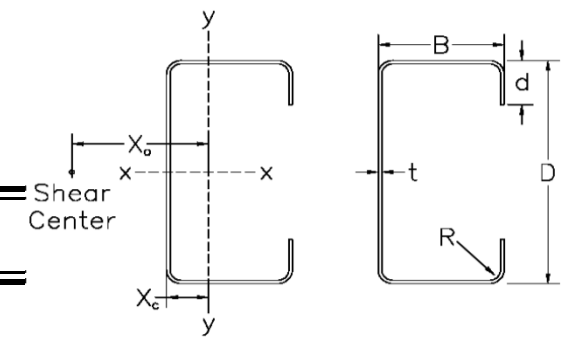




## Cee Sections: Gross Section Properties



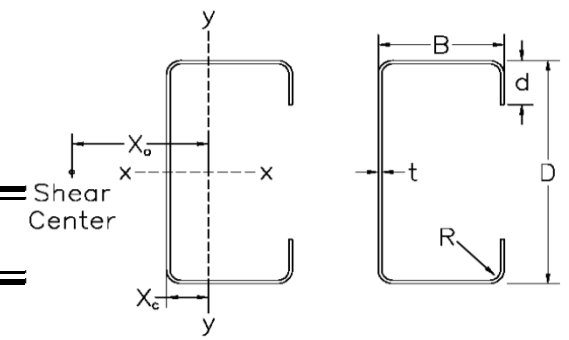
1. Section properties are calculated in accordance with the 2016 AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Material: A1011 HSLAS Grade 55 Class 1 Steel or A653 SS Grade 55 Steel
3. Strength Increase due to Cold Working has been applied where applicable

4. Web Crippling values are based on a 4 inch bearing length, one flange fastened to support
  5. Appropriate factors of safety have been applied for Allowable Stress Design (ASD)
  6. Strength calculations based on a fully braced condition
  7. Consult with an engineering professional before using the above design aids
- \* Section meets geometric criteria listed in I6.2.1 of the 2016 Ed. AISI NAS for CFS Members

| Member    | Ga. | Dimensions |        |        |                          |        | Gross Section Properties |                |                                   |   |                     |                                   |  |   |                     |                     |                     |                      |                                   |         |
|-----------|-----|------------|--------|--------|--------------------------|--------|--------------------------|----------------|-----------------------------------|---|---------------------|-----------------------------------|--|---|---------------------|---------------------|---------------------|----------------------|-----------------------------------|---------|
|           |     | D (in)     | B (in) | d (in) | t <sub>design</sub> (in) | R (in) | Area (in <sup>2</sup> )  | Weight (lb/ft) | Axis X-X                          |   |                     | Axis Y-Y                          |  |   |                     | Centroid (in)       | Shear Center (in)   | Torsional Properties |                                   |         |
|           |     |            |        |        |                          |        |                          |                | I <sub>x</sub> (in <sup>4</sup> ) | S <sub>x</sub> TOP & BOT (in <sup>3</sup> ) | r <sub>x</sub> (in) | I <sub>y</sub> (in <sup>4</sup> ) | S <sub>y</sub> LEFT (in <sup>3</sup> ) | S <sub>y</sub> RIGHT (in <sup>3</sup> ) | r <sub>y</sub> (in) | X <sub>c</sub> (in) | X <sub>s</sub> (in) | J (in <sup>4</sup> ) | C <sub>w</sub> (in <sup>6</sup> ) | j (in)  |
| 2.5 x 1.5 | 16  | 2.5        | 1.5    | 0.56   | 0.0579                   | 0.1875 | 0.3484                   | 1.182          | 0.3431                            | 0.275                                       | 0.992               | 0.113                             | 0.19295                                | 0.1232                                  | 0.569               | 0.58462             | -1.35558            | 0.0004               | 0.1904                            | 1.68866 |
| 4 x 2     | 14  | 4          | 2      | 0.81   | 0.0689                   | 0.1875 | 0.6176                   | 2.095          | 1.5436                            | 0.772                                       | 1.581               | 0.368                             | 0.49532                                | 0.2932                                  | 0.772               | 0.74362             | -1.76774            | 0.001                | 1.5274                            | 2.40158 |
| 4 x 2     | 16  | 4          | 2      | 0.78   | 0.0579                   | 0.1875 | 0.5186                   | 1.761          | 1.3085                            | 0.654                                       | 1.588               | 0.31                              | 0.42165                                | 0.2452                                  | 0.773               | 0.73547             | -1.75987            | 0.0006               | 1.2642                            | 2.41177 |
| 4 x 2.5   | 12  | 4          | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.0165                   | 3.436          | 2.6047                            | 1.302                                       | 1.601               | 0.923                             | 0.93314                                | 0.6105                                  | 0.953               | 0.98869             | -2.27665            | 0.0035               | 4.0335                            | 2.78293 |
| 4 x 2.5   | 14  | 4          | 2.5    | 0.81   | 0.0689                   | 0.1875 | 0.6865                   | 2.33           | 1.8099                            | 0.905                                       | 1.624               | 0.625                             | 0.65084                                | 0.4055                                  | 0.954               | 0.95964             | -2.24147            | 0.0011               | 2.5654                            | 2.79989 |
| 4 x 2.5   | 16  | 4          | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.5765                   | 1.958          | 1.5335                            | 0.767                                       | 1.631               | 0.525                             | 0.55244                                | 0.339                                   | 0.955               | 0.95077             | -2.23197            | 0.0006               | 2.1209                            | 2.80589 |
| 4 x 3.5   | 12  | 4          | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.2197                   | 4.127          | 3.3769                            | 1.688                                       | 1.664               | 2.072                             | 1.4377                                 | 1.0067                                  | 1.304               | 1.44143             | -3.24369            | 0.0042               | 8.9094                            | 3.66824 |
| 4 x 3.5   | 14  | 4          | 3.5    | 0.81   | 0.0689                   | 0.1875 | 0.8243                   | 2.799          | 2.3423                            | 1.171                                       | 1.686               | 1.4                               | 0.99348                                | 0.6692                                  | 1.303               | 1.40871             | -3.20072            | 0.0013               | 5.6644                            | 3.6666  |
| 4 x 3.5   | 16  | 4          | 3.5    | 0.78   | 0.0579                   | 0.1875 | 0.6923                   | 2.352          | 1.9834                            | 0.992                                       | 1.693               | 1.176                             | 0.8406                                 | 0.5596                                  | 1.303               | 1.39879             | -3.18896            | 0.0008               | 4.6817                            | 3.66711 |
| 4 x 4     | 12  | 4          | 4      | 0.91   | 0.1016                   | 0.1875 | 1.3213                   | 4.473          | 3.763                             | 1.882                                       | 1.688               | 2.868                             | 1.71402                                | 1.2326                                  | 1.473               | 1.67325             | -3.73046            | 0.0045               | 12.242                            | 4.12702 |
| 4 x 4     | 14  | 4          | 4      | 0.81   | 0.0689                   | 0.1875 | 0.8932                   | 3.033          | 2.6085                            | 1.304                                       | 1.709               | 1.936                             | 1.18112                                | 0.82                                    | 1.472               | 1.63914             | -3.68467            | 0.0014               | 7.7919                            | 4.11893 |
| 4 x 4     | 16  | 4          | 4      | 0.78   | 0.0579                   | 0.1875 | 0.7502                   | 2.549          | 2.2084                            | 1.104                                       | 1.716               | 1.626                             | 0.9984                                 | 0.6858                                  | 1.472               | 1.62882             | -3.6721             | 0.0008               | 6.442                             | 4.11753 |
| 6 x 2.5   | 12  | 6          | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.2197                   | 4.127          | 6.7269                            | 2.242                                       | 2.348               | 1.072                             | 1.28746                                | 0.6427                                  | 0.937               | 0.83243             | -1.99143            | 0.0042               | 8.5554                            | 3.28141 |
| 6 x 2.5   | 14  | 6          | 2.5    | 0.81   | 0.0689                   | 0.1875 | 0.8243                   | 2.799          | 4.6239                            | 1.541                                       | 2.368               | 0.723                             | 0.898                                  | 0.4265                                  | 0.936               | 0.80497             | -1.96069            | 0.0013               | 5.5847                            | 3.32102 |
| 6 x 2.5   | 16  | 6          | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.6923                   | 2.352          | 3.9046                            | 1.302                                       | 2.375               | 0.607                             | 0.76228                                | 0.3565                                  | 0.937               | 0.79658             | -1.9526             | 0.0008               | 4.6506                            | 3.33348 |
| 6 x 3     | 12  | 6          | 3      | 0.91   | 0.1016                   | 0.1875 | 1.3213                   | 4.473          | 7.6106                            | 2.537                                       | 2.4                 | 1.661                             | 1.6057                                 | 0.8447                                  | 1.121               | 1.03419             | -2.44441            | 0.0045               | 13.142                            | 3.59128 |
| 6 x 3     | 14  | 6          | 3      | 0.81   | 0.0689                   | 0.1875 | 0.8932                   | 3.033          | 5.2299                            | 1.743                                       | 2.42                | 1.119                             | 1.11343                                | 0.5608                                  | 1.119               | 1.00483             | -2.40927            | 0.0014               | 8.5684                            | 3.61709 |
| 6 x 3     | 16  | 6          | 3      | 0.78   | 0.0579                   | 0.1875 | 0.7502                   | 2.549          | 4.4157                            | 1.472                                       | 2.426               | 0.939                             | 0.94324                                | 0.4687                                  | 1.119               | 0.9959              | -2.39994            | 0.0008               | 7.1319                            | 3.62559 |
| 6 x 3.5   | 12  | 6          | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.4229                   | 4.819          | 8.4944                            | 2.831                                       | 2.443               | 2.409                             | 1.9386                                 | 1.0674                                  | 1.301               | 1.24283             | -2.90402            | 0.0049               | 18.947                            | 3.94652 |
| 6 x 3.5   | 14  | 6          | 3.5    | 0.81   | 0.0689                   | 0.1875 | 0.9621                   | 3.268          | 5.8358                            | 1.945                                       | 2.463               | 1.623                             | 1.33888                                | 0.7091                                  | 1.299               | 1.21187             | -2.8653             | 0.0015               | 12.351                            | 3.96166 |
| 6 x 3.5   | 16  | 6          | 3.5    | 0.78   | 0.0579                   | 0.1875 | 0.8081                   | 2.746          | 4.9268                            | 1.642                                       | 2.469               | 1.362                             | 1.13265                                | 0.5928                                  | 1.298               | 1.20249             | -2.85494            | 0.0009               | 10.28                             | 3.96709 |
| 6 x 4     | 12  | 6          | 4      | 0.91   | 0.1016                   | 0.1875 | 1.5245                   | 5.164          | 9.3782                            | 3.126                                       | 2.48                | 3.332                             | 2.28674                                | 1.3102                                  | 1.478               | 1.45699             | -3.36897            | 0.0052               | 26.079                            | 4.33116 |
| 6 x 4     | 14  | 6          | 4      | 0.81   | 0.0689                   | 0.1875 | 1.031                    | 3.502          | 6.4418                            | 2.147                                       | 2.5                 | 2.243                             | 1.57475                                | 0.8711                                  | 1.475               | 1.42465             | -3.32726            | 0.0016               | 17.01                             | 4.33782 |
| 6 x 4     | 16  | 6          | 4      | 0.78   | 0.0579                   | 0.1875 | 0.866                    | 2.943          | 5.4379                            | 1.813                                       | 2.506               | 1.883                             | 1.33086                                | 0.7284                                  | 1.475               | 1.41488             | -3.31605            | 0.001                | 14.158                            | 4.34079 |
| 7 x 2     | 12  | 7          | 2      | 0.91   | 0.1016                   | 0.1875 | 1.2197                   | 4.127          | 8.4684                            | 2.42  | 2.635               | 0.661                             | 1.11948                                | 0.4689                                  | 0.736               | 0.59042             | -1.44841            | 0.0042               | 6.942                             | 3.56361 |
| 7 x 2     | 14  | 7          | 2      | 0.81   | 0.0689                   | 0.1875 | 0.8243                   | 2.799          | 5.8044                            | 1.658                                       | 2.654               | 0.446                             | 0.78881                                | 0.3112                                  | 0.736               | 0.56579             | -1.42511            | 0.0013               | 4.577                             | 3.63418 |
| 7 x 2     | 16  | 7          | 2      | 0.78   | 0.0579                   | 0.1875 | 0.6923                   | 2.352          | 4.8973                            | 1.399                                       | 2.66                | 0.375                             | 0.67199                                | 0.2602                                  | 0.736               | 0.5582              | -1.41914            | 0.0008               | 3.8227                            | 3.65523 |
| *7 x 2.5  | 12  | 7          | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.3213                   | 4.473          | 9.6773                            | 2.765                                       | 2.706               | 1.129                             | 1.46195                                | 0.6535                                  | 0.924               | 0.77233             | -1.87667            | 0.0045               | 11.699                            | 3.67637 |
| *7 x 2.5  | 14  | 7          | 2.5    | 0.81   | 0.0689                   | 0.1875 | 0.8932                   | 3.033          | 6.6319                            | 1.895                                       | 2.725               | 0.761                             | 1.02026                                | 0.4335                                  | 0.923               | 0.74553             | -1.84802            | 0.0014               | 7.6875                            | 3.72693 |
| *7 x 2.5  | 16  | 7          | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.7502                   | 2.549          | 5.5949                            | 1.599                                       | 2.731               | 0.639                             | 0.86625                                | 0.3624                                  | 0.923               | 0.73733             | -1.84054            | 0.0008               | 6.4132                            | 3.74241 |
| 7 x 3     | 12  | 7          | 3      | 0.91   | 0.1016                   | 0.1875 | 1.4229                   | 4.819          | 10.886                            | 3.11  | 2.766               | 1.752                             | 1.8174                                 | 0.8605                                  | 1.11                | 0.96397             | -2.31546            | 0.0049               | 17.97                             | 3.90301 |
| 7 x 3     | 14  | 7          | 3      | 0.81   | 0.0689                   | 0.1875 | 0.9621                   | 3.268          | 7.4594                            | 2.131                                       | 2.785               | 1.179                             | 1.26058                                | 0.5711                                  | 1.107               | 0.93533             | -2.2825             | 0.0015               | 11.793                            | 3.93841 |
| 7 x 3     | 16  | 7          | 3      | 0.78   | 0.0579                   | 0.1875 | 0.8081                   | 2.746          | 6.2925                            | 1.798                                       | 2.79                | 0.99                              | 1.06802                                | 0.4773                                  | 1.107               | 0.92662             | -2.2738             | 0.0009               | 9.8335                            | 3.9496  |
| 7 x 3.5   | 12  | 7          | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.5245                   | 5.164          | 12.095                            | 3.456                                       | 2.817               | 2.544                             | 2.18688                                | 1.0888                                  | 1.292               | 1.16339             | -2.7626             | 0.0052               | 25.905                            | 4.1965  |
| 7 x 3.5   | 14  | 7          | 3.5    | 0.81   | 0.0689                   | 0.1875 | 1.031                    | 3.502          | 8.287                             | 2.368                                       | 2.835               | 1.712                             | 1.51053                                | 0.7232                                  | 1.289               | 1.13318             | -2.72609            | 0.0016               | 16.998                            | 4.22012 |
| 7 x 3.5   | 16  | 7          | 3.5    | 0.78   | 0.0579                   | 0.1875 | 0.866                    | 2.943          | 6.9901                            | 1.997                                       | 2.841               | 1.436                             | 1.27793                                | 0.6046                                  | 1.288               | 1.12403             | -2.71639            | 0.001                | 14.171                            | 4.22795 |
| 7 x 4     | 12  | 7          | 4      | 0.91   | 0.1016                   | 0.1875 | 1.6261                   | 5.51           | 13.304                            | 3.801                                       | 2.86                | 3.52                              | 2.57112                                | 1.338                                   | 1.471               | 1.36912             | -3.21647            | 0.0056               | 35.657                            | 4.53312 |
| 7 x 4     | 14  | 7          | 4      | 0.81   | 0.0689                   | 0.1875 | 1.0999                   | 3.737          | 9.1145                            | 2.604                                       | 2.879               | 2.368                             | 1.77062                                | 0.8895                                  | 1.467               | 1.33757             | -3.17699            | 0.0017               | 23.404                            | 4.54735 |
| 7 x 4     | 16  | 7          | 4      | 0.78   | 0.0579                   | 0.1875 | 0.9239                   | 3.14           | 7.6877                            | 2.196                                       | 2.885               | 1.987                             | 1.49641                                | 0.7437                                  | 1.467               | 1.32803             | -3.16644            | 0.001                | 19.513                            | 4.55248 |



## Cee Sections: Gross Section Properties



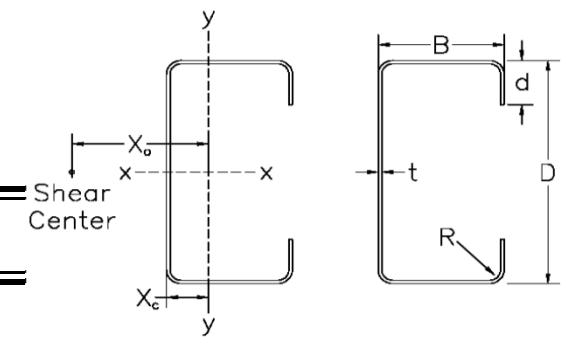
1. Section properties are calculated in accordance with the 2016 AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Material: A1011 HSLAS Grade 55 Class 1 Steel or A653 SS Grade 55 Steel
3. Strength Increase due to Cold Working has been applied where applicable

4. Web Crippling values are based on a 4 inch bearing length, one flange fastened to support
  5. Appropriate factors of safety have been applied for Allowable Stress Design (ASD)
  6. Strength calculations based on a fully braced condition
  7. Consult with an engineering professional before using the above design aids
- \* Section meets geometric criteria listed in I6.2.1 of the 2016 Ed. AISI NAS for CFS Members

| Member    | Ga. | Dimensions |        |        |                          |        | Gross Section Properties |                |                                   |   |                     |                                   |  |   |                     |                     |                     |                      |                                   |         |
|-----------|-----|------------|--------|--------|--------------------------|--------|--------------------------|----------------|-----------------------------------|---|---------------------|-----------------------------------|--|---|---------------------|---------------------|---------------------|----------------------|-----------------------------------|---------|
|           |     | D (in)     | B (in) | d (in) | t <sub>design</sub> (in) | R (in) | Area (in <sup>2</sup> )  | Weight (lb/ft) | Axis X-X                          |   |                     | Axis Y-Y                          |  |   |                     | Centroid            | Shear Center        | Torsional Properties |                                   |         |
|           |     |            |        |        |                          |        |                          |                | I <sub>x</sub> (in <sup>4</sup> ) | S <sub>x</sub> TOP & BOT (in <sup>3</sup> ) | r <sub>x</sub> (in) | I <sub>y</sub> (in <sup>4</sup> ) | S <sub>y</sub> LEFT (in <sup>3</sup> ) | S <sub>y</sub> RIGHT (in <sup>3</sup> ) | r <sub>y</sub> (in) | X <sub>c</sub> (in) | X <sub>s</sub> (in) | J (in <sup>4</sup> ) | C <sub>w</sub> (in <sup>6</sup> ) | j (in)  |
| 8 x 2     | 12  | 8          | 2      | 0.91   | 0.1016                   | 0.1875 | 1.3213                   | 4.473          | 11.704                            | 2.926                                       | 2.976               | 0.688                             | 1.25402                                | 0.4744                                  | 0.722               | 0.54892             | -1.36302            | 0.0045               | 9.1844                            | 4.19344 |
| 8 x 2     | 14  | 8          | 2      | 0.81   | 0.0689                   | 0.1875 | 0.8932                   | 3.033          | 8.003                             | 2.001                                       | 2.993               | 0.464                             | 0.88468                                | 0.3147                                  | 0.721               | 0.5248              | -1.34133            | 0.0014               | 6.0824                            | 4.27584 |
| 8 x 2     | 16  | 8          | 2      | 0.78   | 0.0579                   | 0.1875 | 0.7502                   | 2.549          | 6.7472                            | 1.687                                       | 2.999               | 0.39                              | 0.75401                                | 0.2631                                  | 0.721               | 0.51735             | -1.33582            | 0.0008               | 5.0861                            | 4.29999 |
| *8 x 2.5  | 12  | 8          | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.4229                   | 4.819          | 13.288                            | 3.322                                       | 3.056               | 1.178                             | 1.63471                                | 0.6623                                  | 0.91                | 0.72081             | -1.77592            | 0.0049               | 15.478                            | 4.16593 |
| *8 x 2.5  | 14  | 8          | 2.5    | 0.81   | 0.0689                   | 0.1875 | 0.9621                   | 3.268          | 9.0865                            | 2.272                                       | 3.073               | 0.793                             | 1.14166                                | 0.4392                                  | 0.908               | 0.6946              | -1.74907            | 0.0015               | 10.217                            | 4.22706 |
| *8 x 2.5  | 16  | 8          | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.8081                   | 2.746          | 7.6603                            | 1.915                                       | 3.079               | 0.666                             | 0.9696                                 | 0.3671                                  | 0.908               | 0.68658             | -1.74211            | 0.0009               | 8.534                             | 4.24541 |
| 8 x 3     | 12  | 8          | 3      | 0.91   | 0.1016                   | 0.1875 | 1.5245                   | 5.164          | 14.873                            | 3.718                                       | 3.123               | 1.831                             | 2.02753                                | 0.8732                                  | 1.096               | 0.90311             | -2.20115            | 0.0052               | 23.774                            | 4.29586 |
| 8 x 3     | 14  | 8          | 3      | 0.81   | 0.0689                   | 0.1875 | 1.031                    | 3.502          | 10.17                             | 2.543                                       | 3.141               | 1.231                             | 1.40696                                | 0.5795                                  | 1.093               | 0.87513             | -2.1701             | 0.0016               | 15.674                            | 4.34062 |
| 8 x 3     | 16  | 8          | 3      | 0.78   | 0.0579                   | 0.1875 | 0.866                    | 2.943          | 8.5734                            | 2.143                                       | 3.146               | 1.033                             | 1.19224                                | 0.4843                                  | 1.092               | 0.8666              | -2.16195            | 0.001                | 13.085                            | 4.35439 |
| 8 x 3.5   | 10  | 8          | 3.5    | 1.01   | 0.1337                   | 0.1875 | 2.1457                   | 7.251          | 21.474                            | 5.369                                       | 3.164               | 3.531                             | 3.14483                                | 1.4854                                  | 1.283               | 1.12283             | -2.67051            | 0.0128               | 46.45                             | 4.48475 |
| 8 x 3.5   | 12  | 8          | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.6261                   | 5.51           | 16.458                            | 4.114                                       | 3.181               | 2.662                             | 2.43373                                | 1.1064                                  | 1.28                | 1.09387             | -2.6362             | 0.0056               | 34.269                            | 4.51793 |
| 8 x 3.5   | 14  | 8          | 3.5    | 0.81   | 0.0689                   | 0.1875 | 1.0999                   | 3.737          | 11.254                            | 2.813                                       | 3.199               | 1.79                              | 1.68149                                | 0.7348                                  | 1.276               | 1.06435             | -2.60166            | 0.0017               | 22.587                            | 4.54986 |
| 8 x 4     | 16  | 8          | 4      | 0.78   | 0.0579                   | 0.1875 | 0.9239                   | 3.14           | 9.4864                            | 2.372                                       | 3.204               | 1.502                             | 1.42271                                | 0.6142                                  | 1.275               | 1.0554              | -2.59253            | 0.001                | 18.854                            | 4.56    |
| 8 x 4     | 12  | 8          | 4      | 0.91   | 0.1016                   | 0.1875 | 1.7277                   | 5.856          | 18.042                            | 4.511                                       | 3.232               | 3.686                             | 2.85419                                | 1.3611                                  | 1.461               | 1.2916              | -3.07922            | 0.0059               | 47.163                            | 4.79924 |
| 8 x 2     | 14  | 8          | 2      | 0.81   | 0.0689                   | 0.1875 | 1.1688                   | 3.971          | 12.337                            | 3.084                                       | 3.249               | 2.478                             | 1.96586                                | 0.9048                                  | 1.456               | 1.26075             | -3.04173            | 0.0018               | 31.094                            | 4.8209  |
| 9 x 2     | 12  | 9          | 2      | 0.91   | 0.1016                   | 0.1875 | 1.4229                   | 4.819          | 15.599                            | 3.467                                       | 3.311               | 0.712                             | 1.38667                                | 0.4788                                  | 0.707               | 0.51335             | -1.28808            | 0.0049               | 11.819                            | 4.93656 |
| 9 x 2     | 14  | 9          | 2      | 0.81   | 0.0689                   | 0.1875 | 0.9621                   | 3.268          | 10.648                            | 2.366                                       | 3.327               | 0.48                              | 0.97958                                | 0.3176                                  | 0.706               | 0.48968             | -1.26776            | 0.0015               | 7.8514                            | 5.03018 |
| 9 x 2     | 16  | 9          | 2      | 0.78   | 0.0579                   | 0.1875 | 0.8081                   | 2.746          | 8.9723                            | 1.994                                       | 3.332               | 0.403                             | 0.83533                                | 0.2655                                  | 0.706               | 0.48236             | -1.26263            | 0.0009               | 6.5708                            | 5.05721 |
| *9 x 2.5  | 12  | 9          | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.5245                   | 5.164          | 17.611                            | 3.914                                       | 3.399               | 1.221                             | 1.80576                                | 0.6694                                  | 0.895               | 0.67615             | -1.68661            | 0.0052               | 19.923                            | 4.74868 |
| *9 x 2.5  | 14  | 9          | 2.5    | 0.81   | 0.0689                   | 0.1875 | 1.031                    | 3.502          | 12.022                            | 2.672                                       | 3.415               | 0.821                             | 1.26221                                | 0.4439                                  | 0.892               | 0.65048             | -1.6613             | 0.0016               | 13.194                            | 4.82006 |
| *9 x 2.5  | 16  | 9          | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.866                    | 2.943          | 10.13                             | 2.251                                       | 3.42                | 0.689                             | 1.07233                                | 0.371                                   | 0.892               | 0.64261             | -1.65478            | 0.001                | 11.029                            | 4.84115 |
| *9 x 3    | 12  | 9          | 3      | 0.91   | 0.1016                   | 0.1875 | 1.6261                   | 5.51           | 19.622                            | 4.36  | 3.474               | 1.9                               | 2.2361                                 | 0.8838                                  | 1.081               | 0.84985             | -2.09895            | 0.0056               | 30.602                            | 4.76843 |
| *9 x 3    | 14  | 9          | 3      | 0.81   | 0.0689                   | 0.1875 | 1.0999                   | 3.737          | 13.396                            | 2.977                                       | 3.49                | 1.277                             | 1.55258                                | 0.5864                                  | 1.077               | 0.82246             | -2.06956            | 0.0017               | 20.241                            | 4.82233 |
| 9 x 3     | 16  | 9          | 3      | 0.78   | 0.0579                   | 0.1875 | 0.9239                   | 3.14           | 11.287                            | 2.508                                       | 3.495               | 1.071                             | 1.31591                                | 0.4901                                  | 1.077               | 0.81411             | -2.06189            | 0.001                | 16.913                            | 4.83859 |
| 9 x 3.5   | 12  | 9          | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.7277                   | 5.856          | 21.633                            | 4.807                                       | 3.539               | 2.766                             | 2.67916                                | 1.1211                                  | 1.265               | 1.03253             | -2.52238            | 0.0059               | 44.11                             | 4.9094  |
| 9 x 3.5   | 14  | 9          | 3.5    | 0.81   | 0.0689                   | 0.1875 | 1.1688                   | 3.971          | 14.77                             | 3.282                                       | 3.555               | 1.859                             | 1.85176                                | 0.7445                                  | 1.261               | 1.00364             | -2.48957            | 0.0018               | 29.168                            | 4.94947 |
| 9 x 4     | 12  | 9          | 4      | 0.91   | 0.1016                   | 0.1875 | 1.8293                   | 6.201          | 23.645                            | 5.254                                       | 3.595               | 3.834                             | 3.13596                                | 1.3806                                  | 1.448               | 1.22268             | -2.95487            | 0.0063               | 60.699                            | 5.12807 |
| 9 x 4     | 14  | 9          | 4      | 0.81   | 0.0689                   | 0.1875 | 1.2377                   | 4.205          | 16.144                            | 3.588                                       | 3.612               | 2.576                             | 2.16047                                | 0.9177                                  | 1.443               | 1.19248             | -2.91915            | 0.002                | 40.147                            | 5.15704 |
| 10 x 2    | 12  | 10         | 2      | 0.91   | 0.1016                   | 0.1875 | 1.5245                   | 5.164          | 20.207                            | 4.041                                       | 3.641               | 0.732                             | 1.5175                                 | 0.4825                                  | 0.693               | 0.48252             | -1.22168            | 0.0052               | 14.858                            | 5.7919  |
| 10 x 2    | 14  | 10         | 2      | 0.81   | 0.0689                   | 0.1875 | 1.031                    | 3.502          | 13.774                            | 2.755                                       | 3.655               | 0.493                             | 1.07355                                | 0.32                                    | 0.692               | 0.45926             | -1.20251            | 0.0016               | 9.8929                            | 5.89625 |
| 10 x 2    | 16  | 10         | 2      | 0.78   | 0.0579                   | 0.1875 | 0.866                    | 2.943          | 11.601                            | 2.32  | 3.66                | 0.414                             | 0.91595                                | 0.2675                                  | 0.691               | 0.45204             | -1.1977             | 0.001                | 8.2842                            | 5.92594 |
| 10 x 2.5  | 10  | 10         | 2.5    | 1.01   | 0.1337                   | 0.1875 | 2.1457                   | 7.251          | 29.702                            | 5.94  | 3.721               | 1.669                             | 2.52231                                | 0.9079                                  | 0.882               | 0.66169             | -1.63017            | 0.0128               | 33.681                            | 5.34054 |
| *10 x 2.5 | 12  | 10         | 2.5    | 0.91   | 0.1016                   | 0.1875 | 1.6261                   | 5.51           | 22.695                            | 4.539                                       | 3.736               | 1.258                             | 1.97512                                | 0.6755                                  | 0.88                | 0.63708             | -1.60674            | 0.0056               | 25.057                            | 5.42357 |
| *10 x 2.5 | 14  | 10         | 2.5    | 0.81   | 0.0689                   | 0.1875 | 1.0999                   | 3.737          | 15.473                            | 3.095                                       | 3.751               | 0.846                             | 1.38192                                | 0.4478                                  | 0.877               | 0.61189             | -1.58278            | 0.0017               | 16.633                            | 5.50494 |
| 10 x 2.5  | 16  | 10         | 2.5    | 0.78   | 0.0579                   | 0.1875 | 0.9239                   | 3.14           | 13.032                            | 2.606                                       | 3.756               | 0.71                              | 1.17444                                | 0.3743                                  | 0.876               | 0.60415             | -1.57663            | 0.001                | 13.913                            | 5.52865 |
| *10 x 3   | 12  | 10         | 3      | 0.91   | 0.1016                   | 0.1875 | 1.7277                   | 5.856          | 25.184                            | 5.037                                       | 3.818               | 1.962                             | 2.44314                                | 0.8928                                  | 1.066               | 0.80286             | -2.00689            | 0.0059               | 38.497                            | 5.31966 |
| *10 x 3   | 14  | 10         | 3      | 0.81   | 0.0689                   | 0.1875 | 1.1688                   | 3.971          | 17.172                            | 3.434                                       | 3.833               | 1.317                             | 1.69744                                | 0.5923                                  | 1.062               | 0.77601             | -1.97895            | 0.0018               | 25.525                            | 5.38254 |
| *10 x 3.5 | 10  | 10         | 3.5    | 1.01   | 0.1337                   | 0.1875 | 2.4131                   | 8.161          | 36.21                             | 7.242                                       | 3.874               | 3.797                             | 3.77469                                | 1.5222                                  | 1.254               | 1.00581             | -2.45026            | 0.0144               | 74.756                            | 5.32025 |
| *10 x 3.5 | 12  | 10         | 3.5    | 0.91   | 0.1016                   | 0.1875 | 1.8293                   | 6.201          | 27.673                            | 5.535                                       | 3.889               | 2.859                             | 2.92318                                | 1.1336                                  | 1.25                | 0.978               | -2.4192             | 0.0063               | 55.493                            | 5.36981 |



## Cee Sections: Gross Section Properties



1. Section properties are calculated in accordance with the 2016 AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Material: A1011 HSLAS Grade 55 Class 1 Steel or A653 SS Grade 55 Steel
3. Strength Increase due to Cold Working has been applied where applicable

4. Web Crippling values are based on a 4 inch bearing length, one flange fastened to support
  5. Appropriate factors of safety have been applied for Allowable Stress Design (ASD)
  6. Strength calculations based on a fully braced condition
  7. Consult with an engineering professional before using the above design aids
- \* Section meets geometric criteria listed in I6.2.1 of the 2016 Ed. AISI NAS for CFS Members

| Member    | Ga. |
|-----------|-----|
| 10 x 3.5  | 14  |
| 10 x 4    | 12  |
| 10 x 4    | 14  |
| 12 x 2.5  | 10  |
| *12 x 2.5 | 12  |
| 12 x 2.5  | 14  |
| *12 x 3   | 12  |
| 12 x 3    | 14  |
| *12 x 3.5 | 10  |
| *12 x 3.5 | 12  |
| 12 x 3.5  | 14  |
| *12 x 4   | 12  |
| 14 x 2.5  | 10  |
| 14 x 2.5  | 12  |
| 14 x 3    | 12  |
| 14 x 3.5  | 10  |
| 16 x 3.5  | 12  |
| 16 x 3.5  | 10  |
| 16 x 4    | 10  |
| 20 x 3.5  | 10  |

| Dimensions |           |           |                             |           |
|------------|-----------|-----------|-----------------------------|-----------|
| D<br>(in)  | B<br>(in) | d<br>(in) | t <sub>design</sub><br>(in) | R<br>(in) |
| 10         | 3.5       | 0.81      | 0.0689                      | 0.1875    |
| 10         | 4         | 0.91      | 0.1016                      | 0.1875    |
| 10         | 4         | 0.81      | 0.0689                      | 0.1875    |
| 12         | 2.5       | 1.01      | 0.1337                      | 0.1875    |
| 12         | 2.5       | 0.91      | 0.1016                      | 0.1875    |
| 12         | 2.5       | 0.81      | 0.0689                      | 0.1875    |
| 12         | 3         | 0.91      | 0.1016                      | 0.1875    |
| 12         | 3         | 0.81      | 0.0689                      | 0.1875    |
| 12         | 3.5       | 1.01      | 0.1337                      | 0.1875    |
| 12         | 3.5       | 0.91      | 0.1016                      | 0.1875    |
| 12         | 3.5       | 0.81      | 0.0689                      | 0.1875    |
| 12         | 4         | 0.91      | 0.1016                      | 0.1875    |
| 14         | 2.5       | 1.01      | 0.1337                      | 0.1875    |
| 14         | 2.5       | 0.91      | 0.1016                      | 0.1875    |
| 14         | 3         | 0.91      | 0.1016                      | 0.1875    |
| 14         | 3.5       | 1.01      | 0.1337                      | 0.1875    |
| 16         | 3.5       | 1.13      | 0.1016                      | 0.1875    |
| 16         | 3.5       | 1.23      | 0.1337                      | 0.1875    |
| 16         | 4         | 1.29      | 0.1337                      | 0.1875    |
| 20         | 3.5       | 1.23      | 0.1337                      | 0.1875    |

| Gross Section Properties        |                   |                                      |  |                        |                                      |   |  |                        |                                    |  |                         |                                      |           |  |
|---------------------------------|-------------------|--------------------------------------|--|------------------------|--------------------------------------|---|--|------------------------|------------------------------------|--|-------------------------|--------------------------------------|-----------|--|
| Area<br>A<br>(in <sup>2</sup> ) | Weight<br>(lb/ft) | Axis X-X                             |  |                        | Axis Y-Y                             |   |  |                        | Centroid<br>X <sub>c</sub><br>(in) | Shear Center<br>X <sub>o</sub><br>(in) | Torsional Properties    |                                      |           |  |
|                                 |                   | I <sub>x</sub><br>(in <sup>4</sup> ) | S <sub>x</sub> TOP & BOT<br>(in <sup>3</sup> ) | r <sub>x</sub><br>(in) | I <sub>y</sub><br>(in <sup>4</sup> ) | S <sub>y</sub> LEFT<br>(in <sup>3</sup> ) | S <sub>y</sub> RIGHT<br>(in <sup>3</sup> ) | r <sub>y</sub><br>(in) |                                    |  | J<br>(in <sup>4</sup> ) | C <sub>w</sub><br>(in <sup>6</sup> ) | j<br>(in) |  |
| 1.2377                          | 4.205             | 18.871                               | 3.774  | 3.905                  | 1.92                                 | 2.02135                                   | 0.7527                                     | 1.245                  | 0.94969                            | -2.38792                               | 0.002                   | 36.783                               | 5.41792   |  |
| 1.9309                          | 6.547             | 30.162                               | 6.032  | 3.952                  | 3.967                                | 3.41645                                   | 1.3972                                     | 1.433                  | 1.16102                            | -2.84151                               | 0.0066                  | 76.358                               | 5.51853   |  |
| 1.3066                          | 4.44              | 20.57                                | 4.114  | 3.968                  | 2.664                                | 2.35446                                   | 0.9286                                     | 1.428                  | 1.13141                            | -2.80736                               | 0.0021                  | 50.623                               | 5.55471   |  |
| 2.4131                          | 8.161             | 46.358                               | 7.726  | 4.383                  | 1.754                                | 2.94326                                   | 0.9209                                     | 0.852                  | 0.59577                            | -1.49081                               | 0.0144                  | 50.211                               | 6.94438   |  |
| 1.8293                          | 6.201             | 35.355                               | 5.892  | 4.396                  | 1.321                                | 2.30887                                   | 0.6849                                     | 0.85                   | 0.57196                            | -1.46956                               | 0.0063                  | 37.481                               | 7.04678   |  |
| 1.2377                          | 4.205             | 24.06                                | 4.01   | 4.409                  | 0.886                                | 1.61883                                   | 0.454                                      | 0.846                  | 0.5476                             | -1.4478                                | 0.002                   | 24.958                               | 7.14752   |  |
| 1.9309                          | 6.547             | 38.951                               | 6.492  | 4.491                  | 2.065                                | 2.85265                                   | 0.907                                      | 1.034                  | 0.72372                            | -1.84724                               | 0.0066                  | 57.629                               | 6.65507   |  |
| 1.3066                          | 4.44              | 26.512                               | 4.419  | 4.505                  | 1.385                                | 1.98491                                   | 0.6016                                     | 1.03                   | 0.6978                             | -1.82172                               | 0.0021                  | 38.332                               | 6.73563   |  |
| 2.6805                          | 9.071             | 55.772                               | 9.295  | 4.561                  | 4.009                                | 4.39543                                   | 1.5493                                     | 1.223                  | 0.91214                            | -2.26732                               | 0.016                   | 111.55                               | 6.4289    |  |
| 2.0325                          | 6.893             | 42.547                               | 7.091  | 4.575                  | 3.016                                | 3.40706                                   | 1.1536                                     | 1.218                  | 0.8853                             | -2.23881                               | 0.007                   | 83.102                               | 6.49445   |  |
| 1.3755                          | 4.674             | 28.964                               | 4.827  | 4.589                  | 2.024                                | 2.35848                                   | 0.7659                                     | 1.213                  | 0.858                              | -2.21009                               | 0.0022                  | 55.26                                | 6.55846   |  |
| 2.1341                          | 7.239             | 46.143                               | 7.69   | 4.65                   | 4.193                                | 3.97359                                   | 1.424                                      | 1.402                  | 1.0553                             | -2.64192                               | 0.0073                  | 114.36                               | 6.48122   |  |
| 2.6805                          | 9.071             | 67.841                               | 9.692  | 5.031                  | 1.821                                | 3.35401                                   | 0.9306                                     | 0.824                  | 0.54301                            | -1.37509                               | 0.016                   | 70.714                               | 8.91007   |  |
| 2.0325                          | 6.893             | 51.672                               | 7.382  | 5.042                  | 1.37                                 | 2.63617                                   | 0.6921                                     | 0.821                  | 0.51985                            | -1.35555                               | 0.007                   | 52.895                               | 9.03112   |  |
| 2.1341                          | 7.239             | 56.579                               | 8.083  | 5.149                  | 2.148                                | 3.25621                                   | 0.9178                                     | 1.003                  | 0.65964                            | -1.71311                               | 0.0073                  | 81.416                               | 8.2976    |  |
| 2.9479                          | 9.98              | 80.695                               | 11.53  | 5.232                  | 4.183                                | 5.00724                                   | 1.57                                       | 1.191                  | 0.83547                            | -2.11227                               | 0.0176                  | 157.36                               | 7.80588   |  |
| 2.4836                          | 8.427             | 87.074                               | 10.88  | 5.921                  | 3.573                                | 4.49523                                   | 1.3209                                     | 1.199                  | 0.7949                             | -2.07962                               | 0.0085                  | 179.04                               | 9.27109   |  |
| 3.2741                          | 11.09             | 114.3                                | 14.29  | 5.908                  | 4.738                                | 5.78246                                   | 1.7675                                     | 1.203                  | 0.81937                            | -2.10245                               | 0.0195                  | 238.95                               | 9.17719   |  |
| 3.4239                          | 11.6              | 123.44                               | 15.43  | 6.004                  | 6.703                                | 6.79165                                   | 2.2246                                     | 1.399                  | 0.98694                            | -2.51847                               | 0.0204                  | 336.67                               | 8.78064   |  |
| 3.8089                          | 12.91             | 197.62                               | 19.76  | 7.203                  | 4.999                                | 7.00438                                   | 1.7942                                     | 1.146                  | 0.71371                            | -1.87274                               | 0.0227                  | 393.45                               | 13.0921   |  |