 6.90 | 4.35 | 6.54 |
| | 32 | 4.30 | 6.47 | 3.48 | 5.23 | 3.05 | 4.59 | 2.28 | 3.43 | 4.30 | 6.47 | 4.08 | 6.13 |
| | 34 | 4.05 | 6.09 | 3.27 | 4.92 | 2.87 | 4.32 | 2.15 | 3.22 | 4.05 | 6.09 | 3.84 | 5.77 |
| | 36 | 3.83 | 5.75 | 3.09 | 4.65 | 2.71 | 4.08 | 2.03 | 3.05 | 3.83 | 5.75 | 3.63 | 5.45 |
| | 38 | 3.62 | 5.45 | 2.93 | 4.40 | 2.57 | 3.87 | 1.92 | 2.88 | 3.62 | 5.45 | 3.44 | 5.16 |
| | 40 | 3.44 | 5.18 | 2.78 | 4.18 | 2.44 | 3.67 | 1.82 | 2.74 | 3.44 | 5.18 | 3.26 | 4.91 |
| | 42 | 3.28 | 4.93 | 2.65 | 3.98 | 2.33 | 3.50 | 1.74 | 2.61 | 3.28 | 4.93 | 3.11 | 4.67 |
| | 44 | 3.13 | 4.70 | 2.53 | 3.80 | 2.22 | 3.34 | 1.66 | 2.49 | 3.13 | 4.70 | 2.97 | 4.46 |
| | 46 | 2.99 | 4.50 | 2.42 | 3.64 | 2.12 | 3.19 | 1.59 | 2.38 | 2.99 | 4.50 | 2.84 | 4.27 |
| | 48 | 2.87 | 4.31 | 2.32 | 3.49 | 2.04 | 3.06 | 1.52 | 2.28 | 2.87 | 4.31 | 2.72 | 4.09 |
| | 50 | 2.75 | 4.14 | 2.23 | 3.35 | 1.95 | 2.94 | 1.46 | 2.19 | 2.75 | 4.14 | 2.61 | 3.92 |
| | 52 | 2.65 | 3.98 | 2.14 | 3.22 | 1.88 | 2.82 | 1.40 | 2.11 | 2.65 | 3.98 | 2.51 | 3.77 |
| | 54 | 2.55 | 3.83 | 2.06 | 3.10 | 1.81 | 2.72 | 1.35 | 2.03 | 2.55 | 3.83 | 2.42 | 3.63 |
| | 56 | 2.46 | 3.70 | 1.99 | 2.99 | 1.75 | 2.62 | 1.30 | 1.96 | 2.46 | 3.70 | 2.33 | 3.50 |
| | 58 | 2.37 | 3.57 | 1.92 | 2.88 | 1.68 | 2.53 | 1.26 | 1.89 | 2.37 | 3.57 | 2.25 | 3.38 |
| | 60 | 2.30 | 3.45 | 1.85 | 2.79 | 1.63 | 2.45 | 1.22 | 1.83 | 2.30 | 3.45 | 2.18 | 3.27 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 138 | 207 | 111 | 167 | 97.7 | 147 | 72.9 | 110 | 138 | 207 | 131 | 196 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 17.2 | 25.9 | 13.9 | 20.9 | 12.2 | 18.4 | 9.12 | 13.7 | 17.2 | 25.9 | 16.3 | 24.5 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 6.80 | 10.2 | 6.46 | 9.71 | 4.84 | 7.28 | 3.66 | 5.50 | 6.80 | 10.2 | 6.42 | 9.65 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.542 | 0.815 | 0.457 | 0.687 | 0.514 | 0.773 | 0.470 | 0.706 | 0.320 | 0.481 | 0.297 | 0.446 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 17.6 | 26.5 | 14.8 | 22.3 | 14.9 | 22.5 | 10.8 | 16.2 | 15.0 | 22.5 | 17.0 | 25.6 |
| $Z_x$, in.$^3$ | | 11.5 | | 10.6 | | 8.16 | | 6.09 | | 11.5 | | 10.9 | |
| $L_p$, ft | | 1.98 | | 7.26 | | 1.88 | | 1.86 | | 2.63 | | 2.57 | |
| $L_r$, ft | | 21.2 | | 23.6 | | 16.2 | | 13.5 | | 35.2 | | 35.9 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-3 (continued)
# Maximum Total Uniform Load, kips
## W-Shapes (Welded)

W5-W4

| Shape | | W5× | | W4× | |
|---|---|---|---|---|---|
| | | 16 | | 13 | |
| Design | | ASD | LRFD | ASD | LRFD |
| Span, ft | 4 | 26.0 | 39.0 | 18.5 | 27.9 |
| | 5 | 22.7 | 34.1 | 14.8 | 22.3 |
| | 6 | 18.9 | 28.4 | 12.4 | 18.6 |
| | 7 | 16.2 | 24.4 | 10.6 | 15.9 |
| | 8 | 14.2 | 21.3 | 9.27 | 13.9 |
| | 9 | 12.6 | 18.9 | 8.24 | 12.4 |
| | 10 | 11.3 | 17.0 | 7.41 | 11.1 |
| | 11 | 10.3 | 15.5 | 6.74 | 10.1 |
| | 12 | 9.45 | 14.2 | 6.18 | 9.29 |
| | 13 | 8.72 | 13.1 | 5.70 | 8.57 |
| | 14 | 8.10 | 12.2 | 5.30 | 7.96 |
| | 15 | 7.56 | 11.4 | 4.94 | 7.43 |
| | 16 | 7.09 | 10.7 | 4.63 | 6.96 |
| | 17 | 6.67 | 10.0 | 4.36 | 6.55 |
| | 18 | 6.30 | 9.47 | 4.12 | 6.19 |
| | 19 | 5.97 | 8.97 | 3.90 | 5.86 |
| | 20 | 5.67 | 8.52 | 3.71 | 5.57 |
| | 21 | 5.40 | 8.12 | 3.53 | 5.31 |
| | 22 | 5.16 | 7.75 | 3.37 | 5.06 |
| | 23 | 4.93 | 7.41 | 3.22 | 4.84 |
| | 24 | 4.73 | 7.10 | 3.09 | 4.64 |
| | 25 | 4.54 | 6.82 | 2.97 | 4.46 |
| | 26 | 4.36 | 6.56 | 2.85 | 4.29 |
| | 27 | 4.20 | 6.31 | 2.75 | 4.13 |
| | 28 | 4.05 | 6.09 | 2.65 | 3.98 |
| | 29 | 3.91 | 5.88 | 2.56 | 3.84 |
| | 30 | 3.78 | 5.68 | 2.47 | 3.71 |
| | 32 | 3.54 | 5.33 | 2.32 | 3.48 |
| | 34 | 3.34 | 5.01 | 2.18 | 3.28 |
| | 36 | 3.15 | 4.74 | 2.06 | 3.10 |
| | 38 | 2.98 | 4.49 | 1.95 | 2.93 |
| | 40 | 2.84 | 4.26 | 1.85 | 2.79 |
| | 42 | 2.70 | 4.06 | 1.77 | 2.65 |
| | 44 | 2.58 | 3.87 | 1.68 | 2.53 |
| | 46 | 2.47 | 3.71 | 1.61 | 2.42 |
| | 48 | 2.36 | 3.55 | 1.54 | 2.32 |
| | 50 | 2.27 | 3.41 | 1.48 | 2.23 |
| | 52 | 2.18 | 3.28 | 1.43 | 2.14 |
| | 54 | 2.10 | 3.16 | 1.37 | 2.06 |
| | 56 | 2.03 | 3.04 | 1.32 | 1.99 |
| | 58 | 1.96 | 2.94 | 1.28 | 1.92 |
| | 60 | 1.89 | 2.84 | 1.24 | 1.86 |
| **Beam Properties** | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 113 | 170 | 74.1 | 111 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 14.2 | 21.3 | 9.27 | 13.9 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 5.67 | 8.52 | 3.62 | 5.45 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.311 | 0.467 | 0.207 | 0.311 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 13.0 | 19.5 | 12.6 | 18.9 |
| $Z_x$, in.$^3$ | | 9.47 | | 6.19 | |
| $L_p$, ft | | 2.59 | | 2.06 | |
| $L_r$, ft | | 30.0 | | 29.3 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-3 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

S15-S12

# Table 2-4
# Maximum Total Uniform Load, kips
## S-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | S15× | | | | S12× | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 50 | | 42.9 | | 50 | | 40.8 | | 35 | | 31.8 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 6 | 153 | 230 | 133 | 200 | 121 | 182 | 105 | 158 | 88.6 | 133 | 83.0 | 125 |
| | 7 | 131 | 197 | 117 | 176 | 104 | 156 | 90.2 | 136 | 76.0 | 114 | 71.2 | 107 |
| | 8 | 115 | 172 | 103 | 154 | 90.7 | 136 | 78.9 | 119 | 66.5 | 99.9 | 62.3 | 93.6 |
| | 9 | 102 | 153 | 91.3 | 137 | 80.6 | 121 | 70.1 | 105 | 59.1 | 88.8 | 55.4 | 83.2 |
| | 10 | 91.6 | 138 | 82.2 | 123 | 72.6 | 109 | 63.1 | 94.9 | 53.2 | 79.9 | 49.8 | 74.9 |
| | 11 | 83.3 | 125 | 74.7 | 112 | 66.0 | 99.2 | 57.4 | 86.2 | 48.3 | 72.7 | 45.3 | 68.1 |
| | 12 | 76.3 | 115 | 68.5 | 103 | 60.5 | 90.9 | 52.6 | 79.1 | 44.3 | 66.6 | 41.5 | 62.4 |
| | 13 | 70.5 | 106 | 63.2 | 95.0 | 55.8 | 83.9 | 48.5 | 73.0 | 40.9 | 61.5 | 38.3 | 57.6 |
| | 14 | 65.4 | 98.4 | 58.7 | 88.2 | 51.8 | 77.9 | 45.1 | 67.8 | 38.0 | 57.1 | 35.6 | 53.5 |
| | 15 | 61.1 | 91.8 | 54.8 | 82.3 | 48.4 | 72.7 | 42.1 | 63.2 | 35.4 | 53.3 | 33.2 | 49.9 |
| | 16 | 57.3 | 86.1 | 51.3 | 77.2 | 45.4 | 68.2 | 39.4 | 59.3 | 33.2 | 50.0 | 31.1 | 46.8 |
| | 17 | 53.9 | 81.0 | 48.3 | 72.6 | 42.7 | 64.2 | 37.1 | 55.8 | 31.3 | 47.0 | 29.3 | 44.0 |
| | 18 | 50.9 | 76.5 | 45.6 | 68.6 | 40.3 | 60.6 | 35.1 | 52.7 | 29.5 | 44.4 | 27.7 | 41.6 |
| | 19 | 48.2 | 72.5 | 43.2 | 65.0 | 38.2 | 57.4 | 33.2 | 49.9 | 28.0 | 42.1 | 26.2 | 39.4 |
| | 20 | 45.8 | 68.9 | 41.1 | 61.7 | 36.3 | 54.5 | 31.6 | 47.4 | 26.6 | 40.0 | 24.9 | 37.4 |
| | 21 | 43.6 | 65.6 | 39.1 | 58.8 | 34.6 | 51.9 | 30.1 | 45.2 | 25.3 | 38.1 | 23.7 | 35.7 |
| | 22 | 41.6 | 62.6 | 37.3 | 56.1 | 33.0 | 49.6 | 28.7 | 43.1 | 24.2 | 36.3 | 22.6 | 34.0 |
| | 23 | 39.8 | 59.9 | 35.7 | 53.7 | 31.6 | 47.4 | 27.4 | 41.2 | 23.1 | 34.7 | 21.7 | 32.6 |
| | 24 | 38.2 | 57.4 | 34.2 | 51.5 | 30.2 | 45.5 | 26.3 | 39.5 | 22.2 | 33.3 | 20.8 | 31.2 |
| | 25 | 36.6 | 55.1 | 32.9 | 49.4 | 29.0 | 43.6 | 25.2 | 37.9 | 21.3 | 32.0 | 19.9 | 30.0 |
| | 26 | 35.2 | 53.0 | 31.6 | 47.5 | 27.9 | 42.0 | 24.3 | 36.5 | 20.5 | 30.7 | 19.2 | 28.8 |
| | 27 | 33.9 | 51.0 | 30.4 | 45.7 | 26.9 | 40.4 | 23.4 | 35.1 | 19.7 | 29.6 | 18.5 | 27.7 |
| | 28 | 32.7 | 49.2 | 29.3 | 44.1 | 25.9 | 39.0 | 22.5 | 33.9 | 19.0 | 28.5 | 17.8 | 26.7 |
| | 29 | 31.6 | 47.5 | 28.3 | 42.6 | 25.0 | 37.6 | 21.8 | 32.7 | 18.3 | 27.6 | 17.2 | 25.8 |
| | 30 | 30.5 | 45.9 | 27.4 | 41.2 | 24.2 | 36.4 | 21.0 | 31.6 | 17.7 | 26.6 | 16.6 | 25.0 |
| | 32 | 28.6 | 43.0 | 25.7 | 38.6 | 22.7 | 34.1 | 19.7 | 29.6 | 16.6 | 25.0 | 15.6 | 23.4 |
| | 34 | 26.9 | 40.5 | 24.2 | 36.3 | 21.3 | 32.1 | 18.6 | 27.9 | 15.6 | 23.5 | 14.7 | 22.0 |
| | 36 | 25.4 | 38.3 | 22.8 | 34.3 | 20.2 | 30.3 | 17.5 | 26.4 | 14.8 | 22.2 | 13.8 | 20.8 |
| | 38 | 24.1 | 36.2 | 21.6 | 32.5 | 19.1 | 28.7 | 16.6 | 25.0 | 14.0 | 21.0 | 13.1 | 19.7 |
| | 40 | 22.9 | 34.4 | 20.5 | 30.9 | 18.1 | 27.3 | 15.8 | 23.7 | 13.3 | 20.0 | 12.5 | 18.7 |
| | 42 | 21.8 | 32.8 | 19.6 | 29.4 | 17.3 | 26.0 | 15.0 | 22.6 | 12.7 | 19.0 | 11.9 | 17.8 |
| | 44 | 20.8 | 31.3 | 18.7 | 28.1 | 16.5 | 24.8 | 14.3 | 21.6 | 12.1 | 18.2 | 11.3 | 17.0 |
| | 46 | 19.9 | 29.9 | 17.9 | 26.8 | 15.8 | 23.7 | 13.7 | 20.6 | 11.6 | 17.4 | 10.8 | 16.3 |
| | 48 | 19.1 | 28.7 | 17.1 | 25.7 | 15.1 | 22.7 | 13.1 | 19.8 | 11.1 | 16.7 | 10.4 | 15.6 |
| | 50 | 18.3 | 27.5 | 16.4 | 24.7 | 14.5 | 21.8 | 12.6 | 19.0 | 10.6 | 16.0 | 10.0 | 15.0 |
| | 52 | 17.6 | 26.5 | 15.8 | 23.7 | 14.0 | 21.0 | 12.1 | 18.2 | 10.2 | 15.4 | 9.58 | 14.4 |
| | 54 | 17.0 | 25.5 | 15.2 | 22.9 | 13.4 | 20.2 | 11.7 | 17.6 | 9.85 | 14.8 | 9.23 | 13.9 |
| | 56 | 16.4 | 24.6 | 14.7 | 22.1 | 13.0 | 19.5 | 11.3 | 16.9 | 9.50 | 14.3 | 8.90 | 13.4 |
| | 58 | 15.8 | 23.7 | 14.2 | 21.3 | 12.5 | 18.8 | 10.9 | 16.4 | 9.17 | 13.8 | 8.59 | 12.9 |
| | 60 | 15.3 | 23.0 | 13.7 | 20.6 | 12.1 | 18.2 | 10.5 | 15.8 | 8.86 | 13.3 | 8.30 | 12.5 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 916 | 1380 | 822 | 1230 | 726 | 1090 | 631 | 949 | 532 | 799 | 498 | 749 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 115 | 172 | 103 | 154 | 90.7 | 136 | 78.9 | 119 | 66.5 | 99.9 | 62.3 | 93.6 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 43.3 | 65.1 | 39.8 | 59.8 | 33.9 | 50.9 | 30.4 | 45.8 | 25.6 | 38.5 | 24.4 | 36.7 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 3.82 | 5.74 | 3.73 | 5.60 | 2.17 | 3.27 | 2.28 | 3.43 | 2.33 | 3.50 | 2.30 | 3.45 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 88.9 | 134 | 66.4 | 99.9 | 88.9 | 134 | 61.0 | 91.8 | 55.4 | 83.2 | 45.3 | 68.0 |
| $Z_x$, in.$^3$ | | 76.5 | | 68.6 | | 60.6 | | 52.7 | | 44.4 | | 41.6 | |
| $L_p$, ft | | 2.30 | | 2.40 | | 2.28 | | 2.34 | | 2.20 | | 2.26 | |
| $L_r$, ft | | 20.9 | | 19.3 | | 28.4 | | 23.6 | | 19.7 | | 18.8 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-4 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-4 (continued)
# Maximum Total Uniform Load, kips
## S-Shapes (Welded)

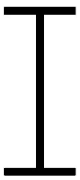
S10-S7

| Shape | | S10× | | | | S8× | | | | S7× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 35 | | 25.4 | | 23 | | 18.4 | | 20 | | 15.3 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 6 | 70.1 | 105 | 56.1 | 84.3 | 38.1 | 57.3 | 32.5 | 48.9 | 28.5 | 42.9 | 23.8 | 35.7 |
| | 7 | 60.1 | 90.3 | 48.1 | 72.3 | 32.7 | 49.1 | 27.9 | 41.9 | 24.5 | 36.8 | 20.4 | 30.6 |
| | 8 | 52.5 | 79.0 | 42.1 | 63.2 | 28.6 | 43.0 | 24.4 | 36.7 | 21.4 | 32.2 | 17.8 | 26.8 |
| | 9 | 46.7 | 70.2 | 37.4 | 56.2 | 25.4 | 38.2 | 21.7 | 32.6 | 19.0 | 28.6 | 15.8 | 23.8 |
| | 10 | 42.0 | 63.2 | 33.7 | 50.6 | 22.9 | 34.4 | 19.5 | 29.3 | 17.1 | 25.7 | 14.3 | 21.4 |
| | 11 | 38.2 | 57.4 | 30.6 | 46.0 | 20.8 | 31.3 | 17.7 | 26.7 | 15.6 | 23.4 | 13.0 | 19.5 |
| | 12 | 35.0 | 52.7 | 28.0 | 42.2 | 19.1 | 28.7 | 16.3 | 24.5 | 14.3 | 21.5 | 11.9 | 17.9 |
| | 13 | 32.3 | 48.6 | 25.9 | 38.9 | 17.6 | 26.4 | 15.0 | 22.6 | 13.2 | 19.8 | 11.0 | 16.5 |
| | 14 | 30.0 | 45.1 | 24.0 | 36.1 | 16.3 | 24.6 | 13.9 | 21.0 | 12.2 | 18.4 | 10.2 | 15.3 |
| | 15 | 28.0 | 42.1 | 22.4 | 33.7 | 15.2 | 22.9 | 13.0 | 19.6 | 11.4 | 17.2 | 9.50 | 14.3 |
| | 16 | 26.3 | 39.5 | 21.0 | 31.6 | 14.3 | 21.5 | 12.2 | 18.3 | 10.7 | 16.1 | 8.91 | 13.4 |
| | 17 | 24.7 | 37.2 | 19.8 | 29.8 | 13.5 | 20.2 | 11.5 | 17.3 | 10.1 | 15.1 | 8.38 | 12.6 |
| | 18 | 23.4 | 35.1 | 18.7 | 28.1 | 12.7 | 19.1 | 10.8 | 16.3 | 9.51 | 14.3 | 7.92 | 11.9 |
| | 19 | 22.1 | 33.3 | 17.7 | 26.6 | 12.0 | 18.1 | 10.3 | 15.4 | 9.01 | 13.5 | 7.50 | 11.3 |
| | 20 | 21.0 | 31.6 | 16.8 | 25.3 | 11.4 | 17.2 | 9.76 | 14.7 | 8.56 | 12.9 | 7.13 | 10.7 |
| | 21 | 20.0 | 30.1 | 16.0 | 24.1 | 10.9 | 16.4 | 9.30 | 14.0 | 8.16 | 12.3 | 6.79 | 10.2 |
| | 22 | 19.1 | 28.7 | 15.3 | 23.0 | 10.4 | 15.6 | 8.87 | 13.3 | 7.78 | 11.7 | 6.48 | 9.74 |
| | 23 | 18.3 | 27.5 | 14.6 | 22.0 | 9.95 | 14.9 | 8.49 | 12.8 | 7.45 | 11.2 | 6.20 | 9.31 |
| | 24 | 17.5 | 26.3 | 14.0 | 21.1 | 9.53 | 14.3 | 8.13 | 12.2 | 7.14 | 10.7 | 5.94 | 8.93 |
| | 25 | 16.8 | 25.3 | 13.5 | 20.2 | 9.15 | 13.8 | 7.81 | 11.7 | 6.85 | 10.3 | 5.70 | 8.57 |
| | 26 | 16.2 | 24.3 | 12.9 | 19.5 | 8.80 | 13.2 | 7.51 | 11.3 | 6.59 | 9.90 | 5.48 | 8.24 |
| | 27 | 15.6 | 23.4 | 12.5 | 18.7 | 8.47 | 12.7 | 7.23 | 10.9 | 6.34 | 9.53 | 5.28 | 7.93 |
| | 28 | 15.0 | 22.6 | 12.0 | 18.1 | 8.17 | 12.3 | 6.97 | 10.5 | 6.12 | 9.19 | 5.09 | 7.65 |
| | 29 | 14.5 | 21.8 | 11.6 | 17.4 | 7.89 | 11.9 | 6.73 | 10.1 | 5.91 | 8.88 | 4.91 | 7.39 |
| | 30 | 14.0 | 21.1 | 11.2 | 16.9 | 7.62 | 11.5 | 6.51 | 9.78 | 5.71 | 8.58 | 4.75 | 7.14 |
| | 32 | 13.1 | 19.7 | 10.5 | 15.8 | 7.15 | 10.7 | 6.10 | 9.17 | 5.35 | 8.04 | 4.45 | 6.69 |
| | 34 | 12.4 | 18.6 | 9.90 | 14.9 | 6.73 | 10.1 | 5.74 | 8.63 | 5.04 | 7.57 | 4.19 | 6.30 |
| | 36 | 11.7 | 17.6 | 9.35 | 14.1 | 6.35 | 9.55 | 5.42 | 8.15 | 4.76 | 7.15 | 3.96 | 5.95 |
| | 38 | 11.1 | 16.6 | 8.86 | 13.3 | 6.02 | 9.05 | 5.14 | 7.72 | 4.51 | 6.77 | 3.75 | 5.64 |
| | 40 | 10.5 | 15.8 | 8.41 | 12.6 | 5.72 | 8.60 | 4.88 | 7.34 | 4.28 | 6.44 | 3.56 | 5.36 |
| | 42 | 10.0 | 15.0 | 8.01 | 12.0 | 5.45 | 8.19 | 4.65 | 6.99 | 4.08 | 6.13 | 3.39 | 5.10 |
| | 44 | 9.55 | 14.4 | 7.65 | 11.5 | 5.20 | 7.81 | 4.44 | 6.67 | 3.89 | 5.85 | 3.24 | 4.87 |
| | 46 | 9.14 | 13.7 | 7.32 | 11.0 | 4.97 | 7.47 | 4.24 | 6.38 | 3.72 | 5.60 | 3.10 | 4.66 |
| | 48 | 8.76 | 13.2 | 7.01 | 10.5 | 4.77 | 7.16 | 4.07 | 6.11 | 3.57 | 5.36 | 2.97 | 4.46 |
| | 50 | 8.41 | 12.6 | 6.73 | 10.1 | 4.57 | 6.88 | 3.90 | 5.87 | 3.43 | 5.15 | 2.85 | 4.28 |
| | 52 | 8.08 | 12.2 | 6.47 | 9.73 | 4.40 | 6.61 | 3.75 | 5.64 | 3.29 | 4.95 | 2.74 | 4.12 |
| | 54 | 7.78 | 11.7 | 6.23 | 9.37 | 4.24 | 6.37 | 3.61 | 5.43 | 3.17 | 4.77 | 2.64 | 3.97 |
| | 56 | 7.51 | 11.3 | 6.01 | 9.03 | 4.08 | 6.14 | 3.49 | 5.24 | 3.06 | 4.60 | 2.54 | 3.83 |
| | 58 | 7.25 | 10.9 | 5.80 | 8.72 | 3.94 | 5.93 | 3.37 | 5.06 | 2.95 | 4.44 | 2.46 | 3.69 |
| | 60 | 7.01 | 10.5 | 5.61 | 8.43 | 3.81 | 5.73 | 3.25 | 4.89 | 2.85 | 4.29 | 2.38 | 3.57 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 420 | 632 | 337 | 506 | 229 | 344 | 195 | 293 | 171 | 257 | 143 | 214 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 52.5 | 79.0 | 42.1 | 63.2 | 28.6 | 43.0 | 24.4 | 36.7 | 21.4 | 32.2 | 17.8 | 26.8 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 19.7 | 29.6 | 16.6 | 24.9 | 10.8 | 16.3 | 9.63 | 14.5 | 8.08 | 12.2 | 7.01 | 10.5 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.45 | 2.18 | 1.54 | 2.32 | 0.942 | 1.42 | 0.962 | 1.45 | 0.677 | 1.02 | 0.727 | 1.09 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 64.0 | 96.2 | 33.5 | 50.4 | 38.0 | 57.2 | 23.4 | 35.1 | 34.0 | 51.0 | 19.0 | 28.6 |
| $Z_x$, in.$^3$ | | 35.1 | | 28.1 | | 19.1 | | 16.3 | | 14.3 | | 11.9 | |
| $L_p$, ft | | 2.02 | | 2.16 | | 1.79 | | 1.88 | | 1.65 | | 1.73 | |
| $L_r$, ft | | 24.7 | | 18.7 | | 20.6 | | 17.2 | | 21.3 | | 16.6 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-4 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.



S6-S4

## Table 2-4 (continued)
# Maximum Total Uniform Load, kips
### S-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | S6× | | | | S5× | | | | S4× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 17.25 | | 12.5 | | 14.75 | | 10 | | 9.5 | | 7.7 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 6 | 21.0 | 31.5 | 16.7 | 25.1 | 14.6 | 22.0 | 11.1 | 16.7 | 7.96 | 12.0 | 6.89 | 10.4 |
| | 7 | 18.0 | 27.0 | 14.3 | 21.5 | 12.5 | 18.8 | 9.55 | 14.3 | 6.83 | 10.3 | 5.90 | 8.87 |
| | 8 | 15.7 | 23.6 | 12.5 | 18.8 | 11.0 | 16.5 | 8.35 | 12.6 | 5.97 | 8.98 | 5.16 | 7.76 |
| | 9 | 14.0 | 21.0 | 11.1 | 16.7 | 9.75 | 14.7 | 7.43 | 11.2 | 5.31 | 7.98 | 4.59 | 6.90 |
| | 10 | 12.6 | 18.9 | 10.0 | 15.0 | 8.78 | 13.2 | 6.68 | 10.0 | 4.78 | 7.18 | 4.13 | 6.21 |
| | 11 | 11.4 | 17.2 | 9.10 | 13.7 | 7.98 | 12.0 | 6.08 | 9.13 | 4.34 | 6.53 | 3.76 | 5.65 |
| | 12 | 10.5 | 15.8 | 8.34 | 12.5 | 7.32 | 11.0 | 5.57 | 8.37 | 3.98 | 5.99 | 3.44 | 5.18 |
| | 13 | 9.67 | 14.5 | 7.70 | 11.6 | 6.75 | 10.1 | 5.14 | 7.73 | 3.68 | 5.52 | 3.18 | 4.78 |
| | 14 | 8.98 | 13.5 | 7.15 | 10.7 | 6.27 | 9.42 | 4.77 | 7.17 | 3.41 | 5.13 | 2.95 | 4.44 |
| | 15 | 8.38 | 12.6 | 6.67 | 10.0 | 5.85 | 8.80 | 4.46 | 6.70 | 3.19 | 4.79 | 2.75 | 4.14 |
| | 16 | 7.86 | 11.8 | 6.26 | 9.41 | 5.49 | 8.25 | 4.18 | 6.28 | 2.99 | 4.49 | 2.58 | 3.88 |
| | 17 | 7.40 | 11.1 | 5.89 | 8.85 | 5.16 | 7.76 | 3.93 | 5.91 | 2.81 | 4.22 | 2.43 | 3.65 |
| | 18 | 6.99 | 10.5 | 5.56 | 8.36 | 4.88 | 7.33 | 3.71 | 5.58 | 2.65 | 3.99 | 2.30 | 3.45 |
| | 19 | 6.62 | 9.95 | 5.27 | 7.92 | 4.62 | 6.94 | 3.52 | 5.29 | 2.51 | 3.78 | 2.17 | 3.27 |
| | 20 | 6.29 | 9.45 | 5.01 | 7.52 | 4.39 | 6.60 | 3.34 | 5.02 | 2.39 | 3.59 | 2.07 | 3.11 |
| | 21 | 5.99 | 9.00 | 4.77 | 7.17 | 4.18 | 6.28 | 3.18 | 4.78 | 2.28 | 3.42 | 1.97 | 2.96 |
| | 22 | 5.72 | 8.59 | 4.55 | 6.84 | 3.99 | 6.00 | 3.04 | 4.57 | 2.17 | 3.26 | 1.88 | 2.82 |
| | 23 | 5.47 | 8.22 | 4.35 | 6.54 | 3.82 | 5.74 | 2.91 | 4.37 | 2.08 | 3.12 | 1.80 | 2.70 |
| | 24 | 5.24 | 7.88 | 4.17 | 6.27 | 3.66 | 5.50 | 2.78 | 4.19 | 1.99 | 2.99 | 1.72 | 2.59 |
| | 25 | 5.03 | 7.56 | 4.00 | 6.02 | 3.51 | 5.28 | 2.67 | 4.02 | 1.91 | 2.87 | 1.65 | 2.48 |
| | 26 | 4.84 | 7.27 | 3.85 | 5.79 | 3.38 | 5.07 | 2.57 | 3.86 | 1.84 | 2.76 | 1.59 | 2.39 |
| | 27 | 4.66 | 7.00 | 3.71 | 5.57 | 3.25 | 4.89 | 2.48 | 3.72 | 1.77 | 2.66 | 1.53 | 2.30 |
| | 28 | 4.49 | 6.75 | 3.58 | 5.37 | 3.14 | 4.71 | 2.39 | 3.59 | 1.71 | 2.57 | 1.48 | 2.22 |
| | 29 | 4.34 | 6.52 | 3.45 | 5.19 | 3.03 | 4.55 | 2.30 | 3.46 | 1.65 | 2.48 | 1.42 | 2.14 |
| | 30 | 4.19 | 6.30 | 3.34 | 5.02 | 2.93 | 4.40 | 2.23 | 3.35 | 1.59 | 2.39 | 1.38 | 2.07 |
| | 32 | 3.93 | 5.91 | 3.13 | 4.70 | 2.74 | 4.12 | 2.09 | 3.14 | 1.49 | 2.24 | 1.29 | 1.94 |
| | 34 | 3.70 | 5.56 | 2.94 | 4.43 | 2.58 | 3.88 | 1.97 | 2.95 | 1.41 | 2.11 | 1.22 | 1.83 |
| | 36 | 3.49 | 5.25 | 2.78 | 4.18 | 2.44 | 3.67 | 1.86 | 2.79 | 1.33 | 2.00 | 1.15 | 1.73 |
| | 38 | 3.31 | 4.97 | 2.63 | 3.96 | 2.31 | 3.47 | 1.76 | 2.64 | 1.26 | 1.89 | 1.09 | 1.63 |
| | 40 | 3.14 | 4.73 | 2.50 | 3.76 | 2.19 | 3.30 | 1.67 | 2.51 | 1.19 | 1.80 | 1.03 | 1.55 |
| | 42 | 2.99 | 4.50 | 2.38 | 3.58 | 2.09 | 3.14 | 1.59 | 2.39 | 1.14 | 1.71 | 0.984 | 1.48 |
| | 44 | 2.86 | 4.30 | 2.28 | 3.42 | 2.00 | 3.00 | 1.52 | 2.28 | 1.09 | 1.63 | 0.939 | 1.41 |
| | 46 | 2.73 | 4.11 | 2.18 | 3.27 | 1.91 | 2.87 | 1.45 | 2.18 | 1.04 | 1.56 | 0.898 | 1.35 |
| | 48 | 2.62 | 3.94 | 2.09 | 3.14 | 1.83 | 2.75 | 1.39 | 2.09 | 1.00 | 1.50 | 0.861 | 1.29 |
| | 50 | 2.51 | 3.78 | 2.00 | 3.01 | 1.76 | 2.64 | 1.34 | 2.01 | 0.956 | 1.44 | 0.826 | 1.24 |
| | 52 | 2.42 | 3.63 | 1.93 | 2.89 | 1.69 | 2.54 | 1.29 | 1.93 | 0.919 | 1.38 | 0.795 | 1.19 |
| | 54 | 2.33 | 3.50 | 1.85 | 2.79 | 1.63 | 2.44 | 1.24 | 1.86 | 0.885 | 1.33 | 0.765 | 1.15 |
| | 56 | 2.25 | 3.38 | 1.79 | 2.69 | 1.57 | 2.36 | 1.19 | 1.79 | 0.853 | 1.28 | 0.738 | 1.11 |
| | 58 | 2.17 | 3.26 | 1.73 | 2.59 | 1.51 | 2.27 | 1.15 | 1.73 | 0.824 | 1.24 | 0.712 | 1.07 |
| | 60 | 2.10 | 3.15 | 1.67 | 2.51 | 1.46 | 2.20 | 1.11 | 1.67 | 0.796 | 1.20 | 0.689 | 1.04 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 126 | 189 | 100 | 150 | 87.8 | 132 | 66.8 | 100 | 47.8 | 71.8 | 41.3 | 62.1 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 15.7 | 23.6 | 12.5 | 18.8 | 11.0 | 16.5 | 8.35 | 12.6 | 5.97 | 8.98 | 5.16 | 7.76 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 5.86 | 8.81 | 4.92 | 7.39 | 4.07 | 6.12 | 3.29 | 4.94 | 2.27 | 3.41 | 2.03 | 3.05 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.462 | 0.694 | 0.523 | 0.787 | 0.282 | 0.423 | 0.351 | 0.528 | 0.198 | 0.297 | 0.214 | 0.322 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 30.1 | 45.2 | 15.0 | 22.6 | 26.6 | 40.0 | 11.5 | 17.3 | 14.1 | 21.1 | 8.32 | 12.5 |
| $Z_x$, in.$^3$ | | 10.5 | | 8.36 | | 7.33 | | 5.58 | | 3.99 | | 3.45 | |
| $L_p$, ft | | 1.51 | | 1.59 | | 1.38 | | 1.45 | | 1.28 | | 1.31 | |
| $L_r$, ft | | 22.9 | | 16.1 | | 25.9 | | 15.9 | | 20.0 | | 16.0 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-4 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-4 (continued)
# Maximum Total Uniform Load, kips
## S-Shapes (Welded)

S3

| Shape | | S3× | | | |
|---|---|---|---|---|---|
| | | 7.5 | | 5.7 | |
| Design | | ASD | LRFD | ASD | LRFD |
| Span, ft | 6 | 4.63 | 6.96 | 3.83 | 5.76 |
| | 7 | 3.97 | 5.97 | 3.28 | 4.94 |
| | 8 | 3.47 | 5.22 | 2.87 | 4.32 |
| | 9 | 3.09 | 4.64 | 2.55 | 3.84 |
| | 10 | 2.78 | 4.18 | 2.30 | 3.46 |
| | 11 | 2.53 | 3.80 | 2.09 | 3.14 |
| | 12 | 2.32 | 3.48 | 1.92 | 2.88 |
| | 13 | 2.14 | 3.21 | 1.77 | 2.66 |
| | 14 | 1.98 | 2.98 | 1.64 | 2.47 |
| | 15 | 1.85 | 2.78 | 1.53 | 2.30 |
| | 16 | 1.74 | 2.61 | 1.44 | 2.16 |
| | 17 | 1.63 | 2.46 | 1.35 | 2.03 |
| | 18 | 1.54 | 2.32 | 1.28 | 1.92 |
| | 19 | 1.46 | 2.20 | 1.21 | 1.82 |
| | 20 | 1.39 | 2.09 | 1.15 | 1.73 |
| | 21 | 1.32 | 1.99 | 1.09 | 1.65 |
| | 22 | 1.26 | 1.90 | 1.05 | 1.57 |
| | 23 | 1.21 | 1.82 | 1.00 | 1.50 |
| | 24 | 1.16 | 1.74 | 0.958 | 1.44 |
| | 25 | 1.11 | 1.67 | 0.920 | 1.38 |
| | 26 | 1.07 | 1.61 | 0.884 | 1.33 |
| | 27 | 1.03 | 1.55 | 0.852 | 1.28 |
| | 28 | 0.992 | 1.49 | 0.821 | 1.23 |
| | 29 | 0.958 | 1.44 | 0.793 | 1.19 |
| | 30 | 0.926 | 1.39 | 0.766 | 1.15 |
| | 32 | 0.868 | 1.31 | 0.719 | 1.08 |
| | 34 | 0.817 | 1.23 | 0.676 | 1.02 |
| | 36 | 0.772 | 1.16 | 0.639 | 0.960 |
| | 38 | 0.731 | 1.10 | 0.605 | 0.909 |
| | 40 | 0.695 | 1.04 | 0.575 | 0.864 |
| | 42 | 0.662 | 0.994 | 0.547 | 0.823 |
| | 44 | 0.631 | 0.949 | 0.523 | 0.785 |
| | 46 | 0.604 | 0.908 | 0.500 | 0.751 |
| | 48 | 0.579 | 0.870 | 0.479 | 0.720 |
| | 50 | 0.556 | 0.835 | 0.460 | 0.691 |
| | 52 | 0.534 | 0.803 | 0.442 | 0.665 |
| | 54 | 0.515 | 0.773 | 0.426 | 0.640 |
| | 56 | 0.496 | 0.746 | 0.411 | 0.617 |
| | 58 | 0.479 | 0.720 | 0.396 | 0.596 |
| | 60 | 0.463 | 0.696 | 0.383 | 0.576 |
| **Beam Properties** | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 27.8 | 41.8 | 23.0 | 34.6 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 3.47 | 5.22 | 2.87 | 4.32 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 1.30 | 1.95 | 1.13 | 1.69 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.094 | 0.141 | 0.111 | 0.167 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 11.3 | 17.0 | 5.50 | 8.26 |
| $Z_x$, in.$^3$ | | 2.32 | | 1.92 | |
| $L_p$, ft | | 1.15 | | 1.18 | |
| $L_r$, ft | | 24.4 | | 16.9 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-4 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

S6-S3

# Table 2-5
# Maximum Total Uniform Load, kips
## S-Shapes (Hot Rolled)

$F_y$ = 30 ksi

| Shape | | S6× | | S5× | | S4× | | S3× | |
|---|---|---|---|---|---|---|---|---|---|
| | | 12.5 | | 10 | | 7.7 | | 5.7 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 6 | 16.9 | 25.4 | 11.3 | 17.0 | 6.99 | 10.5 | 3.87 | 5.82 |
| | 7 | 14.5 | 21.7 | 9.68 | 14.6 | 5.99 | 9.00 | 3.32 | 4.99 |
| | 8 | 12.6 | 19.0 | 8.47 | 12.7 | 5.24 | 7.88 | 2.90 | 4.37 |
| | 9 | 11.2 | 16.9 | 7.53 | 11.3 | 4.66 | 7.00 | 2.58 | 3.88 |
| | 10 | 10.1 | 15.2 | 6.78 | 10.2 | 4.19 | 6.30 | 2.32 | 3.49 |
| | 11 | 9.20 | 13.8 | 6.16 | 9.26 | 3.81 | 5.73 | 2.11 | 3.17 |
| | 12 | 8.43 | 12.7 | 5.65 | 8.49 | 3.49 | 5.25 | 1.94 | 2.91 |
| | 13 | 7.78 | 11.7 | 5.21 | 7.84 | 3.22 | 4.85 | 1.79 | 2.69 |
| | 14 | 7.23 | 10.9 | 4.84 | 7.28 | 2.99 | 4.50 | 1.66 | 2.49 |
| | 15 | 6.75 | 10.1 | 4.52 | 6.79 | 2.79 | 4.20 | 1.55 | 2.33 |
| | 16 | 6.32 | 9.51 | 4.24 | 6.37 | 2.62 | 3.94 | 1.45 | 2.18 |
| | 17 | 5.95 | 8.95 | 3.99 | 5.99 | 2.47 | 3.71 | 1.37 | 2.05 |
| | 18 | 5.62 | 8.45 | 3.77 | 5.66 | 2.33 | 3.50 | 1.29 | 1.94 |
| | 19 | 5.33 | 8.01 | 3.57 | 5.36 | 2.21 | 3.32 | 1.22 | 1.84 |
| | 20 | 5.06 | 7.61 | 3.39 | 5.09 | 2.10 | 3.15 | 1.16 | 1.75 |
| | 21 | 4.82 | 7.24 | 3.23 | 4.85 | 2.00 | 3.00 | 1.11 | 1.66 |
| | 22 | 4.60 | 6.91 | 3.08 | 4.63 | 1.91 | 2.86 | 1.06 | 1.59 |
| | 23 | 4.40 | 6.61 | 2.95 | 4.43 | 1.82 | 2.74 | 1.01 | 1.52 |
| | 24 | 4.22 | 6.34 | 2.82 | 4.25 | 1.75 | 2.63 | 0.968 | 1.46 |
| | 25 | 4.05 | 6.08 | 2.71 | 4.08 | 1.68 | 2.52 | 0.929 | 1.40 |
| | 26 | 3.89 | 5.85 | 2.61 | 3.92 | 1.61 | 2.42 | 0.894 | 1.34 |
| | 27 | 3.75 | 5.63 | 2.51 | 3.77 | 1.55 | 2.33 | 0.861 | 1.29 |
| | 28 | 3.61 | 5.43 | 2.42 | 3.64 | 1.50 | 2.25 | 0.830 | 1.25 |
| | 29 | 3.49 | 5.24 | 2.34 | 3.51 | 1.45 | 2.17 | 0.801 | 1.20 |
| | 30 | 3.37 | 5.07 | 2.26 | 3.40 | 1.40 | 2.10 | 0.774 | 1.16 |
| | 32 | 3.16 | 4.75 | 2.12 | 3.18 | 1.31 | 1.97 | 0.726 | 1.09 |
| | 34 | 2.98 | 4.47 | 1.99 | 3.00 | 1.23 | 1.85 | 0.683 | 1.03 |
| | 36 | 2.81 | 4.23 | 1.88 | 2.83 | 1.16 | 1.75 | 0.645 | 0.970 |
| | 38 | 2.66 | 4.00 | 1.78 | 2.68 | 1.10 | 1.66 | 0.611 | 0.919 |
| | 40 | 2.53 | 3.80 | 1.69 | 2.55 | 1.05 | 1.58 | 0.581 | 0.873 |
| | 42 | 2.41 | 3.62 | 1.61 | 2.43 | 1.00 | 1.50 | 0.553 | 0.831 |
| | 44 | 2.30 | 3.46 | 1.54 | 2.32 | 0.953 | 1.43 | 0.528 | 0.794 |
| | 46 | 2.20 | 3.31 | 1.47 | 2.21 | 0.911 | 1.37 | 0.505 | 0.759 |
| | 48 | 2.11 | 3.17 | 1.41 | 2.12 | 0.873 | 1.31 | 0.484 | 0.728 |
| | 50 | 2.02 | 3.04 | 1.36 | 2.04 | 0.838 | 1.26 | 0.465 | 0.698 |
| | 52 | 1.95 | 2.93 | 1.30 | 1.96 | 0.806 | 1.21 | 0.447 | 0.672 |
| | 54 | 1.87 | 2.82 | 1.26 | 1.89 | 0.776 | 1.17 | 0.430 | 0.647 |
| | 56 | 1.81 | 2.72 | 1.21 | 1.82 | 0.749 | 1.13 | 0.415 | 0.624 |
| | 58 | 1.74 | 2.62 | 1.17 | 1.76 | 0.723 | 1.09 | 0.401 | 0.602 |
| | 60 | 1.69 | 2.54 | 1.13 | 1.70 | 0.699 | 1.05 | 0.387 | 0.582 |
| Beam Properties | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 101 | 152 | 67.8 | 102 | 41.9 | 63.0 | 23.2 | 34.9 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 12.6 | 19.0 | 8.47 | 12.7 | 5.24 | 7.88 | 2.90 | 4.37 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 4.94 | 7.43 | 3.30 | 4.96 | 2.04 | 3.07 | 1.13 | 1.69 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.507 | 0.762 | 0.338 | 0.508 | 0.203 | 0.305 | 0.104 | 0.157 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 15.0 | 22.6 | 11.5 | 17.3 | 8.32 | 12.5 | 5.50 | 8.26 |
| $Z_x$, in.$^3$ | | 8.45 | | 5.66 | | 3.50 | | 1.94 | |
| $L_p$, ft | | 1.43 | | 1.30 | | 1.17 | | 1.06 | |
| $L_r$, ft | | 16.6 | | 16.6 | | 16.9 | | 18.1 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-5 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

C15-C12

# Table 2-6
# Maximum Total Uniform Load, kips
## C-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | C15× | | | | | | C12× | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 50 | | 40 | | 33.9 | | 30 | | 25 | | 20.7 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 232 | 348 | | | | | 132 | 198 | 100 | 150 | | |
| | 4 | 204 | 307 | 168 | 252 | 129 | 194 | 101 | 152 | 87.7 | 132 | 73.0 | 110 |
| | 5 | 164 | 246 | 137 | 206 | 121 | 182 | 80.7 | 121 | 70.2 | 105 | 61.1 | 91.8 |
| | 6 | 136 | 205 | 114 | 172 | 101 | 152 | 67.3 | 101 | 58.5 | 87.9 | 50.9 | 76.5 |
| | 7 | 117 | 176 | 97.9 | 147 | 86.4 | 130 | 57.7 | 86.7 | 50.1 | 75.3 | 43.6 | 65.6 |
| | 8 | 102 | 154 | 85.6 | 129 | 75.6 | 114 | 50.4 | 75.8 | 43.9 | 65.9 | 38.2 | 57.4 |
| | 9 | 90.9 | 137 | 76.1 | 114 | 67.2 | 101 | 44.8 | 67.4 | 39.0 | 58.6 | 33.9 | 51.0 |
| | 10 | 81.8 | 123 | 68.5 | 103 | 60.5 | 90.9 | 40.4 | 60.7 | 35.1 | 52.7 | 30.5 | 45.9 |
| | 11 | 74.4 | 112 | 62.3 | 93.6 | 55.0 | 82.6 | 36.7 | 55.1 | 31.9 | 47.9 | 27.8 | 41.7 |
| | 12 | 68.2 | 102 | 57.1 | 85.8 | 50.4 | 75.8 | 33.6 | 50.6 | 29.2 | 44.0 | 25.4 | 38.3 |
| | 13 | 62.9 | 94.6 | 52.7 | 79.2 | 46.5 | 69.9 | 31.0 | 46.7 | 27.0 | 40.6 | 23.5 | 35.3 |
| | 14 | 58.4 | 87.8 | 48.9 | 73.5 | 43.2 | 64.9 | 28.8 | 43.3 | 25.1 | 37.7 | 21.8 | 32.8 |
| | 15 | 54.5 | 82.0 | 45.7 | 68.6 | 40.3 | 60.6 | 26.9 | 40.4 | 23.4 | 35.2 | 20.4 | 30.6 |
| | 16 | 51.1 | 76.8 | 42.8 | 64.4 | 37.8 | 56.8 | 25.2 | 37.9 | 21.9 | 33.0 | 19.1 | 28.7 |
| | 17 | 48.1 | 72.3 | 40.3 | 60.6 | 35.6 | 53.5 | 23.7 | 35.7 | 20.6 | 31.0 | 18.0 | 27.0 |
| | 18 | 45.4 | 68.3 | 38.1 | 57.2 | 33.6 | 50.5 | 22.4 | 33.7 | 19.5 | 29.3 | 17.0 | 25.5 |
| | 19 | 43.1 | 64.7 | 36.1 | 54.2 | 31.8 | 47.8 | 21.2 | 31.9 | 18.5 | 27.8 | 16.1 | 24.2 |
| | 20 | 40.9 | 61.5 | 34.3 | 51.5 | 30.2 | 45.5 | 20.2 | 30.3 | 17.5 | 26.4 | 15.3 | 23.0 |
| | 21 | 39.0 | 58.5 | 32.6 | 49.0 | 28.8 | 43.3 | 19.2 | 28.9 | 16.7 | 25.1 | 14.5 | 21.9 |
| | 22 | 37.2 | 55.9 | 31.1 | 46.8 | 27.5 | 41.3 | 18.3 | 27.6 | 15.9 | 24.0 | 13.9 | 20.9 |
| | 23 | 35.6 | 53.5 | 29.8 | 44.8 | 26.3 | 39.5 | 17.5 | 26.4 | 15.3 | 22.9 | 13.3 | 20.0 |
| | 24 | 34.1 | 51.2 | 28.5 | 42.9 | 25.2 | 37.9 | 16.8 | 25.3 | 14.6 | 22.0 | 12.7 | 19.1 |
| | 25 | 32.7 | 49.2 | 27.4 | 41.2 | 24.2 | 36.4 | 16.1 | 24.3 | 14.0 | 21.1 | 12.2 | 18.4 |
| | 26 | 31.5 | 47.3 | 26.3 | 39.6 | 23.3 | 35.0 | 15.5 | 23.3 | 13.5 | 20.3 | 11.7 | 17.7 |
| | 27 | 30.3 | 45.5 | 25.4 | 38.1 | 22.4 | 33.7 | 14.9 | 22.5 | 13.0 | 19.5 | 11.3 | 17.0 |
| | 28 | 29.2 | 43.9 | 24.5 | 36.8 | 21.6 | 32.5 | 14.4 | 21.7 | 12.5 | 18.8 | 10.9 | 16.4 |
| | 29 | 28.2 | 42.4 | 23.6 | 35.5 | 20.9 | 31.3 | 13.9 | 20.9 | 12.1 | 18.2 | 10.5 | 15.8 |
| | 30 | 27.3 | 41.0 | 22.8 | 34.3 | 20.2 | 30.3 | 13.5 | 20.2 | 11.7 | 17.6 | 10.2 | 15.3 |
| | 31 | 26.4 | 39.7 | 22.1 | 33.2 | 19.5 | 29.3 | 13.0 | 19.6 | 11.3 | 17.0 | 9.85 | 14.8 |
| | 32 | 25.6 | 38.4 | 21.4 | 32.2 | 18.9 | 28.4 | 12.6 | 19.0 | 11.0 | 16.5 | 9.54 | 14.3 |
| | 33 | 24.8 | 37.3 | 20.8 | 31.2 | 18.3 | 27.5 | 12.2 | 18.4 | 10.6 | 16.0 | 9.25 | 13.9 |
| | 34 | 24.1 | 36.2 | 20.1 | 30.3 | 17.8 | 26.7 | 11.9 | 17.8 | 10.3 | 15.5 | 8.98 | 13.5 |
| | 35 | 23.4 | 35.1 | 19.6 | 29.4 | 17.3 | 26.0 | 11.5 | 17.3 | 10.0 | 15.1 | 8.73 | 13.1 |
| | 36 | 22.7 | 34.2 | 19.0 | 28.6 | 16.8 | 25.3 | 11.2 | 16.9 | 9.75 | 14.7 | 8.48 | 12.8 |
| | 37 | 22.1 | 33.2 | 18.5 | 27.8 | 16.3 | 24.6 | 10.9 | 16.4 | 9.48 | 14.3 | 8.25 | 12.4 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 818 | 1230 | 685 | 1030 | 605 | 909 | 404 | 607 | 351 | 527 | 305 | 459 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 102 | 154 | 85.6 | 129 | 75.6 | 114 | 50.4 | 75.8 | 43.9 | 65.9 | 38.2 | 57.4 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 36.2 | 54.4 | 31.2 | 46.9 | 28.1 | 42.2 | 18.2 | 27.3 | 16.2 | 24.3 | 14.5 | 21.8 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 3.12 | 4.68 | 3.27 | 4.91 | 3.22 | 4.84 | 1.96 | 2.95 | 2.01 | 3.02 | 1.95 | 2.93 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 116 | 174 | 84.1 | 126 | 64.7 | 97.2 | 66.0 | 99.1 | 50.1 | 75.2 | 36.5 | 54.8 |
| $Z_x$, in.$^3$ | | 68.3 | | 57.2 | | 50.5 | | 33.7 | | 29.3 | | 25.5 | |
| $L_p$, ft | | 1.94 | | 1.99 | | 2.03 | | 1.73 | | 1.78 | | 1.82 | |
| $L_r$, ft | | 23.1 | | 18.7 | | 16.8 | | 18.2 | | 15.6 | | 14.0 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-6 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-6 (continued)
# Maximum Total Uniform Load, kips
## C-Shapes (Welded)

C10-C9

| Shape | | C10× | | | | | | | | C9× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | | 25 | | 20 | | 15.3 | | 20 | | 15 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 107 | 160 | 91.8 | 138 | 77.0 | 116 | 51.8 | 77.8 | 67.5 | 101 | 54.3 | 81.6 |
| | 4 | 79.9 | 120 | 68.9 | 104 | 57.8 | 86.9 | 47.3 | 71.1 | 50.6 | 76.1 | 40.7 | 61.2 |
| | 5 | 64.0 | 96.1 | 55.1 | 82.8 | 46.2 | 69.5 | 37.8 | 56.9 | 40.5 | 60.8 | 32.6 | 49.0 |
| | 6 | 53.3 | 80.1 | 45.9 | 69.0 | 38.5 | 57.9 | 31.5 | 47.4 | 33.7 | 50.7 | 27.1 | 40.8 |
| | 7 | 45.7 | 68.7 | 39.3 | 59.1 | 33.0 | 49.6 | 27.0 | 40.6 | 28.9 | 43.5 | 23.3 | 35.0 |
| | 8 | 40.0 | 60.1 | 34.4 | 51.8 | 28.9 | 43.4 | 23.7 | 35.6 | 25.3 | 38.0 | 20.4 | 30.6 |
| | 9 | 35.5 | 53.4 | 30.6 | 46.0 | 25.7 | 38.6 | 21.0 | 31.6 | 22.5 | 33.8 | 18.1 | 27.2 |
| | 10 | 32.0 | 48.1 | 27.5 | 41.4 | 23.1 | 34.7 | 18.9 | 28.4 | 20.2 | 30.4 | 16.3 | 24.5 |
| | 11 | 29.1 | 43.7 | 25.0 | 37.6 | 21.0 | 31.6 | 17.2 | 25.9 | 18.4 | 27.7 | 14.8 | 22.3 |
| | 12 | 26.6 | 40.1 | 23.0 | 34.5 | 19.3 | 29.0 | 15.8 | 23.7 | 16.9 | 25.4 | 13.6 | 20.4 |
| | 13 | 24.6 | 37.0 | 21.2 | 31.8 | 17.8 | 26.7 | 14.6 | 21.9 | 15.6 | 23.4 | 12.5 | 18.8 |
| | 14 | 22.8 | 34.3 | 19.7 | 29.6 | 16.5 | 24.8 | 13.5 | 20.3 | 14.5 | 21.7 | 11.6 | 17.5 |
| | 15 | 21.3 | 32.0 | 18.4 | 27.6 | 15.4 | 23.2 | 12.6 | 19.0 | 13.5 | 20.3 | 10.9 | 16.3 |
| | 16 | 20.0 | 30.0 | 17.2 | 25.9 | 14.4 | 21.7 | 11.8 | 17.8 | 12.6 | 19.0 | 10.2 | 15.3 |
| | 17 | 18.8 | 28.3 | 16.2 | 24.4 | 13.6 | 20.4 | 11.1 | 16.7 | 11.9 | 17.9 | 9.58 | 14.4 |
| | 18 | 17.8 | 26.7 | 15.3 | 23.0 | 12.8 | 19.3 | 10.5 | 15.8 | 11.2 | 16.9 | 9.05 | 13.6 |
| | 19 | 16.8 | 25.3 | 14.5 | 21.8 | 12.2 | 18.3 | 10.0 | 15.0 | 10.7 | 16.0 | 8.57 | 12.9 |
| | 20 | 16.0 | 24.0 | 13.8 | 20.7 | 11.6 | 17.4 | 9.46 | 14.2 | 10.1 | 15.2 | 8.14 | 12.2 |
| | 21 | 15.2 | 22.9 | 13.1 | 19.7 | 11.0 | 16.5 | 9.01 | 13.5 | 9.64 | 14.5 | 7.76 | 11.7 |
| | 22 | 14.5 | 21.8 | 12.5 | 18.8 | 10.5 | 15.8 | 8.60 | 12.9 | 9.20 | 13.8 | 7.40 | 11.1 |
| | 23 | 13.9 | 20.9 | 12.0 | 18.0 | 10.0 | 15.1 | 8.23 | 12.4 | 8.80 | 13.2 | 7.08 | 10.6 |
| | 24 | 13.3 | 20.0 | 11.5 | 17.3 | 9.63 | 14.5 | 7.88 | 11.9 | 8.43 | 12.7 | 6.79 | 10.2 |
| | 25 | 12.8 | 19.2 | 11.0 | 16.6 | 9.25 | 13.9 | 7.57 | 11.4 | 8.10 | 12.2 | 6.51 | 9.79 |
| | 26 | 12.3 | 18.5 | 10.6 | 15.9 | 8.89 | 13.4 | 7.28 | 10.9 | 7.78 | 11.7 | 6.26 | 9.42 |
| | 27 | 11.8 | 17.8 | 10.2 | 15.3 | 8.56 | 12.9 | 7.01 | 10.5 | 7.50 | 11.3 | 6.03 | 9.07 |
| | 28 | 11.4 | 17.2 | 9.84 | 14.8 | 8.25 | 12.4 | 6.76 | 10.2 | 7.23 | 10.9 | 5.82 | 8.74 |
| | 29 | 11.0 | 16.6 | 9.50 | 14.3 | 7.97 | 12.0 | 6.52 | 9.81 | 6.98 | 10.5 | 5.62 | 8.44 |
| | 30 | 10.7 | 16.0 | 9.18 | 13.8 | 7.70 | 11.6 | 6.31 | 9.48 | 6.75 | 10.1 | 5.43 | 8.16 |
| | 31 | 10.3 | 15.5 | 8.89 | 13.4 | 7.46 | 11.2 | 6.10 | 9.17 | 6.53 | 9.81 | 5.25 | 7.90 |
| | 32 | 10.0 | 15.0 | 8.61 | 12.9 | 7.22 | 10.9 | 5.91 | 8.89 | 6.32 | 9.51 | 5.09 | 7.65 |
| | 33 | 9.69 | 14.6 | 8.35 | 12.5 | 7.00 | 10.5 | 5.73 | 8.62 | 6.13 | 9.22 | 4.94 | 7.42 |
| | 34 | 9.40 | 14.1 | 8.10 | 12.2 | 6.80 | 10.2 | 5.57 | 8.36 | 5.95 | 8.95 | 4.79 | 7.20 |
| | 35 | 9.14 | 13.7 | 7.87 | 11.8 | 6.60 | 9.93 | 5.41 | 8.13 | 5.78 | 8.69 | 4.65 | 6.99 |
| | 36 | 8.88 | 13.4 | 7.65 | 11.5 | 6.42 | 9.65 | 5.26 | 7.90 | 5.62 | 8.45 | 4.52 | 6.80 |
| | 37 | 8.64 | 13.0 | 7.44 | 11.2 | 6.25 | 9.39 | 5.11 | 7.69 | 5.47 | 8.22 | 4.40 | 6.62 |
| **Beam Properties** | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 320 | 481 | 275 | 414 | 231 | 347 | 189 | 284 | 202 | 304 | 163 | 245 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 40.0 | 60.1 | 34.4 | 51.8 | 28.9 | 43.4 | 23.7 | 35.6 | 25.3 | 38.0 | 20.4 | 30.6 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 13.9 | 20.9 | 12.3 | 18.4 | 10.6 | 15.9 | 9.03 | 13.6 | 9.09 | 13.7 | 7.61 | 11.4 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.15 | 1.73 | 1.27 | 1.90 | 1.36 | 2.04 | 1.32 | 1.99 | 1.04 | 1.57 | 1.10 | 1.65 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 72.5 | 109 | 56.7 | 85.2 | 40.9 | 61.4 | 25.9 | 38.9 | 43.5 | 65.3 | 27.6 | 41.6 |
| $Z_x$, in.$^3$ | | 26.7 | | 23.0 | | 19.3 | | 15.8 | | 16.9 | | 13.6 | |
| $L_p$, ft | | 1.51 | | 1.54 | | 1.58 | | 1.63 | | 1.46 | | 1.51 | |
| $L_r$, ft | | 24.2 | | 19.0 | | 15.1 | | 12.7 | | 17.0 | | 13.1 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-6 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

C9-C7

## Table 2-6 (continued)
# Maximum Total Uniform Load, kips
### C-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | C9× | | C8× | | | | | | C7× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 13.4 | | 18.75 | | 13.75 | | 11.5 | | 14.75 | | 12.25 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 45.2 | 68.0 | 55.5 | 83.4 | 43.5 | 65.4 | 38.0 | 57.0 | 38.7 | 58.2 | 33.5 | 50.4 |
| | 4 | 37.4 | 56.3 | 41.6 | 62.6 | 32.6 | 49.1 | 28.7 | 43.1 | 29.0 | 43.7 | 25.1 | 37.8 |
| | 5 | 29.9 | 45.0 | 33.3 | 50.0 | 26.1 | 39.2 | 22.9 | 34.5 | 23.2 | 34.9 | 20.1 | 30.2 |
| | 6 | 25.0 | 37.5 | 27.7 | 41.7 | 21.8 | 32.7 | 19.1 | 28.7 | 19.4 | 29.1 | 16.8 | 25.2 |
| | 7 | 21.4 | 32.1 | 23.8 | 35.7 | 18.6 | 28.0 | 16.4 | 24.6 | 16.6 | 24.9 | 14.4 | 21.6 |
| | 8 | 18.7 | 28.1 | 20.8 | 31.3 | 16.3 | 24.5 | 14.3 | 21.5 | 14.5 | 21.8 | 12.6 | 18.9 |
| | 9 | 16.6 | 25.0 | 18.5 | 27.8 | 14.5 | 21.8 | 12.7 | 19.1 | 12.9 | 19.4 | 11.2 | 16.8 |
| | 10 | 15.0 | 22.5 | 16.6 | 25.0 | 13.1 | 19.6 | 11.5 | 17.2 | 11.6 | 17.5 | 10.1 | 15.1 |
| | 11 | 13.6 | 20.5 | 15.1 | 22.7 | 11.9 | 17.8 | 10.4 | 15.7 | 10.6 | 15.9 | 9.15 | 13.7 |
| | 12 | 12.5 | 18.8 | 13.9 | 20.9 | 10.9 | 16.4 | 9.55 | 14.4 | 9.68 | 14.6 | 8.38 | 12.6 |
| | 13 | 11.5 | 17.3 | 12.8 | 19.2 | 10.0 | 15.1 | 8.82 | 13.3 | 8.94 | 13.4 | 7.74 | 11.6 |
| | 14 | 10.7 | 16.1 | 11.9 | 17.9 | 9.32 | 14.0 | 8.19 | 12.3 | 8.30 | 12.5 | 7.19 | 10.8 |
| | 15 | 9.98 | 15.0 | 11.1 | 16.7 | 8.70 | 13.1 | 7.64 | 11.5 | 7.74 | 11.6 | 6.71 | 10.1 |
| | 16 | 9.36 | 14.1 | 10.4 | 15.6 | 8.16 | 12.3 | 7.16 | 10.8 | 7.26 | 10.9 | 6.29 | 9.45 |
| | 17 | 8.81 | 13.2 | 9.79 | 14.7 | 7.68 | 11.5 | 6.74 | 10.1 | 6.83 | 10.3 | 5.92 | 8.89 |
| | 18 | 8.32 | 12.5 | 9.25 | 13.9 | 7.25 | 10.9 | 6.37 | 9.57 | 6.45 | 9.70 | 5.59 | 8.40 |
| | 19 | 7.88 | 11.8 | 8.76 | 13.2 | 6.87 | 10.3 | 6.03 | 9.07 | 6.11 | 9.19 | 5.29 | 7.96 |
| | 20 | 7.49 | 11.3 | 8.32 | 12.5 | 6.53 | 9.81 | 5.73 | 8.61 | 5.81 | 8.73 | 5.03 | 7.56 |
| | 21 | 7.13 | 10.7 | 7.93 | 11.9 | 6.22 | 9.34 | 5.46 | 8.20 | 5.53 | 8.31 | 4.79 | 7.20 |
| | 22 | 6.80 | 10.2 | 7.57 | 11.4 | 5.93 | 8.92 | 5.21 | 7.83 | 5.28 | 7.94 | 4.57 | 6.87 |
| | 23 | 6.51 | 9.78 | 7.24 | 10.9 | 5.68 | 8.53 | 4.98 | 7.49 | 5.05 | 7.59 | 4.37 | 6.57 |
| | 24 | 6.24 | 9.38 | 6.94 | 10.4 | 5.44 | 8.18 | 4.78 | 7.18 | 4.84 | 7.28 | 4.19 | 6.30 |
| | 25 | 5.99 | 9.00 | 6.66 | 10.0 | 5.22 | 7.85 | 4.58 | 6.89 | 4.65 | 6.98 | 4.02 | 6.05 |
| | 26 | 5.76 | 8.65 | 6.40 | 9.62 | 5.02 | 7.55 | 4.41 | 6.63 | 4.47 | 6.72 | 3.87 | 5.82 |
| | 27 | 5.54 | 8.33 | 6.17 | 9.27 | 4.83 | 7.27 | 4.24 | 6.38 | 4.30 | 6.47 | 3.73 | 5.60 |
| | 28 | 5.35 | 8.04 | 5.95 | 8.94 | 4.66 | 7.01 | 4.09 | 6.15 | 4.15 | 6.24 | 3.59 | 5.40 |
| | 29 | 5.16 | 7.76 | 5.74 | 8.63 | 4.50 | 6.77 | 3.95 | 5.94 | 4.01 | 6.02 | 3.47 | 5.21 |
| | 30 | 4.99 | 7.50 | 5.55 | 8.34 | 4.35 | 6.54 | 3.82 | 5.74 | 3.87 | 5.82 | 3.35 | 5.04 |
| | 31 | 4.83 | 7.26 | 5.37 | 8.07 | 4.21 | 6.33 | 3.70 | 5.56 | 3.75 | 5.63 | 3.25 | 4.88 |
| | 32 | 4.68 | 7.03 | 5.20 | 7.82 | 4.08 | 6.13 | 3.58 | 5.38 | 3.63 | 5.46 | 3.14 | 4.73 |
| | 33 | 4.54 | 6.82 | 5.04 | 7.58 | 3.96 | 5.95 | 3.47 | 5.22 | 3.52 | 5.29 | 3.05 | 4.58 |
| | 34 | 4.40 | 6.62 | 4.90 | 7.36 | 3.84 | 5.77 | 3.37 | 5.07 | 3.42 | 5.14 | 2.96 | 4.45 |
| | 35 | 4.28 | 6.43 | 4.76 | 7.15 | 3.73 | 5.61 | 3.27 | 4.92 | 3.32 | 4.99 | 2.87 | 4.32 |
| | 36 | 4.16 | 6.25 | 4.62 | 6.95 | 3.63 | 5.45 | 3.18 | 4.79 | 3.23 | 4.85 | 2.79 | 4.20 |
| | 37 | 4.05 | 6.08 | 4.50 | 6.76 | 3.53 | 5.30 | 3.10 | 4.66 | 3.14 | 4.72 | 2.72 | 4.09 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 150 | 225 | 166 | 250 | 131 | 196 | 115 | 172 | 116 | 175 | 101 | 151 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 18.7 | 28.1 | 20.8 | 31.3 | 16.3 | 24.5 | 14.3 | 21.5 | 14.5 | 21.8 | 12.6 | 18.9 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 7.14 | 10.7 | 7.41 | 11.1 | 6.06 | 9.11 | 5.46 | 8.20 | 5.21 | 7.84 | 4.64 | 6.98 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 1.08 | 1.62 | 0.770 | 1.16 | 0.856 | 1.29 | 0.842 | 1.27 | 0.588 | 0.884 | 0.635 | 0.954 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 22.6 | 34.0 | 42.0 | 63.1 | 26.1 | 39.3 | 19.0 | 28.5 | 31.6 | 47.5 | 23.7 | 35.6 |
| $Z_x$, in.$^3$ | | 12.5 | | 13.9 | | 10.9 | | 9.57 | | 9.70 | | 8.40 | |
| $L_p$, ft | | 1.52 | | 1.36 | | 1.39 | | 1.42 | | 1.27 | | 1.29 | |
| $L_r$, ft | | 12.3 | | 18.8 | | 13.4 | | 12.0 | | 17.1 | | 13.8 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-6 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-6 (continued)
# Maximum Total Uniform Load, kips
### C-Shapes (Welded)

C7-C5

| Shape | | C7× | | C6× | | | | | | C5× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.8 | | 13 | | 10.5 | | 8.2 | | 9 | | 6.7 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 28.5 | 42.8 | 29.1 | 43.7 | 24.6 | 37.0 | 20.5 | 30.8 | 17.4 | 26.2 | 14.1 | 21.1 |
| | 4 | 21.4 | 32.1 | 21.8 | 32.8 | 18.4 | 27.7 | 15.4 | 23.1 | 13.1 | 19.7 | 10.5 | 15.8 |
| | 5 | 17.1 | 25.7 | 17.4 | 26.2 | 14.8 | 22.2 | 12.3 | 18.5 | 10.5 | 15.7 | 8.43 | 12.7 |
| | 6 | 14.3 | 21.4 | 14.5 | 21.8 | 12.3 | 18.5 | 10.3 | 15.4 | 8.72 | 13.1 | 7.03 | 10.6 |
| | 7 | 12.2 | 18.4 | 12.5 | 18.7 | 10.5 | 15.8 | 8.79 | 13.2 | 7.48 | 11.2 | 6.02 | 9.05 |
| | 8 | 10.7 | 16.1 | 10.9 | 16.4 | 9.22 | 13.9 | 7.69 | 11.6 | 6.54 | 9.83 | 5.27 | 7.92 |
| | 9 | 9.50 | 14.3 | 9.69 | 14.6 | 8.20 | 12.3 | 6.84 | 10.3 | 5.82 | 8.74 | 4.68 | 7.04 |
| | 10 | 8.55 | 12.9 | 8.72 | 13.1 | 7.38 | 11.1 | 6.16 | 9.25 | 5.23 | 7.87 | 4.22 | 6.34 |
| | 11 | 7.77 | 11.7 | 7.93 | 11.9 | 6.71 | 10.1 | 5.60 | 8.41 | 4.76 | 7.15 | 3.83 | 5.76 |
| | 12 | 7.13 | 10.7 | 7.27 | 10.9 | 6.15 | 9.24 | 5.13 | 7.71 | 4.36 | 6.56 | 3.51 | 5.28 |
| | 13 | 6.58 | 9.89 | 6.71 | 10.1 | 5.67 | 8.53 | 4.74 | 7.12 | 4.03 | 6.05 | 3.24 | 4.87 |
| | 14 | 6.11 | 9.18 | 6.23 | 9.36 | 5.27 | 7.92 | 4.40 | 6.61 | 3.74 | 5.62 | 3.01 | 4.53 |
| | 15 | 5.70 | 8.57 | 5.81 | 8.74 | 4.92 | 7.39 | 4.10 | 6.17 | 3.49 | 5.24 | 2.81 | 4.22 |
| | 16 | 5.34 | 8.03 | 5.45 | 8.19 | 4.61 | 6.93 | 3.85 | 5.78 | 3.27 | 4.92 | 2.63 | 3.96 |
| | 17 | 5.03 | 7.56 | 5.13 | 7.71 | 4.34 | 6.52 | 3.62 | 5.44 | 3.08 | 4.63 | 2.48 | 3.73 |
| | 18 | 4.75 | 7.14 | 4.84 | 7.28 | 4.10 | 6.16 | 3.42 | 5.14 | 2.91 | 4.37 | 2.34 | 3.52 |
| | 19 | 4.50 | 6.76 | 4.59 | 6.90 | 3.88 | 5.84 | 3.24 | 4.87 | 2.75 | 4.14 | 2.22 | 3.33 |
| | 20 | 4.28 | 6.43 | 4.36 | 6.55 | 3.69 | 5.54 | 3.08 | 4.63 | 2.62 | 3.93 | 2.11 | 3.17 |
| | 21 | 4.07 | 6.12 | 4.15 | 6.24 | 3.51 | 5.28 | 2.93 | 4.41 | 2.49 | 3.75 | 2.01 | 3.02 |
| | 22 | 3.89 | 5.84 | 3.96 | 5.96 | 3.35 | 5.04 | 2.80 | 4.21 | 2.38 | 3.58 | 1.92 | 2.88 |
| | 23 | 3.72 | 5.59 | 3.79 | 5.70 | 3.21 | 4.82 | 2.68 | 4.02 | 2.28 | 3.42 | 1.83 | 2.75 |
| | 24 | 3.56 | 5.36 | 3.63 | 5.46 | 3.07 | 4.62 | 2.56 | 3.86 | 2.18 | 3.28 | 1.76 | 2.64 |
| | 25 | 3.42 | 5.14 | 3.49 | 5.24 | 2.95 | 4.44 | 2.46 | 3.70 | 2.09 | 3.15 | 1.69 | 2.53 |
| | 26 | 3.29 | 4.94 | 3.35 | 5.04 | 2.84 | 4.26 | 2.37 | 3.56 | 2.01 | 3.03 | 1.62 | 2.44 |
| | 27 | 3.17 | 4.76 | 3.23 | 4.85 | 2.73 | 4.11 | 2.28 | 3.43 | 1.94 | 2.91 | 1.56 | 2.35 |
| | 28 | 3.05 | 4.59 | 3.11 | 4.68 | 2.63 | 3.96 | 2.20 | 3.30 | 1.87 | 2.81 | 1.51 | 2.26 |
| | 29 | 2.95 | 4.43 | 3.01 | 4.52 | 2.54 | 3.82 | 2.12 | 3.19 | 1.80 | 2.71 | 1.45 | 2.18 |
| | 30 | 2.85 | 4.28 | 2.91 | 4.37 | 2.46 | 3.70 | 2.05 | 3.08 | 1.74 | 2.62 | 1.41 | 2.11 |
| | 31 | 2.76 | 4.15 | 2.81 | 4.23 | 2.38 | 3.58 | 1.99 | 2.98 | 1.69 | 2.54 | 1.36 | 2.04 |
| | 32 | 2.67 | 4.02 | 2.72 | 4.10 | 2.31 | 3.47 | 1.92 | 2.89 | 1.64 | 2.46 | 1.32 | 1.98 |
| | 33 | 2.59 | 3.89 | 2.64 | 3.97 | 2.24 | 3.36 | 1.87 | 2.80 | 1.59 | 2.38 | 1.28 | 1.92 |
| | 34 | 2.51 | 3.78 | 2.56 | 3.85 | 2.17 | 3.26 | 1.81 | 2.72 | 1.54 | 2.31 | 1.24 | 1.86 |
| | 35 | 2.44 | 3.67 | 2.49 | 3.74 | 2.11 | 3.17 | 1.76 | 2.64 | 1.50 | 2.25 | 1.20 | 1.81 |
| | 36 | 2.38 | 3.57 | 2.42 | 3.64 | 2.05 | 3.08 | 1.71 | 2.57 | 1.45 | 2.19 | 1.17 | 1.76 |
| | 37 | 2.31 | 3.47 | 2.36 | 3.54 | 1.99 | 3.00 | 1.66 | 2.50 | 1.41 | 2.13 | 1.14 | 1.71 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 85.5 | 129 | 87.2 | 131 | 73.8 | 111 | 61.6 | 92.5 | 52.3 | 78.7 | 42.2 | 63.4 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 10.7 | 16.1 | 10.9 | 16.4 | 9.22 | 13.9 | 7.69 | 11.6 | 6.54 | 9.83 | 5.27 | 7.92 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 4.08 | 6.14 | 3.89 | 5.84 | 3.39 | 5.09 | 2.94 | 4.42 | 2.39 | 3.59 | 2.01 | 3.02 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.640 | 0.963 | 0.400 | 0.602 | 0.447 | 0.671 | 0.463 | 0.695 | 0.288 | 0.432 | 0.310 | 0.466 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 15.8 | 23.8 | 28.3 | 42.5 | 20.3 | 30.5 | 12.9 | 19.4 | 17.5 | 26.3 | 10.2 | 15.4 |
| $Z_x$, in.$^3$ | | 7.14 | | 7.28 | | 6.16 | | 5.14 | | 4.37 | | 3.52 | |
| $L_p$, ft | | 1.32 | | 1.18 | | 1.19 | | 1.21 | | 1.11 | | 1.11 | |
| $L_r$, ft | | 11.6 | | 18.7 | | 14.3 | | 11.5 | | 15.5 | | 11.6 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-6 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

C4-C3

## Table 2-6 (continued)
# Maximum Total Uniform Load, kips
### C-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | C4× | | | | C3× | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7.25 | | 5.4 | | 6 | | 5 | | 4.1 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 11.3 | 16.9 | 9.06 | 13.6 | 6.91 | 10.4 | 6.03 | 9.06 | 5.23 | 7.86 |
| | 4 | 8.44 | 12.7 | 6.80 | 10.2 | 5.18 | 7.79 | 4.52 | 6.80 | 3.92 | 5.90 |
| | 5 | 6.75 | 10.2 | 5.44 | 8.17 | 4.14 | 6.23 | 3.62 | 5.44 | 3.14 | 4.72 |
| | 6 | 5.63 | 8.46 | 4.53 | 6.81 | 3.45 | 5.19 | 3.01 | 4.53 | 2.61 | 3.93 |
| | 7 | 4.82 | 7.25 | 3.88 | 5.84 | 2.96 | 4.45 | 2.58 | 3.88 | 2.24 | 3.37 |
| | 8 | 4.22 | 6.35 | 3.40 | 5.11 | 2.59 | 3.89 | 2.26 | 3.40 | 1.96 | 2.95 |
| | 9 | 3.75 | 5.64 | 3.02 | 4.54 | 2.30 | 3.46 | 2.01 | 3.02 | 1.74 | 2.62 |
| | 10 | 3.38 | 5.08 | 2.72 | 4.09 | 2.07 | 3.11 | 1.81 | 2.72 | 1.57 | 2.36 |
| | 11 | 3.07 | 4.61 | 2.47 | 3.71 | 1.88 | 2.83 | 1.64 | 2.47 | 1.43 | 2.14 |
| | 12 | 2.81 | 4.23 | 2.27 | 3.41 | 1.73 | 2.60 | 1.51 | 2.27 | 1.31 | 1.97 |
| | 13 | 2.60 | 3.90 | 2.09 | 3.14 | 1.59 | 2.40 | 1.39 | 2.09 | 1.21 | 1.81 |
| | 14 | 2.41 | 3.63 | 1.94 | 2.92 | 1.48 | 2.22 | 1.29 | 1.94 | 1.12 | 1.68 |
| | 15 | 2.25 | 3.38 | 1.81 | 2.72 | 1.38 | 2.08 | 1.21 | 1.81 | 1.05 | 1.57 |
| | 16 | 2.11 | 3.17 | 1.70 | 2.55 | 1.29 | 1.95 | 1.13 | 1.70 | 0.981 | 1.47 |
| | 17 | 1.99 | 2.99 | 1.60 | 2.40 | 1.22 | 1.83 | 1.06 | 1.60 | 0.923 | 1.39 |
| | 18 | 1.88 | 2.82 | 1.51 | 2.27 | 1.15 | 1.73 | 1.00 | 1.51 | 0.872 | 1.31 |
| | 19 | 1.78 | 2.67 | 1.43 | 2.15 | 1.09 | 1.64 | 0.952 | 1.43 | 0.826 | 1.24 |
| | 20 | 1.69 | 2.54 | 1.36 | 2.04 | 1.04 | 1.56 | 0.904 | 1.36 | 0.784 | 1.18 |
| | 21 | 1.61 | 2.42 | 1.29 | 1.95 | 0.987 | 1.48 | 0.861 | 1.29 | 0.747 | 1.12 |
| | 22 | 1.54 | 2.31 | 1.24 | 1.86 | 0.942 | 1.42 | 0.822 | 1.24 | 0.713 | 1.07 |
| | 23 | 1.47 | 2.21 | 1.18 | 1.78 | 0.901 | 1.35 | 0.786 | 1.18 | 0.682 | 1.03 |
| | 24 | 1.41 | 2.12 | 1.13 | 1.70 | 0.863 | 1.30 | 0.753 | 1.13 | 0.654 | 0.983 |
| | 25 | 1.35 | 2.03 | 1.09 | 1.63 | 0.829 | 1.25 | 0.723 | 1.09 | 0.628 | 0.943 |
| | 26 | 1.30 | 1.95 | 1.05 | 1.57 | 0.797 | 1.20 | 0.696 | 1.05 | 0.603 | 0.907 |
| | 27 | 1.25 | 1.88 | 1.01 | 1.51 | 0.767 | 1.15 | 0.670 | 1.01 | 0.581 | 0.873 |
| | 28 | 1.21 | 1.81 | 0.971 | 1.46 | 0.740 | 1.11 | 0.646 | 0.971 | 0.560 | 0.842 |
| | 29 | 1.16 | 1.75 | 0.937 | 1.41 | 0.714 | 1.07 | 0.624 | 0.937 | 0.541 | 0.813 |
| | 30 | 1.13 | 1.69 | 0.906 | 1.36 | 0.691 | 1.04 | 0.603 | 0.906 | 0.523 | 0.786 |
| | 31 | 1.09 | 1.64 | 0.877 | 1.32 | 0.668 | 1.00 | 0.583 | 0.877 | 0.506 | 0.761 |
| | 32 | 1.06 | 1.59 | 0.850 | 1.28 | 0.647 | 0.973 | 0.565 | 0.849 | 0.490 | 0.737 |
| | 33 | 1.02 | 1.54 | 0.824 | 1.24 | 0.628 | 0.944 | 0.548 | 0.824 | 0.475 | 0.715 |
| | 34 | 0.993 | 1.49 | 0.800 | 1.20 | 0.609 | 0.916 | 0.532 | 0.799 | 0.461 | 0.694 |
| | 35 | 0.965 | 1.45 | 0.777 | 1.17 | 0.592 | 0.890 | 0.517 | 0.777 | 0.448 | 0.674 |
| | 36 | 0.938 | 1.41 | 0.755 | 1.14 | 0.576 | 0.865 | 0.502 | 0.755 | 0.436 | 0.655 |
| | 37 | 0.913 | 1.37 | 0.735 | 1.10 | 0.560 | 0.842 | 0.489 | 0.735 | 0.424 | 0.637 |
| **Beam Properties** | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 33.8 | 50.8 | 27.2 | 40.9 | 20.7 | 31.1 | 18.1 | 27.2 | 15.7 | 23.6 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 4.22 | 6.35 | 3.40 | 5.11 | 2.59 | 3.89 | 2.26 | 3.40 | 1.96 | 2.95 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 1.54 | 2.31 | 1.29 | 1.93 | 0.930 | 1.40 | 0.829 | 1.25 | 0.741 | 1.11 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.171 | 0.257 | 0.190 | 0.285 | 0.083 | 0.125 | 0.093 | 0.140 | 0.099 | 0.149 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 13.8 | 20.8 | 7.93 | 11.9 | 11.5 | 17.3 | 8.34 | 12.5 | 5.50 | 8.26 |
| $Z_x$, in.$^3$ | | 2.82 | | 2.27 | | 1.73 | | 1.51 | | 1.31 | |
| $L_p$, ft | | 1.01 | | 1.00 | | 0.931 | | 0.919 | | 0.900 | |
| $L_r$, ft | | 16.7 | | 12.1 | | 20.9 | | 16.3 | | 13.2 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-6 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

C8-C4

# Table 2-7
# Maximum Total Uniform Load, kips
## C-Shapes (Hot Rolled)

$F_y$ = 30 ksi

| Shape | | C8× | | C6× | | | | C5× | | | | C4× | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 18.75 | | 10.5 | | 8.2 | | 9 | | 6.7 | | 7.25 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 55.5 | 83.4 | 24.7 | 37.1 | 20.6 | 31.0 | 17.5 | 26.3 | 14.2 | 21.3 | 11.3 | 17.0 |
| | 4 | 41.6 | 62.6 | 18.5 | 27.8 | 15.4 | 23.2 | 13.1 | 19.8 | 10.6 | 16.0 | 8.50 | 12.8 |
| | 5 | 33.3 | 50.0 | 14.8 | 22.2 | 12.4 | 18.6 | 10.5 | 15.8 | 8.50 | 12.8 | 6.80 | 10.2 |
| | 6 | 27.7 | 41.7 | 12.3 | 18.5 | 10.3 | 15.5 | 8.76 | 13.2 | 7.09 | 10.7 | 5.67 | 8.52 |
| | 7 | 23.8 | 35.7 | 10.6 | 15.9 | 8.83 | 13.3 | 7.51 | 11.3 | 6.07 | 9.13 | 4.86 | 7.30 |
| | 8 | 20.8 | 31.3 | 9.25 | 13.9 | 7.72 | 11.6 | 6.57 | 9.88 | 5.31 | 7.99 | 4.25 | 6.39 |
| | 9 | 18.5 | 27.8 | 8.22 | 12.4 | 6.87 | 10.3 | 5.84 | 8.78 | 4.72 | 7.10 | 3.78 | 5.68 |
| | 10 | 16.6 | 25.0 | 7.40 | 11.1 | 6.18 | 9.29 | 5.26 | 7.90 | 4.25 | 6.39 | 3.40 | 5.11 |
| | 11 | 15.1 | 22.7 | 6.73 | 10.1 | 5.62 | 8.44 | 4.78 | 7.18 | 3.86 | 5.81 | 3.09 | 4.65 |
| | 12 | 13.9 | 20.9 | 6.17 | 9.27 | 5.15 | 7.74 | 4.38 | 6.59 | 3.54 | 5.33 | 2.83 | 4.26 |
| | 13 | 12.8 | 19.2 | 5.69 | 8.56 | 4.75 | 7.14 | 4.04 | 6.08 | 3.27 | 4.92 | 2.62 | 3.93 |
| | 14 | 11.9 | 17.9 | 5.29 | 7.95 | 4.41 | 6.63 | 3.76 | 5.64 | 3.04 | 4.56 | 2.43 | 3.65 |
| | 15 | 11.1 | 16.7 | 4.93 | 7.42 | 4.12 | 6.19 | 3.50 | 5.27 | 2.83 | 4.26 | 2.27 | 3.41 |
| | 16 | 10.4 | 15.6 | 4.63 | 6.95 | 3.86 | 5.81 | 3.29 | 4.94 | 2.66 | 3.99 | 2.13 | 3.20 |
| | 17 | 9.79 | 14.7 | 4.35 | 6.54 | 3.64 | 5.46 | 3.09 | 4.65 | 2.50 | 3.76 | 2.00 | 3.01 |
| | 18 | 9.25 | 13.9 | 4.11 | 6.18 | 3.43 | 5.16 | 2.92 | 4.39 | 2.36 | 3.55 | 1.89 | 2.84 |
| | 19 | 8.76 | 13.2 | 3.90 | 5.85 | 3.25 | 4.89 | 2.77 | 4.16 | 2.24 | 3.36 | 1.79 | 2.69 |
| | 20 | 8.32 | 12.5 | 3.70 | 5.56 | 3.09 | 4.64 | 2.63 | 3.95 | 2.13 | 3.20 | 1.70 | 2.56 |
| | 21 | 7.93 | 11.9 | 3.52 | 5.30 | 2.94 | 4.42 | 2.50 | 3.76 | 2.02 | 3.04 | 1.62 | 2.43 |
| | 22 | 7.57 | 11.4 | 3.36 | 5.06 | 2.81 | 4.22 | 2.39 | 3.59 | 1.93 | 2.90 | 1.55 | 2.32 |
| | 23 | 7.24 | 10.9 | 3.22 | 4.84 | 2.69 | 4.04 | 2.29 | 3.44 | 1.85 | 2.78 | 1.48 | 2.22 |
| | 24 | 6.94 | 10.4 | 3.08 | 4.64 | 2.57 | 3.87 | 2.19 | 3.29 | 1.77 | 2.66 | 1.42 | 2.13 |
| | 25 | 6.66 | 10.0 | 2.96 | 4.45 | 2.47 | 3.72 | 2.10 | 3.16 | 1.70 | 2.56 | 1.36 | 2.04 |
| | 26 | 6.40 | 9.62 | 2.85 | 4.28 | 2.38 | 3.57 | 2.02 | 3.04 | 1.64 | 2.46 | 1.31 | 1.97 |
| | 27 | 6.17 | 9.27 | 2.74 | 4.12 | 2.29 | 3.44 | 1.95 | 2.93 | 1.57 | 2.37 | 1.26 | 1.89 |
| | 28 | 5.95 | 8.94 | 2.64 | 3.97 | 2.21 | 3.32 | 1.88 | 2.82 | 1.52 | 2.28 | 1.21 | 1.83 |
| | 29 | 5.74 | 8.63 | 2.55 | 3.84 | 2.13 | 3.20 | 1.81 | 2.72 | 1.47 | 2.20 | 1.17 | 1.76 |
| | 30 | 5.55 | 8.34 | 2.47 | 3.71 | 2.06 | 3.10 | 1.75 | 2.63 | 1.42 | 2.13 | 1.13 | 1.70 |
| | 31 | 5.37 | 8.07 | 2.39 | 3.59 | 1.99 | 3.00 | 1.70 | 2.55 | 1.37 | 2.06 | 1.10 | 1.65 |
| | 32 | 5.20 | 7.82 | 2.31 | 3.48 | 1.93 | 2.90 | 1.64 | 2.47 | 1.33 | 2.00 | 1.06 | 1.60 |
| | 33 | 5.04 | 7.58 | 2.24 | 3.37 | 1.87 | 2.81 | 1.59 | 2.39 | 1.29 | 1.94 | 1.03 | 1.55 |
| | 34 | 4.90 | 7.36 | 2.18 | 3.27 | 1.82 | 2.73 | 1.55 | 2.32 | 1.25 | 1.88 | 1.00 | 1.50 |
| | 35 | 4.76 | 7.15 | 2.11 | 3.18 | 1.77 | 2.65 | 1.50 | 2.26 | 1.21 | 1.83 | 0.972 | 1.46 |
| | 36 | 4.62 | 6.95 | 2.06 | 3.09 | 1.72 | 2.58 | 1.46 | 2.20 | 1.18 | 1.78 | 0.945 | 1.42 |
| | 37 | 4.50 | 6.76 | 2.00 | 3.01 | 1.67 | 2.51 | 1.42 | 2.14 | 1.15 | 1.73 | 0.919 | 1.38 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 166 | 250 | 74.0 | 111 | 61.8 | 92.9 | 52.6 | 79.0 | 42.5 | 63.9 | 34.0 | 51.1 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 20.8 | 31.3 | 9.25 | 13.9 | 7.72 | 11.6 | 6.57 | 9.88 | 5.31 | 7.99 | 4.25 | 6.39 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 7.41 | 11.1 | 3.40 | 5.10 | 2.93 | 4.40 | 2.40 | 3.60 | 2.01 | 3.03 | 1.54 | 2.32 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.776 | 1.17 | 0.435 | 0.654 | 0.454 | 0.682 | 0.278 | 0.417 | 0.302 | 0.454 | 0.161 | 0.242 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 42.0 | 63.1 | 20.3 | 30.5 | 12.9 | 19.4 | 17.5 | 26.3 | 10.2 | 15.4 | 13.8 | 20.8 |
| $Z_x$, in.$^3$ | | 13.9 | | 6.18 | | 5.16 | | 4.39 | | 3.55 | | 2.84 | |
| $L_p$, ft | | 1.22 | | 1.08 | | 1.09 | | 0.990 | | 0.996 | | 0.910 | |
| $L_r$, ft | | 18.5 | | 14.5 | | 11.7 | | 16.0 | | 11.9 | | 17.7 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-7 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-7 (continued)
# Maximum Total Uniform Load, kips
## C-Shapes (Hot Rolled)

C4-C3

| Shape | | C4× 5.4 | | C3× 4.1 | |
|---|---|---|---|---|---|
| Design | | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 9.14 | 13.7 | 5.27 | 7.92 |
| | 4 | 6.86 | 10.3 | 3.95 | 5.94 |
| | 5 | 5.49 | 8.24 | 3.16 | 4.75 |
| | 6 | 4.57 | 6.87 | 2.63 | 3.96 |
| | 7 | 3.92 | 5.89 | 2.26 | 3.39 |
| | 8 | 3.43 | 5.15 | 1.98 | 2.97 |
| | 9 | 3.05 | 4.58 | 1.76 | 2.64 |
| | 10 | 2.74 | 4.12 | 1.58 | 2.38 |
| | 11 | 2.49 | 3.75 | 1.44 | 2.16 |
| | 12 | 2.29 | 3.44 | 1.32 | 1.98 |
| | 13 | 2.11 | 3.17 | 1.22 | 1.83 |
| | 14 | 1.96 | 2.94 | 1.13 | 1.70 |
| | 15 | 1.83 | 2.75 | 1.05 | 1.58 |
| | 16 | 1.71 | 2.58 | 0.988 | 1.49 |
| | 17 | 1.61 | 2.42 | 0.930 | 1.40 |
| | 18 | 1.52 | 2.29 | 0.878 | 1.32 |
| | 19 | 1.44 | 2.17 | 0.832 | 1.25 |
| | 20 | 1.37 | 2.06 | 0.790 | 1.19 |
| | 21 | 1.31 | 1.96 | 0.753 | 1.13 |
| | 22 | 1.25 | 1.87 | 0.719 | 1.08 |
| | 23 | 1.19 | 1.79 | 0.687 | 1.03 |
| | 24 | 1.14 | 1.72 | 0.659 | 0.990 |
| | 25 | 1.10 | 1.65 | 0.632 | 0.950 |
| | 26 | 1.05 | 1.59 | 0.608 | 0.914 |
| | 27 | 1.02 | 1.53 | 0.585 | 0.880 |
| | 28 | 0.979 | 1.47 | 0.565 | 0.849 |
| | 29 | 0.946 | 1.42 | 0.545 | 0.819 |
| | 30 | 0.914 | 1.37 | 0.527 | 0.792 |
| | 31 | 0.885 | 1.33 | 0.510 | 0.766 |
| | 32 | 0.857 | 1.29 | 0.494 | 0.743 |
| | 33 | 0.831 | 1.25 | 0.479 | 0.720 |
| | 34 | 0.807 | 1.21 | 0.465 | 0.699 |
| | 35 | 0.784 | 1.18 | 0.452 | 0.679 |
| | 36 | 0.762 | 1.15 | 0.439 | 0.660 |
| | 37 | 0.741 | 1.11 | 0.427 | 0.642 |
| **Beam Properties** | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 27.4 | 41.2 | 15.8 | 23.8 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 3.43 | 5.15 | 1.98 | 2.97 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 1.29 | 1.94 | 0.741 | 1.11 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.180 | 0.271 | 0.092 | 0.139 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 7.93 | 11.9 | 5.50 | 8.26 |
| $Z_x$, in.$^3$ | | 2.29 | | 1.32 | |
| $L_p$, ft | | 0.904 | | 0.811 | |
| $L_r$, ft | | 12.7 | | 14.2 | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

Note 1: Beams must be laterally supported if Table 2-7 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

MC8-MC4

# Table 2-8
# Maximum Total Uniform Load, kips
## MC-Shapes (Welded)

$F_y$ = 30 ksi

| Shape | | MC8× | | | | MC6× | | | | MC4× | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 19.8 [f1] | | 13.5 [f1] | | 14.6 | | 10 [f1] | | 6.5 | | 6.1 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 61.8 | 92.9 | 21.9 | 32.9 | 35.6 | 53.5 | 20.3 | 30.5 | 10.5 | 15.8 | 9.62 | 14.5 |
| | 4 | 46.4 | 69.7 | 16.4 | 24.7 | 26.7 | 40.1 | 15.2 | 22.9 | 7.90 | 11.9 | 7.22 | 10.8 |
| | 5 | 37.1 | 55.8 | 13.1 | 19.7 | 21.3 | 32.1 | 12.2 | 18.3 | 6.32 | 9.50 | 5.77 | 8.68 |
| | 6 | 30.9 | 46.5 | 10.9 | 16.4 | 17.8 | 26.7 | 10.1 | 15.2 | 5.27 | 7.92 | 4.81 | 7.23 |
| | 7 | 26.5 | 39.8 | 9.38 | 14.1 | 15.2 | 22.9 | 8.70 | 13.1 | 4.52 | 6.79 | 4.12 | 6.20 |
| | 8 | 23.2 | 34.8 | 8.21 | 12.3 | 13.3 | 20.0 | 7.61 | 11.4 | 3.95 | 5.94 | 3.61 | 5.42 |
| | 9 | 20.6 | 31.0 | 7.29 | 11.0 | 11.9 | 17.8 | 6.76 | 10.2 | 3.51 | 5.28 | 3.21 | 4.82 |
| | 10 | 18.5 | 27.9 | 6.56 | 9.87 | 10.7 | 16.0 | 6.09 | 9.15 | 3.16 | 4.75 | 2.89 | 4.34 |
| | 11 | 16.9 | 25.3 | 5.97 | 8.97 | 9.70 | 14.6 | 5.53 | 8.32 | 2.87 | 4.32 | 2.62 | 3.94 |
| | 12 | 15.5 | 23.2 | 5.47 | 8.22 | 8.89 | 13.4 | 5.07 | 7.62 | 2.63 | 3.96 | 2.41 | 3.62 |
| | 13 | 14.3 | 21.4 | 5.05 | 7.59 | 8.21 | 12.3 | 4.68 | 7.04 | 2.43 | 3.66 | 2.22 | 3.34 |
| | 14 | 13.2 | 19.9 | 4.69 | 7.05 | 7.62 | 11.5 | 4.35 | 6.54 | 2.26 | 3.39 | 2.06 | 3.10 |
| | 15 | 12.4 | 18.6 | 4.38 | 6.58 | 7.11 | 10.7 | 4.06 | 6.10 | 2.11 | 3.17 | 1.92 | 2.89 |
| | 16 | 11.6 | 17.4 | 4.10 | 6.17 | 6.67 | 10.0 | 3.80 | 5.72 | 1.98 | 2.97 | 1.80 | 2.71 |
| | 17 | 10.9 | 16.4 | 3.86 | 5.80 | 6.28 | 9.43 | 3.58 | 5.38 | 1.86 | 2.80 | 1.70 | 2.55 |
| | 18 | 10.3 | 15.5 | 3.65 | 5.48 | 5.93 | 8.91 | 3.38 | 5.08 | 1.76 | 2.64 | 1.60 | 2.41 |
| | 19 | 9.76 | 14.7 | 3.46 | 5.19 | 5.62 | 8.44 | 3.20 | 4.82 | 1.66 | 2.50 | 1.52 | 2.28 |
| | 20 | 9.27 | 13.9 | 3.28 | 4.93 | 5.34 | 8.02 | 3.04 | 4.57 | 1.58 | 2.38 | 1.44 | 2.17 |
| | 21 | 8.83 | 13.3 | 3.13 | 4.70 | 5.08 | 7.64 | 2.90 | 4.36 | 1.51 | 2.26 | 1.37 | 2.07 |
| | 22 | 8.43 | 12.7 | 2.98 | 4.48 | 4.85 | 7.29 | 2.77 | 4.16 | 1.44 | 2.16 | 1.31 | 1.97 |
| | 23 | 8.06 | 12.1 | 2.85 | 4.29 | 4.64 | 6.97 | 2.65 | 3.98 | 1.37 | 2.07 | 1.25 | 1.89 |
| | 24 | 7.73 | 11.6 | 2.74 | 4.11 | 4.45 | 6.68 | 2.54 | 3.81 | 1.32 | 1.98 | 1.20 | 1.81 |
| | 25 | 7.42 | 11.2 | 2.63 | 3.95 | 4.27 | 6.42 | 2.44 | 3.66 | 1.26 | 1.90 | 1.15 | 1.74 |
| | 26 | 7.13 | 10.7 | 2.52 | 3.79 | 4.10 | 6.17 | 2.34 | 3.52 | 1.22 | 1.83 | 1.11 | 1.67 |
| | 27 | 6.87 | 10.3 | 2.43 | 3.65 | 3.95 | 5.94 | 2.25 | 3.39 | 1.17 | 1.76 | 1.07 | 1.61 |
| | 28 | 6.62 | 9.96 | 2.34 | 3.52 | 3.81 | 5.73 | 2.17 | 3.27 | 1.13 | 1.70 | 1.03 | 1.55 |
| | 29 | 6.40 | 9.61 | 2.26 | 3.40 | 3.68 | 5.53 | 2.10 | 3.16 | 1.09 | 1.64 | 0.995 | 1.50 |
| | 30 | 6.18 | 9.29 | 2.19 | 3.29 | 3.56 | 5.35 | 2.03 | 3.05 | 1.05 | 1.58 | 0.962 | 1.45 |
| | 32 | 5.80 | 8.71 | 2.05 | 3.08 | 3.33 | 5.01 | 1.90 | 2.86 | 0.988 | 1.49 | 0.902 | 1.36 |
| | 34 | 5.46 | 8.20 | 1.93 | 2.90 | 3.14 | 4.72 | 1.79 | 2.69 | 0.930 | 1.40 | 0.849 | 1.28 |
| | 36 | 5.15 | 7.74 | 1.82 | 2.74 | 2.96 | 4.46 | 1.69 | 2.54 | 0.878 | 1.32 | 0.802 | 1.21 |
| | 38 | 4.88 | 7.34 | 1.73 | 2.60 | 2.81 | 4.22 | 1.60 | 2.41 | 0.832 | 1.25 | 0.760 | 1.14 |
| | 40 | 4.64 | 6.97 | 1.64 | 2.47 | 2.67 | 4.01 | 1.52 | 2.29 | 0.790 | 1.19 | 0.722 | 1.08 |
| | 42 | 4.42 | 6.64 | 1.56 | 2.35 | 2.54 | 3.82 | 1.45 | 2.18 | 0.753 | 1.13 | 0.687 | 1.03 |
| | 44 | 4.22 | 6.34 | 1.49 | 2.24 | 2.43 | 3.65 | 1.38 | 2.08 | 0.719 | 1.08 | 0.656 | 0.986 |
| Beam Properties | | | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 185 | 279 | 65.6 | 98.7 | 107 | 160 | 60.9 | 91.5 | 31.6 | 47.5 | 28.9 | 43.4 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 23.2 | 34.8 | 8.21 | 12.30 | 13.3 | 20.0 | 7.61 | 11.4 | 3.95 | 5.94 | 3.61 | 5.42 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 9.36 | 14.1 | 6.53 | 9.82 | 5.01 | 7.52 | 3.57 | 5.37 | 1.49 | 2.24 | 1.34 | 2.01 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.694 | 1.04 | N/A | N/A | 0.380 | 0.571 | 0.393 | 0.591 | 0.173 | 0.261 | 0.181 | 0.272 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 32.3 | 48.6 | 21.6 | 32.4 | 24.3 | 36.5 | 16.2 | 24.3 | 10.8 | 16.2 | 10.8 | 16.2 |
| $Z_x$, in.$^3$ | | 16.4 | | 11.3 | | 8.91 | | 6.20 | | 2.64 | | 2.41 | |
| $L_p$, ft | | 4.47 | | N/A | | 1.86 | | 6.14 | | 1.24 | | 1.06 | |
| $L_r$, ft | | 24.4 | | 18.3 | | 23.8 | | 16.4 | | 15.4 | | 13.6 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-8 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.

$F_y$ = 30 ksi

## Table 2-8 (continued)
# Maximum Total Uniform Load, kips
### MC-Shapes (Welded)

MC3-MC2

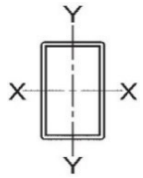
| Shape | | MC3× | | | | MC2× | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.8 | | 3.5 | | 3 | | 2.4 | | 1.6 | |
| Design | | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD | ASD | LRFD |
| Span, ft | 3 | 5.67 | 8.52 | 4.19 | 6.30 | 2.31 | 3.47 | 1.86 | 2.79 | 1.32 | 1.98 |
| | 4 | 4.25 | 6.39 | 3.14 | 4.73 | 1.73 | 2.60 | 1.39 | 2.09 | 0.988 | 1.49 |
| | 5 | 3.40 | 5.11 | 2.51 | 3.78 | 1.38 | 2.08 | 1.11 | 1.67 | 0.790 | 1.19 |
| | 6 | 2.83 | 4.26 | 2.10 | 3.15 | 1.15 | 1.73 | 0.928 | 1.40 | 0.659 | 0.990 |
| | 7 | 2.43 | 3.65 | 1.80 | 2.70 | 0.989 | 1.49 | 0.796 | 1.20 | 0.565 | 0.849 |
| | 8 | 2.13 | 3.20 | 1.57 | 2.36 | 0.865 | 1.30 | 0.696 | 1.05 | 0.494 | 0.743 |
| | 9 | 1.89 | 2.84 | 1.40 | 2.10 | 0.769 | 1.16 | 0.619 | 0.930 | 0.439 | 0.660 |
| | 10 | 1.70 | 2.56 | 1.26 | 1.89 | 0.692 | 1.04 | 0.557 | 0.837 | 0.395 | 0.594 |
| | 11 | 1.55 | 2.32 | 1.14 | 1.72 | 0.629 | 0.946 | 0.506 | 0.761 | 0.359 | 0.540 |
| | 12 | 1.42 | 2.13 | 1.05 | 1.58 | 0.577 | 0.867 | 0.464 | 0.698 | 0.329 | 0.495 |
| | 13 | 1.31 | 1.97 | 0.967 | 1.45 | 0.532 | 0.800 | 0.428 | 0.644 | 0.304 | 0.457 |
| | 14 | 1.21 | 1.83 | 0.898 | 1.35 | 0.494 | 0.743 | 0.398 | 0.598 | 0.282 | 0.424 |
| | 15 | 1.13 | 1.70 | 0.838 | 1.26 | 0.461 | 0.694 | 0.371 | 0.558 | 0.263 | 0.396 |
| | 16 | 1.06 | 1.60 | 0.786 | 1.18 | 0.433 | 0.650 | 0.348 | 0.523 | 0.247 | 0.371 |
| | 17 | 1.00 | 1.50 | 0.740 | 1.11 | 0.407 | 0.612 | 0.328 | 0.492 | 0.232 | 0.349 |
| | 18 | 0.945 | 1.42 | 0.699 | 1.05 | 0.385 | 0.578 | 0.309 | 0.465 | 0.220 | 0.330 |
| | 19 | 0.895 | 1.35 | 0.662 | 0.995 | 0.364 | 0.548 | 0.293 | 0.441 | 0.208 | 0.313 |
| | 20 | 0.850 | 1.28 | 0.629 | 0.945 | 0.346 | 0.520 | 0.278 | 0.419 | 0.198 | 0.297 |
| | 21 | 0.810 | 1.22 | 0.599 | 0.900 | 0.330 | 0.495 | 0.265 | 0.399 | 0.188 | 0.283 |
| | 22 | 0.773 | 1.16 | 0.572 | 0.859 | 0.315 | 0.473 | 0.253 | 0.380 | 0.180 | 0.270 |
| | 23 | 0.739 | 1.11 | 0.547 | 0.822 | 0.301 | 0.452 | 0.242 | 0.364 | 0.172 | 0.258 |
| | 24 | 0.709 | 1.07 | 0.524 | 0.788 | 0.288 | 0.434 | 0.232 | 0.349 | 0.165 | 0.248 |
| | 25 | 0.680 | 1.02 | 0.503 | 0.756 | 0.277 | 0.416 | 0.223 | 0.335 | 0.158 | 0.238 |
| | 26 | 0.654 | 0.983 | 0.484 | 0.727 | 0.266 | 0.400 | 0.214 | 0.322 | 0.152 | 0.228 |
| | 27 | 0.630 | 0.947 | 0.466 | 0.700 | 0.256 | 0.385 | 0.206 | 0.310 | 0.146 | 0.220 |
| | 28 | 0.607 | 0.913 | 0.449 | 0.675 | 0.247 | 0.372 | 0.199 | 0.299 | 0.141 | 0.212 |
| | 29 | 0.586 | 0.881 | 0.434 | 0.652 | 0.239 | 0.359 | 0.192 | 0.289 | 0.136 | 0.205 |
| | 30 | 0.567 | 0.852 | 0.419 | 0.630 | 0.231 | 0.347 | 0.186 | 0.279 | 0.132 | 0.198 |
| | 32 | 0.531 | 0.799 | 0.393 | 0.591 | 0.216 | 0.325 | 0.174 | 0.262 | 0.124 | 0.186 |
| | 34 | 0.500 | 0.752 | 0.370 | 0.556 | 0.204 | 0.306 | 0.164 | 0.246 | 0.116 | 0.175 |
| | 36 | 0.472 | 0.710 | 0.349 | 0.525 | 0.192 | 0.289 | 0.155 | 0.233 | 0.110 | 0.165 |
| | 38 | 0.448 | 0.673 | 0.331 | 0.497 | 0.182 | 0.274 | 0.147 | 0.220 | 0.104 | 0.156 |
| | 40 | 0.425 | 0.639 | 0.314 | 0.473 | 0.173 | 0.260 | 0.139 | 0.209 | 0.099 | 0.149 |
| | 42 | 0.405 | 0.609 | 0.299 | 0.450 | 0.165 | 0.248 | 0.133 | 0.199 | 0.094 | 0.141 |
| | 44 | 0.386 | 0.581 | 0.286 | 0.430 | 0.157 | 0.236 | 0.127 | 0.190 | 0.090 | 0.135 |
| **Beam Properties** | | | | | | | | | | | |
| $W_c/\Omega_b$ | $\varphi_b W_c$, kip-ft | 17.0 | 25.6 | 12.6 | 18.9 | 6.92 | 10.4 | 5.57 | 8.37 | 3.95 | 5.94 |
| $M_p/\Omega_b$ | $\varphi_b M_{px}$, kip-ft | 2.13 | 3.20 | 1.57 | 2.36 | 0.865 | 1.30 | 0.696 | 1.05 | 0.494 | 0.743 |
| $M_r/\Omega_b$ | $\varphi_b M_{rx}$, kip-ft | 0.788 | 1.18 | 0.588 | 0.884 | 0.307 | 0.462 | 0.254 | 0.382 | 0.186 | 0.279 |
| $BF/\Omega_b$ | $\varphi_b BF$, kips | 0.094 | 0.141 | 0.102 | 0.154 | 0.039 | 0.058 | 0.043 | 0.065 | 0.047 | 0.071 |
| $V_n/\Omega_v$ | $\varphi_v V_{nx}$, kips | 8.08 | 12.2 | 6.08 | 9.14 | 5.39 | 8.10 | 4.05 | 6.09 | 2.69 | 4.05 |
| $Z_x$, in.$^3$ | | 1.42 | | 1.05 | | 0.578 | | 0.465 | | 0.330 | |
| $L_p$, ft | | 0.912 | | 0.845 | | 0.591 | | 0.605 | | 0.619 | |
| $L_r$, ft | | 15.2 | | 10.5 | | 15.0 | | 10.9 | | 7.12 | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |
| $\Omega_v$ = 1.67 | $\varphi_v$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

Note 1: Beams must be laterally supported if Table 2-8 is used.

Note 2: Available strength tabulated above heavy line is limited by available shear strength.




HSS16-HSS8

## Table 2-9
# Available Flexural Strength, kip-ft
### Rectangular HSS (Roll Formed)

$F_y$ = 30 ksi

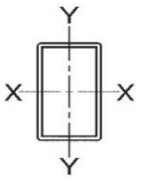
| Shape | | X-Axis | | Y-Axis | | Shape | | X-Axis | | Y-Axis | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ | | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ |
| | | ASD | LRFD | ASD | LRFD | | | ASD | LRFD | ASD | LRFD |
| HSS16×8× | 0.500 | 168 | 252 | 103 | 155 | HSS10×8× | 0.500 | 81.1 | 122 | 69.6 | 105 |
| | 0.375 | 131 | 197 | 71.3 | 107 | | 0.375 | 64.5 | 97.0 | 55.4 | 83.3 |
| | 0.312 | 110 | 165 | 54.1 | 81.3 | | 0.312 | 54.3 | 81.7 | 46.7 | 70.2 |
| | 0.250 | 90.3 | 136 | 38.4 | 57.8 | | 0.250 | 44.9 | 67.5 | 36.3 | 54.6 |
| HSS14×10× | 0.500 | 156 | 234 | 124 | 186 | HSS10×6× | 0.500 | 66.9 | 101 | 47.0 | 70.7 |
| | 0.375 | 122 | 183 | 97.0 | 146 | | 0.375 | 53.7 | 80.8 | 37.7 | 56.7 |
| | 0.312 | 102 | 154 | 69.7 | 105 | | 0.312 | 45.4 | 68.2 | 31.9 | 47.9 |
| | 0.250 [f1] | 77.5 | 116 | 50.0 | 75.1 | | 0.250 | 37.6 | 56.5 | 25.0 | 37.5 |
| | | | | | | | 0.180 | 27.7 | 41.6 | 14.7 | 22.2 |
| HSS14×8× | 0.500 | 136 | 204 | 92.1 | 138 | | | | | | |
| | 0.375 | 107 | 160 | 72.6 | 109 | HSS10×4× | 0.500 | 52.7 | 79.2 | 27.2 | 41.0 |
| | 0.312 | 89.7 | 135 | 52.5 | 79.0 | | 0.375 | 43.0 | 64.6 | 22.3 | 33.5 |
| | 0.250 | 73.7 | 111 | 37.4 | 56.3 | | 0.312 | 36.2 | 54.5 | 19.0 | 28.6 |
| | | | | | | | 0.250 | 30.2 | 45.5 | 15.0 | 22.5 |
| HSS14×6× | 0.500 | 115 | 173 | 63.5 | 95.4 | | | | | | |
| | 0.375 | 91.5 | 137 | 50.3 | 75.6 | HSS10×2× | 0.375 | 32.2 | 48.4 | 9.06 | 13.6 |
| | 0.312 | 76.8 | 115 | 36.6 | 55.1 | | 0.250 | 23.1 | 34.7 | 6.26 | 9.41 |
| | 0.250 | 63.3 | 95.2 | 26.0 | 39.1 | | 0.180 | 17.2 | 25.9 | 3.69 | 5.54 |
| HSS12×10× | 0.500 | 124 | 187 | 110 | 165 | HSS9×5× | 0.500 | 50.3 | 75.6 | 33.4 | 50.2 |
| | 0.375 | 97.6 | 147 | 86.2 | 130 | | 0.375 | 40.9 | 61.4 | 27.1 | 40.7 |
| | 0.312 | 82.0 | 123 | 72.5 | 109 | | 0.250 | 28.9 | 43.4 | 19.2 | 28.8 |
| | 0.250 [f1] | 62.4 | 93.8 | 48.2 | 72.5 | | | | | | |
| | | | | | | HSS9×3× | 0.500 | 37.6 | 56.5 | 16.6 | 25.0 |
| HSS12×8× | 0.500 | 107 | 161 | 80.8 | 122 | | 0.375 | 31.3 | 47.0 | 13.9 | 20.9 |
| | 0.375 | 84.6 | 127 | 63.9 | 96.1 | | 0.250 | 22.3 | 33.5 | 10.1 | 15.1 |
| | 0.312 | 71.1 | 107 | 53.9 | 81.0 | | 0.180 | 16.6 | 25.0 | 6.01 | 9.04 |
| | 0.250 | 58.5 | 88.0 | 36.2 | 54.4 | | | | | | |
| | | | | | | HSS8×6× | 0.500 | 47.2 | 70.9 | 38.8 | 58.3 |
| HSS12×6× | 0.500 | 89.7 | 135 | 55.2 | 83.0 | | 0.375 | 38.3 | 57.6 | 31.4 | 47.3 |
| | 0.375 | 71.4 | 107 | 44.0 | 66.2 | | 0.312 | 32.3 | 48.6 | 26.6 | 40.1 |
| | 0.312 | 60.2 | 90.5 | 37.3 | 56.0 | | 0.250 | 26.9 | 40.5 | 22.2 | 33.3 |
| | 0.250 | 49.7 | 74.7 | 25.2 | 37.9 | | 0.180 | 19.9 | 29.9 | 14.0 | 21.0 |
| HSS12×4× | 0.500 | 72.5 | 109 | 32.5 | 48.8 | HSS8×4× | 0.500 | 35.9 | 54.0 | 22.0 | 33.1 |
| | 0.375 | 58.4 | 87.8 | 26.3 | 39.6 | | 0.375 | 29.8 | 44.8 | 18.3 | 27.5 |
| | 0.312 | 49.3 | 74.0 | 22.5 | 33.8 | | 0.312 | 25.1 | 37.8 | 15.6 | 23.4 |
| | 0.250 | 40.9 | 61.4 | 15.2 | 22.8 | | 0.250 | 21.1 | 31.7 | 13.1 | 19.6 |
| | 0.180 | 30.2 | 45.5 | 9.14 | 13.7 | | 0.180 | 15.7 | 23.6 | 8.37 | 12.6 |
| | | | | | | | 0.120 | 10.9 | 16.4 | 4.51 | 6.78 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

## Table 2-9 (continued)
# Available Flexural Strength, kip-ft
### Rectangular HSS (Roll Formed)

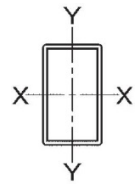



HSS8-HSS3

| Shape | | X-Axis | | Y-Axis | | Shape | | X-Axis | | Y-Axis | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ | | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ |
| | | ASD | LRFD | ASD | LRFD | | | ASD | LRFD | ASD | LRFD |
| HSS8×2× | 0.375 | 21.3 | 32.0 | 7.23 | 10.9 | HSS5×4× | 0.500 | 16.5 | 24.8 | 14.1 | 21.2 |
| | 0.312 | 18.0 | 27.0 | 6.29 | 9.45 | | 0.375 | 14.1 | 21.2 | 12.1 | 18.2 |
| | 0.250 | 15.4 | 23.2 | 5.43 | 8.17 | | 0.312 | 12.1 | 18.1 | 10.3 | 15.5 |
| | 0.180 | 11.6 | 17.4 | 3.51 | 5.27 | | 0.250 | 10.3 | 15.5 | 8.83 | 13.3 |
| | 0.120 | 8.04 | 12.1 | 1.88 | 2.83 | | 0.180 | 7.77 | 11.7 | 6.68 | 10.0 |
| | | | | | | | 0.120 | 5.42 | 8.15 | 4.07 | 6.11 |
| HSS7×5× | 0.500 | 33.7 | 50.6 | 26.6 | 40.1 | | | | | | |
| | 0.375 | 27.7 | 41.6 | 21.9 | 32.9 | HSS5×3× | 0.500 | 13.1 | 19.7 | 9.10 | 13.7 |
| | 0.250 | 19.8 | 29.7 | 15.6 | 23.4 | | 0.375 | 11.5 | 17.3 | 8.01 | 12.0 |
| | 0.180 | 14.7 | 22.1 | 11.5 | 17.2 | | 0.312 | 9.87 | 14.8 | 6.90 | 10.4 |
| | | | | | | | 0.250 | 8.53 | 12.8 | 5.96 | 8.96 |
| HSS7×4× | 0.500 | 28.7 | 43.2 | 19.3 | 29.0 | | 0.180 | 6.47 | 9.72 | 4.55 | 6.84 |
| | 0.375 | 24.0 | 36.0 | 16.2 | 24.3 | | 0.120 | 4.55 | 6.84 | 2.83 | 4.25 |
| | 0.250 | 17.2 | 25.9 | 11.6 | 17.5 | | | | | | |
| | | | | | | HSS5×2× | 0.250 | 6.75 | 10.1 | 3.47 | 5.22 |
| HSS7×3× | 0.500 | 24.0 | 36.0 | 12.8 | 19.3 | | 0.180 | 5.18 | 7.79 | 2.68 | 4.03 |
| | 0.375 | 20.2 | 30.4 | 11.0 | 16.5 | | 0.120 | 3.67 | 5.51 | 1.70 | 2.56 |
| | 0.250 | 14.7 | 22.0 | 8.02 | 12.1 | | | | | | |
| | 0.180 | 11.0 | 16.5 | 5.97 | 8.97 | HSS4×3× | 0.250 | 6.03 | 9.07 | 4.94 | 7.43 |
| | | | | | | | 0.180 | 4.61 | 6.93 | 3.79 | 5.69 |
| HSS6×4× | 0.500 | 22.3 | 33.5 | 16.8 | 25.2 | | 0.120 | 3.26 | 4.91 | 2.68 | 4.03 |
| | 0.375 | 18.7 | 28.1 | 14.1 | 21.2 | | 0.080 | 2.25 | 3.38 | 1.47 | 2.20 |
| | 0.312 | 16.0 | 24.1 | 12.1 | 18.1 | | | | | | |
| | 0.250 | 13.6 | 20.4 | 10.2 | 15.4 | HSS4×2× | 0.375 | 5.99 | 9.00 | 3.58 | 5.38 |
| | 0.180 | 10.2 | 15.3 | 7.69 | 11.6 | | 0.312 | 5.18 | 7.79 | 3.14 | 4.73 |
| | 0.120 | 7.07 | 10.6 | 4.26 | 6.40 | | 0.250 | 4.63 | 6.95 | 2.81 | 4.23 |
| | | | | | | | 0.180 | 3.58 | 5.38 | 2.20 | 3.31 |
| HSS6×3× | 0.500 | 18.1 | 27.2 | 11.0 | 16.5 | | 0.120 | 2.56 | 3.85 | 1.59 | 2.39 |
| | 0.375 | 15.6 | 23.4 | 9.49 | 14.3 | | 0.080 | 1.78 | 2.68 | 0.874 | 1.31 |
| | 0.312 | 13.3 | 20.0 | 8.16 | 12.3 | | | | | | |
| | 0.250 | 11.4 | 17.1 | 6.99 | 10.5 | HSS4×1.5× | 0.250 | 3.92 | 5.90 | 1.89 | 2.84 |
| | 0.180 | 8.59 | 12.9 | 5.30 | 7.97 | | 0.180 | 3.07 | 4.61 | 1.50 | 2.25 |
| | 0.120 | 6.00 | 9.02 | 2.96 | 4.44 | | 0.120 | 2.22 | 3.33 | 1.10 | 1.65 |
| | | | | | | | 0.083 | 1.60 | 2.41 | 0.644 | 0.968 |
| HSS6×2× | 0.375 | 12.5 | 18.7 | 5.40 | 8.12 | | 0.063 | 1.22 | 1.84 | 0.417 | 0.627 |
| | 0.312 | 10.7 | 16.0 | 4.72 | 7.09 | | | | | | |
| | 0.250 | 9.25 | 13.9 | 4.12 | 6.19 | HSS3×2× | 0.250 | 2.87 | 4.32 | 2.16 | 3.24 |
| | 0.180 | 7.04 | 10.6 | 3.17 | 4.77 | | 0.180 | 2.26 | 3.40 | 1.71 | 2.57 |
| | 0.120 | 4.94 | 7.43 | 1.77 | 2.67 | | 0.120 | 1.65 | 2.48 | 1.24 | 1.87 |
| | | | | | | | 0.080 | 1.15 | 1.73 | 0.873 | 1.31 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.




HSS3-HSS1.5

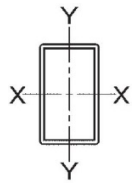
## Table 2-9 (continued)
# Available Flexural Strength, kip-ft
### Rectangular HSS (Roll Formed)

$F_y$ = 30 ksi

| Shape | | X-Axis | | Y-Axis | |
|---|---|---|---|---|---|
| | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ |
| | | ASD | LRFD | ASD | LRFD |
| HSS3×1.5× | 0.250 | 2.37 | 3.56 | 1.42 | 2.14 |
| | 0.180 | 1.89 | 2.84 | 1.15 | 1.73 |
| | 0.120 | 1.39 | 2.09 | 0.850 | 1.28 |
| | 0.083 | 1.01 | 1.52 | 0.623 | 0.936 |
| | 0.060 | 0.747 | 1.12 | 0.371 | 0.558 |
| HSS3×1× | 0.180 | 1.51 | 2.27 | 0.656 | 0.986 |
| | 0.120 | 1.13 | 1.70 | 0.503 | 0.756 |
| | 0.080 | 0.802 | 1.21 | 0.362 | 0.545 |
| | 0.060 | 0.615 | 0.925 | 0.223 | 0.335 |
| HSS2.5×1.5× | 0.250 | 1.72 | 2.59 | 1.19 | 1.78 |
| | 0.180 | 1.39 | 2.09 | 0.970 | 1.46 |
| | 0.120 | 1.04 | 1.56 | 0.728 | 1.09 |
| | 0.083 | 0.763 | 1.15 | 0.536 | 0.806 |
| | 0.063 | 0.587 | 0.882 | 0.390 | 0.586 |
| HSS2.5×1× | 0.120 | 0.826 | 1.24 | 0.424 | 0.637 |
| | 0.083 | 0.612 | 0.920 | 0.317 | 0.477 |
| | 0.063 | 0.473 | 0.711 | 0.234 | 0.352 |
| HSS2×1.5× | 0.120 | 0.737 | 1.11 | 0.603 | 0.907 |
| | 0.080 | 0.527 | 0.792 | 0.433 | 0.650 |
| | 0.060 | 0.406 | 0.610 | 0.334 | 0.502 |
| HSS2×1× | 0.180 | 0.725 | 1.09 | 0.436 | 0.655 |
| | 0.120 | 0.569 | 0.855 | 0.344 | 0.518 |
| | 0.080 | 0.412 | 0.619 | 0.253 | 0.380 |
| | 0.060 | 0.319 | 0.479 | 0.196 | 0.295 |
| HSS1.5×1× | 0.120 | 0.355 | 0.533 | 0.266 | 0.401 |
| | 0.080 | 0.262 | 0.394 | 0.198 | 0.297 |
| | 0.060 | 0.204 | 0.306 | 0.154 | 0.232 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.




HSS32-HSS12

# Table 2-10
# Available Flexural Strength, kip-ft
## Rectangular HSS (Press Braked)

$F_y$ = 30 ksi

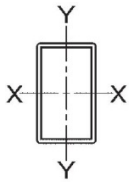
| Shape | | X-Axis | | Y-Axis | | Shape | | X-Axis | | Y-Axis | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ | | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ |
| | | ASD | LRFD | ASD | LRFD | | | ASD | LRFD | ASD | LRFD |
| HSS32×16× | 0.375 [f1] | 454 | 682 | 201 | 302 | HSS16×12× | 0.625 | 259 | 389 | 213 | 320 |
| | | | | | | | 0.500 | 213 | 320 | 175 | 263 |
| HSS32×8× | 0.375 [f1] | 370 | 556 | 81.9 | 123 | | 0.375 | 165 | 248 | 120 | 180 |
| | | | | | | | 0.312 [f1] | 139 | 209 | 91.2 | 137 |
| HSS28×8× | 0.375 | 322 | 484 | 80.5 | 121 | | 0.250 [f1] | 91.1 | 137 | 65.8 | 98.8 |
| | 0.312 [f1] | 234 | 352 | 60.0 | 90.2 | | | | | | |
| | | | | | | HSS16×4× | 0.375 | 94.6 | 142 | 30.2 | 45.4 |
| HSS24×16× | 0.375 [f1] | 301 | 453 | 190 | 286 | | 0.312 | 80.5 | 121 | 22.8 | 34.3 |
| | 0.312 [f1] | 233 | 350 | 145 | 217 | | 0.250 | 66.0 | 99.2 | 16.2 | 24.3 |
| | | | | | | | 0.180 [f1] | 42.3 | 63.6 | 9.58 | 14.4 |
| HSS24×8× | 0.375 | 249 | 374 | 78.3 | 118 | | | | | | |
| | 0.312 | 210 | 315 | 58.6 | 88.1 | HSS14×10× | 0.625 | 187 | 281 | 149 | 224 |
| | | | | | | | 0.500 | 156 | 234 | 124 | 186 |
| HSS20×16× | 0.625 | 434 | 653 | 374 | 563 | | 0.375 | 121 | 182 | 96.1 | 144 |
| | 0.500 | 356 | 536 | 297 | 447 | | 0.312 | 102 | 154 | 69.9 | 105 |
| | 0.375 [f1] | 234 | 352 | 183 | 276 | | 0.250 [f1] | 80.6 | 121 | 50.4 | 75.7 |
| | 0.312 [f1] | 180 | 270 | 140 | 210 | | | | | | |
| | | | | | | HSS14×6× | 0.625 | 137 | 206 | 75.1 | 113 |
| HSS20×12× | 0.625 | 362 | 545 | 254 | 383 | | 0.500 | 115 | 173 | 63.2 | 95.0 |
| | 0.500 | 298 | 448 | 204 | 307 | | 0.375 | 90.1 | 135 | 49.9 | 74.9 |
| | 0.375 | 229 | 344 | 126 | 190 | | 0.312 | 76.6 | 115 | 36.7 | 55.2 |
| | 0.312 [f1] | 193 | 290 | 95.5 | 144 | | 0.250 | 62.7 | 94.3 | 26.2 | 39.4 |
| | 0.250 [f1] | 124 | 187 | 68.5 | 103 | | 0.180 [f1] | 46.3 | 69.5 | 15.8 | 23.7 |
| HSS20×8× | 0.625 | 289 | 434 | 151 | 227 | HSS12×8× | 0.625 | 127 | 191 | 96.3 | 145 |
| | 0.500 | 240 | 360 | 123 | 184 | | 0.500 | 107 | 160 | 80.7 | 121 |
| | 0.375 | 186 | 279 | 75.4 | 113 | | 0.375 | 83.4 | 125 | 63.3 | 95.2 |
| | 0.312 | 156 | 234 | 56.8 | 85.4 | | 0.312 | 71.0 | 107 | 53.7 | 80.8 |
| | 0.250 [f1] | 126 | 189 | 40.2 | 60.4 | | 0.250 | 58.1 | 87.3 | 36.3 | 54.6 |
| | | | | | | | 0.180 [f1] | 35.3 | 53.1 | 22.4 | 33.6 |
| HSS20×4× | 0.375 | 141 | 212 | 31.6 | 47.5 | | | | | | |
| | 0.312 | 119 | 180 | 23.9 | 35.9 | HSS12×4× | 0.375 | 57.3 | 86.2 | 25.9 | 38.9 |
| | 0.250 [f1] | 96.0 | 144 | 16.8 | 25.2 | | 0.312 | 49.1 | 73.8 | 22.3 | 33.5 |
| | | | | | | | 0.250 | 40.4 | 60.8 | 15.3 | 22.9 |
| HSS18×6× | 0.625 | 211 | 317 | 95.2 | 143 | | 0.180 | 29.9 | 45.0 | 9.20 | 13.8 |
| | 0.500 | 175 | 263 | 79.6 | 120 | | | | | | |
| | 0.375 | 136 | 205 | 51.6 | 77.5 | | | | | | |
| | 0.312 | 116 | 174 | 38.9 | 58.4 | | | | | | |
| | 0.250 | 94.3 | 142 | 27.5 | 41.3 | | | | | | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

## Table 2-10 (continued)
# Available Flexural Strength, kip-ft
### Rectangular HSS (Press Braked)

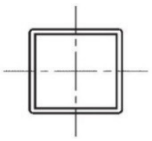


HSS10-HSS6

| Shape | | X-Axis | | Y-Axis | |
|---|---|---|---|---|---|
| | | $M_n/\Omega_b$ | $\varphi_b M_n$ | $M_n/\Omega_b$ | $\varphi_b M_n$ |
| | | ASD | LRFD | ASD | LRFD |
| HSS10×6× | 0.625 | 78.6 | 118 | 54.9 | 82.6 |
| | 0.500 | 66.6 | 100 | 46.7 | 70.2 |
| | 0.375 | 52.8 | 79.4 | 37.1 | 55.8 |
| | 0.312 | 45.2 | 68.0 | 31.9 | 47.9 |
| | 0.250 | 37.1 | 55.8 | 25.6 | 38.4 |
| | 0.180 | 27.5 | 41.4 | 14.8 | 22.3 |
| | 0.120 [f1] | 14.7 | 22.1 | 8.05 | 12.1 |
| HSS8×4× | 0.375 | 29.0 | 43.7 | 17.8 | 26.8 |
| | 0.312 | 25.1 | 37.8 | 15.4 | 23.2 |
| | 0.250 | 20.8 | 31.3 | 12.9 | 19.4 |
| | 0.180 | 15.6 | 23.4 | 8.40 | 12.6 |
| | 0.120 | 10.8 | 16.2 | 4.55 | 6.85 |
| HSS7×4× | 0.375 | 23.4 | 35.1 | 15.9 | 23.9 |
| | 0.312 | 20.2 | 30.4 | 13.7 | 20.7 |
| | 0.250 | 16.9 | 25.4 | 11.5 | 17.3 |
| | 0.180 | 12.7 | 19.1 | 8.67 | 13.0 |
| | 0.120 | 8.79 | 13.2 | 4.43 | 6.66 |
| HSS6×3× | 0.250 | 11.2 | 16.8 | 6.87 | 10.3 |
| | 0.180 | 8.49 | 12.8 | 5.25 | 7.90 |
| | 0.120 | 5.93 | 8.91 | 2.98 | 4.48 |
| HSS6×2× | 0.250 | 9.01 | 13.5 | 4.04 | 6.08 |
| | 0.180 | 6.93 | 10.4 | 3.14 | 4.73 |
| | 0.120 | 4.87 | 7.31 | 1.80 | 2.70 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.



HSS12-HSS1.5

# Table 2-11
# Available Flexural Strength, kip-ft
## Square HSS (Roll Formed)

$F_y$ = 30 ksi

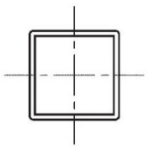
| Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD | Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD |
|---|---|---|---|---|---|---|---|
| HSS12×12× | 0.500 | 141 | 212 | HSS4×4× | 0.500 | 11.5 | 17.3 |
| | 0.375 | 111 | 166 | | 0.375 | 10.1 | 15.1 |
| | 0.312 | 93.0 | 140 | | 0.312 | 8.62 | 13.0 |
| | 0.250 [f1] | 61.5 | 92.4 | | 0.250 | 7.44 | 11.2 |
| | | | | | 0.180 | 5.64 | 8.48 |
| HSS10×10× | 0.500 | 95.4 | 143 | | 0.120 | 3.97 | 5.96 |
| | 0.375 | 75.4 | 113 | | 0.083 [f1] | 2.26 | 3.39 |
| | 0.312 | 63.5 | 95.4 | | | | |
| | 0.250 [f1] | 48.8 | 73.4 | HSS3.5×3.5× | 0.250 | 5.52 | 8.30 |
| | | | | | 0.180 | 4.24 | 6.37 |
| HSS9×9× | 0.500 | 75.7 | 114 | | 0.120 | 2.99 | 4.50 |
| | 0.375 | 60.3 | 90.7 | | 0.083 [f1] | 1.83 | 2.76 |
| | 0.312 | 50.7 | 76.3 | | | | |
| | 0.250 | 41.9 | 63.0 | HSS3×3× | 0.375 | 5.06 | 7.61 |
| | | | | | 0.250 | 3.91 | 5.87 |
| HSS8×8× | 0.500 | 58.4 | 87.8 | | 0.180 | 3.02 | 4.55 |
| | 0.375 | 46.9 | 70.4 | | 0.120 | 2.17 | 3.26 |
| | 0.312 | 39.5 | 59.4 | | 0.080 | 1.50 | 2.25 |
| | 0.250 | 32.8 | 49.3 | | | | |
| | 0.180 [f1] | 20.3 | 30.6 | HSS2.5×2.5× | 0.250 | 2.56 | 3.85 |
| | | | | | 0.180 | 2.02 | 3.04 |
| HSS7×7× | 0.500 | 43.4 | 65.3 | | 0.120 | 1.47 | 2.21 |
| | 0.375 | 35.2 | 52.9 | | 0.080 | 1.03 | 1.54 |
| | 0.312 | 29.6 | 44.6 | | 0.060 [f1] | 0.689 | 1.04 |
| | 0.250 | 24.7 | 37.1 | | | | |
| | | | | HSS2×2× | 0.250 | 1.50 | 2.25 |
| HSS6×6× | 0.500 | 30.5 | 45.9 | | 0.180 | 1.22 | 1.83 |
| | 0.375 | 25.1 | 37.8 | | 0.120 | 0.906 | 1.36 |
| | 0.312 | 21.3 | 32.0 | | 0.080 | 0.642 | 0.965 |
| | 0.250 | 17.8 | 26.8 | | 0.060 | 0.493 | 0.740 |
| | 0.180 | 13.3 | 20.0 | | | | |
| | 0.120 [f1] | 7.24 | 10.9 | HSS1.75×1.75× | 0.180 | 0.889 | 1.34 |
| | | | | | 0.120 | 0.675 | 1.01 |
| HSS5×5× | 0.500 | 19.9 | 29.9 | | 0.083 | 0.500 | 0.752 |
| | 0.375 | 16.8 | 25.2 | | 0.063 | 0.386 | 0.581 |
| | 0.312 | 14.3 | 21.4 | | | | |
| | 0.250 | 12.1 | 18.2 | HSS1.5×1.5× | 0.250 | 0.720 | 1.08 |
| | 0.180 | 9.07 | 13.6 | | 0.180 | 0.614 | 0.923 |
| | 0.120 [f1] | 5.44 | 8.17 | | 0.120 | 0.479 | 0.720 |
| | | | | | 0.080 | 0.347 | 0.522 |
| | | | | | 0.060 | 0.268 | 0.403 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

$F_y$ = 30 ksi

## Table 2-11 (continued)
# Available Flexural Strength, kip-ft
### Square HSS (Roll Formed)

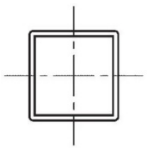


HSS1.25-HSS1

| Shape | | $M_n/\Omega_b$ | $\varphi_b M_n$ |
|---|---|---|---|
| | | ASD | LRFD |
| HSS1.25×1.25× | 0.180 | 0.389 | 0.585 |
| | 0.120 | 0.316 | 0.475 |
| | 0.080 | 0.234 | 0.351 |
| | 0.060 | 0.183 | 0.275 |
| HSS1×1× | 0.180 | 0.214 | 0.322 |
| | 0.120 | 0.187 | 0.281 |
| | 0.080 | 0.143 | 0.214 |
| | 0.060 | 0.112 | 0.168 |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.



HSS20-HSS5

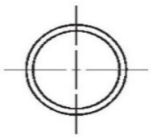
# Table 2-12
# Available Flexural Strength, kip-ft
## Square HSS (Press Braked)

$F_y$ = 30 ksi

| Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD | Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD |
|---|---|---|---|---|---|---|---|
| HSS20×20× | 0.625 | 507 | 763 | HSS6×6× | 0.500 | 30.2 | 45.5 |
| | 0.500 [f1] | 403 | 605 | | 0.375 | 24.6 | 36.9 |
| | 0.375 [f1] | 245 | 369 | | 0.312 | 21.3 | 32.0 |
| | | | | | 0.250 | 17.7 | 26.6 |
| HSS16×16× | 0.625 | 316 | 475 | | 0.180 | 13.2 | 19.8 |
| | 0.500 | 259 | 389 | | 0.120 [f1] | 7.26 | 10.9 |
| | 0.375 [f1] | 175 | 263 | | | | |
| | 0.312 [f1] | 133 | 200 | HSS5×5× | 0.250 | 11.9 | 17.9 |
| | | | | | 0.180 | 8.98 | 13.5 |
| HSS14×14× | 0.625 | 238 | 358 | | 0.120 [f1] | 5.67 | 8.52 |
| | 0.500 | 196 | 295 | | | | |
| | 0.375 | 151 | 227 | | | | |
| | 0.312 [f1] | 108 | 162 | | | | |
| | | | | | | | |
| HSS12×12× | 0.625 | 169 | 254 | | | | |
| | 0.500 | 141 | 212 | | | | |
| | 0.375 | 110 | 165 | | | | |
| | 0.312 | 92.8 | 140 | | | | |
| | 0.250 [f1] | 61.8 | 92.8 | | | | |
| | | | | | | | |
| HSS10×10× | 0.625 | 114 | 171 | | | | |
| | 0.500 | 95.1 | 143 | | | | |
| | 0.375 | 74.4 | 112 | | | | |
| | 0.312 | 63.3 | 95.2 | | | | |
| | 0.250 [f1] | 50.3 | 75.5 | | | | |
| | | | | | | | |
| HSS8×8× | 0.625 | 68.7 | 103 | | | | |
| | 0.500 | 58.2 | 87.5 | | | | |
| | 0.375 | 46.1 | 69.3 | | | | |
| | 0.312 | 39.5 | 59.4 | | | | |
| | 0.250 | 32.5 | 48.8 | | | | |
| | 0.180 [f1] | 20.4 | 30.7 | | | | |
| | | | | | | | |
| HSS7×7× | 0.500 | 43.1 | 64.8 | | | | |
| | 0.375 | 34.4 | 51.8 | | | | |
| | 0.312 | 29.6 | 44.6 | | | | |
| | 0.250 | 24.4 | 36.7 | | | | |
| | 0.180 | 18.3 | 27.5 | | | | |

| ASD | LRFD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.



HSS7.5-HSS2.5

# Table 2-13
# Available Flexural Strength, kip-ft
## Round HSS

$F_y$ = 30 ksi

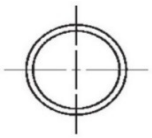
| Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD | Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD |
|---|---|---|---|---|---|---|---|
| HSS7.5× | 0.375 | 28.6 | 43.0 | HSS3.125× | 0.250 | 3.10 | 4.66 |
| | 0.250 | 19.6 | 29.5 | | 0.180 | 2.34 | 3.51 |
| | 0.180 | 14.4 | 21.7 | | 0.120 | 1.62 | 2.43 |
| | 0.120 | 9.79 | 14.7 | | 0.109 | 1.49 | 2.23 |
| | | | | | 0.083 | 1.15 | 1.73 |
| HSS6.25× | 0.375 | 19.5 | 29.3 | | 0.063 | 0.877 | 1.32 |
| | 0.250 | 13.5 | 20.3 | | | | |
| | 0.180 | 9.93 | 14.9 | HSS3× | 0.250 | 2.84 | 4.28 |
| | 0.120 | 6.75 | 10.1 | | 0.180 | 2.14 | 3.22 |
| | | | | | 0.148 | 1.80 | 2.70 |
| HSS5× | 0.250 | 8.46 | 12.7 | | 0.120 | 1.49 | 2.24 |
| | 0.180 | 6.26 | 9.41 | | 0.109 | 1.36 | 2.05 |
| | 0.120 | 4.28 | 6.44 | | 0.083 | 1.06 | 1.59 |
| | 0.109 | 3.91 | 5.87 | | 0.063 | 0.807 | 1.21 |
| | 0.083 | 3.01 | 4.52 | | 0.049 | 0.639 | 0.961 |
| | | | | | | | |
| HSS4.5× | 0.250 | 6.77 | 10.2 | HSS2.875× | 0.180 | 1.96 | 2.95 |
| | 0.180 | 5.03 | 7.56 | | 0.120 | 1.36 | 2.05 |
| | 0.148 | 4.19 | 6.30 | | 0.109 | 1.25 | 1.88 |
| | 0.120 | 3.44 | 5.18 | | 0.083 | 0.969 | 1.46 |
| | 0.109 | 3.14 | 4.73 | | | | |
| | 0.083 | 2.43 | 3.65 | HSS2.75× | 0.250 | 2.35 | 3.53 |
| | | | | | 0.180 | 1.78 | 2.68 |
| HSS4× | 0.120 | 2.71 | 4.07 | | 0.148 | 1.50 | 2.25 |
| | 0.109 | 2.47 | 3.71 | | 0.120 | 1.24 | 1.87 |
| | 0.083 | 1.90 | 2.86 | | 0.109 | 1.14 | 1.71 |
| | | | | | 0.083 | 0.885 | 1.33 |
| HSS3.75× | 0.250 | 4.60 | 6.91 | | 0.065 | 0.702 | 1.06 |
| | 0.180 | 3.44 | 5.18 | | | | |
| | 0.148 | 2.87 | 4.32 | HSS2.5× | 0.250 | 1.90 | 2.86 |
| | 0.120 | 2.37 | 3.56 | | 0.180 | 1.45 | 2.18 |
| | 0.109 | 2.17 | 3.26 | | 0.148 | 1.23 | 1.85 |
| | 0.083 | 1.68 | 2.52 | | 0.120 | 1.02 | 1.53 |
| | | | | | 0.109 | 0.934 | 1.40 |
| HSS3.5× | 0.180 | 2.98 | 4.48 | | 0.083 | 0.726 | 1.09 |
| | 0.148 | 2.49 | 3.74 | | 0.063 | 0.555 | 0.835 |
| | 0.120 | 2.05 | 3.08 | | 0.049 | 0.440 | 0.662 |
| | 0.109 | 1.87 | 2.81 | | | | |
| | 0.083 | 1.45 | 2.18 | | | | |
| | 0.063 | 1.11 | 1.66 | | | | |
| | 0.049 [f1] | 0.862 | 1.30 | | | | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 65 ksi.

**$F_y$ = 30 ksi**

## Table 2-13 (continued)
# Available Flexural Strength, kip-ft
### Round HSS

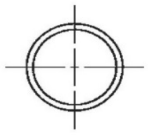


**HSS2.375-HSS1**

| Shape | | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD | Shape | | $M_n/\Omega_b$ | $\varphi_b M_n$ |
|---|---|---|---|---|---|---|---|
| HSS2.375× | 0.180 | 1.30 | 1.96 | HSS1.66× | 0.148 | 0.507 | 0.763 |
| | 0.148 | 1.10 | 1.65 | | 0.120 | 0.427 | 0.641 |
| | 0.120 | 0.915 | 1.37 | | 0.109 | 0.394 | 0.592 |
| | 0.109 | 0.838 | 1.26 | | 0.083 | 0.310 | 0.466 |
| | 0.083 | 0.653 | 0.981 | | 0.063 | 0.240 | 0.360 |
| | 0.063 | 0.500 | 0.752 | | | | |
| | 0.049 | 0.397 | 0.596 | HSS1.5× | 0.120 | 0.343 | 0.515 |
| | | | | | 0.109 | 0.316 | 0.475 |
| HSS2.25× | 0.180 | 1.16 | 1.74 | | 0.083 | 0.250 | 0.376 |
| | 0.148 | 0.981 | 1.47 | | 0.063 | 0.193 | 0.290 |
| | 0.120 | 0.816 | 1.23 | | 0.049 | 0.154 | 0.232 |
| | 0.109 | 0.749 | 1.13 | | 0.035 | 0.112 | 0.169 |
| | 0.083 | 0.584 | 0.878 | | | | |
| | 0.063 | 0.448 | 0.673 | HSS1.25× | 0.120 | 0.231 | 0.347 |
| | | | | | 0.109 | 0.213 | 0.320 |
| HSS2× | 0.180 | 0.895 | 1.35 | | 0.083 | 0.169 | 0.254 |
| | 0.148 | 0.762 | 1.15 | | 0.063 | 0.132 | 0.198 |
| | 0.120 | 0.636 | 0.956 | | 0.049 | 0.106 | 0.159 |
| | 0.109 | 0.584 | 0.878 | | 0.035 | 0.077 | 0.116 |
| | 0.083 | 0.457 | 0.686 | | | | |
| | 0.063 | 0.352 | 0.529 | HSS1× | 0.120 | 0.140 | 0.210 |
| | 0.049 | 0.280 | 0.421 | | 0.109 | 0.130 | 0.196 |
| | 0.035 | 0.202 | 0.304 | | 0.083 | 0.105 | 0.158 |
| | | | | | 0.065 | 0.085 | 0.128 |
| HSS1.9× | 0.148 | 0.681 | 1.02 | | 0.063 | 0.082 | 0.124 |
| | 0.120 | 0.570 | 0.857 | | 0.049 | 0.067 | 0.100 |
| | 0.109 | 0.524 | 0.788 | | 0.042 | 0.058 | 0.087 |
| | 0.083 | 0.410 | 0.617 | | 0.035 | 0.049 | 0.073 |
| | 0.063 | 0.316 | 0.475 | | 0.032 | 0.045 | 0.068 |
| | 0.049 | 0.251 | 0.378 | | | | |
| | 0.035 | 0.183 | 0.275 | | | | |
| HSS1.75× | 0.120 | 0.478 | 0.718 | | | | |
| | 0.109 | 0.440 | 0.662 | | | | |
| | 0.083 | 0.346 | 0.520 | | | | |
| | 0.063 | 0.266 | 0.401 | | | | |
| | 0.049 | 0.213 | 0.320 | | | | |
| | 0.035 | 0.154 | 0.232 | | | | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 65 ksi.



PIPE 12-PIPE 1

# Table 2-14
# Available Flexural Strength, kip-ft
## Pipe

$F_y$ = 30 ksi

| Shape | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD | Shape | $M_n/\Omega_b$ ASD | $\varphi_b M_n$ LRFD |
|---|---|---|---|---|---|
| Pipe 12 Std. 40S | 86.7 | 130 | Pipe 2 Std. 80S | 1.53 | 2.30 |
| Pipe 12 Std. 10S [f1] | 42.4 | 63.7 | Pipe 2 Std. 40S | 1.14 | 1.72 |
| | | | Pipe 2 Std. 10S | 0.843 | 1.27 |
| Pipe 10 Std. 40S | 59.6 | 89.6 | Pipe 2 Std. 5S | 0.521 | 0.783 |
| Pipe 10 Std. 10S [f1] | 28.0 | 42.1 | | | |
| | | | Pipe 1½ Std. 80S | 0.870 | 1.31 |
| Pipe 8 Std. 80S | 49.6 | 74.5 | Pipe 1½ Std. 40S | 0.671 | 1.01 |
| Pipe 8 Std. 40S | 33.2 | 50.0 | Pipe 1½ Std. 10S | 0.524 | 0.788 |
| Pipe 8 Std. 10S | 15.9 | 23.9 | Pipe 1½ Std. 5S | 0.328 | 0.493 |
| Pipe 8 Std. 5S [f1] | 11.5 | 17.2 | | | |
| | | | Pipe 1¼ Std. 80S | 0.620 | 0.932 |
| Pipe 6 Std. 80S | 24.9 | 37.4 | Pipe 1¼ Std. 40S | 0.485 | 0.729 |
| Pipe 6 Std. 40S | 16.9 | 25.4 | Pipe 1¼ Std. 10S | 0.394 | 0.592 |
| Pipe 6 Std. 10S | 8.47 | 12.7 | Pipe 1¼ Std. 5S | 0.247 | 0.371 |
| Pipe 6 Std. 5S | 6.95 | 10.4 | | | |
| | | | Pipe 1 Std. 80S | 0.352 | 0.529 |
| Pipe 5 Std. 80S | 15.1 | 22.7 | Pipe 1 Std. 40S | 0.281 | 0.423 |
| Pipe 5 Std. 40S | 10.9 | 16.3 | Pipe 1 Std. 10S | 0.240 | 0.360 |
| Pipe 5 Std. 10S | 5.91 | 8.89 | Pipe 1 Std. 5S | 0.153 | 0.230 |
| Pipe 5 Std. 5S | 4.85 | 7.29 | | | |
| | | | | | |
| Pipe 4 Std. 80S | 8.76 | 13.2 | | | |
| Pipe 4 Std. 40S | 6.45 | 9.70 | | | |
| Pipe 4 Std.10S | 3.44 | 5.18 | | | |
| Pipe 4 Std. 5S | 2.43 | 3.65 | | | |
| | | | | | |
| Pipe 3½ Std. 80S | 6.47 | 9.72 | | | |
| Pipe 3½ Std. 40S | 4.82 | 7.25 | | | |
| Pipe 3½ Std. 10S | 2.71 | 4.07 | | | |
| Pipe 3½ Std. 5S | 1.90 | 2.86 | | | |
| | | | | | |
| Pipe 3 Std. 80S | 4.61 | 6.93 | | | |
| Pipe 3 Std. 40S | 3.49 | 5.24 | | | |
| Pipe 3 Std. 10S | 2.05 | 3.08 | | | |
| Pipe 3 Std. 5S | 1.45 | 2.18 | | | |
| | | | | | |
| Pipe 2½ Std. 80S | 2.81 | 4.23 | | | |
| Pipe 2½ Std. 40S | 2.19 | 3.29 | | | |
| Pipe 2½ Std. 10S | 1.37 | 2.06 | | | |
| Pipe 2½ Std. 5S | 0.973 | 1.46 | | | |

| ASD | LFRD |
|---|---|
| $\Omega_b$ = 1.67 | $\varphi_b$ = 0.90 |

[f1] Shape exceeds compact limit for flexure with $F_y$ = 30 ksi.

## STRUCTURAL STAINLESS STEEL DESIGN TABLES

### IN ACCORDANCE WITH AISC DG27: STRUCTURAL STAINLESS STEEL

This publication presents design data derived in accordance with the American Institute of Steel Construction's Design Guide 27 *Structural Stainless Steel*. The data is presented in an equivalent set of tables to those in the AISC *Steel Construction Manual* for carbon steel sections. Tables cover dimensions and properties, design data for flexural members and design data for compression members. Two strength levels are covered – 30 ksi which corresponds to austenitic stainless steels and 65 ksi which corresponds to duplex stainless steels.

The following structural sections are included in this publication:

- W- and S-shapes
- C- and MC-shapes
- Equal angles
- Rectangular hollow structural sections (HSS)
- Square HSS
- Circular HSS.

Section ranges listed cover sections that are readily available at the time of printing.

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Always refer to www.steel-stainless.org/usdesigntables for the latest version