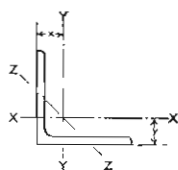


Table 13
ROLLED STEEL STRUCTURAL SHAPES*

ANGLES
EQUAL LEGS
PROPERTIES FOR DESIGNING

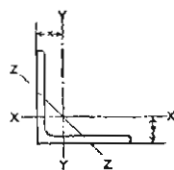


| Size | Thickness | Weight per Foot | Area | AXIS X-X AND AXIS Y-Y | | | | AXIS Z-Z |
|-------|-----------|-----------------|------------------|-----------------------|------------------|------|--------|----------|
| | | | | I | S | r | x or y | r |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. | In. |
| 8 x 8 | 1 1/8 | 56.9 | 16.73 | 98.0 | 17.5 | 2.42 | 2.41 | 1.56 |
| | 1 | 51.0 | 15.00 | 89.0 | 15.8 | 2.44 | 2.37 | 1.56 |
| | 7/8 | 45.0 | 13.23 | 79.6 | 14.0 | 2.45 | 2.32 | 1.57 |
| | 3/4 | 38.9 | 11.44 | 69.7 | 12.2 | 2.47 | 2.28 | 1.57 |
| | 5/8 | 32.7 | 9.61 | 59.4 | 10.3 | 2.49 | 2.23 | 1.58 |
| | 3/8 | 29.6 | 8.68 | 54.1 | 9.3 | 2.50 | 2.21 | 1.58 |
| 1/2 | 26.4 | 7.75 | 48.6 | 8.4 | 2.50 | 2.19 | 1.59 | |
| 6 x 6 | 1 | 37.4 | 11.00 | 35.5 | 8.6 | 1.80 | 1.86 | 1.17 |
| | 3/4 | 33.1 | 9.73 | 31.9 | 7.6 | 1.81 | 1.82 | 1.17 |
| | 5/8 | 28.7 | 8.44 | 28.2 | 6.7 | 1.83 | 1.78 | 1.17 |
| | 3/8 | 24.2 | 7.11 | 24.2 | 5.7 | 1.84 | 1.73 | 1.18 |
| | 5/16 | 21.9 | 6.43 | 22.1 | 5.1 | 1.85 | 1.71 | 1.18 |
| | 1/2 | 19.6 | 5.75 | 19.9 | 4.6 | 1.86 | 1.68 | 1.18 |
| | 3/8 | 17.2 | 5.06 | 17.7 | 4.1 | 1.87 | 1.66 | 1.19 |
| | 3/16 | 14.9 | 4.36 | 15.4 | 3.5 | 1.88 | 1.64 | 1.19 |
| 3/16 | 12.5 | 3.66 | 13.0 | 3.0 | 1.89 | 1.61 | 1.19 | |
| 5 x 5 | 3/8 | 27.2 | 7.98 | 17.8 | 5.2 | 1.49 | 1.57 | .97 |
| | 3/4 | 23.6 | 6.94 | 15.7 | 4.5 | 1.51 | 1.52 | .97 |
| | 5/8 | 20.0 | 5.86 | 13.6 | 3.9 | 1.52 | 1.48 | .98 |
| | 1/2 | 16.2 | 4.75 | 11.3 | 3.2 | 1.54 | 1.43 | .98 |
| | 3/8 | 14.3 | 4.18 | 10.0 | 2.8 | 1.55 | 1.41 | .98 |
| | 3/8 | 12.3 | 3.61 | 8.7 | 2.4 | 1.56 | 1.39 | .99 |
| 3/16 | 10.3 | 3.03 | 7.4 | 2.0 | 1.57 | 1.37 | .99 | |
| 4 x 4 | 3/4 | 18.5 | 5.44 | 7.7 | 2.8 | 1.19 | 1.27 | .78 |
| | 5/8 | 15.7 | 4.61 | 6.7 | 2.4 | 1.20 | 1.23 | .78 |
| | 1/2 | 12.8 | 3.75 | 5.6 | 2.0 | 1.22 | 1.18 | .78 |
| | 3/8 | 11.3 | 3.31 | 5.0 | 1.8 | 1.23 | 1.16 | .78 |
| | 3/8 | 9.8 | 2.86 | 4.4 | 1.5 | 1.23 | 1.14 | .79 |
| | 3/16 | 8.2 | 2.40 | 3.7 | 1.3 | 1.24 | 1.12 | .79 |
| 1/4 | 6.6 | 1.94 | 3.0 | 1.1 | 1.25 | 1.09 | .80 | |

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Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

ANGLES
EQUAL LEGS
PROPERTIES FOR DESIGNING

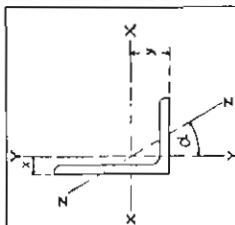


| Size | Thickness | Weight per Foot | Area | AXIS X-X AND AXIS Y-Y | | | | AXIS Z-Z |
|---------------|-----------|-----------------|------------------|-----------------------|------------------|------|--------|----------|
| | | | | I | S | r | x or y | r |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. | In. |
| 3 1/2 x 3 1/2 | 1 1/8 | 11.1 | 3.25 | 3.6 | 1.5 | 1.06 | 1.06 | .68 |
| | 7/8 | 9.8 | 2.87 | 3.3 | 1.3 | 1.07 | 1.04 | .68 |
| | 3/4 | 8.5 | 2.48 | 2.9 | 1.2 | 1.07 | 1.01 | .69 |
| | 5/8 | 7.2 | 2.09 | 2.5 | .98 | 1.08 | .99 | .69 |
| 3 x 3 | 1/2 | 5.8 | 1.69 | 2.0 | .79 | 1.09 | .97 | .69 |
| | 3/8 | 9.4 | 2.75 | 2.2 | 1.1 | .90 | .93 | .58 |
| | 7/8 | 8.3 | 2.43 | 2.0 | .95 | .91 | .91 | .58 |
| | 3/8 | 7.2 | 2.11 | 1.8 | .83 | .91 | .89 | .58 |
| 2 1/2 x 2 1/2 | 3/8 | 6.1 | 1.78 | 1.5 | .71 | .92 | .87 | .59 |
| | 1/2 | 4.9 | 1.44 | 1.2 | .58 | .93 | .84 | .59 |
| | 3/8 | 3.71 | 1.09 | .96 | .44 | .94 | .82 | .59 |
| | 3/8 | 7.7 | 2.25 | 1.2 | .72 | .74 | .81 | .49 |
| 2 x 2 | 3/8 | 5.9 | 1.73 | .98 | .57 | .75 | .76 | .49 |
| | 1/2 | 5.0 | 1.47 | .85 | .48 | .76 | .74 | .49 |
| | 3/8 | 4.1 | 1.19 | .70 | .39 | .77 | .72 | .49 |
| | 3/8 | 3.07 | .90 | .55 | .30 | .78 | .69 | .49 |
| 1 3/4 x 1 3/4 | 3/8 | 4.7 | 1.36 | .48 | .35 | .59 | .64 | .39 |
| | 1/2 | 3.92 | 1.15 | .42 | .30 | .60 | .61 | .39 |
| | 3/8 | 3.19 | .94 | .35 | .25 | .61 | .59 | .39 |
| | 3/8 | 2.44 | .71 | .27 | .19 | .62 | .57 | .39 |
| 1 1/2 x 1 1/2 | 1/2 | 1.65 | .48 | .19 | .13 | .63 | .55 | .40 |
| | 3/8 | 2.77 | .81 | .23 | .19 | .53 | .53 | .34 |
| | 3/8 | 2.12 | .62 | .18 | .14 | .54 | .51 | .34 |
| | 1/2 | 1.44 | .42 | .13 | .10 | .55 | .48 | .35 |
| 1 1/2 x 1 1/2 | 3/8 | 2.34 | .69 | .14 | .13 | .45 | .47 | .29 |
| | 1/2 | 1.80 | .53 | .11 | .10 | .46 | .44 | .29 |
| | 3/8 | 1.23 | .36 | .08 | .07 | .47 | .42 | .30 |
| | 3/8 | 1.92 | .56 | .08 | .09 | .37 | .40 | .24 |
| 1 1/4 x 1 1/4 | 3/8 | 1.48 | .43 | .06 | .07 | .38 | .36 | .24 |
| | 1/2 | 1.01 | .30 | .04 | .05 | .38 | .36 | .25 |
| | 3/8 | 1.49 | .44 | .04 | .06 | .29 | .34 | .20 |
| | 3/8 | 1.16 | .34 | .03 | .04 | .30 | .32 | .19 |
| 1 x 1 | 1/2 | .80 | .23 | .02 | .03 | .30 | .30 | .20 |
| | 3/8 | .80 | .23 | .02 | .03 | .30 | .30 | .20 |
| | 3/8 | .80 | .23 | .02 | .03 | .30 | .30 | .20 |
| | 3/8 | .80 | .23 | .02 | .03 | .30 | .30 | .20 |

Table 13 (Cont'd)

ROLLED STEEL STRUCTURAL SHAPES

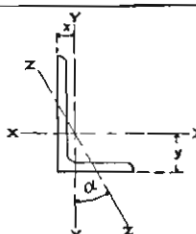
ANGLES
UNEQUAL LEGS
PROPERTIES FOR DESIGNING



| Size | Thickness | Weight per Foot | Area | AXIS X-X | | | AXIS Y-Y | | | AXIS Z-Z | | |
|-------|-----------|-----------------|------------------|------------------|------------------|------|------------------|------------------|------|------------------|------------------|------|
| | | | | I | S | r | I | S | r | I | S | r |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. ⁴ | In. ³ | In. | In. ⁴ | In. ³ | In. |
| 9 x 4 | 1 | 40.8 | 12.00 | 97.0 | 17.6 | 2.84 | 3.50 | 12.0 | 4.0 | 1.00 | 8.3 | .203 |
| | 3/4 | 36.1 | 10.61 | 86.8 | 15.7 | 2.86 | 3.45 | 10.8 | 3.6 | 1.01 | .95 | .208 |
| | 5/8 | 31.3 | 9.19 | 76.1 | 13.6 | 2.88 | 3.41 | 9.6 | 3.1 | 1.02 | .91 | .212 |
| | 3/8 | 26.3 | 7.73 | 64.9 | 11.5 | 2.90 | 3.36 | 8.3 | 2.6 | 1.04 | .86 | .216 |
| | 1/2 | 23.8 | 7.00 | 59.1 | 10.4 | 2.91 | 3.33 | 7.0 | 2.4 | 1.04 | .83 | .218 |
| | 3/8 | 21.3 | 6.25 | 53.2 | 9.3 | 2.92 | 3.31 | 6.9 | 2.2 | 1.05 | .81 | .220 |
| 8 x 6 | 1 | 44.2 | 13.00 | 80.8 | 15.1 | 2.49 | 2.65 | 38.8 | 8.9 | 1.73 | 1.65 | .543 |
| | 3/4 | 39.1 | 11.48 | 72.3 | 13.4 | 2.51 | 2.61 | 34.9 | 7.9 | 1.74 | 1.61 | .547 |
| | 5/8 | 33.8 | 9.94 | 63.4 | 11.7 | 2.53 | 2.56 | 30.7 | 6.9 | 1.76 | 1.56 | .551 |
| | 3/8 | 28.5 | 8.36 | 54.1 | 9.5 | 2.54 | 2.52 | 26.3 | 5.9 | 1.77 | 1.52 | .554 |
| | 1/2 | 25.7 | 7.56 | 49.3 | 9.0 | 2.55 | 2.50 | 24.0 | 5.3 | 1.78 | 1.50 | .556 |
| | 3/8 | 23.0 | 6.75 | 44.3 | 8.0 | 2.56 | 2.47 | 21.7 | 4.8 | 1.79 | 1.47 | .558 |
| 8 x 4 | 1 | 37.4 | 11.00 | 69.6 | 14.1 | 2.52 | 3.05 | 11.6 | 3.9 | 1.03 | 1.05 | .85 |
| | 3/4 | 33.1 | 9.73 | 62.5 | 12.5 | 2.53 | 3.00 | 10.5 | 3.5 | 1.04 | 1.00 | .85 |
| | 5/8 | 28.7 | 8.44 | 54.9 | 10.9 | 2.55 | 2.95 | 9.4 | 3.1 | 1.05 | .95 | .85 |
| | 3/8 | 24.2 | 7.11 | 46.9 | 9.2 | 2.57 | 2.91 | 8.1 | 2.6 | 1.07 | .91 | .86 |
| | 1/2 | 21.9 | 6.43 | 42.8 | 8.4 | 2.58 | 2.88 | 7.4 | 2.4 | 1.07 | .88 | .86 |
| | 3/8 | 19.6 | 5.75 | 38.5 | 7.5 | 2.59 | 2.86 | 6.7 | 2.2 | 1.08 | .86 | .86 |
| 7 x 4 | 1 | 30.2 | 8.86 | 42.9 | 9.7 | 2.20 | 2.55 | 10.2 | 3.5 | 1.07 | 1.05 | .86 |
| | 3/4 | 26.2 | 7.69 | 37.8 | 8.4 | 2.22 | 2.51 | 9.1 | 3.0 | 1.09 | 1.01 | .86 |
| | 5/8 | 22.1 | 6.48 | 32.4 | 7.1 | 2.24 | 2.46 | 7.8 | 2.6 | 1.10 | .96 | .86 |
| | 3/8 | 20.0 | 5.87 | 29.6 | 6.5 | 2.24 | 2.44 | 7.2 | 2.4 | 1.11 | .94 | .87 |
| | 1/2 | 17.9 | 5.25 | 26.7 | 5.8 | 2.25 | 2.42 | 6.5 | 2.1 | 1.11 | .92 | .87 |
| | 3/8 | 15.8 | 4.62 | 23.7 | 5.1 | 2.26 | 2.39 | 5.8 | 1.9 | 1.12 | .89 | .88 |
| 3/8 | 13.6 | 3.98 | 20.6 | 4.4 | 2.27 | 2.37 | 5.1 | 1.6 | 1.13 | .87 | .88 | |

Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

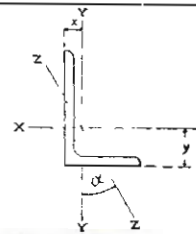
**ANGLES
UNEQUAL LEGS
PROPERTIES FOR DESIGNING**



| Size | Thick-ness | Weight per Foot | Area | AXIS X-X | | | | AXIS Y-Y | | | | AXIS Z-Z | | |
|-----------|------------|-----------------|------------------|------------------|------------------|------|------|------------------|------|------|------|----------|-------|--|
| | | | | l | s | r | y | l | s | r | x | r | Tan α | |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. | In. ⁴ | In. | In. | In. | In. | In. | |
| 6 x 4 | 3/8 | 27.2 | 7.98 | 27.7 | 7.2 | 1.86 | 2.12 | 9.8 | 3.4 | 1.11 | 1.12 | .86 | .421 | |
| | 3/4 | 23.6 | 6.94 | 24.5 | 6.3 | 1.88 | 2.08 | 8.7 | 3.0 | 1.12 | 1.08 | .86 | .428 | |
| | 5/8 | 20.0 | 5.86 | 21.1 | 5.3 | 1.90 | 2.03 | 7.5 | 2.5 | 1.13 | 1.03 | .86 | .435 | |
| | 3/2 | 18.1 | 5.31 | 19.3 | 4.8 | 1.90 | 2.01 | 6.9 | 2.3 | 1.14 | 1.01 | .87 | .438 | |
| | 3/4 | 16.2 | 4.75 | 17.4 | 4.3 | 1.91 | 1.99 | 6.3 | 2.1 | 1.15 | .99 | .87 | .440 | |
| | 3/8 | 14.3 | 4.18 | 15.5 | 3.8 | 1.92 | 1.96 | 5.6 | 1.9 | 1.16 | .96 | .87 | .443 | |
| | 3/4 | 12.3 | 3.61 | 13.5 | 3.3 | 1.93 | 1.94 | 4.9 | 1.6 | 1.17 | .94 | .88 | .446 | |
| | 3/8 | 10.3 | 3.03 | 11.4 | 2.8 | 1.94 | 1.92 | 4.2 | 1.4 | 1.17 | .92 | .88 | .449 | |
| 6 x 3 1/2 | 1/2 | 15.3 | 4.50 | 16.6 | 4.2 | 1.92 | 2.08 | 4.3 | 1.6 | .97 | .83 | .76 | .344 | |
| | 3/8 | 11.7 | 3.42 | 12.9 | 3.2 | 1.94 | 2.04 | 3.3 | 1.2 | .99 | .79 | .77 | .350 | |
| | 3/4 | 9.8 | 2.87 | 10.9 | 2.7 | 1.95 | 2.01 | 2.9 | 1.0 | 1.00 | .76 | .77 | .352 | |
| | 3/8 | 7.9 | 2.31 | 8.9 | 2.2 | 1.96 | 1.99 | 2.3 | 0.85 | 1.01 | .74 | .78 | .355 | |
| 5 x 3 1/2 | 3/4 | 19.8 | 5.81 | 13.9 | 4.3 | 1.55 | 1.75 | 5.6 | 2.2 | .98 | 1.00 | .75 | .464 | |
| | 3/8 | 16.8 | 4.92 | 12.0 | 3.7 | 1.56 | 1.70 | 4.8 | 1.9 | .99 | .95 | .75 | .472 | |
| | 1/2 | 13.6 | 4.00 | 10.0 | 3.0 | 1.58 | 1.66 | 4.1 | 1.6 | 1.01 | .91 | .75 | .479 | |
| | 3/4 | 12.0 | 3.53 | 8.9 | 2.6 | 1.59 | 1.63 | 3.6 | 1.4 | 1.01 | .88 | .76 | .482 | |
| | 3/8 | 10.4 | 3.05 | 7.8 | 2.3 | 1.60 | 1.61 | 3.2 | 1.2 | 1.02 | .86 | .76 | .486 | |
| | 3/4 | 8.7 | 2.56 | 6.6 | 1.9 | 1.61 | 1.59 | 2.7 | 1.0 | 1.03 | .84 | .76 | .489 | |
| 5 x 3 | 1/2 | 7.0 | 2.06 | 5.4 | 1.6 | 1.61 | 1.56 | 2.2 | .83 | 1.04 | .81 | .76 | .492 | |
| | 3/4 | 12.8 | 3.75 | 9.5 | 2.9 | 1.59 | 1.75 | 2.6 | 1.1 | .83 | .75 | .65 | .367 | |
| | 3/8 | 11.3 | 3.31 | 8.4 | 2.6 | 1.60 | 1.73 | 2.3 | 1.0 | .84 | .73 | .65 | .361 | |
| | 3/4 | 9.8 | 2.86 | 7.4 | 2.2 | 1.61 | 1.70 | 2.0 | .89 | .84 | .70 | .65 | .364 | |
| | 3/8 | 8.2 | 2.40 | 6.3 | 1.9 | 1.61 | 1.68 | 1.8 | .75 | .85 | .68 | .66 | .368 | |
| 3/4 | 6.6 | 1.94 | 5.1 | 1.5 | 1.62 | 1.66 | 1.4 | .61 | .86 | .66 | .66 | .371 | | |

Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

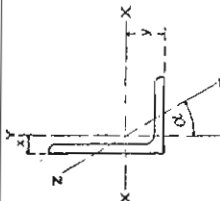
**ANGLES
UNEQUAL LEGS
PROPERTIES FOR DESIGNING**



| Size | Thick-ness | Weight per Foot | Area | AXIS X-X | | | | AXIS Y-Y | | | | AXIS Z-Z | | |
|---------------|------------|-----------------|------------------|------------------|------------------|------|------|------------------|-----|------|------|----------|-------|--|
| | | | | l | s | r | y | l | s | r | x | r | Tan α | |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. | In. ⁴ | In. | In. | In. | In. | In. | |
| 4 x 3 1/2 | 3/8 | 14.7 | 4.30 | 6.4 | 2.4 | 1.22 | 1.29 | 4.5 | 1.8 | 1.03 | 1.04 | .72 | .745 | |
| | 1/2 | 11.9 | 3.50 | 5.3 | 1.9 | 1.23 | 1.25 | 3.8 | 1.5 | 1.04 | 1.00 | .72 | .750 | |
| | 3/4 | 10.6 | 3.09 | 4.8 | 1.7 | 1.24 | 1.23 | 3.4 | 1.4 | 1.05 | .98 | .72 | .753 | |
| | 3/8 | 9.1 | 2.67 | 4.2 | 1.5 | 1.25 | 1.21 | 3.0 | 1.2 | 1.06 | .96 | .73 | .755 | |
| | 3/4 | 7.7 | 2.25 | 3.6 | 1.3 | 1.26 | 1.18 | 2.6 | 1.0 | 1.07 | .93 | .73 | .757 | |
| | 3/8 | 6.2 | 1.81 | 2.9 | 1.0 | 1.27 | 1.16 | 2.1 | .81 | 1.07 | .91 | .73 | .759 | |
| 4 x 3 | 3/8 | 13.6 | 3.98 | 6.0 | 2.3 | 1.23 | 1.37 | 2.9 | 1.4 | .85 | .87 | .64 | .534 | |
| | 1/2 | 11.1 | 3.25 | 5.1 | 1.9 | 1.25 | 1.33 | 2.4 | 1.1 | .86 | .83 | .64 | .543 | |
| | 3/4 | 9.8 | 2.87 | 4.5 | 1.7 | 1.25 | 1.30 | 2.2 | 1.0 | .87 | .80 | .64 | .547 | |
| | 3/8 | 8.5 | 2.48 | 4.0 | 1.5 | 1.26 | 1.28 | 1.9 | .87 | .88 | .78 | .64 | .551 | |
| | 3/4 | 7.2 | 2.09 | 3.4 | 1.2 | 1.27 | 1.26 | 1.7 | .73 | .89 | .76 | .65 | .554 | |
| 3 1/2 x 3 | 1/2 | 5.8 | 1.69 | 2.8 | 1.0 | 1.28 | 1.24 | 1.4 | .60 | .90 | .74 | .65 | .558 | |
| | 3/8 | 10.2 | 3.00 | 3.5 | 1.5 | 1.07 | 1.13 | 2.3 | 1.1 | .88 | .88 | .62 | .714 | |
| | 3/4 | 9.1 | 2.65 | 3.1 | 1.3 | 1.08 | 1.10 | 2.1 | .98 | .89 | .85 | .62 | .718 | |
| | 3/8 | 7.9 | 2.30 | 2.7 | 1.1 | 1.09 | 1.08 | 1.9 | .85 | .90 | .83 | .62 | .721 | |
| 3 1/2 x 2 1/2 | 3/8 | 6.6 | 1.93 | 2.3 | .95 | 1.10 | 1.06 | 1.6 | .72 | .90 | .81 | .63 | .724 | |
| | 1/2 | 5.4 | 1.56 | 1.9 | .78 | 1.11 | 1.04 | 1.3 | .59 | .91 | .79 | .63 | .727 | |
| | 3/4 | 9.4 | 2.75 | 3.2 | 1.4 | 1.09 | 1.20 | 1.4 | .76 | .70 | .70 | .53 | .486 | |
| | 3/8 | 8.3 | 2.43 | 2.9 | 1.3 | 1.09 | 1.18 | 1.2 | .68 | .71 | .68 | .54 | .491 | |
| | 3/4 | 7.2 | 2.11 | 2.6 | 1.1 | 1.10 | 1.16 | 1.1 | .59 | .72 | .66 | .54 | .496 | |
| 3 1/2 x 2 | 3/8 | 6.1 | 1.78 | 2.2 | .93 | 1.11 | 1.14 | .94 | .50 | .73 | .64 | .54 | .501 | |
| | 1/2 | 4.9 | 1.44 | 1.8 | .75 | 1.12 | 1.11 | .78 | .41 | .74 | .61 | .54 | .506 | |

Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

**ANGLES
UNEQUAL LEGS
PROPERTIES FOR DESIGNING**



| Size | Thick-ness | Weight per Foot | Area | AXIS X-X | | | AXIS Y-Y | | | AXIS Z-Z | | | | |
|---------------|------------|-----------------|------------------|------------------|------------------|-----|------------------|-----|------------------|------------------|-----|------------------|-------|-----|
| | | | | l | s | r | l | s | r | l | s | r | Tan α | |
| In. | In. | Lb. | In. ² | In. ⁴ | In. ³ | In. | In. ⁴ | In. | In. ⁴ | In. ³ | In. | In. ⁴ | In. | In. |
| 3 x 2 1/2 | 3/8 | 8.5 | 2.50 | 2.1 | 1.0 | .91 | 1.00 | 1.3 | .74 | .72 | .75 | .82 | .667 | |
| | 3/4 | 7.6 | 2.21 | 1.9 | .93 | .92 | .98 | 1.2 | .66 | .73 | .73 | .52 | .672 | |
| | 3/8 | 6.6 | 1.92 | 1.7 | .81 | .93 | .96 | 1.0 | .58 | .74 | .71 | .52 | .676 | |
| | 3/4 | 5.6 | 1.62 | 1.4 | .69 | .94 | .93 | .90 | .49 | .74 | .68 | .53 | .680 | |
| | 3/8 | 4.5 | 1.31 | 1.2 | .56 | .95 | .91 | .74 | .40 | .75 | .66 | .53 | .684 | |
| 3 x 2 | 1/2 | 7.7 | 2.25 | 1.9 | 1.0 | .92 | 1.08 | .67 | .47 | .55 | .58 | .43 | .414 | |
| | 3/4 | 6.8 | 2.00 | 1.7 | .89 | .93 | 1.06 | .61 | .42 | .55 | .56 | .43 | .421 | |
| | 3/8 | 5.9 | 1.73 | 1.5 | .78 | .94 | 1.04 | .54 | .37 | .56 | .54 | .43 | .428 | |
| | 3/4 | 5.0 | 1.47 | 1.3 | .66 | .95 | 1.02 | .47 | .32 | .57 | .52 | .43 | .435 | |
| | 3/8 | 4.1 | 1.19 | 1.1 | .54 | .95 | .99 | .39 | .26 | .57 | .49 | .43 | .440 | |
| 2 1/2 x 2 | 3/8 | 3.07 | .90 | .84 | .41 | .97 | .97 | .31 | .20 | .58 | .47 | .44 | .446 | |
| | 3/4 | 5.3 | 1.55 | .91 | .55 | .77 | .83 | .51 | .36 | .58 | .58 | .42 | .614 | |
| | 3/8 | 4.5 | 1.31 | .79 | .47 | .78 | .81 | .45 | .31 | .58 | .56 | .42 | .620 | |
| | 3/4 | 3.62 | 1.06 | .65 | .38 | .78 | .79 | .37 | .25 | .59 | .54 | .42 | .626 | |
| | 3/8 | 2.75 | .81 | .51 | .29 | .79 | .76 | .29 | .20 | .60 | .51 | .43 | .631 | |
| 2 1/2 x 1 1/2 | 3/8 | 4.7 | 1.36 | .82 | .52 | .78 | .92 | .22 | .20 | .40 | .42 | .32 | .340 | |
| | 3/4 | 3.92 | 1.15 | .71 | .44 | .79 | .90 | .19 | .17 | .41 | .40 | .32 | .349 | |
| | 3/8 | 3.19 | .94 | .59 | .39 | .79 | .88 | .16 | .14 | .41 | .38 | .32 | .357 | |
| | 3/4 | 2.44 | .72 | .46 | .28 | .80 | .85 | .13 | .11 | .42 | .35 | .33 | .364 | |
| | 3/8 | 2.77 | .81 | .32 | .24 | .82 | .86 | .15 | .14 | .43 | .41 | .32 | .343 | |
| 2 x 1 1/2 | 3/8 | 2.12 | .62 | .25 | .18 | .63 | .64 | .12 | .11 | .44 | .39 | .32 | .351 | |
| | 3/4 | 1.44 | .42 | .17 | .13 | .64 | .62 | .09 | .08 | .45 | .37 | .33 | .358 | |
| | 3/8 | 2.34 | .69 | .20 | .18 | .54 | .60 | .09 | .10 | .35 | .35 | .27 | .486 | |
| 1 3/4 x 1 1/4 | 3/8 | 1.80 | .53 | .16 | .14 | .55 | .58 | .07 | .08 | .36 | .33 | .27 | .496 | |
| | 3/4 | 1.23 | .36 | .11 | .09 | .56 | .56 | .05 | .05 | .37 | .31 | .27 | .506 | |

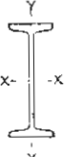
Table 13 (Cont'd)

ROLLED STEEL STRUCTURAL SHAPES

| Nominal Size | | Weight per Foot | Area | Depth | Flange | | Web Thickness | AXIS X-X | | | AXIS Y-Y | | |
|--------------|-----------------------|-------------------------|-------------------------|-------------------------|----------------------|----------------------|----------------------------|-------------------------|----------------------|----------------------|----------------------|----------------------|----------|
| In. | Lb. | In. ² | In. | In. | In. | In. | In. | <i>I</i> | <i>S</i> | <i>r</i> | <i>I</i> | <i>S</i> | <i>r</i> |
| 24 x 7 7/8 | 120.0 105.9 | 35.13 30.98 | 24.00 24.00 | 8.048 7.875 | 1.102 1.102 | .798 .625 | 3010.8 2811.5 | 250.9 234.3 | 9.26 9.53 | 84.9 78.9 | 21.1 20.0 | 1.56 1.60 | |
| 24 x 7 | 100.0 90.0 79.9 | 29.25 26.30 23.33 | 24.00 24.00 24.00 | 7.247 7.124 7.000 | .871 .871 .871 | .747 .624 .500 | 2371.8 2230.1 2087.2 | 197.6 185.8 173.9 | 9.05 9.21 9.46 | 48.4 45.5 42.9 | 13.4 12.8 12.2 | 1.29 1.32 1.36 | |
| 20 x 7 | 95.0 85.0 | 27.74 24.80 | 20.00 20.00 | 7.200 7.063 | .916 .916 | .800 .653 | 1599.7 1501.7 | 160.0 150.2 | 7.59 7.78 | 50.5 47.0 | 14.0 13.3 | 1.35 1.38 | |
| 20 x 6 1/2 | 75.0 65.4 | 21.90 19.08 | 20.00 20.00 | 6.391 6.250 | .789 .789 | .641 .500 | 1263.5 1169.5 | 126.3 116.9 | 7.60 7.83 | 30.1 27.9 | 9.4 8.9 | 1.17 1.21 | |
| 18 x 6 | 70.0 54.7 | 20.46 15.94 | 18.00 18.00 | 6.251 6.000 | .691 .691 | .711 .460 | 917.5 795.5 | 101.9 88.4 | 6.70 7.07 | 24.5 21.2 | 7.8 7.1 | 1.09 1.15 | |
| 15 x 5 1/2 | 50.0 42.9 | 14.59 12.49 | 15.00 15.00 | 5.640 5.500 | .622 .622 | .550 .410 | 481.1 441.8 | 64.2 58.9 | 5.74 5.95 | 16.0 14.6 | 5.7 5.3 | 1.05 1.08 | |
| 12 x 5 1/4 | 50.0 40.8 | 14.57 11.84 | 12.00 12.00 | 5.477 5.250 | .659 .659 | .687 .460 | 301.6 268.9 | 50.3 44.8 | 4.55 4.77 | 16.0 13.8 | 5.8 5.3 | 1.05 1.08 | |
| 12 x 5 | 35.0 31.8 | 10.20 9.26 | 12.00 12.00 | 5.078 5.000 | .544 .544 | .428 .350 | 227.0 215.8 | 37.8 36.0 | 4.72 4.83 | 10.0 9.5 | 3.9 3.8 | .99 1.01 | |
| 10 x 4 3/4 | 35.0 25.4 | 10.22 7.38 | 10.00 10.00 | 4.944 4.660 | .491 .491 | .594 .310 | 145.8 122.1 | 29.2 24.4 | 3.78 4.07 | 8.5 6.9 | 3.4 3.0 | .91 .97 | |
| 8 x 4 | 23.0 18.4 | 6.71 5.34 | 8.00 8.00 | 4.171 4.000 | .425 .425 | .441 .270 | 64.2 56.9 | 16.0 14.2 | 3.09 3.26 | 4.4 3.8 | 2.1 1.9 | .81 .84 | |
| 7 x 3 3/4 | 20.0 15.3 | 5.83 4.43 | 7.00 7.00 | 3.860 3.660 | .392 .392 | .450 .290 | 41.9 36.2 | 12.0 10.4 | 2.68 2.86 | 3.1 2.7 | 1.6 1.5 | .74 .78 | |
| 6 x 3 3/4 | 17.25 12.5 | 5.02 3.61 | 6.00 6.00 | 3.565 3.330 | .359 .359 | .465 .230 | 26.0 21.8 | 8.7 7.3 | 2.28 2.46 | 2.3 1.8 | 1.3 1.1 | .68 .72 | |
| 5 x 3 | 14.75 10.0 | 4.29 2.87 | 5.00 5.00 | 3.284 3.000 | .326 .326 | .494 .210 | 15.0 12.1 | 6.0 4.8 | 1.87 2.05 | 1.7 1.2 | 1.0 .82 | .63 .65 | |
| 4 x 2 3/4 | 9.5 7.7 | 2.76 2.21 | 4.00 4.00 | 2.796 2.660 | .293 .293 | .326 .190 | 6.7 6.0 | 3.3 3.0 | 1.56 1.64 | .91 .77 | .65 .58 | .58 .59 | |
| 3 x 2 3/4 | 7.5 5.7 | 2.17 1.64 | 3.00 3.00 | 2.509 2.330 | .260 .260 | .349 .170 | 2.9 2.5 | 1.9 1.7 | 1.15 1.23 | .59 .46 | .47 .40 | .52 .53 | |



AMERICAN STANDARD BEAMS
PROPERTIES FOR DESIGNING



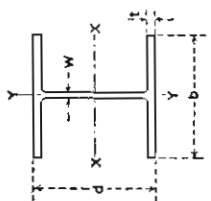
AMERICAN STANDARD CHANNELS
PROPERTIES FOR DESIGNING

| Nominal Size | Weight per Foot | Area | Depth | Flange | | Web Thickness | AXIS X-X | | | AXIS Y-Y | | | |
|--------------|------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------|------------------------------|----------------------------------|------------------------------|------------------------------|------------------------------|--------------------------|------------------------------|--------------------------|
| | | | | Width | Average Thickness | | <i>I</i> | <i>S</i> | <i>r</i> | <i>I</i> | <i>S</i> | <i>r</i> | <i>t</i> |
| 18 x 4 | 58.0 51.9 45.8 42.7 | 16.98 15.18 13.38 12.48 | 18.00 18.00 18.00 18.00 | 4.200 4.100 4.000 3.950 | .625 .625 .625 .625 | .700 .600 .500 .450 | 670.7 622.1 573.5 549.2 | 74.5 69.1 63.7 61.0 | 6.29 6.40 6.55 6.64 | 18.5 17.1 15.8 15.0 | 5.6 5.3 5.1 4.9 | 1.04 1.06 1.09 1.10 | .88 .87 .89 .90 |
| 15 x 3 3/4 | 50.0 40.0 33.9 | 14.64 11.70 9.90 | 15.00 15.00 15.00 | 3.716 3.520 3.400 | .650 .650 .650 | .716 .520 .400 | 401.4 346.3 312.6 | 53.6 46.2 41.7 | 5.24 5.44 5.62 | 11.2 9.3 8.2 | 3.8 3.4 3.2 | .87 .89 .91 | .80 .78 .79 |
| 12 x 3 | 30.0 25.0 20.7 | 8.79 7.32 6.03 | 12.00 12.00 12.00 | 3.170 3.047 2.940 | .501 .501 .501 | .510 .387 .280 | 161.2 143.5 128.1 | 26.9 23.9 21.4 | 4.28 4.43 4.61 | 5.2 4.5 3.9 | 2.1 1.9 1.7 | .77 .79 .81 | .68 .68 .70 |
| 10 x 2 3/4 | 30.0 25.0 20.0 15.3 | 8.80 7.33 5.86 4.47 | 10.00 10.00 10.00 10.00 | 3.033 2.886 2.739 2.600 | .436 .436 .436 .436 | .673 .526 .379 .240 | 103.0 90.7 78.5 66.9 | 20.6 18.1 15.7 13.4 | 3.42 3.52 3.66 3.87 | 4.0 3.4 2.8 2.3 | 1.7 1.5 1.3 1.2 | .67 .68 .70 .72 | .65 .62 .61 .64 |
| 9 x 2 1/2 | 20.0 15.0 13.4 | 5.86 4.39 3.89 | 9.00 9.00 9.00 | 2.648 2.485 2.430 | .413 .413 .413 | .448 .285 .230 | 60.6 50.7 47.3 | 13.5 11.3 10.5 | 3.22 3.40 3.49 | 2.4 1.9 1.8 | 1.2 1.0 .97 | .65 .67 .61 | .59 .59 .59 |
| 8 x 2 1/4 | 18.75 13.75 11.5 | 5.49 4.02 3.36 | 8.00 8.00 8.00 | 2.527 2.343 2.260 | .390 .390 .390 | .487 .303 .220 | 43.7 35.8 32.3 | 10.9 9.0 8.1 | 2.82 2.99 3.10 | 2.0 1.5 1.3 | 1.0 .86 .79 | .60 .62 .63 | .57 .56 .58 |
| 7 x 2 1/4 | 14.75 12.25 9.8 | 4.32 3.58 2.85 | 7.00 7.00 7.00 | 2.299 2.194 2.090 | .366 .366 .366 | .419 .314 .210 | 27.1 24.1 21.1 | 7.7 6.9 6.0 | 2.51 2.59 2.72 | 1.4 1.2 1.1 | .79 .71 .63 | .57 .58 .59 | .53 .53 .55 |
| 6 x 2 | 13.0 10.5 8.2 | 3.81 3.07 2.39 | 6.00 6.00 6.00 | 2.157 2.034 1.920 | .343 .343 .343 | .437 .314 .200 | 17.3 15.1 13.0 | 5.8 5.0 4.3 | 2.13 2.22 2.34 | 1.1 .87 .70 | .65 .57 .50 | .53 .53 .54 | .52 .50 .52 |
| 5 x 1 3/4 | 9.0 6.7 | 2.63 1.95 | 5.00 5.00 | 1.885 1.750 | .320 .320 | .325 .190 | 8.8 7.4 | 3.5 3.0 | 1.83 1.95 | .64 .48 | .45 .38 | .49 .50 | .48 .49 |
| 4 x 1 1/2 | 7.25 5.4 | 2.12 1.56 | 4.00 4.00 | 1.720 1.580 | .296 .296 | .320 .180 | 4.5 3.8 | 2.3 1.9 | 1.47 1.56 | .44 .32 | .35 .29 | .46 .46 | .46 .46 |
| 3 x 1 1/2 | 6.0 5.0 4.1 | 1.75 1.46 1.19 | 3.00 3.00 3.00 | 1.596 1.498 1.410 | .273 .273 .273 | .356 .258 .170 | 2.1 1.8 1.6 | 1.4 1.2 1.1 | 1.08 1.12 1.17 | .31 .25 .20 | .27 .24 .21 | .42 .44 .41 | .46 .44 .44 |

*Car and Shipbuilding Channel; not an American Standard.

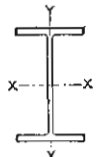
Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

H BEARING PILES
DIMENSIONS AND
PROPERTIES FOR DESIGNING



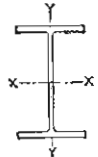
| Section Number | Weight per Foot | Area | Depth | Flange | | Web Thickness | AXIS X-X | | | AXIS Y-Y | | |
|----------------|-----------------|-------|--------|--------|-----------|---------------|----------|----------|----------|----------|----------|----------|
| | | | | Width | Thickness | | <i>I</i> | <i>S</i> | <i>r</i> | <i>I</i> | <i>S</i> | <i>r</i> |
| BP 14 | 117 | 34.44 | 14.234 | 14.885 | .805 | 1228.5 | 172.6 | 5.97 | 443.1 | 59.5 | 3.59 | |
| 14x14 1/2 | 102 | 30.01 | 14.032 | 14.784 | .704 | 1055.1 | 150.4 | 5.93 | 379.6 | 51.3 | 3.56 | |
| | 89 | 26.19 | 13.856 | 14.696 | .616 | 909.1 | 131.2 | 5.89 | 326.2 | 44.4 | 3.53 | |
| | 73 | 21.46 | 13.636 | 14.566 | .506 | 733.1 | 107.5 | 5.85 | 261.9 | 35.9 | 3.49 | |
| BP 12 | 74 | 21.76 | 12.122 | 12.217 | .607 | 566.5 | 93.5 | 5.10 | 184.7 | 30.2 | 2.91 | |
| 12 x 12 | 53 | 15.58 | 11.780 | 12.046 | .436 | 394.8 | 67.0 | 5.03 | 127.3 | 21.2 | 2.86 | |
| | 57 | 16.76 | 10.012 | 10.224 | .564 | 294.7 | 58.9 | 4.19 | 100.6 | 19.7 | 2.45 | |
| 10 x 10 | 42 | 12.35 | 9.720 | 10.078 | .418 | 210.8 | 43.4 | 4.13 | 71.4 | 14.2 | 2.40 | |
| BP 8 | 36 | 10.60 | 8.026 | 8.158 | .446 | 119.8 | 29.9 | 3.36 | 40.4 | 9.9 | 1.95 | |
| 8 x 8 | | | | | | | | | | | | |

WF SHAPES
PROPERTIES FOR DESIGNING



| Nominal Size | Weight per Foot | Area | Depth | Flange | | Web Thickness | AXIS X-X | | | AXIS Y-Y | | |
|--------------|-----------------|------------------|-------|--------|------------|---------------|------------------|------------------|-------|------------------|------------------|------|
| | | | | Width | Thick-ness | | I | S | r | I | S | r |
| In. | Lb. | In. ² | In. | In. | In. | In. | In. ⁴ | In. ³ | In. | In. ⁴ | In. ³ | In. |
| 36 x 16 1/2 | 300 | 88.17 | 36.72 | 16.655 | 1.680 | .945 | 20290.2 | 1105.1 | 15.17 | 1225.2 | 147.1 | 3.73 |
| | 280 | 82.32 | 36.50 | 16.595 | 1.570 | .885 | 18819.3 | 1031.2 | 15.12 | 1127.5 | 135.9 | 3.70 |
| | 260 | 76.56 | 36.24 | 16.555 | 1.440 | .845 | 17233.8 | 951.1 | 15.00 | 1020.6 | 123.3 | 3.65 |
| | 245 | 72.03 | 36.06 | 16.512 | 1.350 | .802 | 16092.2 | 892.5 | 14.95 | 944.7 | 114.4 | 3.62 |
| | 230 | 67.73 | 35.88 | 16.475 | 1.260 | .765 | 14988.4 | 835.5 | 14.88 | 870.9 | 105.7 | 3.59 |
| 36 x 12 | 194 | 57.11 | 36.48 | 12.117 | 1.260 | .770 | 12103.4 | 663.6 | 14.56 | 355.4 | 58.7 | 2.49 |
| | 182 | 53.54 | 36.32 | 12.072 | 1.180 | .725 | 11281.5 | 621.2 | 14.52 | 327.7 | 54.3 | 2.47 |
| | 170 | 49.98 | 36.16 | 12.027 | 1.100 | .680 | 10470.0 | 579.1 | 14.47 | 300.6 | 50.0 | 2.45 |
| | 160 | 47.09 | 36.00 | 12.000 | 1.020 | .653 | 9738.8 | 541.0 | 14.38 | 275.4 | 45.9 | 2.42 |
| | 150 | 44.16 | 35.84 | 11.972 | .940 | .625 | 9012.1 | 502.9 | 14.29 | 250.4 | 41.8 | 2.38 |
| 33 x 15 3/4 | 240 | 70.52 | 33.50 | 15.865 | 1.400 | .830 | 13585.1 | 811.1 | 13.88 | 874.3 | 110.2 | 3.52 |
| | 220 | 64.73 | 33.25 | 15.810 | 1.275 | .775 | 12312.1 | 740.6 | 13.79 | 782.4 | 99.0 | 3.48 |
| | 200 | 58.79 | 33.00 | 15.750 | 1.150 | .715 | 11048.2 | 669.6 | 13.71 | 691.7 | 87.8 | 3.43 |
| 33 x 11 1/2 | 152 | 44.71 | 33.50 | 11.565 | 1.055 | .635 | 8147.6 | 486.4 | 13.50 | 256.1 | 44.3 | 2.39 |
| | 141 | 41.51 | 33.31 | 11.535 | .960 | .605 | 7442.2 | 446.8 | 13.39 | 229.7 | 39.8 | 2.35 |
| | 130 | 38.26 | 33.10 | 11.510 | .855 | .580 | 6699.0 | 404.8 | 13.23 | 201.4 | 35.0 | 2.29 |
| 30 x 15 | 210 | 61.78 | 30.38 | 15.105 | 1.315 | .775 | 9872.4 | 649.9 | 12.64 | 707.9 | 93.7 | 3.38 |
| | 190 | 55.90 | 30.12 | 15.040 | 1.185 | .710 | 8825.9 | 586.1 | 12.57 | 624.6 | 83.1 | 3.34 |
| | 172 | 50.65 | 29.88 | 14.985 | 1.065 | .655 | 7891.5 | 528.2 | 12.48 | 550.1 | 73.4 | 3.30 |
| 30 x 10 1/2 | 132 | 38.83 | 30.30 | 10.551 | 1.000 | .615 | 5753.1 | 379.7 | 12.17 | 185.0 | 35.1 | 2.18 |
| | 124 | 36.45 | 30.16 | 10.521 | .930 | .585 | 5347.1 | 354.6 | 12.11 | 169.7 | 32.3 | 2.16 |
| | 116 | 34.13 | 30.00 | 10.500 | .850 | .564 | 4919.1 | 327.9 | 12.00 | 153.2 | 29.2 | 2.12 |
| | 108 | 31.77 | 29.82 | 10.484 | .760 | .548 | 4461.0 | 299.2 | 11.85 | 135.1 | 25.8 | 2.06 |

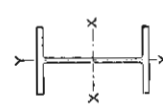
WF SHAPES
PROPERTIES FOR DESIGNING



| Nominal Size | Weight per Foot | Area | Depth | Flange | | Web Thickness | AXIS X-X | | | AXIS Y-Y | | |
|--------------|-----------------|------------------|-------|--------|------------|---------------|------------------|------------------|-------|------------------|------------------|------|
| | | | | Width | Thick-ness | | I | S | r | I | S | r |
| In. | Lb. | In. ² | In. | In. | In. | In. | In. ⁴ | In. ³ | In. | In. ⁴ | In. ³ | In. |
| 27 x 14 | 177 | 52.10 | 27.31 | 14.090 | 1.190 | .725 | 6728.6 | 492.8 | 11.36 | 518.9 | 73.7 | 3.16 |
| | 160 | 47.04 | 27.08 | 14.023 | 1.075 | .658 | 6018.6 | 444.5 | 11.31 | 458.0 | 65.3 | 3.12 |
| | 145 | 42.68 | 26.88 | 13.965 | .975 | .600 | 5414.3 | 402.9 | 11.26 | 406.9 | 58.3 | 3.09 |
| 27 x 10 | 114 | 33.53 | 27.28 | 10.070 | .932 | .570 | 4080.5 | 299.2 | 11.03 | 149.6 | 29.7 | 2.11 |
| | 102 | 30.01 | 27.07 | 10.018 | .827 | .518 | 3604.1 | 266.3 | 10.96 | 129.5 | 25.9 | 2.08 |
| | 94 | 27.65 | 26.91 | 9.990 | .747 | .490 | 3266.7 | 242.8 | 10.87 | 115.1 | 23.0 | 2.04 |
| 24 x 14 | 160 | 47.04 | 24.72 | 14.091 | 1.135 | .656 | 5110.3 | 413.5 | 10.42 | 492.6 | 69.9 | 3.23 |
| | 145 | 42.62 | 24.49 | 14.043 | 1.020 | .608 | 4561.0 | 372.5 | 10.34 | 434.3 | 61.8 | 3.19 |
| | 130 | 38.21 | 24.25 | 14.000 | .900 | .565 | 4009.5 | 330.7 | 10.24 | 375.2 | 53.6 | 3.13 |
| 24 x 12 | 120 | 35.29 | 24.31 | 12.088 | .930 | .556 | 3635.3 | 299.1 | 10.15 | 254.0 | 42.0 | 2.88 |
| | 110 | 32.36 | 24.16 | 12.042 | .855 | .510 | 3315.0 | 274.4 | 10.12 | 229.1 | 38.0 | 2.86 |
| | 100 | 29.43 | 24.00 | 12.000 | .775 | .468 | 2987.3 | 248.9 | 10.08 | 203.5 | 33.9 | 2.83 |
| 24 x 9 | 94 | 27.63 | 24.29 | 9.061 | .872 | .516 | 2683.0 | 220.9 | 9.85 | 102.2 | 22.6 | 1.92 |
| | 84 | 24.71 | 24.09 | 9.015 | .772 | .470 | 2364.3 | 196.3 | 9.78 | 88.3 | 19.6 | 1.89 |
| | 76 | 22.37 | 23.91 | 8.985 | .682 | .440 | 2096.4 | 175.4 | 9.68 | 76.5 | 17.0 | 1.85 |
| 21 x 13 | 142 | 41.76 | 21.46 | 13.132 | 1.095 | .659 | 3403.1 | 317.2 | 9.03 | 385.9 | 58.8 | 3.04 |
| | 127 | 37.34 | 21.24 | 13.061 | .985 | .588 | 3017.2 | 284.1 | 8.99 | 338.6 | 51.8 | 3.01 |
| | 112 | 32.93 | 21.00 | 13.000 | .865 | .527 | 2620.6 | 249.6 | 8.92 | 289.7 | 44.6 | 2.96 |
| 21 x 9 | 96 | 28.21 | 21.14 | 9.038 | .935 | .575 | 2088.9 | 197.6 | 8.60 | 109.3 | 24.2 | 1.97 |
| | 82 | 24.10 | 20.86 | 8.962 | .795 | .499 | 1752.4 | 168.0 | 8.53 | 89.6 | 20.0 | 1.93 |
| | 21 x 8 1/2 | 73 | 21.46 | 21.24 | 8.295 | .740 | .455 | 1600.3 | 150.7 | 8.64 | 66.2 | 16.0 |
| 68 | | 20.02 | 21.13 | 8.270 | .685 | .430 | 1478.3 | 139.9 | 8.59 | 60.4 | 14.6 | 1.74 |
| 62 | | 18.23 | 20.99 | 8.240 | .615 | .400 | 1326.8 | 126.4 | 8.53 | 53.1 | 12.9 | 1.71 |

Table 13 (Cont'd)
ROLLED STEEL STRUCTURAL SHAPES

WF SHAPES
PROPERTIES FOR DESIGNING



| Nominal Size | Weight per Foot | Area | Depth | Flange Width | Flange Thick-ness | Web Thick-ness | AXIS X-X | | | AXIS Y-Y | | |
|--------------|-----------------|------------------|-------|--------------|-------------------|----------------|------------------|------------------|------|------------------|------------------|------|
| | | | | | | | I | S | r | I | S | r |
| In. | Lb. | In. ² | In. | In. | In. | In. | In. ⁴ | In. ³ | In. | In. ⁴ | In. ³ | In. |
| 18 x 11 3/4 | 114 | 33.51 | 18.48 | 11.833 | .991 | .595 | 2033.8 | 220.1 | 7.79 | 255.6 | 43.2 | 2.75 |
| | 105 | 30.86 | 18.32 | 11.792 | .911 | .554 | 1852.5 | 202.2 | 7.75 | 231.0 | 39.2 | 2.73 |
| 18 x 8 3/4 | 96 | 28.22 | 18.16 | 11.750 | .831 | .512 | 1674.7 | 184.4 | 7.70 | 206.8 | 35.2 | 2.71 |
| | 85 | 24.97 | 18.32 | 8.838 | .911 | .526 | 1429.9 | 156.1 | 7.57 | 99.4 | 22.5 | 2.00 |
| | 77 | 22.63 | 18.16 | 8.787 | .831 | .475 | 1286.8 | 141.7 | 7.54 | 86.6 | 20.2 | 1.98 |
| | 70 | 20.55 | 18.00 | 8.750 | .751 | .438 | 1153.9 | 128.2 | 7.49 | 78.5 | 17.9 | 1.95 |
| 18 x 7 1/2 | 64 | 18.80 | 17.87 | 8.715 | .686 | .403 | 1045.8 | 117.0 | 7.46 | 70.3 | 16.1 | 1.93 |
| | 60 | 17.64 | 18.25 | 7.558 | .695 | .416 | 984.0 | 107.8 | 7.47 | 47.1 | 12.5 | 1.63 |
| | 55 | 16.19 | 18.12 | 7.532 | .630 | .390 | 889.9 | 98.2 | 7.41 | 42.0 | 11.1 | 1.61 |
| | 50 | 14.71 | 18.00 | 7.500 | .570 | .358 | 800.6 | 89.0 | 7.38 | 37.2 | 9.9 | 1.59 |
| 16 x 11 1/2 | 96 | 28.22 | 16.32 | 11.533 | .875 | .535 | 1355.1 | 166.1 | 6.93 | 207.2 | 35.9 | 2.71 |
| | 88 | 25.87 | 16.16 | 11.502 | .795 | .504 | 1222.6 | 151.3 | 6.87 | 185.2 | 32.2 | 2.67 |
| 16 x 8 1/2 | 78 | 22.92 | 16.32 | 8.566 | .875 | .529 | 1042.6 | 127.8 | 6.74 | 87.5 | 20.4 | 1.95 |
| | 71 | 20.86 | 16.16 | 8.543 | .795 | .486 | 936.9 | 115.9 | 6.70 | 77.9 | 18.2 | 1.93 |
| | 64 | 18.80 | 16.00 | 8.500 | .715 | .443 | 833.8 | 104.2 | 6.66 | 68.4 | 16.1 | 1.91 |
| | 58 | 17.04 | 15.86 | 8.464 | .645 | .407 | 746.4 | 94.1 | 6.62 | 60.5 | 14.3 | 1.88 |
| 16 x 7 | 50 | 14.70 | 16.25 | 7.073 | .628 | .380 | 655.4 | 80.7 | 6.68 | 34.8 | 9.8 | 1.54 |
| | 45 | 13.24 | 16.12 | 7.039 | .563 | .346 | 583.3 | 72.4 | 6.64 | 30.5 | 8.7 | 1.52 |
| | 40 | 11.77 | 16.00 | 7.000 | .503 | .307 | 515.5 | 64.4 | 6.62 | 26.5 | 7.6 | 1.50 |
| | 36 | 10.59 | 15.85 | 6.992 | .428 | .299 | 446.3 | 56.3 | 6.49 | 22.1 | 6.3 | 1.45 |

