# DESIGN GUIDE
# LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS

# **CJ-**SERIES

## **Light Weight Concrete**

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | Concrete Slab Parameters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span** | **Joist Depth** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| **(ft.)** | **(in.)** | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| **20** | **10** | **Pbr(lbs)** | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 500 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 21 | 21 | 24 | 27 | 30 | 31 | 33 | 35 | 45 |
| | **12** | **Pbr(lbs)** | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 450 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 30 | 30 | 34 | 37 | 38 | 43 | 45 | 47 | 60 |
| | **14** | **Pbr(lbs)** | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 400 | 400 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 41 | 41 | 41 | 47 | 50 | 52 | 55 | 68 | 75 |
| | **16** | **Pbr(lbs)** | 250 | 250 | 250 | 250 | 250 | 300 | 400 | 400 | 450 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 53 | 53 | 53 | 61 | 61 | 68 | 77 | 83 | 100 |
| | **18** | **Pbr(lbs)** | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 68 | 68 | 68 | 68 | 79 | 79 | 85 | 93 | 98 |
| | **20** | **Pbr(lbs)** | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 350 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 82 | 82 | 82 | 82 | 95 | 95 | 102 | 110 | 138 |
| | **24** | **Pbr(lbs)** | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 250 | 300 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 111 | 111 | 111 | 111 | 128 | 128 | 138 | 149 | 187 |
| | **28** | **Pbr(lbs)** | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 300 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 139 | 139 | 139 | 139 | 161 | 161 | 173 | 187 | 236 |
| | **32** | **Pbr(lbs)** | 200 | 200 | 200 | 200 | 200 | 200 | 250 | 300 | 300 |
| | | **X mat'l size** | | | | | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 166 | 166 | 166 | 166 | 166 | 200 | 223 | 236 | 281 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 500 | 600 | 600 | 750 | 750 | 750 | 1050 | 1050 | 1050 | 1050 | 1250 | 1250 | 1250 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 45 | 52 | 54 | 63 | 64 | 68 | 83 | 86 | 86 | 91 | 103 | 105 | 108 |
| 450 | 450 | 550 | 550 | 650 | 650 | 700 | 750 | 950 | 950 | 950 | 950 | 950 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 60 | 64 | 75 | 77 | 88 | 92 | 98 | 108 | 121 | 126 | 132 | 132 | 138 |
| 500 | 500 | 550 | 600 | 650 | 750 | 750 | 750 | 900 | 1100 | 1100 | 1100 | 1200 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 84 | 92 | 98 | 108 | 116 | 130 | 138 | 143 | 161 | 180 | 189 | 199 | 210 |
| 450 | 550 | 600 | 700 | 700 | 700 | 800 | 800 | 1000 | 1000 | 1000 | 1100 | 1250 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 105 | 122 | 134 | 152 | 160 | 165 | 189 | 203 | 228 | 237 | 249 | 277 | 290 |
| 250 | 350 | 350 | 350 | 450 | 450 | 550 | 550 | 550 | 600 | 750 | 750 | 750 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 107 | 132 | 144 | 149 | 167 | 173 | 204 | 216 | 230 | 247 | 287 | 299 | 314 |
| 350 | 400 | 400 | 450 | 500 | 500 | 600 | 600 | 600 | 700 | 700 | 700 | 850 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 147 | 166 | 180 | 194 | 216 | 239 | 262 | 280 | 288 | 323 | 336 | 349 | 397 |
| 300 | 350 | 350 | 350 | 450 | 450 | 550 | 550 | 550 | 600 | 600 | 600 | 750 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 200 | 225 | 245 | 264 | 294 | 325 | 357 | 381 | 393 | 441 | 459 | 477 | 544 |
| 300 | 350 | 350 | 350 | 400 | 450 | 500 | 500 | 500 | 600 | 600 | 600 | 700 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 251 | 282 | 308 | 332 | 370 | 410 | 450 | 481 | 497 | 557 | 580 | 604 | 690 |
| 350 | 350 | 400 | 450 | 450 | 500 | 500 | 500 | 600 | 600 | 700 | 700 | 700 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 320 | 337 | 392 | 434 | 466 | 495 | 538 | 575 | 641 | 667 | 755 | 790 | 828 |

## LIGHT WEIGHT CONCRETE

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | Based on a 50 ksi Maximum Yield Strength | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 25 | 10 | Pbr(lbs) | 200 | 350 | 350 | 350 | 350 | 350 | 550 | 550 | 550 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 25 | 30 | 33 | 35 | 38 | 39 | 50 | 52 | 56 |
| | 12 | Pbr(lbs) | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 500 | 500 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 36 | 39 | 42 | 47 | 50 | 54 | 55 | 71 | 75 |
| | 14 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 450 | 450 | 450 | 550 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 42 | 48 | 53 | 60 | 63 | 81 | 84 | 91 | 106 |
| | 16 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 350 | 450 | 450 | 450 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 54 | 63 | 67 | 74 | 78 | 91 | 105 | 110 | 118 |
| | 18 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 71 | 71 | 82 | 88 | 97 | 108 | 112 | 115 | 123 |
| | 20 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 87 | 87 | 100 | 108 | 118 | 125 | 132 | 137 | 146 |
| | 24 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 121 | 121 | 121 | 140 | 151 | 166 | 175 | 185 | 192 |
| | 28 | Pbr(lbs) | 200 | 200 | 200 | 200 | 200 | 250 | 250 | 300 | 350 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 157 | 157 | 157 | 182 | 196 | 212 | 241 | 266 | 320 |
| | 32 | Pbr(lbs) | 200 | 200 | 200 | 200 | 200 | 200 | 250 | 300 | 300 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 193 | 193 | 193 | 224 | 241 | 260 | 289 | 328 | 366 |

LIGHT WEIGHT CONCRETE

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 650 | 650 | 800 | 800 | 900 | 1100 | 1100 | 1100 | 1350 | 1500 | 1500 | 1650 | 1650 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 61 | 63 | 75 | 78 | 85 | 99 | 104 | 107 | 118 | 129 | 135 | 150 | 150 |
| 500 | 600 | 600 | 700 | 700 | 800 | 1050 | 1050 | 1050 | 1250 | 1250 | 1400 | 1400 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 77 | 88 | 91 | 105 | 109 | 122 | 143 | 146 | 150 | 171 | 177 | 196 | 196 |
| 550 | 650 | 700 | 750 | 850 | 850 | 950 | 1150 | 1150 | 1150 | 1300 | 1450 | 1450 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 109 | 128 | 139 | 150 | 159 | 165 | 189 | 215 | 215 | 228 | 251 | 265 | 274 |
| 500 | 600 | 650 | 700 | 750 | 750 | 900 | 900 | 1100 | 1100 | 1100 | 1200 | 1350 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 132 | 153 | 167 | 182 | 202 | 208 | 236 | 247 | 271 | 283 | 290 | 319 | 349 |
| 350 | 400 | 500 | 500 | 600 | 600 | 650 | 850 | 850 | 1000 | 1000 | 1000 | 1150 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 143 | 165 | 190 | 196 | 225 | 233 | 266 | 312 | 327 | 358 | 375 | 384 | 422 |
| 300 | 400 | 450 | 450 | 550 | 550 | 600 | 700 | 800 | 800 | 950 | 950 | 1050 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 170 | 196 | 222 | 229 | 270 | 277 | 306 | 339 | 385 | 404 | 443 | 463 | 505 |
| 300 | 350 | 400 | 400 | 400 | 500 | 500 | 600 | 700 | 700 | 850 | 850 | 950 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 229 | 268 | 312 | 321 | 340 | 390 | 416 | 480 | 544 | 571 | 628 | 657 | 717 |
| 350 | 400 | 450 | 500 | 550 | 550 | 550 | 600 | 750 | 750 | 750 | 750 | 850 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 349 | 391 | 432 | 479 | 524 | 544 | 583 | 630 | 745 | 781 | 823 | 823 | 913 |
| 350 | 350 | 400 | 450 | 500 | 500 | 500 | 550 | 600 | 700 | 700 | 700 | 700 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 430 | 464 | 533 | 572 | 647 | 672 | 721 | 779 | 845 | 967 | 1020 | 1020 | 1070 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | Concrete Slab Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 30 | 12 | Pbr(lbs) | 350 | 350 | 350 | 350 | 350 | 350 | 500 | 500 | 500 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 41 | 49 | 52 | 56 | 60 | 62 | 81 | 83 | 87 |
| | 14 | Pbr(lbs) | 350 | 350 | 350 | 350 | 500 | 500 | 500 | 500 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 54 | 62 | 68 | 73 | 94 | 100 | 103 | 108 | 128 |
| | 16 | Pbr(lbs) | 300 | 300 | 300 | 350 | 450 | 450 | 550 | 550 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 65 | 76 | 85 | 93 | 113 | 122 | 142 | 146 | 176 |
| | 18 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 350 | 450 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 83 | 90 | 104 | 109 | 117 | 125 | 129 | 145 | 176 |
| | 20 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 400 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 89 | 103 | 121 | 128 | 141 | 150 | 155 | 160 | 214 |
| | 24 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 350 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 127 | 146 | 158 | 173 | 183 | 201 | 206 | 214 | 280 |
| | 26 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 300 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 147 | 147 | 170 | 189 | 212 | 224 | 233 | 240 | 289 |
| | 28 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 300 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 168 | 168 | 194 | 209 | 230 | 243 | 256 | 274 | 331 |
| | 32 | Pbr(lbs) | 200 | 200 | 200 | 200 | 200 | 250 | 250 | 300 | 350 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 211 | 211 | 244 | 263 | 289 | 322 | 355 | 400 | 469 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 600 | 650 | 750 | 850 | 1100 | 1100 | 1300 | 1300 | 1500 | 1650 | 1650 | 1900 | 1900 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 99 | 107 | 121 | 134 | 157 | 162 | 191 | 191 | 214 | 228 | 237 | 258 | 264 |
| 700 | 750 | 850 | 1000 | 1000 | 1000 | 1250 | 1250 | 1400 | 1550 | 1650 | 1650 | 1800 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 145 | 159 | 178 | 203 | 207 | 213 | 244 | 251 | 280 | 297 | 324 | 338 | 355 |
| 700 | 800 | 800 | 950 | 950 | 1150 | 1150 | 1300 | 1450 | 1550 | 1550 | 1700 | 1850 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 188 | 208 | 223 | 255 | 255 | 292 | 309 | 341 | 373 | 404 | 404 | 447 | 471 |
| 450 | 500 | 650 | 650 | 650 | 750 | 900 | 1100 | 1100 | 1250 | 1250 | 1350 | 1450 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 181 | 209 | 251 | 260 | 280 | 303 | 353 | 403 | 418 | 460 | 480 | 510 | 558 |
| 400 | 500 | 500 | 600 | 650 | 700 | 850 | 850 | 1050 | 1050 | 1150 | 1300 | 1300 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 218 | 253 | 278 | 312 | 334 | 363 | 431 | 440 | 504 | 522 | 575 | 609 | 637 |
| 350 | 450 | 450 | 550 | 550 | 600 | 750 | 750 | 950 | 950 | 1050 | 1150 | 1150 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 298 | 344 | 375 | 422 | 449 | 483 | 569 | 596 | 686 | 705 | 776 | 852 | 852 |
| 350 | 400 | 450 | 500 | 550 | 550 | 750 | 750 | 900 | 900 | 1000 | 1100 | 1100 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 334 | 390 | 425 | 474 | 506 | 544 | 663 | 695 | 765 | 801 | 875 | 957 | 996 |
| 350 | 400 | 400 | 500 | 500 | 550 | 700 | 700 | 850 | 850 | 950 | 1050 | 1050 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 372 | 435 | 472 | 544 | 579 | 624 | 729 | 798 | 879 | 919 | 1010 | 1100 | 1140 |
| 350 | 450 | 450 | 500 | 550 | 550 | 550 | 600 | 750 | 750 | 750 | 850 | 850 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 511 | 609 | 645 | 710 | 787 | 817 | 848 | 922 | 1110 | 1170 | 1200 | 1320 | 1370 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 35 | 14 | Pbr(lbs) | 350 | 350 | 350 | 350 | 500 | 500 | 500 | 600 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 64 | 72 | 78 | 84 | 108 | 113 | 119 | 135 | 165 |
| | 16 | Pbr(lbs) | 350 | 350 | 350 | 350 | 500 | 500 | 500 | 550 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 78 | 87 | 97 | 103 | 134 | 144 | 146 | 171 | 188 |
| | 18 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 450 | 450 | 450 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 90 | 104 | 118 | 126 | 132 | 139 | 182 | 185 | 199 |
| | 20 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 350 | 450 | 450 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 112 | 130 | 142 | 152 | 161 | 170 | 186 | 226 | 237 |
| | 22 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 400 | 400 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 126 | 149 | 166 | 177 | 190 | 196 | 221 | 268 | 281 |
| | 24 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 300 | 400 | 400 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 150 | 166 | 187 | 205 | 219 | 227 | 255 | 304 | 327 |
| | 26 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 300 | 350 | 350 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 175 | 188 | 207 | 230 | 246 | 265 | 291 | 343 | 373 |
| | 28 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 350 | 350 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 174 | 217 | 238 | 265 | 276 | 295 | 326 | 386 | 421 |
| | 32 | Pbr(lbs) | 200 | 200 | 200 | 200 | 200 | 250 | 300 | 300 | 400 |
| | | X mat'l size | | | | | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 222 | 257 | 277 | 304 | 339 | 374 | 456 | 477 | 553 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 800 | 900 | 900 | 1050 | 1050 | 1300 | 1300 | 1450 | 1600 | 1900 | 1900 | 2050 | 2250 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 171 | 195 | 200 | 228 | 234 | 270 | 282 | 315 | 336 | 375 | 391 | 414 | 439 |
| 700 | 800 | 850 | 850 | 1000 | 1000 | 1200 | 1350 | 1500 | 1500 | 1650 | 1800 | 1950 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 206 | 240 | 254 | 260 | 297 | 305 | 353 | 397 | 423 | 440 | 468 | 492 | 543 |
| 550 | 650 | 700 | 750 | 950 | 950 | 1150 | 1150 | 1300 | 1450 | 1550 | 1700 | 1850 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 222 | 272 | 291 | 310 | 366 | 378 | 433 | 450 | 507 | 540 | 586 | 617 | 667 |
| 500 | 650 | 650 | 700 | 900 | 900 | 1100 | 1100 | 1200 | 1350 | 1450 | 1600 | 1750 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 271 | 327 | 351 | 380 | 445 | 458 | 527 | 565 | 606 | 678 | 706 | 776 | 821 |
| 500 | 600 | 600 | 700 | 850 | 850 | 1050 | 1050 | 1150 | 1300 | 1400 | 1500 | 1500 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 320 | 384 | 398 | 447 | 531 | 543 | 622 | 664 | 710 | 788 | 865 | 909 | 951 |
| 450 | 550 | 550 | 650 | 800 | 800 | 1000 | 1000 | 1100 | 1200 | 1300 | 1450 | 1450 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 370 | 445 | 459 | 512 | 609 | 634 | 744 | 771 | 823 | 944 | 983 | 1090 | 1090 |
| 450 | 550 | 550 | 600 | 650 | 800 | 950 | 950 | 1050 | 1150 | 1150 | 1350 | 1350 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 423 | 505 | 538 | 601 | 652 | 715 | 846 | 875 | 968 | 1060 | 1110 | 1210 | 1280 |
| 400 | 500 | 500 | 600 | 650 | 750 | 900 | 900 | 1000 | 1100 | 1100 | 1200 | 1300 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 488 | 544 | 602 | 669 | 722 | 827 | 952 | 980 | 1080 | 1190 | 1230 | 1340 | 1410 |
| 400 | 450 | 500 | 550 | 550 | 600 | 650 | 800 | 900 | 900 | 1000 | 1100 | 1200 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 593 | 678 | 744 | 829 | 892 | 970 | 1060 | 1230 | 1340 | 1390 | 1530 | 1650 | 1720 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 40 | 16 | Pbr(lbs) | 400 | 400 | 400 | 500 | 500 | 600 | 650 | 750 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H | L1.25x0.109H |
| | | I non-comp eff | 95 | 110 | 119 | 144 | 155 | 176 | 193 | 221 | 251 |
| | 18 | Pbr(lbs) | 350 | 350 | 350 | 350 | 450 | 450 | 450 | 550 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 105 | 118 | 130 | 139 | 182 | 191 | 200 | 230 | 247 |
| | 20 | Pbr(lbs) | 300 | 300 | 300 | 300 | 350 | 450 | 450 | 450 | 550 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 123 | 143 | 158 | 165 | 190 | 232 | 238 | 249 | 297 |
| | 22 | Pbr(lbs) | 300 | 300 | 300 | 300 | 350 | 450 | 450 | 450 | 500 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 150 | 167 | 185 | 197 | 223 | 270 | 283 | 290 | 350 |
| | 24 | Pbr(lbs) | 300 | 300 | 300 | 300 | 300 | 400 | 400 | 400 | 500 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 163 | 199 | 213 | 229 | 257 | 315 | 331 | 338 | 407 |
| | 26 | Pbr(lbs) | 250 | 250 | 250 | 250 | 300 | 400 | 400 | 400 | 450 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 191 | 222 | 243 | 260 | 296 | 361 | 379 | 389 | 467 |
| | 28 | Pbr(lbs) | 250 | 250 | 250 | 250 | 300 | 350 | 350 | 350 | 450 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 205 | 242 | 270 | 300 | 332 | 403 | 429 | 439 | 526 |
| | 30 | Pbr(lbs) | 250 | 250 | 250 | 250 | 300 | 350 | 350 | 350 | 400 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 234 | 277 | 309 | 331 | 380 | 450 | 479 | 491 | 584 |
| | 32 | Pbr(lbs) | 250 | 250 | 250 | 250 | 250 | 250 | 350 | 350 | 400 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 265 | 294 | 331 | 363 | 388 | 430 | 522 | 541 | 644 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 900 | 1050 | 1050 | 1250 | 1250 | 1400 | 1550 | 1700 | 2000 | 2200 | 2500 | 2500 | 2900 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.138H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.187H | L2.5x0.25H | | | |
| 261 | 306 | 314 | 364 | 380 | 409 | 453 | 481 | 560 | 589 | 668 | 668 | 757 |
| 700 | 800 | 1000 | 1000 | 1200 | 1200 | 1350 | 1500 | 1750 | 1900 | 1900 | 2100 | 2400 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 281 | 319 | 379 | 389 | 451 | 472 | 508 | 564 | 632 | 698 | 698 | 740 | 834 |
| 650 | 700 | 800 | 950 | 1150 | 1150 | 1300 | 1300 | 1550 | 1650 | 1650 | 1800 | 1950 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.17H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 341 | 371 | 416 | 475 | 545 | 567 | 639 | 664 | 740 | 796 | 829 | 880 | 934 |
| 650 | 650 | 750 | 900 | 900 | 1100 | 1200 | 1200 | 1350 | 1600 | 1600 | 1750 | 1900 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.17H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 401 | 446 | 496 | 564 | 582 | 669 | 747 | 784 | 836 | 958 | 980 | 1080 | 1140 |
| 600 | 650 | 750 | 800 | 850 | 1050 | 1050 | 1150 | 1300 | 1500 | 1500 | 1650 | 1800 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 480 | 516 | 583 | 625 | 676 | 779 | 836 | 898 | 1000 | 1100 | 1150 | 1250 | 1310 |
| 550 | 600 | 650 | 750 | 800 | 1000 | 1000 | 1100 | 1200 | 1300 | 1450 | 1550 | 1700 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 546 | 584 | 636 | 720 | 774 | 920 | 948 | 1060 | 1130 | 1240 | 1360 | 1440 | 1560 |
| 550 | 550 | 600 | 700 | 800 | 950 | 950 | 1050 | 1150 | 1250 | 1350 | 1500 | 1650 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 614 | 656 | 738 | 836 | 899 | 1030 | 1070 | 1180 | 1310 | 1440 | 1520 | 1680 | 1760 |
| 500 | 500 | 600 | 700 | 750 | 900 | 900 | 1000 | 1100 | 1200 | 1300 | 1450 | 1550 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 680 | 725 | 810 | 923 | 1010 | 1150 | 1180 | 1350 | 1440 | 1570 | 1740 | 1840 | 2030 |
| 500 | 500 | 550 | 650 | 700 | 850 | 850 | 950 | 1050 | 1150 | 1250 | 1350 | 1500 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 769 | 795 | 918 | 1050 | 1090 | 1260 | 1340 | 1490 | 1630 | 1780 | 1870 | 2090 | 2190 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | Concrete Slab Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span (ft.)** | **Joist Depth (in.)** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| | | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| **45** | **18** | **Pbr(lbs)** | 400 | 400 | 500 | 500 | 500 | 500 | 600 | 600 | 700 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 131 | 146 | 174 | 186 | 196 | 205 | 238 | 244 | 293 |
| | **20** | **Pbr(lbs)** | 350 | 350 | 350 | 350 | 400 | 450 | 550 | 550 | 700 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 152 | 169 | 183 | 195 | 215 | 250 | 288 | 297 | 359 |
| | **22** | **Pbr(lbs)** | 300 | 300 | 300 | 300 | 450 | 450 | 550 | 550 | 650 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 167 | 186 | 202 | 216 | 283 | 299 | 341 | 352 | 431 |
| | **24** | **Pbr(lbs)** | 300 | 300 | 300 | 300 | 400 | 400 | 500 | 500 | 600 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 190 | 214 | 237 | 249 | 333 | 349 | 399 | 409 | 501 |
| | **26** | **Pbr(lbs)** | 300 | 300 | 300 | 300 | 400 | 400 | 500 | 500 | 600 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 211 | 245 | 271 | 305 | 382 | 400 | 457 | 483 | 592 |
| | **28** | **Pbr(lbs)** | 250 | 250 | 250 | 300 | 400 | 400 | 450 | 450 | 550 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 245 | 273 | 304 | 346 | 423 | 455 | 516 | 547 | 662 |
| | **30** | **Pbr(lbs)** | 250 | 250 | 250 | 300 | 350 | 350 | 450 | 450 | 500 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 264 | 313 | 335 | 385 | 485 | 509 | 577 | 610 | 708 |
| | **32** | **Pbr(lbs)** | 250 | 250 | 250 | 250 | 300 | 300 | 350 | 400 | 500 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 290 | 337 | 380 | 409 | 460 | 513 | 593 | 673 | 780 |
| | **36** | **Pbr(lbs)** | 250 | 250 | 250 | 250 | 300 | 350 | 350 | 400 | 400 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 337 | 398 | 444 | 526 | 597 | 665 | 708 | 798 | 900 |

LIGHT WEIGHT CONCRETE

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Based on a 50 ksi Maximum Yield Strength** | | | | | | | | | | | | |
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 800 | 1000 | 1000 | 1250 | 1400 | 1400 | 1550 | 1800 | 1950 | 2150 | 2450 | 2450 | 2850 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.187H | L2.5x0.187H | L2.5x0.187H | L2.5x0.25H | | | |
| 328 | 403 | 403 | 472 | 528 | 528 | 596 | 658 | 703 | 772 | 865 | 865 | 979 |
| 750 | 1000 | 1000 | 1200 | 1300 | 1300 | 1450 | 1700 | 1900 | 2050 | 2350 | 2350 | 2700 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.187H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | |
| 400 | 476 | 506 | 568 | 640 | 665 | 724 | 830 | 882 | 935 | 1060 | 1090 | 1200 |
| 750 | 950 | 950 | 1150 | 1250 | 1250 | 1400 | 1650 | 1800 | 1950 | 2250 | 2250 | 2600 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.176H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | |
| 477 | 583 | 599 | 698 | 749 | 786 | 873 | 983 | 1040 | 1140 | 1250 | 1300 | 1480 |
| 700 | 900 | 900 | 1100 | 1100 | 1200 | 1350 | 1550 | 1700 | 1850 | 2150 | 2150 | 2450 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 562 | 680 | 701 | 807 | 841 | 947 | 1010 | 1160 | 1260 | 1380 | 1500 | 1510 | 1730 |
| 650 | 750 | 850 | 1050 | 1050 | 1150 | 1150 | 1250 | 1500 | 1650 | 1800 | 2050 | 2050 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 613 | 707 | 804 | 927 | 955 | 1070 | 1120 | 1250 | 1370 | 1490 | 1640 | 1780 | 1790 |
| 600 | 700 | 750 | 900 | 1000 | 1000 | 1200 | 1200 | 1450 | 1550 | 1700 | 1700 | 1950 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.17H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 713 | 806 | 865 | 987 | 1110 | 1160 | 1330 | 1400 | 1610 | 1700 | 1830 | 1920 | 2080 |
| 550 | 650 | 700 | 800 | 950 | 950 | 1050 | 1150 | 1350 | 1500 | 1650 | 1650 | 1900 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 787 | 893 | 995 | 1080 | 1240 | 1280 | 1440 | 1610 | 1770 | 1960 | 2060 | 2120 | 2400 |
| 550 | 650 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1450 | 1550 | 1800 | 1800 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 863 | 1020 | 1110 | 1250 | 1370 | 1510 | 1740 | 1820 | 2020 | 2130 | 2350 | 2610 | 2610 |
| 500 | 550 | 650 | 700 | 850 | 850 | 950 | 1050 | 1200 | 1350 | 1350 | 1450 | 1650 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1020 | 1170 | 1340 | 1460 | 1670 | 1720 | 1910 | 2190 | 2400 | 2690 | 2690 | 2960 | 3190 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES



| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 50 | 20 | Pbr(lbs) | 450 | 500 | 500 | 500 | 500 | 550 | 550 | 700 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 176 | 212 | 228 | 245 | 257 | 298 | 306 | 359 | 400 |
| | 22 | Pbr(lbs) | 400 | 400 | 400 | 450 | 450 | 550 | 550 | 650 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 199 | 228 | 246 | 292 | 306 | 352 | 364 | 432 | 479 |
| | 24 | Pbr(lbs) | 350 | 350 | 350 | 350 | 450 | 500 | 500 | 600 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 221 | 254 | 274 | 290 | 359 | 410 | 437 | 482 | 561 |
| | 26 | Pbr(lbs) | 300 | 300 | 300 | 350 | 400 | 500 | 500 | 550 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 236 | 272 | 294 | 336 | 413 | 472 | 500 | 538 | 648 |
| | 28 | Pbr(lbs) | 300 | 300 | 300 | 300 | 400 | 400 | 500 | 500 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 275 | 305 | 332 | 375 | 468 | 493 | 565 | 605 | 741 |
| | 30 | Pbr(lbs) | 250 | 250 | 300 | 400 | 400 | 450 | 450 | 550 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 299 | 338 | 400 | 489 | 526 | 615 | 633 | 713 | 826 |
| | 32 | Pbr(lbs) | 250 | 250 | 250 | 300 | 350 | 350 | 450 | 450 | 550 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 340 | 373 | 413 | 480 | 583 | 613 | 700 | 769 | 908 |
| | 36 | Pbr(lbs) | 250 | 250 | 250 | 250 | 300 | 350 | 400 | 450 | 500 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 405 | 451 | 502 | 573 | 639 | 735 | 857 | 915 | 1070 |
| | 40 | Pbr(lbs) | 200 | 200 | 250 | 300 | 300 | 400 | 400 | 400 | 450 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 450 | 523 | 657 | 742 | 826 | 968 | 1020 | 1050 | 1260 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1000 | 1000 | 1200 | 1350 | 1350 | 1500 | 1750 | 1950 | 2100 | 2400 | 2400 | 2800 | 2800 |
| | | | | | | | | | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.109H | L1.5x0.17H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.232H | L2.5x0.187H | L2.5x0.212H | | | | |
| 506 | 526 | 595 | 665 | 677 | 751 | 837 | 924 | 975 | 1100 | 1130 | 1300 | 1300 |
| 950 | 950 | 1150 | 1300 | 1300 | 1450 | 1700 | 1850 | 2000 | 2300 | 2300 | 2650 | 2650 |
| | | | | | | | | | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.219H | L2.5x0.187H | L2.5x0.187H | | | | |
| 584 | 621 | 731 | 788 | 818 | 892 | 1020 | 1100 | 1200 | 1310 | 1350 | 1530 | 1600 |
| 800 | 900 | 1100 | 1100 | 1250 | 1350 | 1600 | 1750 | 1900 | 2200 | 2200 | 2550 | 2550 |
| | | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.187H | L2.5x0.25H | | | |
| 634 | 722 | 843 | 882 | 950 | 1060 | 1190 | 1310 | 1400 | 1580 | 1580 | 1800 | 1860 |
| 750 | 900 | 1050 | 1050 | 1200 | 1300 | 1550 | 1700 | 1850 | 2100 | 2100 | 2450 | 2450 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.187H | L2.5x0.25H | | | |
| 729 | 832 | 999 | 999 | 1130 | 1250 | 1410 | 1560 | 1650 | 1800 | 1880 | 2140 | 2140 |
| 700 | 850 | 950 | 1000 | 1150 | 1250 | 1350 | 1600 | 1750 | 2050 | 2050 | 2350 | 2350 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.176H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | |
| 828 | 972 | 1060 | 1170 | 1250 | 1400 | 1530 | 1750 | 1930 | 2090 | 2110 | 2420 | 2510 |
| 700 | 750 | 800 | 1000 | 1100 | 1100 | 1300 | 1400 | 1550 | 1700 | 1950 | 1950 | 2250 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 934 | 1030 | 1120 | 1290 | 1450 | 1520 | 1700 | 1870 | 2030 | 2230 | 2420 | 2560 | 2800 |
| 650 | 800 | 950 | 950 | 1050 | 1150 | 1250 | 1350 | 1500 | 1600 | 1850 | 2150 | 2150 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.5x0.17H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1060 | 1200 | 1430 | 1480 | 1650 | 1760 | 1940 | 2130 | 2260 | 2440 | 2770 | 3060 | 3210 |
| 550 | 650 | 800 | 850 | 950 | 1050 | 1150 | 1250 | 1400 | 1500 | 1750 | 1750 | 2000 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1240 | 1410 | 1600 | 1750 | 1940 | 2120 | 2330 | 2580 | 2860 | 3010 | 3360 | 3520 | 3840 |
| 550 | 600 | 650 | 800 | 800 | 900 | 1000 | 1150 | 1300 | 1400 | 1600 | 1600 | 1850 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1520 | 1670 | 1820 | 2080 | 2150 | 2380 | 2740 | 3000 | 3350 | 3700 | 3990 | 4130 | 4490 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 55 | 24 | Pbr(lbs) | 400 | 450 | 450 | 450 | 450 | 550 | 550 | 650 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 269 | 310 | 341 | 359 | 377 | 438 | 469 | 541 | 620 |
| | 26 | Pbr(lbs) | 350 | 350 | 350 | 450 | 450 | 500 | 550 | 650 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 294 | 323 | 357 | 414 | 434 | 518 | 554 | 626 | 717 |
| | 28 | Pbr(lbs) | 300 | 300 | 300 | 400 | 400 | 500 | 500 | 600 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 314 | 349 | 377 | 469 | 495 | 584 | 628 | 717 | 815 |
| | 30 | Pbr(lbs) | 300 | 300 | 300 | 350 | 400 | 450 | 500 | 550 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 330 | 365 | 424 | 478 | 555 | 653 | 700 | 769 | 917 |
| | 32 | Pbr(lbs) | 300 | 300 | 300 | 300 | 400 | 450 | 500 | 550 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 382 | 444 | 483 | 545 | 633 | 725 | 799 | 877 | 1050 |
| | 34 | Pbr(lbs) | 300 | 300 | 300 | 350 | 350 | 450 | 450 | 500 | 550 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 431 | 482 | 557 | 663 | 696 | 819 | 843 | 956 | 1110 |
| | 36 | Pbr(lbs) | 300 | 300 | 400 | 400 | 450 | 500 | 600 | 650 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | I non-comp eff | 474 | 587 | 699 | 799 | 872 | 1010 | 1120 | 1250 | 1310 |
| | 40 | Pbr(lbs) | 250 | 250 | 250 | 300 | 350 | 400 | 400 | 450 | 550 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 501 | 582 | 646 | 765 | 912 | 1060 | 1140 | 1280 | 1480 |
| | 44 | Pbr(lbs) | 300 | 300 | 300 | 300 | 350 | 350 | 400 | 450 | 550 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | H mat'l size | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | I non-comp eff | 674 | 763 | 864 | 979 | 1140 | 1210 | 1320 | 1490 | 1780 |

LIGHT WEIGHT CONCRETE

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 950 | 1150 | 1150 | 1250 | 1400 | 1550 | 1800 | 1950 | 2250 | 2250 | 2600 | 2600 | 2950 |
| | | | | | | | | | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.232H | L2.5x0.187H | L2.5x0.212H | | | | |
| 749 | 883 | 915 | 988 | 1080 | 1170 | 1330 | 1460 | 1640 | 1690 | 1860 | 1950 | 2120 |
| 900 | 1100 | 1100 | 1200 | 1350 | 1450 | 1750 | 1900 | 2150 | 2150 | 2500 | 2500 | 2850 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.219H | L2.5x0.187H | L2.5x0.212H | L2.5x0.25H | | | |
| 857 | 1000 | 1050 | 1170 | 1250 | 1340 | 1570 | 1730 | 1890 | 1950 | 2220 | 2220 | 2530 |
| 850 | 1050 | 1050 | 1150 | 1300 | 1400 | 1650 | 1800 | 2100 | 2100 | 2400 | 2400 | 2750 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.138H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.219H | L2.5x0.187H | L2.5x0.212H | L2.5x0.25H | | | |
| 975 | 1170 | 1230 | 1320 | 1470 | 1570 | 1840 | 1950 | 2210 | 2210 | 2520 | 2600 | 2820 |
| 850 | 1000 | 1000 | 1150 | 1250 | 1350 | 1600 | 1750 | 2000 | 2000 | 2300 | 2300 | 2650 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | |
| 1130 | 1300 | 1350 | 1530 | 1630 | 1780 | 2040 | 2240 | 2460 | 2570 | 2810 | 2920 | 3280 |
| 800 | 950 | 950 | 1100 | 1200 | 1300 | 1550 | 1700 | 1950 | 1950 | 2250 | 2250 | 2550 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | |
| 1250 | 1440 | 1550 | 1660 | 1860 | 2040 | 2330 | 2570 | 2790 | 2820 | 3230 | 3350 | 3630 |
| 700 | 750 | 950 | 1050 | 1150 | 1150 | 1350 | 1500 | 1600 | 1850 | 2150 | 2150 | 2150 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.176H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 1300 | 1460 | 1680 | 1880 | 2110 | 2110 | 2430 | 2650 | 2910 | 3160 | 3670 | 3670 | 3810 |
| 750 | 900 | 900 | 1000 | 1000 | 1100 | 1200 | 1300 | 1550 | 1550 | 1800 | 2050 | 2050 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1500 | 1770 | 1830 | 2120 | 2120 | 2370 | 2590 | 2810 | 3130 | 3280 | 3600 | 4130 | 4130 |
| 650 | 750 | 850 | 950 | 1050 | 1100 | 1200 | 1350 | 1450 | 1650 | 1900 | 1900 | 2200 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.17H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1690 | 2000 | 2180 | 2410 | 2780 | 2900 | 3220 | 3570 | 3750 | 4190 | 4800 | 4800 | 5520 |
| 550 | 650 | 800 | 800 | 850 | 950 | 1150 | 1250 | 1350 | 1550 | 1550 | 1800 | 1800 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1940 | 2210 | 2530 | 2620 | 2900 | 3340 | 3660 | 4100 | 4520 | 4880 | 5060 | 5790 | 5790 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | Concrete Slab Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3.25 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span** | **Joist Depth** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| **(ft.)** | **(in.)** | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| 60 | 24 | **Pbr(lbs)** | 500 | 550 | 550 | 550 | 550 | 600 | 650 | 700 | 950 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 314 | 369 | 401 | 424 | 450 | 476 | 555 | 589 | 749 |
| | 26 | **Pbr(lbs)** | 450 | 450 | 450 | 450 | 500 | 550 | 650 | 700 | 850 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 344 | 384 | 414 | 435 | 518 | 555 | 641 | 683 | 813 |
| | 28 | **Pbr(lbs)** | 400 | 400 | 400 | 400 | 500 | 550 | 600 | 650 | 800 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 370 | 438 | 470 | 507 | 585 | 648 | 732 | 778 | 950 |
| | 30 | **Pbr(lbs)** | 350 | 350 | 350 | 400 | 500 | 500 | 550 | 650 | 800 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 394 | 449 | 480 | 571 | 675 | 726 | 795 | 877 | 1070 |
| | 32 | **Pbr(lbs)** | 350 | 350 | 400 | 400 | 450 | 500 | 550 | 600 | 750 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 466 | 515 | 589 | 635 | 748 | 801 | 880 | 982 | 1190 |
| | 36 | **Pbr(lbs)** | 300 | 350 | 350 | 450 | 450 | 500 | 550 | 650 | 650 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 529 | 617 | 731 | 849 | 924 | 1040 | 1160 | 1320 | 1400 |
| | 40 | **Pbr(lbs)** | 300 | 350 | 400 | 400 | 450 | 550 | 600 | 600 | 600 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 643 | 761 | 890 | 1020 | 1170 | 1390 | 1500 | 1560 | 1690 |
| | 44 | **Pbr(lbs)** | 350 | 350 | 450 | 550 | 500 | 500 | 550 | 600 | 750 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | | | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1.25x0.109H |
| | | **I non-comp eff** | 784 | 914 | 1160 | 1370 | 1470 | 1570 | 1740 | 1890 | 2260 |
| | 48 | **Pbr(lbs)** | 250 | 250 | 300 | 350 | 350 | 400 | 450 | 450 | 450 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | | |
| | | **H mat'l size** | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H | L1x0.109H |
| | | **I non-comp eff** | 805 | 954 | 1130 | 1260 | 1440 | 1660 | 1830 | 1990 | 2070 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1150 | 1150 | 1300 | 1450 | 1550 | 1700 | 2000 | 2300 | 2300 | 2700 | 3050 | | |
| | | | | | | | | | L2x0.163X | L2x0.163X | | |
| L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.23H | | | | |
| 883 | 915 | 1010 | 1120 | 1180 | 1290 | 1500 | 1690 | 1690 | 1950 | 2120 | | |
| 900 | 1100 | 1250 | 1400 | 1500 | 1650 | 1950 | 2250 | 2250 | 2550 | 2550 | 2900 | |
| | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X | |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.17H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.25H | L2.5x0.187H | L2.5x0.212H | | | | |
| 924 | 1050 | 1170 | 1280 | 1400 | 1490 | 1730 | 1950 | 2010 | 2320 | 2320 | 2530 | |
| 900 | 1100 | 1200 | 1350 | 1450 | 1550 | 1700 | 2150 | 2150 | 2450 | 2450 | 2800 | 3150 |
| | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.17H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.219H | L2.5x0.187H | L2.5x0.212H | | | | |
| 1040 | 1230 | 1370 | 1500 | 1640 | 1730 | 1930 | 2300 | 2300 | 2610 | 2730 | 2980 | 3150 |
| 850 | 1050 | 1150 | 1300 | 1400 | 1500 | 1650 | 2050 | 2050 | 2400 | 2400 | 2700 | 2700 |
| | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.123H | L1.5x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.205H | L2.5x0.187H | L2.5x0.212H | | | | |
| 1200 | 1420 | 1530 | 1700 | 1830 | 2000 | 2150 | 2570 | 2670 | 2930 | 3030 | 3460 | 3460 |
| 900 | 1000 | 1100 | 1250 | 1350 | 1450 | 1700 | 2000 | 2000 | 2300 | 2600 | 2600 | 2900 |
| | | | | | | | | | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.5x0.109H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L2x0.163H | L2x0.163H | L2x0.219H | L2.5x0.187H | L2.5x0.187H | | | | |
| 1400 | 1550 | 1750 | 1950 | 2040 | 2210 | 2580 | 2950 | 2950 | 3370 | 3640 | 3770 | 4220 |
| 750 | 950 | 950 | 1050 | 1150 | 1250 | 1500 | 1600 | 1850 | 1850 | 2150 | 2150 | 2400 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.123H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2x0.187H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 1640 | 1900 | 1980 | 2240 | 2390 | 2610 | 3000 | 3300 | 3620 | 3790 | 4150 | 4320 | 4840 |
| 700 | 850 | 850 | 950 | 1050 | 1150 | 1250 | 1500 | 1700 | 1700 | 2000 | 2000 | 2250 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 1910 | 2280 | 2350 | 2640 | 2950 | 3100 | 3410 | 3910 | 4450 | 4510 | 5160 | 5160 | 5810 |
| 750 | 900 | 1000 | 1100 | 1100 | 1150 | 1400 | 1600 | 1600 | 1850 | 1850 | 2100 | 2100 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.125H | L1.5x0.109H | L1.5x0.138H | L1.75x0.155H | L1.75x0.155H | L1.75x0.17H | L2x0.176H | L2.5x0.187H | L2.5x0.187H | L2.5x0.212H | | | |
| 2360 | 2830 | 3110 | 3360 | 3540 | 3930 | 4580 | 4950 | 5130 | 5870 | 5960 | 6760 | 6760 |
| 600 | 700 | 750 | 850 | 950 | 1000 | 1200 | 1300 | 1500 | 1500 | 1750 | 1750 | 1950 |
| | | | | | | | | | | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| L1.25x0.109H | L1.5x0.109H | L1.5x0.109H | L1.5x0.155H | L1.75x0.155H | L1.75x0.155H | L2x0.163H | L2.5x0.187H | L2.5x0.187H | L2.5x0.187H | | | |
| 2530 | 2880 | 3140 | 3480 | 4010 | 4190 | 4920 | 5420 | 5860 | 6080 | 6960 | 6960 | 8020 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3.25 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 65 | 30 | Pbr(lbs) | 400 | 400 | 400 | 400 | 500 | 600 | 600 | 700 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 463 | 517 | 557 | 602 | 699 | 846 | 866 | 970 | 1200 |
| | 32 | Pbr(lbs) | 400 | 400 | 500 | 500 | 500 | 550 | 650 | 700 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 511 | 578 | 708 | 750 | 832 | 910 | 1050 | 1160 | 1260 |
| | 34 | Pbr(lbs) | 400 | 400 | 400 | 400 | 450 | 550 | 550 | 650 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 578 | 637 | 702 | 740 | 875 | 999 | 1080 | 1220 | 1470 |
| | 36 | Pbr(lbs) | 350 | 350 | 350 | 450 | 450 | 500 | 550 | 600 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 593 | 679 | 770 | 928 | 954 | 1120 | 1210 | 1340 | 1570 |
| | 38 | Pbr(lbs) | 350 | 350 | 350 | 350 | 450 | 500 | 550 | 600 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 661 | 731 | 792 | 903 | 1070 | 1210 | 1310 | 1470 | 1790 |
| | 40 | Pbr(lbs) | 300 | 300 | 400 | 400 | 450 | 500 | 600 | 650 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 702 | 790 | 980 | 1080 | 1190 | 1390 | 1570 | 1700 | 1880 |
| | 44 | Pbr(lbs) | 300 | 350 | 350 | 450 | 500 | 500 | 500 | 500 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 817 | 1020 | 1120 | 1380 | 1570 | 1700 | 1760 | 1840 | 2160 |
| | 48 | Pbr(lbs) | 350 | 400 | 500 | 500 | 500 | 550 | 600 | 650 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 999 | 1260 | 1550 | 1690 | 1810 | 2080 | 2250 | 2450 | 2980 |
| | 52 | Pbr(lbs) | 300 | 300 | 300 | 350 | 400 | 500 | 450 | 450 | 500 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1090 | 1270 | 1450 | 1660 | 1960 | 2240 | 2260 | 2350 | 2730 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1050 | 1200 | 1300 | 1400 | 1550 | 1700 | 1850 | 2100 | 2450 | 2450 | 2750 | | |
| L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 1420 | 1590 | 1740 | 1900 | 2010 | 2240 | 2360 | 2670 | 3030 | 3180 | 3460 | | |
| 950 | 1000 | 1150 | 1250 | 1500 | 1650 | 1750 | 2050 | 2350 | 2350 | 2650 | 2650 | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | |
| | | | | | | | | | | | | |
| 1460 | 1630 | 1820 | 2000 | 2300 | 2470 | 2710 | 3070 | 3370 | 3480 | 3980 | 3980 | |
| 1000 | 1100 | 1200 | 1300 | 1450 | 1550 | 1700 | 1950 | 2250 | 2250 | 2550 | 2850 | 2850 |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 1770 | 1990 | 2220 | 2330 | 2510 | 2780 | 3090 | 3370 | 3840 | 3960 | 4540 | 4820 | 4820 |
| 850 | 950 | 1050 | 1150 | 1400 | 1500 | 1650 | 1900 | 2200 | 2200 | 2500 | 2500 | 2750 |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 1870 | 2080 | 2240 | 2500 | 2830 | 3140 | 3340 | 3800 | 4330 | 4330 | 4860 | 5120 | 5440 |
| 900 | 1050 | 1150 | 1250 | 1350 | 1450 | 1600 | 1800 | 2100 | 2100 | 2400 | 2650 | 2650 |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 2130 | 2390 | 2680 | 2930 | 3090 | 3360 | 3700 | 4260 | 4670 | 4850 | 5440 | 5770 | 6100 |
| 800 | 900 | 1000 | 1100 | 1200 | 1400 | 1550 | 1750 | 1750 | 2050 | 2300 | 2300 | 2600 |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 2170 | 2470 | 2790 | 2970 | 3260 | 3740 | 4120 | 4530 | 4740 | 5200 | 5850 | 6060 | 6420 |
| 750 | 850 | 950 | 1000 | 1100 | 1200 | 1300 | 1650 | 1650 | 1900 | 1900 | 2150 | 2150 |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 2530 | 2860 | 3210 | 3600 | 3780 | 4160 | 4540 | 5430 | 5510 | 6320 | 6320 | 7110 | 7370 |
| 850 | 950 | 1050 | 1050 | 1250 | 1350 | 1550 | 1550 | 1800 | 1800 | 2050 | 2250 | 2250 |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 3270 | 3730 | 4020 | 4250 | 4980 | 5220 | 5930 | 6150 | 7050 | 7160 | 8120 | 8580 | 8970 |
| 600 | 750 | 800 | 900 | 1000 | 1050 | 1150 | 1450 | 1450 | 1700 | 1700 | 1900 | 1900 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 3130 | 3710 | 4100 | 4730 | 4950 | 5500 | 6100 | 7190 | 7190 | 8240 | 8380 | 9500 | 9500 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Based on a 50 ksi Maximum Yield Strength | | | | | | | | | |
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3.25 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 70 | 32 | Pbr(lbs) | 500 | 500 | 500 | 500 | 500 | 600 | 700 | 750 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 594 | 688 | 751 | 800 | 857 | 992 | 1110 | 1190 | 1380 |
| | 34 | Pbr(lbs) | 450 | 450 | 450 | 450 | 500 | 600 | 650 | 700 | 900 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 630 | 728 | 827 | 877 | 944 | 1100 | 1230 | 1350 | 1660 |
| | 36 | Pbr(lbs) | 400 | 400 | 450 | 450 | 500 | 550 | 600 | 700 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 707 | 795 | 903 | 957 | 1060 | 1160 | 1310 | 1490 | 1760 |
| | 38 | Pbr(lbs) | 350 | 400 | 450 | 500 | 550 | 650 | 650 | 650 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 726 | 867 | 979 | 1170 | 1300 | 1540 | 1570 | 1620 | 1900 |
| | 40 | Pbr(lbs) | 350 | 350 | 400 | 400 | 450 | 500 | 550 | 650 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 805 | 887 | 1090 | 1150 | 1270 | 1400 | 1560 | 1800 | 2050 |
| | 44 | Pbr(lbs) | 350 | 350 | 350 | 400 | 400 | 500 | 550 | 600 | 700 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 930 | 1030 | 1220 | 1350 | 1490 | 1690 | 1910 | 2120 | 2410 |
| | 48 | Pbr(lbs) | 300 | 350 | 400 | 450 | 500 | 500 | 500 | 550 | 650 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1050 | 1260 | 1480 | 1760 | 1960 | 2030 | 2200 | 2460 | 2780 |
| | 52 | Pbr(lbs) | 350 | 500 | 450 | 450 | 550 | 550 | 700 | 700 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1270 | 1690 | 1880 | 2060 | 2360 | 2660 | 3040 | 3190 | 3510 |
| | 56 | Pbr(lbs) | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 500 | 600 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1710 | 1800 | 2060 | 2290 | 2460 | 2640 | 2730 | 3050 | 3640 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1050 | 1150 | 1300 | 1500 | 1650 | 1800 | 2050 | 2400 | 2400 | 2700 | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | |
| | | | | | | | | | | | | |
| 1630 | 1830 | 2070 | 2310 | 2570 | 2720 | 3070 | 3490 | 3660 | 3990 | | | |
| 1000 | 1250 | 1350 | 1450 | 1600 | 1750 | 2000 | 2300 | 2300 | 2600 | 2900 | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 1850 | 2220 | 2390 | 2620 | 2810 | 3090 | 3500 | 3970 | 3970 | 4540 | 4820 | | |
| 950 | 1100 | 1200 | 1400 | 1550 | 1700 | 1950 | 2250 | 2250 | 2550 | 2550 | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 2090 | 2340 | 2560 | 2840 | 3150 | 3350 | 3810 | 4340 | 4490 | 5130 | 5130 | | |
| 950 | 1050 | 1150 | 1250 | 1350 | 1500 | 1850 | 1850 | 2150 | 2450 | 2450 | 2750 | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | |
| | | | | | | | | | | | | |
| 2230 | 2520 | 2800 | 3010 | 3310 | 3520 | 4270 | 4420 | 4870 | 5460 | 5760 | 6120 | |
| 900 | 1000 | 1100 | 1300 | 1450 | 1550 | 1800 | 2100 | 2100 | 2350 | 2350 | 2650 | 3000 |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 2480 | 2800 | 3110 | 3440 | 3760 | 4130 | 4760 | 5220 | 5420 | 6080 | 6420 | 6830 | 7410 |
| 850 | 950 | 1050 | 1150 | 1350 | 1350 | 1700 | 1700 | 1950 | 2200 | 2200 | 2450 | 2800 |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 2880 | 3230 | 3620 | 3970 | 4570 | 4570 | 5470 | 5790 | 6360 | 7160 | 7410 | 7860 | 9040 |
| 800 | 900 | 1000 | 1050 | 1150 | 1250 | 1400 | 1600 | 1850 | 1850 | 2100 | 2100 | 2300 |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 3320 | 3850 | 4090 | 4530 | 4980 | 5440 | 5990 | 6520 | 7590 | 7590 | 8540 | 8850 | 9400 |
| 950 | 1000 | 1000 | 1200 | 1300 | 1500 | 1500 | 1750 | 1750 | 1950 | 2200 | 2200 | 2200 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 4220 | 4750 | 5010 | 5880 | 6160 | 7010 | 7270 | 8330 | 8330 | 9610 | 10160 | 10620 | 11030 |
| 700 | 800 | 850 | 950 | 1050 | 1150 | 1200 | 1400 | 1650 | 1650 | 1850 | 1850 | 2050 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 4180 | 4780 | 5240 | 5780 | 6420 | 6780 | 7480 | 8390 | 9620 | 9790 | 11100 | 11100 | 12280 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Concrete Slab Parameters** | | | | | | | | | |
| | | **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2 | 2 | 3.25 | 3.25 | 3.25 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span** | **Joist Depth** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| **(ft.)** | **(in.)** | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| **75** | **34** | **Pbr(lbs)** | 500 | 500 | 500 | 550 | 600 | 700 | 700 | 800 | 950 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 701 | 833 | 884 | 1000 | 1140 | 1320 | 1320 | 1480 | 1740 |
| | **38** | **Pbr(lbs)** | 450 | 450 | 450 | 450 | 500 | 600 | 700 | 750 | 850 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 845 | 955 | 1040 | 1100 | 1300 | 1510 | 1620 | 1760 | 2100 |
| | **40** | **Pbr(lbs)** | 400 | 400 | 450 | 450 | 500 | 550 | 650 | 700 | 850 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 878 | 1010 | 1160 | 1230 | 1400 | 1600 | 1800 | 1950 | 2340 |
| | **42** | **Pbr(lbs)** | 400 | 400 | 400 | 450 | 500 | 600 | 650 | 700 | 800 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 969 | 1090 | 1240 | 1360 | 1610 | 1810 | 1940 | 2090 | 2480 |
| | **44** | **Pbr(lbs)** | 400 | 450 | 550 | 550 | 550 | 600 | 650 | 800 | 800 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 1030 | 1310 | 1550 | 1720 | 1780 | 2080 | 2180 | 2560 | 2730 |
| | **48** | **Pbr(lbs)** | 350 | 350 | 350 | 400 | 450 | 500 | 600 | 600 | 750 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 1160 | 1350 | 1460 | 1660 | 1950 | 2180 | 2470 | 2660 | 3160 |
| | **52** | **Pbr(lbs)** | 350 | 350 | 400 | 500 | 500 | 500 | 550 | 600 | 700 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 1300 | 1520 | 1870 | 2290 | 2400 | 2490 | 2790 | 3040 | 3580 |
| | **56** | **Pbr(lbs)** | 450 | 450 | 450 | 500 | 550 | 650 | 650 | 650 | 800 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 1720 | 2010 | 2250 | 2640 | 2970 | 3380 | 3530 | 3720 | 4490 |
| | **60** | **Pbr(lbs)** | 450 | 450 | 450 | 450 | 450 | 450 | 500 | 550 | 650 |
| | | **X mat'l size** | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | **H mat'l size** | | | | | | | | | |
| | | **I non-comp eff** | 1960 | 2200 | 2480 | 2730 | 2930 | 3150 | 3510 | 3840 | 4430 |

## LIGHT WEIGHT CONCRETE

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1150 | 1250 | 1350 | 1500 | 1650 | 1750 | 2050 | 2350 | 2650 | | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | |
| | | | | | | | | | | | | |
| 2080 | 2270 | 2480 | 2740 | 2930 | 3190 | 3600 | 4170 | 4550 | | | | |
| 1050 | 1200 | 1300 | 1400 | 1500 | 1650 | 1900 | 2200 | 2500 | 2500 | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | |
| | | | | | | | | | | | | |
| 2520 | 2810 | 3020 | 3320 | 3570 | 3920 | 4430 | 5040 | 5770 | 5770 | | | |
| 1050 | 1150 | 1350 | 1500 | 1600 | 1850 | 2150 | 2150 | 2400 | 2700 | 3050 | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 2810 | 3120 | 3550 | 3930 | 4140 | 4770 | 5440 | 5620 | 6100 | 6840 | 7430 | | |
| 900 | 1100 | 1200 | 1300 | 1450 | 1550 | 1800 | 2050 | 2350 | 2350 | 2600 | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 2880 | 3450 | 3620 | 3930 | 4350 | 4640 | 5280 | 6020 | 6760 | 7130 | 7590 | | |
| 950 | 1050 | 1150 | 1250 | 1400 | 1500 | 1750 | 2000 | 2000 | 2250 | 2250 | 2550 | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | |
| | | | | | | | | | | | | |
| 3250 | 3640 | 3990 | 4320 | 4790 | 5050 | 5820 | 6630 | 6630 | 7450 | 7850 | 8360 | |
| 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1600 | 1900 | 2150 | 2150 | 2350 | 2700 | 2700 |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 3870 | 4340 | 4550 | 5010 | 5480 | 6030 | 6660 | 7630 | 8600 | 8900 | 9450 | 10880 | 10880 |
| 750 | 850 | 950 | 1100 | 1200 | 1350 | 1550 | 1750 | 1750 | 2000 | 2250 | 2250 | 2550 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 4040 | 4540 | 5090 | 5880 | 6230 | 6760 | 7700 | 8970 | 8970 | 10110 | 11120 | 11120 | 12800 |
| 900 | 950 | 1050 | 1250 | 1450 | 1450 | 1650 | 1650 | 1900 | 2100 | 2100 | 2100 | 2400 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 5120 | 5840 | 6120 | 7180 | 8170 | 8170 | 9730 | 9730 | 11220 | 11870 | 12410 | 12890 | 13930 |
| 700 | 800 | 850 | 1000 | 1100 | 1200 | 1400 | 1600 | 1600 | 1850 | 1850 | 2050 | 2300 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 4980 | 5700 | 6370 | 7410 | 7820 | 8630 | 9690 | 11110 | 11310 | 12830 | 12830 | 14190 | 15930 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2 | 3.25 | 3.25 | 3.25 | 3.25 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span (ft.)** | **Joist Depth (in.)** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| | | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| 80 | 38 | Pbr(lbs) | 500 | 500 | 550 | 550 | 550 | 650 | 750 | 800 | 950 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 935 | 1050 | 1220 | 1300 | 1390 | 1550 | 1800 | 1980 | 2340 |
| | 40 | Pbr(lbs) | 450 | 450 | 450 | 550 | 650 | 650 | 650 | 800 | 950 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1010 | 1130 | 1240 | 1510 | 1760 | 1800 | 1860 | 2120 | 2610 |
| | 42 | Pbr(lbs) | 450 | 450 | 450 | 450 | 550 | 600 | 700 | 750 | 900 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1080 | 1250 | 1370 | 1460 | 1670 | 1850 | 2160 | 2340 | 2760 |
| | 44 | Pbr(lbs) | 400 | 400 | 500 | 600 | 550 | 550 | 650 | 700 | 800 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1140 | 1290 | 1540 | 1840 | 1930 | 1970 | 2190 | 2380 | 2850 |
| | 46 | Pbr(lbs) | 400 | 400 | 400 | 400 | 450 | 550 | 600 | 700 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1210 | 1410 | 1540 | 1630 | 1860 | 2180 | 2400 | 2740 | 3320 |
| | 48 | Pbr(lbs) | 400 | 500 | 500 | 500 | 500 | 600 | 700 | 850 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1320 | 1660 | 1910 | 2060 | 2220 | 2480 | 2810 | 3360 | 3620 |
| | 52 | Pbr(lbs) | 500 | 500 | 500 | 600 | 700 | 700 | 700 | 800 | 900 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1670 | 1970 | 2170 | 2590 | 3080 | 3240 | 3380 | 3680 | 4350 |
| | 56 | Pbr(lbs) | 450 | 450 | 450 | 450 | 450 | 500 | 500 | 600 | 750 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1840 | 2200 | 2420 | 2690 | 2790 | 3110 | 3370 | 3820 | 4560 |
| | 60 | Pbr(lbs) | 450 | 450 | 500 | 550 | 650 | 650 | 650 | 700 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1980 | 2390 | 2820 | 3280 | 3890 | 4070 | 4280 | 4710 | 5660 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

**Based on a 50 ksi Maximum Yield Strength**

**Concrete Slab Parameters**

**Light Weight Concrete (110 pcf) f'c = 4.0 ksi**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4 | 4 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1100 | 1300 | 1400 | 1550 | 1700 | 1950 | 2250 | 2550 | 2550 | | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | |
| | | | | | | | | | | | | |
| 2630 | 3140 | 3320 | 3710 | 3920 | 4440 | 5050 | 5780 | 5780 | | | | |
| 1050 | 1150 | 1350 | 1500 | 1650 | 1900 | 2150 | 2150 | 2450 | | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | |
| | | | | | | | | | | | | |
| 2920 | 3200 | 3700 | 3980 | 4370 | 4950 | 5630 | 5900 | 6440 | | | | |
| 1000 | 1200 | 1350 | 1450 | 1600 | 1800 | 2100 | 2400 | 2400 | 2650 | | | |
| L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | | | |
| | | | | | | | | | | | | |
| 3230 | 3730 | 4100 | 4360 | 4840 | 5290 | 6040 | 6770 | 7140 | 7600 | | | |
| 1000 | 1100 | 1300 | 1400 | 1550 | 1750 | 2050 | 2050 | 2300 | 2550 | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | | | |
| | | | | | | | | | | | | |
| 3420 | 3810 | 4340 | 4800 | 5120 | 5840 | 6650 | 6870 | 7880 | 8390 | | | |
| 950 | 1050 | 1250 | 1350 | 1500 | 1700 | 1950 | 1950 | 2250 | 2500 | 2850 | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 3750 | 4170 | 4750 | 5260 | 5550 | 6400 | 7300 | 7540 | 8190 | 9210 | 10000 | | |
| 950 | 1050 | 1100 | 1350 | 1450 | 1650 | 1650 | 1900 | 2150 | 2150 | 2400 | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 4080 | 4540 | 4780 | 5500 | 6050 | 6680 | 6990 | 7970 | 8940 | 9440 | 10060 | | |
| 1050 | 1150 | 1250 | 1350 | 1550 | 1550 | 1800 | 2050 | 2300 | 2300 | 2300 | 2600 | 2600 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 5090 | 5650 | 6260 | 6810 | 7750 | 7750 | 9030 | 10170 | 10780 | 11190 | 11860 | 12880 | 12880 |
| 850 | 900 | 1000 | 1200 | 1300 | 1450 | 1450 | 1700 | 1950 | 2150 | 2150 | 2450 | 2450 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 5290 | 5930 | 6220 | 7260 | 7890 | 8990 | 9130 | 10470 | 11800 | 12510 | 12990 | 14960 | 14960 |
| 950 | 1000 | 1100 | 1400 | 1400 | 1400 | 1600 | 1850 | 2050 | 2050 | 2050 | 2300 | 2300 |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 6370 | 7060 | 7900 | 9430 | 9430 | 9790 | 11230 | 12300 | 13710 | 14340 | 14340 | 16100 | 17150 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | Concrete Slab Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Light Weight Concrete (110 pcf) f'c = 4.0 ksi | | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2 | 3.25 | 3.25 | 3.25 | 3.25 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 90 | 44 | Pbr(lbs) | 550 | 550 | 550 | 550 | 600 | 700 | 750 | 900 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1400 | 1600 | 1840 | 1910 | 2100 | 2390 | 2680 | 3180 | 3570 |
| | 46 | Pbr(lbs) | 500 | 500 | 500 | 550 | 550 | 650 | 750 | 900 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1530 | 1750 | 1870 | 2120 | 2220 | 2480 | 2830 | 3330 | 3910 |
| | 48 | Pbr(lbs) | 450 | 500 | 500 | 500 | 550 | 650 | 700 | 850 | 950 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1580 | 1850 | 2040 | 2190 | 2440 | 2850 | 3090 | 3640 | 4110 |
| | 50 | Pbr(lbs) | 450 | 450 | 500 | 500 | 600 | 650 | 700 | 850 | 950 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1660 | 1930 | 2240 | 2430 | 2780 | 3010 | 3270 | 3960 | 4460 |
| | 52 | Pbr(lbs) | 450 | 450 | 450 | 450 | 500 | 600 | 650 | 800 | 900 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 1800 | 2020 | 2230 | 2500 | 2720 | 3090 | 3540 | 4100 | 4830 |
| | 56 | Pbr(lbs) | 500 | 500 | 500 | 500 | 550 | 600 | 650 | 750 | 850 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2120 | 2450 | 2710 | 2920 | 3400 | 3670 | 3970 | 4610 | 5340 |
| | 60 | Pbr(lbs) | 450 | 450 | 500 | 650 | 650 | 650 | 750 | 800 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2350 | 2700 | 3200 | 3940 | 4340 | 4530 | 4930 | 5650 | 6830 |
| | 66 | Pbr(lbs) | 450 | 600 | 650 | 650 | 800 | 850 | 950 | 1000 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2710 | 3570 | 4160 | 4530 | 5490 | 6100 | 6660 | 7500 | 8140 |
| | 72 | Pbr(lbs) | 650 | 650 | 650 | 650 | 650 | 650 | 650 | 700 | 800 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3640 | 4200 | 4700 | 5120 | 5590 | 5850 | 6160 | 7000 | 8020 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Based on a 50 ksi Maximum Yield Strength** | | | | | | | | | | | |
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (110 pcf) f'c = 4.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4 | 4 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1250 | 1350 | 1600 | 1800 | 1800 | 2100 | 2400 | | | | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | | | | | | |
| | | | | | | | | | | | | |
| 4120 | 4530 | 5350 | 6060 | 6060 | 6900 | 7900 | | | | | | |
| 1100 | 1300 | 1400 | 1550 | 1750 | 2050 | 2300 | 2300 | | | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | |
| | | | | | | | | | | | | |
| 4290 | 4970 | 5340 | 5870 | 6660 | 7570 | 8680 | 8680 | | | | | |
| 1150 | 1250 | 1500 | 1700 | 1700 | 2000 | 2250 | 2500 | | | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | |
| | | | | | | | | | | | | |
| 4800 | 5420 | 6160 | 7020 | 7270 | 8010 | 9490 | 10110 | | | | | |
| 1050 | 1200 | 1350 | 1450 | 1650 | 1950 | 1950 | 2200 | 2450 | | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | |
| | | | | | | | | | | | | |
| 4970 | 5670 | 6280 | 6980 | 7640 | 8720 | 9010 | 10330 | 11010 | | | | |
| 1000 | 1200 | 1300 | 1600 | 1600 | 1850 | 2100 | 2100 | 2350 | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | |
| | | | | | | | | | | | | |
| 5380 | 6140 | 6800 | 7930 | 8290 | 9450 | 10610 | 11200 | 11950 | | | | |
| 950 | 1100 | 1250 | 1350 | 1550 | 1750 | 1750 | 2000 | 2250 | 2550 | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | | | |
| | | | | | | | | | | | | |
| 5990 | 6930 | 7570 | 8340 | 9220 | 10580 | 11000 | 12350 | 13920 | 15120 | | | |
| 1050 | 1150 | 1250 | 1450 | 1450 | 1700 | 1900 | 1900 | 2100 | 2100 | 2400 | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | |
| | | | | | | | | | | | | |
| 7590 | 8410 | 9150 | 10430 | 10430 | 12160 | 13140 | 13700 | 15100 | 16010 | 17390 | | |
| 1200 | 1400 | 1400 | 1600 | 1850 | 1850 | 2050 | 2050 | 2300 | 2450 | 2450 | 2800 | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X | |
| | | | | | | | | | | | | |
| 9490 | 10890 | 11520 | 13010 | 14750 | 14750 | 16800 | 17570 | 18930 | 20320 | 21710 | 23470 | |
| 950 | 1000 | 1100 | 1200 | 1400 | 1400 | 1600 | 1850 | 2050 | 2300 | 2300 | 2450 | 2800 |
| L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X |
| | | | | | | | | | | | | |
| 9710 | 10790 | 11400 | 12580 | 14150 | 14870 | 16540 | 18760 | 20790 | 22400 | 23340 | 25710 | 27790 |

## DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Concrete Slab Parameters | | | | | | | | | |
| | | Light Weight Concrete (110 pcf) f'c = 5.0 ksi | | | | | | | | | |
| | | **hr (in.)** | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | **tc (in.)** | 2 | 2 | 2 | 2 | 2.5 | 3.25 | 3.25 | 3.25 | 3.25 |
| | | **Js (ft.)** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 |
| **Joist Span (ft.)** | **Joist Depth (in.)** | **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | |
| | | **TL** | **300** | **400** | **500** | **600** | **700** | **800** | **900** | **1000** | **1200** |
| **100** | **50** | Pbr(lbs) | 550 | 600 | 600 | 600 | 700 | 850 | 850 | 850 | 1050 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2080 | 2410 | 2620 | 2870 | 3280 | 3970 | 3970 | 4150 | 5110 |
| | **52** | Pbr(lbs) | 550 | 550 | 550 | 600 | 600 | 700 | 850 | 850 | 1050 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2170 | 2510 | 2720 | 3020 | 3190 | 3650 | 4300 | 4500 | 5400 |
| | **54** | Pbr(lbs) | 500 | 500 | 600 | 750 | 750 | 750 | 800 | 900 | 1100 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2290 | 2540 | 3070 | 3810 | 3930 | 4180 | 4640 | 5240 | 6140 |
| | **56** | Pbr(lbs) | 500 | 500 | 500 | 550 | 600 | 700 | 700 | 800 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2370 | 2730 | 2940 | 3420 | 3800 | 4380 | 4700 | 5000 | 6280 |
| | **58** | Pbr(lbs) | 500 | 500 | 500 | 500 | 550 | 650 | 750 | 750 | 950 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2480 | 2930 | 3150 | 3400 | 3870 | 4430 | 5130 | 5370 | 6470 |
| | **60** | Pbr(lbs) | 450 | 450 | 600 | 700 | 700 | 750 | 850 | 950 | 1100 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2650 | 3030 | 3960 | 4570 | 4710 | 5330 | 5880 | 6570 | 7650 |
| | **66** | Pbr(lbs) | 450 | 600 | 650 | 650 | 800 | 850 | 950 | 1000 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3090 | 4040 | 4800 | 5290 | 6170 | 6730 | 7600 | 8230 | 9250 |
| | **72** | Pbr(lbs) | 650 | 650 | 650 | 650 | 650 | 650 | 650 | 700 | 850 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3890 | 4780 | 5420 | 5950 | 6260 | 6530 | 6960 | 7630 | 9420 |
| | **80** | Pbr(lbs) | 650 | 650 | 650 | 650 | 650 | 700 | 800 | 850 | 1000 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5670 | 5670 | 6080 | 6940 | 7260 | 8030 | 9240 | 10120 | 11920 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| Based on a 50 ksi Maximum Yield Strength | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concrete Slab Parameters | | | | | | | | | | | | |
| Light Weight Concrete (145 pcf) f'c = 5.0 ksi | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4 | 4 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1150 | 1350 | 1500 | 1700 | 2000 | 2000 | | | | | | | |
| L1x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | | | | | | | |
| | | | | | | | | | | | | |
| 5590 | 6620 | 7000 | 7940 | 9030 | 9490 | | | | | | | |
| 1200 | 1350 | 1650 | 1650 | 1950 | 2200 | 2200 | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 6420 | 6910 | 8320 | 8620 | 9800 | 11240 | 11240 | | | | | | |
| 1200 | 1300 | 1400 | 1600 | 1900 | 1900 | 2150 | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 6660 | 7380 | 8210 | 9320 | 10260 | 10600 | 12160 | | | | | | |
| 1050 | 1250 | 1350 | 1600 | 1850 | 1850 | 2050 | 2300 | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | | |
| | | | | | | | | | | | | |
| 6800 | 7950 | 8850 | 9700 | 11060 | 11430 | 13110 | 14000 | | | | | |
| 1100 | 1250 | 1550 | 1550 | 1800 | 2000 | 2000 | 2550 | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | | |
| | | | | | | | | | | | | |
| 7710 | 8540 | 9970 | 10420 | 11890 | 13350 | 14090 | 16350 | | | | | |
| 1100 | 1200 | 1500 | 1500 | 1750 | 1750 | 1950 | 2200 | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | | |
| | | | | | | | | | | | | |
| 8010 | 9150 | 10680 | 11160 | 12740 | 12740 | 14310 | 16130 | | | | | |
| 1200 | 1400 | 1400 | 1600 | 1850 | 1850 | 2050 | 2050 | 2300 | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | |
| | | | | | | | | | | | | |
| 10780 | 12120 | 12730 | 14150 | 16050 | 16050 | 18460 | 19570 | 21260 | | | | |
| 950 | 1100 | 1200 | 1400 | 1600 | 1600 | 1850 | 2050 | 2300 | 2450 | | | |
| L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | | |
| | | | | | | | | | | | | |
| 10430 | 12160 | 13240 | 15110 | 16800 | 17640 | 19880 | 21940 | 25270 | 26120 | | | |
| 1000 | 1100 | 1400 | 1400 | 1400 | 1600 | 1850 | 2050 | 2300 | 2300 | 2800 | 2800 | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | L2.5x0.187X | |
| | | | | | | | | | | | | |
| 12640 | 14150 | 16910 | 17600 | 18490 | 20570 | 23340 | 25880 | 29070 | 29070 | 34640 | 34640 | |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | Concrete Slab Parameters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Light Weight Concrete (110 pcf) f'c = 5.0 ksi | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 2.5 | 3.25 | 3.25 | 3.25 | 3.25 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 110 | 56 | Pbr(lbs) | 600 | 600 | 600 | 600 | 750 | 750 | 800 | 900 | 1100 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2820 | 3170 | 3430 | 3930 | 4520 | 4710 | 5250 | 5890 | 6820 |
| | 58 | Pbr(lbs) | 550 | 550 | 550 | 550 | 600 | 700 | 800 | 900 | 1050 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 2910 | 3400 | 3690 | 3890 | 4320 | 5060 | 5640 | 6080 | 7330 |
| | 60 | Pbr(lbs) | 550 | 550 | 700 | 700 | 700 | 850 | 950 | 1050 | 1150 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3120 | 3500 | 4590 | 4880 | 5050 | 6200 | 6960 | 7300 | 8290 |
| | 62 | Pbr(lbs) | 550 | 550 | 550 | 600 | 700 | 700 | 750 | 850 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3330 | 3740 | 4060 | 4550 | 5400 | 5550 | 6170 | 6960 | 8160 |
| | 64 | Pbr(lbs) | 500 | 500 | 500 | 500 | 550 | 650 | 750 | 800 | 1000 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3420 | 3980 | 4330 | 4610 | 5140 | 5920 | 6580 | 7420 | 8700 |
| | 66 | Pbr(lbs) | 500 | 600 | 650 | 650 | 800 | 900 | 950 | 1050 | 1050 |
| | | X mat'l size | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 3640 | 4410 | 5320 | 5730 | 6670 | 7590 | 8380 | 9310 | 9750 |
| | 72 | Pbr(lbs) | 650 | 650 | 800 | 850 | 1000 | 1000 | 1000 | 1100 | 1400 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 4480 | 5250 | 6650 | 7760 | 8710 | 9490 | 9850 | 11000 | 13200 |
| | 80 | Pbr(lbs) | 650 | 650 | 650 | 650 | 650 | 650 | 700 | 800 | 950 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5750 | 6170 | 7040 | 7750 | 8100 | 8620 | 9450 | 10440 | 12930 |
| | 88 | Pbr(lbs) | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 1000 | 1000 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 7890 | 7890 | 9450 | 10560 | 11230 | 11840 | 12810 | 13960 | 15370 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Based on a 50 ksi Maximum Yield Strength** | | | | | | | | | | | | |
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (145 pcf) f'c = 5.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 4 | 4 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1300 | 1400 | 1600 | 1850 | 1850 | 2150 | | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | | | | | | | |
| | | | | | | | | | | | | |
| 8070 | 8880 | 10070 | 11460 | 12040 | 13150 | | | | | | | |
| 1250 | 1350 | 1600 | 1850 | 2050 | 2050 | | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | | | | | | | |
| | | | | | | | | | | | | |
| 8570 | 9540 | 10830 | 12330 | 14140 | 14140 | | | | | | | |
| 1250 | 1350 | 1550 | 1800 | 1800 | 2000 | | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | | | | | | | |
| | | | | | | | | | | | | |
| 9190 | 10230 | 11610 | 12800 | 13220 | 15170 | | | | | | | |
| 1200 | 1300 | 1500 | 1750 | 1750 | 1950 | 2200 | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 9820 | 10510 | 11990 | 13690 | 14140 | 16230 | 17340 | | | | | | |
| 1150 | 1250 | 1450 | 1700 | 1900 | 1900 | 2150 | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 10470 | 11210 | 12800 | 14600 | 16400 | 17310 | 18500 | | | | | | |
| 1250 | 1450 | 1450 | 1650 | 1850 | 1850 | 2100 | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 11240 | 12820 | 13620 | 15550 | 16850 | 17460 | 19710 | | | | | | |
| 1400 | 1600 | 1850 | 1850 | 2050 | 2050 | 2300 | 2450 | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | | |
| | | | | | | | | | | | | |
| 14520 | 16650 | 18270 | 19250 | 21330 | 21330 | 25530 | 26380 | | | | | |
| 1100 | 1200 | 1400 | 1600 | 1600 | 1850 | 2050 | 2300 | 2450 | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | | | | |
| | | | | | | | | | | | | |
| 15090 | 16440 | 18760 | 20880 | 21920 | 24700 | 27280 | 31440 | 32510 | | | | |
| 1200 | 1400 | 1400 | 1600 | 1600 | 1850 | 2050 | 2300 | 2300 | 2800 | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | L2.5x0.187X | | | |
| | | | | | | | | | | | | |
| 18040 | 20560 | 21410 | 24560 | 25050 | 28430 | 31540 | 35420 | 37760 | 42250 | | | |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

| | | | Concrete Slab Parameters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Light Weight Concrete (110 pcf) f'c = 5.0 ksi | | | | | | | | |
| | | hr (in.) | 1 | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| | | tc (in.) | 2 | 2 | 2 | 2 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 |
| | | Js (ft.) | 3 | 3 | 3 | 3 | 3 | 3 | 3.5 | 4 | 4 |
| Joist Span | Joist Depth | Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot | | | | | | | | | |
| (ft.) | (in.) | TL | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 |
| 120 | 72 | Pbr(lbs) | 650 | 650 | 700 | 850 | 950 | 1000 | 1000 | 1000 | 1400 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5060 | 5780 | 7000 | 8420 | 9150 | 10510 | 11140 | 11140 | 14610 |
| | 74 | Pbr(lbs) | 650 | 650 | 650 | 650 | 800 | 850 | 950 | 1000 | 1100 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5340 | 6100 | 6720 | 7230 | 8750 | 9580 | 10590 | 11770 | 13050 |
| | 76 | Pbr(lbs) | 650 | 650 | 650 | 650 | 650 | 700 | 800 | 950 | 1000 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5630 | 6430 | 7080 | 7620 | 8140 | 8890 | 10010 | 11800 | 13000 |
| | 78 | Pbr(lbs) | 650 | 800 | 950 | 1000 | 1000 | 1200 | 1400 | 1400 | 1400 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5530 | 7450 | 9010 | 10270 | 10710 | 12710 | 14540 | 15580 | 16480 |
| | 80 | Pbr(lbs) | 650 | 700 | 850 | 1000 | 1000 | 1000 | 1100 | 1400 | 1400 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 5810 | 7080 | 9140 | 10370 | 11250 | 12210 | 13640 | 16380 | 17320 |
| | 82 | Pbr(lbs) | 650 | 650 | 700 | 850 | 950 | 1000 | 1000 | 1100 | 1400 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 6090 | 7110 | 8180 | 10090 | 11330 | 12340 | 13590 | 14310 | 18180 |
| | 84 | Pbr(lbs) | 650 | 650 | 650 | 950 | 950 | 950 | 1000 | 1000 | 1100 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 6380 | 7450 | 8180 | 10970 | 11410 | 12390 | 13430 | 14250 | 15950 |
| | 88 | Pbr(lbs) | 950 | 950 | 1000 | 1100 | 1400 | 1400 | 1400 | 1400 | 1850 |
| | | X mat'l size | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 8000 | 9110 | 11070 | 12260 | 14860 | 16410 | 17140 | 18390 | 22560 |
| | 96 | Pbr(lbs) | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1400 |
| | | X mat'l size | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X |
| | | H mat'l size | | | | | | | | | |
| | | I non-comp eff | 12330 | 12330 | 12330 | 13900 | 14690 | 15300 | 16670 | 17310 | 23240 |

# DESIGN GUIDE LT WT LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Based on a 50 ksi Maximum Yield Strength** | | | | | | | | | | | | |
| **Concrete Slab Parameters** | | | | | | | | | | | | |
| **Light Weight Concrete (145 pcf) f'c = 5.0 ksi** | | | | | | | | | | | | |
| 1.5 | 1.5 | 1.5 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.5 | 3.5 | 3.5 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5.5 | 6 | 7 | 7.5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot** | | | | | | | | | | | | |
| **1400** | **1600** | **1800** | **2000** | **2200** | **2400** | **2700** | **3000** | **3300** | **3600** | **3900** | **4200** | **4500** |
| 1400 | 1400 | 1600 | 1850 | 2050 | 2050 | | | | | | | |
| L1.25x0.109X | L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | | | | | | | |
| | | | | | | | | | | | | |
| 15350 | 16320 | 18630 | 20200 | 22290 | 23640 | | | | | | | |
| 1200 | 1400 | 1600 | 1600 | 1850 | 2050 | 2300 | | | | | | |
| L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 14880 | 16500 | 18940 | 19690 | 22120 | 24990 | 27150 | | | | | | |
| 1100 | 1400 | 1600 | 1600 | 1850 | 2050 | 2300 | | | | | | |
| L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 14870 | 17410 | 19980 | 20770 | 23330 | 26360 | 28650 | | | | | | |
| 1600 | 2050 | 2050 | 2050 | 2300 | 2300 | 2450 | | | | | | |
| L1.25x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 18630 | 22280 | 24110 | 25210 | 28310 | 28310 | 31200 | | | | | | |
| 1400 | 1600 | 1850 | 2050 | 2050 | 2050 | 2300 | | | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | | | | | | |
| | | | | | | | | | | | | |
| 18030 | 20670 | 23910 | 26520 | 26520 | 27540 | 31740 | | | | | | |
| 1400 | 1400 | 1600 | 1850 | 2050 | 2050 | 2300 | 2300 | | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | | |
| | | | | | | | | | | | | |
| 18920 | 19880 | 23230 | 25110 | 27840 | 28920 | 33330 | 33330 | | | | | |
| 1400 | 1400 | 1400 | 1600 | 1850 | 2050 | 2300 | 2300 | | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | | | | | |
| | | | | | | | | | | | | |
| 19830 | 20840 | 21210 | 24350 | 27450 | 30330 | 34950 | 34950 | | | | | |
| 2050 | 2050 | 2050 | 2300 | 2300 | 2450 | 2800 | 2800 | | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | | | | | |
| | | | | | | | | | | | | |
| 25240 | 28230 | 28230 | 32830 | 34460 | 35510 | 39850 | 42820 | | | | | |
| 1400 | 1400 | 1600 | 1850 | 2050 | 2050 | 2300 | 2300 | 2800 | | | | |
| L1.5x0.109X | L1.5x0.109X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L1.75x0.155X | L2x0.163X | L2x0.163X | L2.5x0.187X | | | | |
| | | | | | | | | | | | | |
| 24580 | 25610 | 29370 | 32270 | 36090 | 37750 | 42400 | 45210 | 50610 | | | | |

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# CODE OF STANDARD PRACTICE

## FOR STEEL JOISTS AND JOIST GIRDERS

Adopted by the Steel Joist Institute April 7, 1931
Revised to Nov. 10, 2014 - Effective Jan.1, 2015

## SECTION 1.
## GENERAL

### 1.1 SCOPE

The practices and customs set forth herein are in accordance with good engineering practice, tend to ensure safety in steel joist and Joist Girder construction, and are standard within the industry. There shall be no conflict between this code and any legal building regulation. This code shall only supplement and amplify such laws. Unless specific provisions to the contrary are made in a contract for the purchase of steel joists or Joist Girders, this code is understood to govern the interpretation of such a contract.

### 1.2 APPLICATION

This Code of Standard Practice is to govern as a standard unless otherwise covered in the architects' and engineers' plans and specifications.

### 1.3 DEFINITIONS

**Add-Load.** A single vertical concentrated load that occurs at any one panel point along the joist chord. This load is in addition to any other gravity loads specified.

**Bend-Check Load.** A vertical concentrated load used to design the joist chord for the additional bending stresses resulting from this load being applied at any location between the joist panel points. This load shall already be accounted for in the specified joist designation load, uniform load, or Add-Load and is used only for the additional bending check in the chord and does not contribute to the overall axial forces within the joist. An ideal use of this is for incidental loads which have already been accounted for in the design loading but may induce additional bending stress due to this load occurring at any location along the chord.

**Buyer.** The entity that has agreed to purchase Material from the manufacturer and has also agreed to the terms of sale.

**Erector.** The entity that is responsible for the safe and proper erection of the materials in accordance with all applicable codes and regulations.

**Material.** Steel joists, Joist Girders and accessories as provided by the seller.

**Owner.** The entity that is identified as such in the contract documents.

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**Placement Plans.** Drawings that are prepared depicting the interpretation of the contract document's requirements for the Material to be supplied by the Seller. These floor or roof plans are approved by the Specifying Professional, Buyer, or Owner for conformance with the design requirements. The Seller uses the information contained on these drawings for final material design. A unique piece mark number is typically shown for the individual placement of the steel joists, Joist Girders and accessories along with sections that describe the end bearing conditions and minimum attachment required so that material is placed in the proper location in the field.

**Seller.** A company certified by the Steel Joist Institute engaged in the manufacture and distribution of steel joists, Joist Girders and accessories.

**Specifying Professional.** The licensed professional who is responsible for sealing the building contract documents, that indicates that he or she has performed or supervised the analysis, design and document preparation for the structure and has knowledge of the load-carrying structural system.

**Structural Drawings.** The graphic or pictorial portions of the contract documents showing the design, location and dimensions of the work. These documents generally include plans, elevations, sections, details, connections, all loads, schedules, diagrams and notes.

### 1.4 DESIGN

In the absence of ordinances or specifications to the contrary, all designs prepared by the Specifying Professional shall be in accordance with the Steel Joist Institute Standard Specifications of latest adoption.

### 1.5 RESPONSIBILITY FOR DESIGN AND ERECTION

When material requirements are specified, the seller shall assume no responsibility other than to furnish the items listed in Section 5.2(a). When material requirements are not specified, the seller shall furnish the items listed in Section 5.2(a) in accordance with Steel Joist Institute Standard Specifications of latest adoption, and this code. Pertinent design information shall be provided to the seller as stipulated in Section 6.1. The seller shall identify material by showing size and type. In no case shall the seller assume any responsibility for the erection of the item furnished.

### 1.6 PERFORMANCE TESTS FOR OPEN WEB STEEL JOIST CONSTRUCTION

When a performance test on a joist is required, the following criteria shall be used:

a) The performance test load shall be the maximum factored uniformly distributed downward design load for the selected joist.

   (1) The TOTAL safe factored uniformly distributed load-carrying capacity tabulated in the Standard LRFD Load Table for the specific joist designation and span.

   (2) For a joist with factored loading conditions other than those found in the Standard LRFD Load Table, this is the LRFD Load Combination resulting in the highest uniformly distributed downward factored design load.

   (3) For a joist with loading conditions other than those found in the Standard ASD Load Table, this is the ASD Load Combination resulting in the highest uniformly distributed downward design load multiplied times 1.50.

b) Joist self-weight and the weight of all test materials shall be included in the calculation of applied performance test loading as appropriate for the joist during testing.

c) Loading shall be uniformly distributed across the full length of the joist top chord, and the load application shall maintain uniform distribution throughout the test. At any stage during the application of the test loading, the test load shall not be distributed in such a manner as to result in any joist component being subjected to a higher proportion of force than intended by the joist design.

d) If tested as a panel assembly, the joists shall be tested in pairs with deck, deck attachments, and bridging installed per the approved joist and deck Placement Plans. All bottom chord horizontal bridging rows shall be terminated by bracing back to the top chord of the adjacent joist or by a lateral restraint system which does not inhibit the vertical deflection of the test joist.

e) If tested singly in a load test machine apparatus, the joist chords shall be braced to prevent lateral movement, without inhibiting vertical displacement. The joist top chord shall have lateral braces located at equal spacing of no more than 36 inches (914 mm) on center. The joist bottom chord shall have lateral braces located, at a minimum, per the bottom chord bridging locations shown on the approved joist placement plan.

f) The performance test loading shall be applied at a rate of no greater than 25 plf per minute and shall be sustained for no less than 15 minutes. After the maximum test load has been removed for a minimum of 10 minutes, the remaining vertical displacement at midspan shall not exceed 20% of the vertical midspan deflection sustained under the full performance test load.

g) All costs associated with such testing shall be borne by the purchaser.

h) Joists that have been designed and manufactured and have satisfied the above performance test criteria shall be considered to satisfy the intent of the Steel Joist Institute Standard Specifications, and shall be considered acceptable for use in construction. No further proof of strength of individual joist components or connections is required.

# SECTION 2.
# JOISTS, JOIST GIRDERS, AND ACCESSORIES

## 2.1 STEEL JOISTS AND JOIST GIRDERS

Steel joists and Joist Girders shall carry the designations and meet the requirements of the Steel Joist Institute Standard Specifications of latest adoption.

K-Series, LH-Series, DLH-Series joists, and Joist Girders are furnished either underslung or square ended, with top chords either parallel, pitched one way or pitched two ways. It is not recommended that any Joist Girder, or any DLH-Series joist that exceeds 72 inches (1829 mm) in depth and has a span greater than 80 feet (24384 mm), be used in a bottom bearing configuration.

The steel joist or Joist Girder designation depth or nominal depth shall be the depth at midspan, except for double pitched joists which shall be the depth at the ridge. K-Series, LH-Series, DLH-Series joists, and Joist Girders shall be permitted to have either parallel chords or a top chord pitch of up to 1/2 inch per foot (1:24).

## 2.2 BEARING SEATS

Underslung types are furnished with minimum end bearing depths as shown in Table 2.2-1. A standard maximum joist bearing seat width (perpendicular to the joist length) is provided. This width shall be permitted to vary based on the joist design and joist manufacturer.

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**TABLE 2.2-1**

| STANDARD END BEARING SEAT DEPTH AND STANDARD MAXIMUM SEAT WIDTH | | |
|---|---|---|
| **JOIST SECTION NUMBER[1]** | **MINIMUM BEARING DEPTH** | **MAXIMUM SEAT WIDTH[2]** |
| K1-12 | 2 ½" (64 mm) | 6" (152 mm) |
| LH02-06 | 5" (127 mm) | 6" (152 mm) |
| LH07-17, DLH10-17 | 5" (127 mm) | 8" (203 mm) |
| JG | 7 ½" (191 mm) | 8" (203 mm) |
| LH/DLH18-25, JG[3] | 7 ½" (191 mm) | 13" (330 mm) |
| JG[4] | 10" (254 mm) | 13" (330 mm) |

**(1) Last two digits of joist designation shown in Load Table.**
**(2) THE SEAT WIDTH MAY VARY BASED ON DESIGN.**
(3) **Joist Girders** with a self weight greater than 50 plf (0.73 kN/m).
(4) **Joist Girders** with a self weight equal to or greater than 150 plf (2.19 kN/m).

Joist Girder bearing seat widths vary depending on the Joist Girder size and shall be permitted to be up to 13" (330 mm) wide. The supporting structural member shall be made wide enough to accommodate the seat widths.

Where steel joists or Joist Girders are sloped, sloped end bearings may be provided where the slope exceeds 1/4 inch per foot (1:48). When sloped end bearings are required, the seat depths shall be adjusted to maintain the standard height at the shallow end of the sloped bearing. For Open Web Steel Joists, K-Series, bearing ends shall be permitted to not be beveled for slopes of 1/4 inch or less per foot (1:48). For sloped joist bearing seats refer to the sloped seat depth requirements of Table 2.2-2 and Table 2.2-3.

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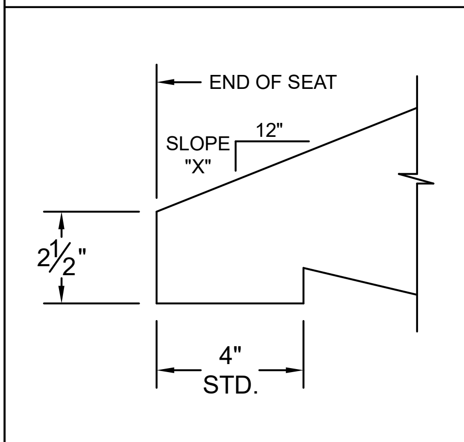
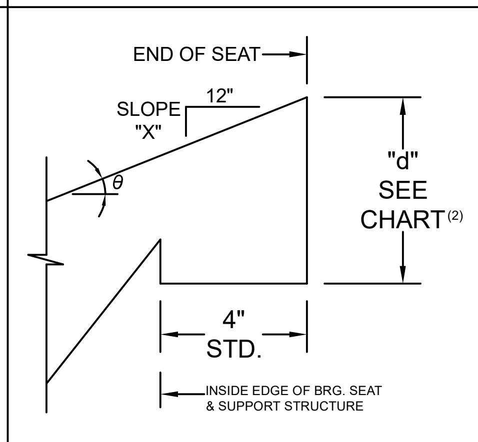
**TABLE 2.2-2**

**SLOPED SEAT REQUIRMENTS FOR SLOPES 3/8":12 AND GREATER**
**K-SERIES OPEN WEB STEEL JOISTS**

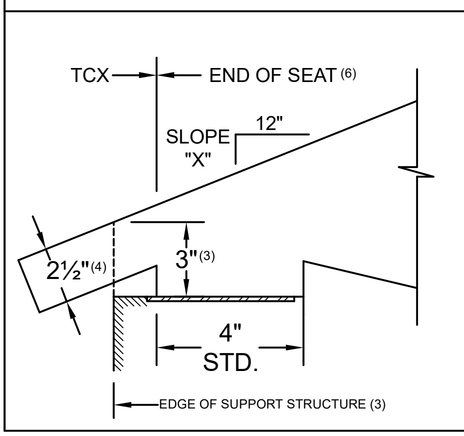
**LOW END W/OUT TOP CHORD EXTENSIONS**



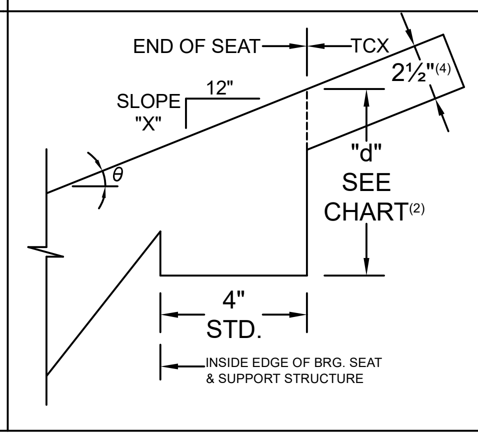

**HIGH END W/OUT TOP CHORD EXTENSIONS**




**LOW END W/ TOP CHORD EXTENSIONS**




**HIGH END W/ TOP CHORD EXTENSIONS**

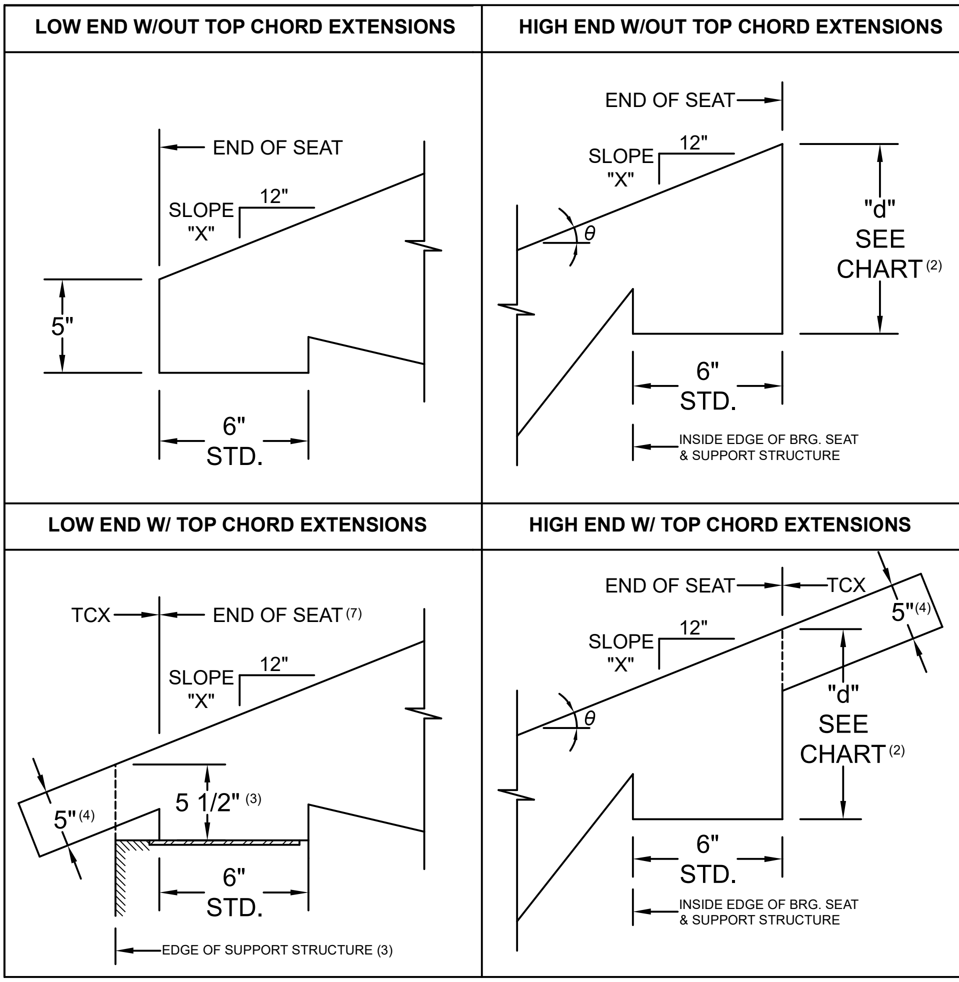



| SLOPE "X":12 | MINIMUM HIGH END SEAT DEPTH "d" |
|---|---|
| 3/8 | 3 1/2 |
| 1/2 | 3 1/2 |
| 1 | 3 1/2 |
| 1 1/2 | 4 |
| 2 | 4 |
| 2 1/2 | 4 |
| 3 | 4 1/2 |
| 3 1/2 | 4 1/2 |
| 4 | 4 1/2 |
| 4 1/2 | 5 |
| 5 | 5 |
| 5 1/2 | 5 1/2 |
| 6 | 5 1/2 |
| SEE NOTE (2) FOR SLOPE RATES GREATER THAN 6:12 | |

Notes:
(1) Depths shown are the minimum required for manufacturing of sloped seats. Depths may vary depending on actual bearing conditions.
(2) $d = 1/2 + 2.5/\cos\theta + 4\tan\theta$ (Rounded up to the nearest 1/2".)
(3) Clearance must be checked at outer edge of support. Increase bearing depths as required to allow passage of 2 1/2" deep extension.
(4) If extension depth greater than 2 1/2" is required, increase bearing depths accordingly.
(5) If slope is 1/4 : 12 or less, sloped seats are not required.
(6) Required bearing seat depth is determined at END OF SEAT.
(7) Also refer to SJI Specification 5.4 for special considerations of joist end reaction location.

**TABLE 2.2-3**

**SLOPED SEAT REQUIRMENTS FOR SLOPES 3/8":12 AND GREATER**
**LH- AND DLH-SERIES OPEN WEB STEEL JOISTS**




| SLOPE "X" : 12 | MINIMUM HIGH END SEAT DEPTH "d" |
|---|---|
| 3/8 | 6 |
| 1/2 | 6 |
| 1 | 6 1/2 |
| 1 1/2 | 6 1/2 |
| 2 | 7 |
| 2 1/2 | 7 |
| 3 | 7 1/2 |
| 3 1/2 | 7 1/2 |
| 4 | 8 |
| 4 1/2 | 8 1/2 |
| 5 | 8 1/2 |
| 5 1/2 | 9 |
| 6 | 9 1/2 |
| SEE NOTE (2) FOR SLOPE RATES GREATER THAN 6:12 | |

Notes:
(1) Depths shown are the minimum required for manufacturing of sloped seats. Depth may vary depending on actual bearing condition.
(2) $d = 1/2 + 5 / \cos\theta + 6 \tan\theta$
(3) Clearance must be checked at outer edge of support. Increase bearing seat depth as required to allow passage of 5" deep extension.
(4) If extension depth greater than 5" is required, increase bearing depths accordingly.
(5) Add 2 1/2" to seat depth at 18 thru 25 chord section numbers. Consult with joist manufacturer for information when TCXs are present.
(6) If slope is 1/4 : 12 or less, sloped seats may not required.
(7) Required bearing seat depth shall be determined at END OF SEAT.
(8) Also refer to SJI Specification 5.4 for special considerations of joist end reaction location.

**2.3 JOIST LOCATION AND SPACING**

The uniform loads as shown in the Standard Specifications Load Tables & Weight Tables of latest adoption shall be used to determine maximum joist spacing.

Where sidewalls, wall beams or tie beams are capable of supporting the floor slab or roof deck, the first adjacent joists should be placed one full space from these members. Joists are provided with camber and may have a significant difference in elevation with respect to the adjacent structure because of this camber. This difference in elevation shall be given consideration when locating the first joist adjacent to a side wall, wall beam, or tie beam.

K-Series Joists should be placed no closer than 6 inches (152 mm) to adjacent walls or structural members. LH-Series and DLH-Series Joists should be placed no closer than 12 inches (305 mm) to adjacent walls or structural members. Where partition walls are supported by parallel floor joists, there shall be at least one joist provided under each such partition, and more than one such joist shall be provided if necessary to safely support the weight of such partition and the adjacent floor. When partitions occur perpendicular to the joists, they shall be treated as concentrated loads on the supporting joists.

**2.4 SPECIFYING DESIGN LOADS**

Neither the Steel Joist Institute nor the joist manufacturer establishes the loading requirements for which structures are designed.

The *specifying professional* shall provide the nominal loads and load combinations as stipulated by the applicable code under which the structure is designed and shall provide the design basis (ASD or LRFD).

The *specifying professional* shall calculate and provide the magnitude and location of ALL JOIST and JOIST GIRDER LOADS. This includes all special loads (drift loads, mechanical units, net uplift, axial loads, moments, structural bracing loads, or other applied loads) which are to be incorporated into the joist or Joist Girder design. For Joist Girders, reactions from supported members shall be clearly denoted as point loads on the Joist Girder. When necessary to clearly convey the information, a load diagram or load schedule shall be provided.

The *specifying professional* shall give due consideration to the following loads and load effects:

- Ponded rain water.
- Accumulation of snow in the vicinity of obstructions such as penthouses, signs, parapets, adjacent buildings, etc.
- Wind and seismic forces. Indicate wind NET uplift in pounds per square foot (Pascals) and any other wind or seismic forces required to be incorporated into the joist or Joist Girder design. If applicable, make clear if loads specified are reduced (i.e. for ASD 0.6W=, 0.7E=) and provide any pertinent $S_{DS}$ values. Connection details shall be designed by the *specifying professional*.
- Movable partitions. Convey any special deflection requirements as well as any stacked loading conditions.
- Type and magnitude of end moments and/or axial forces at the joist and Joist Girder end supports shall be shown on the Structural Drawings. For moment resisting joists or Joist Girders framing at or near the top of a column, due consideration shall be given to extend the column length to allow a plate type connection between the top of the joist or Joist Girder top chord and the column.
  Avoid transferring joist or Joist Girder end moments and axial forces through the bearing seat connection.
  A note shall be provided on the structural drawings stating that all moment resisting joists shall have all dead loads applied to the joist <u>before</u> the bottom chord struts are welded to the supporting connection whenever the design moments provided do not include dead load.
  The top and bottom chord moment connection details shall be designed by the *specifying professional*. The joist designer shall furnish the *specifying professional* with the joist detail information if requested. Additional design tools and details are available at the Steel Joist Institute's website, www.steeljoist.org.
- Joist chords shall not carry out-of-plane or torsional loads, such as from horizontal components of concentrated loads applied to laterally sloped joists, braces, screen walls, posts, etc. The structural contract drawings shall show the required structural bracing to resolve these forces.

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Where concentrated loads occur, the magnitude and location of these concentrated loads shall be shown on the structural drawings when, in the opinion of the *specifying professional*, they shall require consideration by the joist manufacturer. For nominal concentrated loads, which have been accounted for in the specified uniform design loads, a "strut" to transfer the load to a panel point on the opposite chord shall not be required provided that the sum of the concentrated loads within a chord panel does not exceed 100 pounds (445 N) and the attachments are concentric to the chord. When exact dimensional locations for concentrated loads which do not meet the above criteria are provided by the *specifying professional,* the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

**(a) Specifying Joist Design Loads**

The Steel Joist Institute Load Tables are based on uniform loading conditions and are valid for use in selecting joist sizes for gravity loads that can be expressed in terms of "pounds per linear foot" (kiloNewtons per meter) of joist.

For other loads, the Specifying Professional shall use one of the five options described below that allows:

- The estimator to price the joists.
- The joist manufacturer to design the joists in accordance with the Standard Specifications of latest adoption.
- The owner to obtain the most economical joists.

**Option 1**: Select a joist designation from the Standard Load Table (or specify a joist type using a uniform load in the designation) which has been determined to be adequate for all design loads. The shear and moment envelope resulting from the selected uniform load shall meet the actual shear and moment requirements. Thus, this option alone may not be adequate if large concentrated loads need to be designed for.

**Option 2**: Select a joist designation from the Standard Load Table (or specify a joist type using a uniform load in the designation) and also provide the load and location of any additional loads on the structural plan with a note "Joist manufacturer shall design joists for additional loads at locations shown." This option works well for a few added loads per joist with known magnitude and locations.

**Option 3**: For additional point loads with exact locations not known along the joist or for incidental loads, any one, or both, of the following can be specified on the structural plan in addition to option 1 or 2 above:

a) "**Design for a (__) lb. concentrated load located at any one panel point along the joist**". This is referred to as an *Add-Load*.

b) "**Design for additional bending stresses resulting from a (__) lb. concentrated load located at any location along (____) chord**". This is referred to as a *Bend-Check* and can be specified on the **top** chord, **bottom** chord, or **both top and bottom** chords. This can be used when the concentrated load is already accounted for in the joist designation, uniform load, or specified *Add-Load* yet this specified amount of load shall be permitted to also be located at any location between panel points. The additional bending stresses as a result of this load are then designed for. A *Bend-Check* load shall not exceed (*Add-Load* + 400 lbs.) A *Bend-Check* load can be specified by itself without an *Add-Load*.

c) Both (a) and (b) above can be specified with equal concentrated loads for each; or simply denote **"Design joist for a (__) lb. concentrated load at any location along the (___) chord."**

Example uses:

- *Specifying professional* selects a standard joist capable of carrying a 500 lb. RTU. However, the location and exact frame size is not yet known but the frame load shall result in two- 250 lb. point loads at least 5'-0" apart. **Specify a 250 lb. *Bend-Check.***
- Standard joist specified but not selected for 500 lb. RTU load, location not known. **Specify a 500 lb. *Add-Load* and 250 lb. *Bend-Check.***
- Standard SJI joist selected to carry collateral load of 3 psf. *Specifying professional* wants bending from 150 lb. incidental loads to also be designed for. **Specify a 150 lb. *Bend-Check.***

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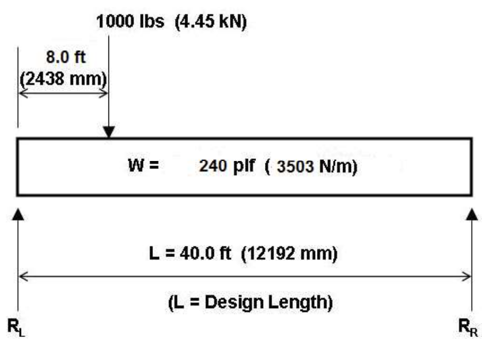
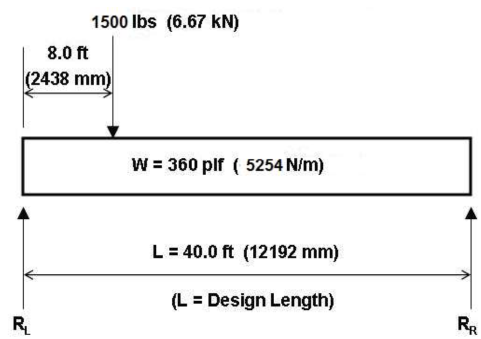
**Option 4**: Select a KCS joist using moment and end reaction without specifying added loads or diagrams. This option works well for concentrated loads for which exact locations are not known or for multiple loading.

a) Determine the maximum moment.

b) Determine the maximum end reaction (shear).

c) Select the required KCS joist that provides the required moment and end reaction (shear). Note that the top chord end panel is designed for axial load based on the force in the first tension web, that is based on the specified end reaction. A uniform load of 825 plf (12030 N/m) LRFD or 550 plf (8020 N/m) ASD is used to check end panel bending. If the end panel loading exceeds this, reduce the joist spacing or go to Option 5.

d) Specify on the structural drawings that an extra web shall be field applied at all concentrated loads not occurring at panel points.

| OPTION 4 - ASD EXAMPLE 1: | OPTION 4 - LRFD EXAMPLE 1: |
|---|---|
| **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** | **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** |
|  |  |
| M = 625 k-in. (70.6 kN-m)<br>$R_L$ = 5600 lbs (24.9 kN), $R_R$ = 5000 lbs (22.2 kN)<br>Select a 22KCS3, M = 658 k-in. (74.3 kN-m)<br>R = 6600 lbs (29.3 kN)<br>Bridging section no. 9 for L = 40 ft. (12192 mm)<br>Use 22K9 to determine bridging and stability requirements.<br>Since a standard KCS Joist can be selected from the load table a load diagram is not required. | M = 938 k-in. (105.9 kN-m)<br>$R_L$ = 8400 lbs (37.37 kN), $R_R$ = 7500 lbs (33.36 kN)<br>Select a 22KCS3, M = 987 k-in. (111.5 kN-m)<br>R = 9900 lbs (44.0 kN)<br>Bridging section no. 9 for L = 40 ft. (12192 mm)<br>Use 22K9 to determine bridging and stability requirements.<br>Since a standard KCS Joist can be selected from the load table a load diagram is not required. |

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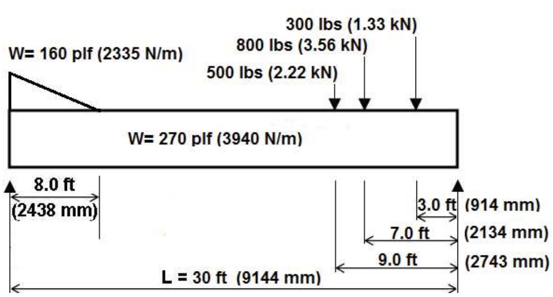
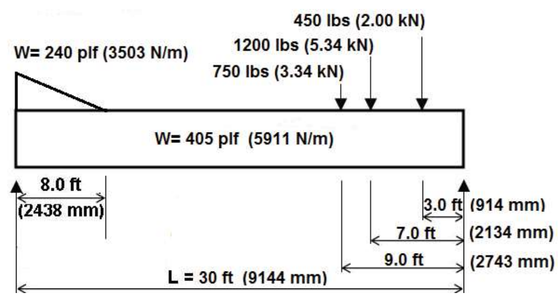
| OPTION 4 - ASD EXAMPLE 2: | OPTION 4 - LRFD EXAMPLE 2: |
|---|---|
| **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** | **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** |
|   |   |
| M = 443 k-in. (50.1 kN-m)<br>$R_L$ = 5000 lbs (22.24 kN), $R_R$ = 5340 lbs (23.75 kN)<br>Select a 22KCS2, M = 488 k-in. (55.1 kN-m)<br>R = 5900 lbs (26.2 kN)<br>Bridging section no. 6 for L = 30 ft. (9144 mm)<br>Use 22K6 to determine bridging and stability requirements. Since the maximum uniform load of 430 plf [6275 N/m) (270 plf (3940 N/m) + 160 plf (2335 N/m)] does not exceed the maximum KCS Joist uniform load of 550 plf (8020 N/m) and a standard KCS Joist can be selected from the load table, a load diagram is not required. | M = 664 k-in. (75.03 kN-m)<br>$R_L$ = 7500 lbs (33.36 kN), $R_R$ = 8010 lbs (35.63 kN)<br>Select a 22KCS2, M = 732 k-in. (82.64 kN-m)<br>R = 8850 lbs (39.3 kN)<br>Bridging section no. 6 for L = 30 ft. (9144mm)<br>Use 22K6 to determine bridging and stability requirements. Since the maximum ***factored*** uniform load of 645 plf (9413 N/m) (405 plf (5911 N/m) + 240 plf (3503 N/m)) does not exceed the maximum KCS Joist uniform load of 825 plf (12030 N/m) and a standard KCS Joist can be selected from the load table, a load diagram is not required. |

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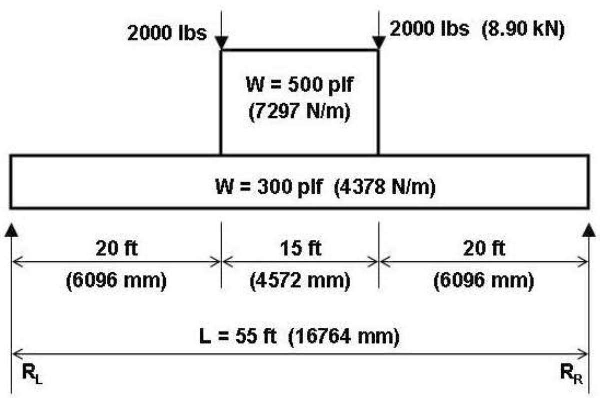
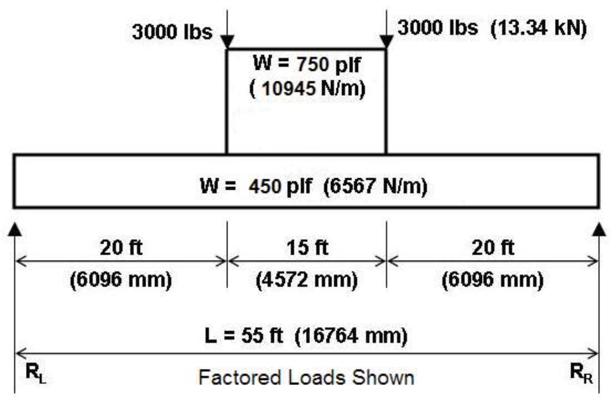
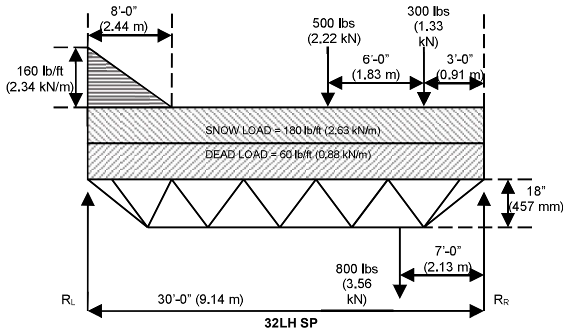
| **OPTION 4 - ASD EXAMPLE 3:** | **OPTION 4 - LRFD EXAMPLE 3:** |
|---|---|
| **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** | **U.S. CUSTOMARY UNITS AND (METRIC UNITS)** |
|  |  |
| M = 2910 k-in. (328.8 kN-m)<br>$R_L$ = $R_R$ = 14000 lbs (62.28 kN)<br>EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST) AND EXCEEDS MAXIMUM UNIFORM LOAD OF 550 plf (8027 N/m).<br>**OPTION A:** Use double joists each having a minimum moment capacity, M = 1455 k-in. (164.4 kN-m) and shear capacity, R = 7000 lbs (31.14 kN) and a uniform load of 400 plf (5838 N/m).<br>Select two 28KCS5, M = 1704 k-in. (192.5 kN-m),<br>R = 9200 lbs (40.9 kN).<br>Bridging section no. 12 for L = 55 ft. (16764 mm). Use 28K12 to determine bridging and stability requirements.<br>**OPTION B:** Select a LH-Series Joist. See OPTION 5. | M = 4365 k-in. (493.2 kN-m)<br>$R_L$ = $R_R$ = 21000 lbs (93.41 kN)<br>EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST AND EXCEEDS MAXIMUM ***FACTORED*** UNIFORM LOAD OF 825 plf (12040 N/m).<br>**OPTION A:** Use double joists each having a minimum moment capacity, M = 2183 k-in. (246.65 kN-m) and shear capacity, R = 10500 lbs (46.71 kN) and a uniform load of 600 plf (8756 N/m).<br>Select two 28KCS5, M = 2556 k-in. (288.7 kN-m),<br>R = 13800 lbs (61.3 kN).<br>Bridging section no. 12 for L = 55 ft. (16764 mm) Use 28K12 to determine bridging and stability requirements.<br>**OPTION B:** Select a LH-Series Joist. See OPTION 5. |

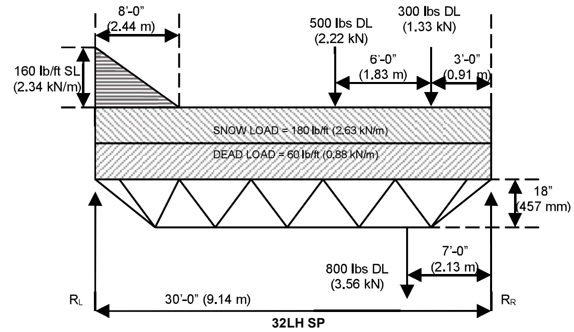
**Option 5**: Specify a SPECIAL joist designation when the joist includes more complex loading or for conditions which need consideration of multiple potentially controlling load combinations.

a) Provide a load diagram and/or enough information on the drawings to clearly define ALL loads.

b) If the loading criteria are too complex to adequately communicate on the drawings or with a simple load diagram, then the *specifying professional* shall provide a load schedule along with the appropriate load combinations. Regardless of where the loads are shown, unfactored design loads broken down by load categories shall be provided in order to design the joists correctly with applicable load combinations.

Place the designation (e.g. 28K SP or 28LH SP) with the following note: "Joist manufacturer to design joist to support loads as shown."

<table>
<tr><td>OPTION 5 - ASD EXAMPLE:</td><td>OPTION 5 - LRFD EXAMPLE:</td></tr>
<tr><td>U.S. CUSTOMARY UNITS AND (METRIC UNITS)</td><td>U.S. CUSTOMARY UNITS AND (METRIC UNITS)</td></tr>
<tr><td>Load diagram per ASCE 7 2.4.1(3), D + S</td><td>Unfactored Load diagram per ASCE 7 2.3.2(3), 1.2D+1.6S</td></tr>
<tr><td>

32LH SP<br>Joist manufacturer to design joist to support loads as shown above.</td>
<td>

32LH SP<br>Joist manufacturer to design joist to support unfactored loads as shown above.</td></tr>
<tr><td colspan="2">PLEASE NOTE THE LOAD COMBINATIONS SHOWN ARE FOR REFERENCE EXAMPLES ONLY.</td></tr>
</table>

**CAUTION FOR OPTIONS 1 thru 5 ABOVE**:

If a K-Series joist is being specified, the Specifying Professional shall compare the equivalent uniform loads derived from the maximum moment and shear to the uniform loads tabulated in the K-Series Load Table. An equivalent unfactored uniform load in excess of 550 plf (8020 N/m) or a maximum unfactored end reaction exceeding 9200 lbs. (40.9 kN) indicates that the *specifying professiona*l shall use additional joists to reduce the loading or use an LH-Series joist and make provisions for 5 inch (127 mm) deep bearing seats.

If the joist has not been designed for localized accumulation of loads that results in a point or concentrated load, this load attachment shall be made at top or bottom chord panel points. Therefore, specify on the structural drawings, "Where concentrated loads do not occur at panel points, an extra web shall be field applied from the point of attachment to a panel point on the opposite chord", and indicate the extra web size and weld requirements. When exact dimensional locations for concentrated loads are provided by the *specifying professional*, the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

**(b) Specifying Joist Girder Design Loads**

The Steel Joist Institute's Design Guide ASD or LRFD Weight Tables for Joist Girders are based on uniformly spaced panel point loading conditions and are valid for use in selecting Joist Girder sizes for gravity conditions that can be expressed in kips (kiloNewtons) per panel point on the Joist Girder. Note that anything other than point loads shall be shown unfactored or in a Load Schedule. For a given Joist Girder span, the *specifying professional* first determines the number of joist spaces. Then the panel point loads are calculated and a depth is selected. The information provided in the tables gives the Joist Girder weight in pounds per linear foot (kiloNewtons per meter) for various depths and loads.

1. The purpose of the Joist Girder Design Guide Weight Table is to assist the *specifying professional* in the selection of a roof or floor support system.
2. It is not necessary to use only the depths, spans, or loads shown in the tables.
3. Holes in chord elements present special problems that shall be considered by both the *specifying professional* and the Joist Girder Manufacturer. The sizes and locations of such holes shall be clearly indicated on the structural drawings.
4. Live load deflection rarely governs because of the relatively small span to depth ratios of Joist Girders. However, it is recommended that a breakdown of the point loads, by load category (i.e. TL/LL), be provided so specified deflection requirements and load combinations can be properly accounted for in design.

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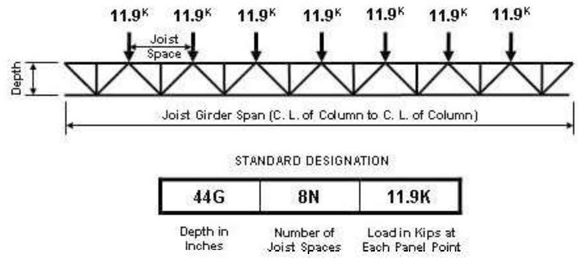
**Example using *Allowable Strength Design (ASD)* and U. S. Customary units:**




Given 42'-0" x 50'-0" bay. Joists spaced on 5'-3" centers

Live Load = 30 psf
Dead Load = 15 psf
(includes the approximate Joist Girder weight)
Total Load = 45 psf

Note: Web configuration may vary from that shown. Contact joist manufacturer if exact layout must be known.

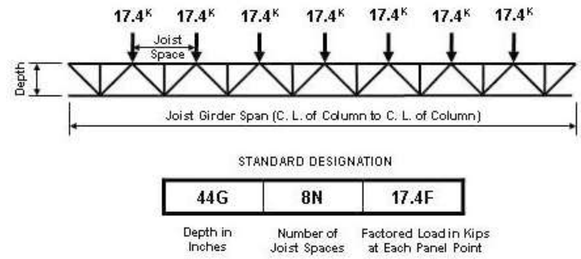
1. Determine number of actual joist spaces (N). In this example, N = 8.
2. Compute total load:

   Total load = 5.25 x 45 psf = 236.25 plf
3. Joist Girder Section: (Interior)
   a) Compute the concentrated load at top chord panel points

      P = 236.25 x 50 = 11,813 lbs = 11.9 kips (use 12K for depth selection).
   b) Select Joist Girder depth:

      Refer to the ASD Joist Girder Design Guide Weight Table for the 42'-0" span, 8 panel, 12.0K Joist Girder. The rule of about one inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore, select a depth of 44 inches.
   c) The Joist Girder shall then be designated 44G8N11.9K.
   d) The ASD Joist Girder Design Guide Weight Table shows the weight for a 44G8N12K as 49 pounds per linear foot. The designer should verify that the weight is not greater than the weight assumed in the Dead Load above.

**Example using *Load and Resistance Factor Design (LRFD)* and U. S. Customary units:**




Given 42'-0" x 50'-0" bay. Joists spaced on 5'-3" centers

Live Load = 30 psf x 1.6
Dead Load = 15 psf x 1.2
(includes the approximate Joist Girder weight)
Total Load = 66 psf (factored)

Note: Web configuration may vary from that shown. Contact joist manufacturer if exact layout must be known.

1. Determine number of actual joist spaces (N). In this example, N = 8.
2. Compute total factored load:

   Total load = 5.25 x 66 psf = 346.50 plf
3. Joist Girder Section: (Interior)
   a) Compute the factored concentrated load at top chord panel points

      P = 346.5 x 50 = 17,325 lbs = 17.4 kips (use 18K for depth selection).
   b) Select Joist Girder depth:

      Refer to the LRFD Joist Girder Design Guide Weight Table for the 42'-0" span, 8 panel, 18.0K Joist Girder. The rule of about one inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore, select a depth of 44 inches.
   c) The Joist Girder shall then be designated 44G8N17.4F. Note that the letter "F" is included at the end of the designation to clearly indicate that this is a factored load.
   d) The LRFD Joist Girder Design Guide Weight Table shows the weight for a 44G8N18.0F as 49 pounds per linear foot. The designer should verify that the weight is not greater than the weight assumed in the Dead Load above.

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| | |
|---|---|
| e) Check live load deflection:<br>Live load = 30 psf x 50 ft. = 1500 plf<br>Approximate Joist Girder moment of inertia<br>= 0.027 NPLd<br>= 0.027 x 8 x 11.9 x 42 x 44 = 4750 in.$^4$<br>Allowable deflection for plastered ceilings<br>= L/360 = $\frac{42(12)}{360} = 1.40$ in.<br>$\Delta = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(1.500/12)[(42)(12)]^4}{384(29000)(4750)}$<br>= 0.88 in. <1.40 in., Okay | e) Check live load deflection:<br>Live load = 30 psf x 50 ft. = 1500 plf<br>Approximate Joist Girder moment of inertia<br>= 0.018 NPLd<br>= 0.018 x 8 x 17.4 x 42 x 44 = 4630 in.$^4$<br>Allowable deflection for plastered ceilings<br>= L/360 = $\frac{42(12)}{360} = 1.40$ in.<br>$\Delta = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(1.500/12)[(42)(12)]^4}{384(29000)(4630)}$<br>= 0.90 in. <1.40 in., Okay |

**(c) Load Schedule Example**

**LOAD SCHEDULE (all loads are to be shown as unfactored)**

| MARK | DESIGNATION(1) ( TL/LL ) Joists: (plf) Girders: (kips) | LOADING(2) | | W WIND | | ADD-LOAD(6) | BEND-CHECK(7) | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | DL(3) (plf) | LL(4) or $L_r$/S/R (plf) | DOWN WARD (plf) | NET(5) UPLIFT (plf) | TL/LL (kips/kips) | D TC (kips) | D BC (kips) | |
| J1 | 18KSP | 120 | 185 | | 180 | 1.0/0.6 | | 0.3 | Axial Loads |
| J2 | 24K7SP | 85 | 155 | | | | | | Wind Moments |
| J3 | 28LHSP | 110 | 355 | 95 | 175 | 0.5 | | | Drift Loads, see diagram |
| G1 | 36G5N6.5K/3.5K | | | | 360 | | | | End Moments |

(1) Joist designation loads include all uniform gravity loads. **Provide both Total and Live loads.**

(2) Loading values are not required if designation loading values are correct for deflection and load combinations.

(3) When standard SJI designations are used, the design Dead Load is required for load combinations with Wind or Seismic.

(4) The Floor or Roof Live load, Snow, or Rain load.

(5) When Net Uplift is specified for simple loading, it shall already take into account possible reduced Dead Loading present in order to create the largest Net uplift load combination. For more complex loading or when the Dead Load varies greatly for use in load combinations below, ***Gross*** uplift should be specified with the minimum and maximum Dead Loading values clearly defined. If the uplift cannot be assigned in pounds per lineal foot, a diagram can be shown for joist loading using pounds per square foot.

(6) A concentrated load applied at any panel point on both the top chord and bottom chord.

(7) Chord members shall be designed for additional bending stresses created by this concentrated Total load.

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When in-plane moments (wind load, seismic load) are specified, continuity moments (live load) **shall** also be specified. A Load Schedule that shows a complete breakdown of all loads by Load Category may be required.

## AXIAL and END MOMENT LOAD SCHEDULE

| MARK | DESIGNATION ( TL/LL ) Joists: (plf) Girders: (kips) | MIN. I (in.$^4$) | AXIAL W WIND (kips) | AXIAL E SEISMIC (kips) | AXIAL $E_m$ (kips) | END MOMENTS LIVE LOAD CONTINUITY MOMENTS (k-ft.) LEFT | END MOMENTS LIVE LOAD CONTINUITY MOMENTS (k-ft.) RIGHT | LATERAL MOMENTS (k-ft.) W WIND LEFT | LATERAL MOMENTS (k-ft.) W WIND RIGHT | LATERAL MOMENTS (k-ft.) E LEFT | LATERAL MOMENTS (k-ft.) E RIGHT | LATERAL MOMENTS (k-ft.) $E_m$ LEFT | LATERAL MOMENTS (k-ft.) $E_m$ RIGHT | TRANSFER DETAILS @ GRIDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1 | 18KSP | | W=18.0 | E=21.8 | | | | | | | | | | 9/S8 @ 4 |
| J2 | 24K7SP | | | | | 40 | 40 | 35 | 35 | | | | | |
| G1 | 36G5N6.5K/3.5K | 985 | | | | 75 | 95 | 55 | 60 | | | | | 11/S8 @ B,C |

When special loads as shown in the tables above are specified, the load combinations to be used for joist and Joist Girder design **shall** be provided. Two examples showing how to list load combinations are shown below:

| **LRFD example**- Basic Load Combinations | **ASD example** - Basic Load Combinations |
|---|---|
| 1. 1.4D | 1. D |
| 2. 1.2D + 1.6L + 0.5($L_r$ or S or R) | 2. D + L |
| 3. 1.2D + 1.6($L_r$ or S or R) + (1.0L or 0.5W) | 3. D + ($L_r$ or S or R) |
| 4. 1.2D + 1.0W + 1.0L + 0.5($L_r$ or S or R) | 4. D + 0.75L + 0.75($L_r$ or S or R) |
| 5. 1.2D + 1.0E + 1.0L + 0.2S | 5. D + (0.6W or 0.7E) |
| 6. 0.9D + 1.0W | 6a. D + 0.75L + 0.75(0.6W) + 0.75($L_r$ or S or R) |
| 7. 0.9D + 1.0E | 6b. D + 0.75L + 0.75(0.7E) +0.75S |
| | 7. 0.6D + 0.6W |
| | 8. 0.6D + 0.7E |
| | |
| Special Seismic Load Combinations | Special Seismic Load Combinations |
| 8. (1.2 + 0.2$S_{DS}$)D + $E_h$ + L + 0.2S | 9. (1.0 + 0.14$S_{DS}$)D + 0.7$E_h$ |
| 9. (0.9 – 0.2$S_{DS}$)D + $E_h$ | 10. (1.0 + 0.105$S_{DS}$)D + 0.525$E_h$ + 0.75L + 0.75($L_r$ or S or R) |
| | 11. (0.6 – 0.14$S_{DS}$)D + 0.7$E_h$ |

### 2.5 JOIST AND JOIST GIRDER EXTENSIONS

Steel joist and Joist Girder extensions shall be specified and designed in accordance with the requirements of the Steel Joist Institute Standard Specifications of latest adoption.

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**2.6 CEILING EXTENSIONS**

Ceiling extensions shall be furnished to support ceilings that are to be attached directly to the bottom of the joists. They are not furnished for the support of suspended ceilings. The ceiling extension shall be either an extended bottom chord element or a loose unit, whichever is standard with the manufacturer, and shall be of sufficient strength to properly support any specified ceiling loads.

**2.7 BRIDGING AND BRIDGING ANCHORS**

(a) Bridging standard with the manufacturer and complying with the Steel Joist Institute Standard Specifications of latest adoption shall be used for bridging all joists furnished by the joist manufacturer. Positive anchorage shall be provided at the ends of each bridging row at both top and bottom chords.

(b) For K-Series and LH-Series joists, horizontal bridging is recommended for spans up to and including 60 feet (18288 mm) except where the Steel Joist Institute Standard Specifications Load Tables & Weight Tables require bolted diagonal bridging for erection stability.

LH-Series and DLH-Series joists exceeding 60 feet (18288 mm) in length shall have bolted diagonal bridging for all rows.

Refer to Section 5.5 in the Steel Joist Institute Standard Specification for erection stability requirements.

Refer to Appendix B for OSHA steel joist erection stability requirements.

Horizontal bridging shall consist of continuous horizontal steel members designed per Section 5.5 in the Steel Joist Institute Standard Specifications. The material sizes listed in Table 2.7-1 meet the requirements of the specifications. Alternately, or for "load/length" designation joists, Table 2.7-2 provides the maximum horizontal bridging force, $P_{br}$, for various combinations of joist spacing and bridging angle size.

(c) Diagonal cross bridging consisting of angles or other shapes connected to the top and bottom chords of K-Series, LH-Series, and DLH-Series joists shall be used when required by the Steel Joist Institute Standard Specifications of latest adoption.

Diagonal bridging, when used, shall be designed per Section 5.5 in the Steel Joist Institute Standard Specifications.

When the bridging members are connected at their point of intersection, the material sizes listed in Table 2.7-3 and Table 2.7-4 meet the requirements of the specifications.

For LH-Series and DLH-Series joists, where the joist spacing is less than 70 percent of the joist depth, bolted horizontal bridging shall be provided in addition to the diagonal bridging, as shown in Table 2.7-4.

(d) When bolted diagonal erection bridging is required, the following shall apply:

1. The bridging shall be indicated on the joist placement plans.
2. The joist placement plans shall be the exclusive indicator for the proper placement of this bridging.
3. Shop installed bridging clips, or functional equivalents, shall be provided where the bridging bolts to the steel joist.
4. When two pieces of bridging are attached to a steel joist by a common bolt, the nut that secures the first piece of bridging shall not be removed from the bolt for the attachment of the second piece.
5. Bridging attachments shall not protrude above the top chord of the steel joists.
6. See Table 2.7-5 for bolt sizes that meet the connection requirements of the Steel Joist Institute Standard Specifications Section 5.5.

## TABLE 2.7-1

**MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING**

SPANS OVER 60 ft. (18.3 m) REQUIRE BOLTED DIAGONAL BRIDGING

| **JOIST SECTION NUMBER[1]** | Nominal Unfactored Force $P_{br}$ lbs (N) | BRIDGING MATERIAL SIZE[2] Equal Leg Angles | | | | | |
|---|---|---|---|---|---|---|---|
| | | **1 x 7/64 (25 x 3 mm) r = 0.20” (5.08 mm)** | **1-1/4 x 7/64 (32 x 3 mm) r = 0.25” (6.35 mm)** | **1-1/2 x 7/64 (38 x 3 mm) r = 0.30” (7.62 mm)** | **1-3/4 x 7/64 (45 x 3 mm) r = 0.35” (8.89 mm)** | **2 x 1/8 (52 x 3 mm) r = 0.40” (10.16 mm)** | **2-1/2 x 5/32 (64 x 4 mm) r = 0.50” (12.70 mm)** |
| | | ft.-in. (mm) | ft.-in. (mm) | ft.-in. (mm) | ft.-in. (mm) | ft.-in. (mm) | ft.-in. (mm) |
| **K1 – 8** | 340 (1512) | 5’-0” (1524) | 6’–3” (1905) | 7’–6” (2286) | 8’-9” (2667) | 10’–0” (3048) | 12’–6” (3810) |
| **K9-10, LH02-03** | 450 (2002) | 4’-4” (1321) | 6’-1” (1854) | 7’–6” (2286) | 8’–9” (2667) | 10’–0” (3048) | 12’–6” (3810) |
| **K11-12, LH04-05** | 560 (2491) | 3’–11”(1194) | 5’–6” (1676) | 7’–4” (2235) | 8’–9” (2667) | 10’–0” (3048) | 12’–6” (3810) |
| **LH06-08** | 750 (3336) | | 4’–9” (1448) | 6’–3” (1905) | 7’–11” (2413) | 10’–0” (3048) | 12’–6” (3810) |
| **LH09** | 850 (3781) | | 4’–5” (1346) | 5’–10” (1778) | 7’–5” (2261) | 9’–9” (2972) | 12’–6” (3810) |
| **LH/DLH10** | 900 (4003) | | 4’–4” (1321) | 5’–8” (1727) | 7’–3” (2210) | 9’–5” (2870) | 12’–6” (3810) |
| **LH/DLH11** | 950 (4226) | | 4’–2” (1270) | 5’–7” (1702) | 7’–0” (2134) | 9’–2” (2794) | 12’–6” (3810) |
| **LH/DLH12** | 1100 (4893) | | 3’-11” (1194) | 5’–2” (1575) | 6’–8” (2032) | 8’–6” (2591) | 12’-6” (3810) |
| **LH/DLH13** | 1200 (5338) | | 3’-9” (1143) | 4’–11” (1499) | 6’–3” (1905) | 8’-2” (2489) | 12-6” (3810) |
| **LH/DLH14** | 1300 (5783) | | | 4’-9” (1448) | 6’-0” (1829) | 7’-10” (2388) | 12’-4” (3759) |
| **LH/DLH15** | 1450 (6450) | | | 4’-6” (1372) | 5’-8” (1727) | 7’-5” (2261) | 11’-8” (3556) |
| **LH/DLH16–17** | 1850 (8229) | | | 4’-0” (1219) | 5’-0” (1524) | 6’-7”(2007) | 10’-4” (3150) |
| **LH/DLH18–20** | 2350 (10453) | | | 3’-7” (1067) | 4’-4” (1321) | 5’-10” (1778) | 9’-1” (2769) |
| **LH/DLH21–22** | 3150 (14012) | | | | 3’-10” (1168) | 5’-0” (1524) | 7’-11” (2413) |
| **LH/DLH23–24** | 4130 (18371) | | | | 3’-4” (1016) | 4’-5” (1346) | 6’-11” (2108) |
| **LH/DLH25** | 4770 (21218) | | | | | 4’-1”(1245) | 6’-5” (1956) |

(1) Refer to last two digit(s) of Joist Designation

(2) Connection to joist shall resist force listed in the Steel Joist Institute Standard Specifications Table 5.5-2

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## TABLE 2.7-2

| MAXIMUM BRIDGING FORCE ($P_{br}$) FOR HORIZONTAL BRIDGING (lbs) | | | | | | | |
|---|---|---|---|---|---|---|---|
| JOIST SPACING (ft.-in.) | BRIDGING ANGLE SIZE (EQUAL LEG ANGLE) | | | | | | |
| | 1 x 7/64<br>r = 0.20" | 1¼ x 7/64<br>r = 0.25" | 1½ x7/64<br>r = 0.30" | 1¾ x 7/64<br>r = 0.35" | 2 x 1/8<br>r = 0.40" | 2½ x 5/32<br>r = 0.50" | 3 x 3/16<br>r = 0.60" |
| 2'-0" | 2150 | 3960 | 5600 | | | | |
| 2'-6" | 1370 | 2730 | 4410 | 5910 | | | |
| 3'-0" | 950 | 1890 | 3290 | 4850 | | | |
| 3'-6" | 700 | 1390 | 2420 | 3840 | 6180 | | |
| 4'-0" | 530 | 1060 | 1850 | 2960 | 5030 | | |
| 4'-6" | 420 | 840 | 1460 | 2340 | 4000 | | |
| 5'-0" | 340 | 680 | 1180 | 1890 | 3240 | | |
| 5'-6" | - | 560 | 980 | 1560 | 2670 | | |
| 6'-0" | - | 470 | 820 | 1310 | 2250 | 5490 | |
| 6'-6" | - | - | 700 | 1120 | 1910 | 4680 | |
| 7'-0" | - | - | 600 | 960 | 1650 | 4030 | |
| 7'-6" | - | - | 520 | 840 | 1440 | 3510 | |
| 8'-0" | - | - | - | 740 | 1260 | 3090 | |
| 8'-6" | - | - | - | 650 | 1120 | 2740 | 5680 |
| 9'-0" | - | - | - | - | 1000 | 2440 | 5060 |
| 9'-6" | - | - | - | - | 890 | 2190 | 4540 |
| 10'-0" | - | - | - | - | 810 | 1970 | 4100 |
| 10'-6" | - | - | - | - | - | 1790 | 3720 |
| 11'-0" | - | - | - | - | - | 1630 | 3390 |
| 11'-6" | - | - | - | - | - | 1490 | 3100 |
| 12'-0" | - | - | - | - | - | 1370 | 2850 |

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## TABLE 2.7-3

| K, LH, and DLH SERIES JOISTS MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING[1] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **JOIST DEPTH** | BRIDGING ANGLE SIZE – (EQUAL LEG ANGLE)[2] | | | | | | | |
| | **1 x 7/64** (25 x 3 mm) **r = 0.20”** (5.08 mm) | **1-1/4 x 7/64** (32 x 3 mm) **r = 0.25”** (6.35 mm) | **1-1/2 x 7/64** (38 x 3 mm) **r = 0.30”** (7.62 mm) | **1-3/4 x 7/64** (45 x 3 mm) **r = 0.35”** (8.89 mm) | **2 x 1/8** (50 x 3 mm) **r = 0.40”** (10.16 mm) | **2 ½ x 5/32** (64x 4 mm) **r=0.50”** (12.70 mm) | **3 x 3/16** (76 x 5 mm) **r = 0.60”** (15.24 mm) | **3 ½ x 1/4** (89 x 6 mm) **r = 0.70”** (17.78 mm) |
| **in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** | **ft.-in. (mm)** |
| **12”** (305) | 6’-7” (2007) | 8’-3” (2514) | 9’-11”(3022) | 11’-7” (3530) | 13’-3”(4038) | 16’-7”(5055) | 19’-11”(6070) | 23’-3”(7086) |
| **14”** (356) | 6’-6” (1981) | 8’-3” (2514) | 9’-11”(3022) | 11’-7” (3530) | 13’-3”(4038) | 16’-7”(5055) | 19’-11”(6070) | 23’-3”(7086) |
| **16”** (406) | 6’-6” (1981) | 8’-2” (2489) | 9’-10”(2997) | 11’-7” (3530) | 13’-3”(4038) | 16’-7”(5055) | 19’-11”(6070) | 23’-3”(7086) |
| **18”** (457) | 6’-6” (1981) | 8’-2” (2489) | 9’-10”(2997) | 11’-6” (3505) | 13’-3”(4038) | 16’-7”(5055) | 19’-11”(6070) | 23’-3”(7086) |
| **20”** (508) | 6’-5” (1955) | 8’-2” (2489) | 9’-10”(2997) | 11’-6” (3505) | 13’-2”(4013) | 16’-7”(5055) | 19’-11”(6070) | 23’-3”(7086) |
| **22”** (559) | 6’-4” (1930) | 8’-1” (2463) | 9’-10”(2997) | 11’-6” (3505) | 13’-2”(4013) | 16’-6”(5029) | 19’-11”(6070) | 23’-3”(7086) |
| **24”** (610) | 6’-4” (1930) | 8’-1” (2463) | 9’-9” (2971) | 11’-5” (3479) | 13’-2”(4013) | 16’-6”(5029) | 19’-10”(6045) | 23’-3”(7086) |
| **26”** (660) | 6’-3” (1905) | 8’-0” (2438) | 9’-9” (2971) | 11’-5” (3479) | 13’-1”(3987) | 16’-6”(5029) | 19’-10”(6045) | 23’-2”(7061) |
| **28”** (711) | 6’-3” (1905) | 8’-0” (2438) | 9’-8” (2946) | 11’-5” (3479) | 13’-1”(3987) | 16’-6”(5029) | 19’-10”(6045) | 23’-2”(7061) |
| **30”** (762) | 6’-2” (1879) | 7’-11 (2413) | 9’-8” (2946) | 11’-4” (3454) | 13’-1”(3987) | 16’-5”(5004) | 19’-10”(6045) | 23’-2”(7061) |
| **32”** (813) | 6’-1” (1854) | 7’-10”(2387) | 9’-7” (2921) | 11’-4” (3454) | 13’-0” (3962) | 16’-5”(5004) | 19’-9”(6020) | 23’-2”(7061) |
| **36”** (914) | 5’-11”(1803) | 7’-9” (2362) | 9’-6” (2895) | 11’-3” (3429) | 12’-11”(3973) | 16’-4”(4979) | 19’-9”(6020) | 23’-1”(7035) |
| **40”** (1016) | 5’-9”(1753) | 7’-7” (2311) | 9’-5” (2870) | 11’-2” (3403) | 12’-10”(3911) | 16’-4”(4979) | 19’-8”(5994) | 23’-1”(7035) |
| **44”** (1118) | 5’-6”(1676) | 7’-5” (2260) | 9’-3” (2819) | 11’-0” (3352) | 12’-9” (3886) | 16’-3”(4953) | 19’-7”(5969) | 23’-0”(7010) |
| **48”** (1219) | 5’-4”(1626) | 7’-3” (2209) | 9’-2” (2794) | 10’-11”(3327) | 12’-8” (3860) | 16’-2”(4928) | 19’-7”(5969) | 22’-11”(6985) |
| **52”** (1321) | 5’-0”(1524) | 7’-1”(2159) | 9’-0” (2743) | 10’-10” (3302) | 12’-7” (3835) | 16’-1”(4902) | 19’-6”(5943) | 22’-11”(6985) |
| **56”** (1422) | 4’-9”(1448) | 6’-10”(2083) | 8’-10”(2692) | 10’-8” (3251) | 12’-5” (3784) | 16’-0”(4877) | 19’-5”(5918) | 22’-10”(6960) |
| **60”** (1524) | 4’-4”(1321) | 6’-8”(2032) | 8’-7” (2616) | 10’-6” (3200) | 12’-4” (3759) | 15’-10”(4826) | 19’-4”(5893) | 22’-9”(6935) |
| **64”** (1626) | ** | 6’-4”(1931) | 8 -5” (2565) | 10’-4” (3149) | 12’-2” (3708) | 15’-9” (4801) | 19’-3”(5867) | 22’-8”(6909) |
| **68”** (1727) | ** | 6’-1”(1854) | 8’-2” (2489) | 10’-2” (3098) | 12’-0” (3657) | 15’-8” (4775) | 19’-2”(5842) | 22’-7”(6884) |
| **72”** (1829) | ** | 5’-9”(1753) | 8’-0” (2438) | 10’-0” (3048) | 11’-10”(3606) | 15’-6” (4724) | 19’-1” (5816) | 22’-6” (6858) |
| **80”** (2032) | ** | 5’-0”(1524) | 7’-5”(2260) | 9’-6” (2895) | 11’-6” (3505) | 15’-3” (4648) | 18’-10”(5740) | 22’-4” (6808) |
| **88”** (2235) | | ** | 6’-9”(2058) | 9’-0” (2743) | 11’-1” (3378) | 14’-11”(4546) | 18’-7” (5664) | 22’-1” (6731) |
| **96”** (2438) | | ** | 6’-0”(1829) | 8’-5” (2565) | 10’-8”(3251) | 14’-7” (4445) | 18’-4” (5588) | 21’-11”(6680) |
| **104”** (2642) | | | ** | 7’-9” (2362) | 10’-1”(3073) | 14’-2” (4318) | 18’-0” (5486) | 21’-8” (6604) |
| **112”** (2845) | | | ** | 7’-0” (2134) | 9’-6”(2895) | 13’-9” (4191) | 17’-8” (5385) | 21’-4” (6503) |
| **120”** (3048) | | | | ** | 8’-9”(2667) | 13’-4”(4064) | 17’-3” (5258) | 21’-1” (6426) |

**** INTERPOLATION BELOW THE MINIMUM VALUES SHOWN IS NOT ALLOWED.**

1) SEE TABLE 2.7-4 FOR MINIMUM JOIST SPACE FOR DIAGONAL ONLY BRIDGING.
2) In the shaded range of the Table, for LH23, 24,and 25, compressive strength requirements may control, reducing the maximum joist spacing shown. Either select a larger bridging angle size (outside of the shaded area) or check compression strength (Ref. Section 2.7(c)) for LH23, 24, and 25.

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## TABLE 2.7-4

| LH AND DLH SERIES JOISTS HORIZONTAL PLUS DIAGONAL BRIDGING REQUIREMENTS | | |
|---|---|---|
| **JOIST DEPTH** | **MINIMUM JOIST SPACE FOR DIAGONAL ONLY BRIDGING (0.70 x DEPTH)*** | **HORIZONTAL AND DIAGONAL MINIMUM ANGLE SIZE REQUIRED** FOR JOIST SPACING < (0.70 X DEPTH) AND JOIST SPANS > 60'-0" (18.3 m) |
| **in. (mm)** | **ft.-in. (mm)** | **in. (mm)** |
| 52" (1321) | 3'- 0" (914) | 1" x 1" x 7/64" (25 x 3) |
| 56" (1422) | 3'- 3" (990) | 1" x 1" x 7/64" (25 x 3) |
| 60" (1524) | 3'- 6" (1066) | 1" x 1" x 7/64" (25 x 3) |
| 64" (1626) | 3'- 8" (1117) | 1¼" x 1¼" x 7/64" (32 x 3) |
| 68" (1727) | 3'-11" (1193) | 1¼" x 1¼" x 7/64" (32 x 3) |
| 72" (1829) | 4'- 2" (1270) | 1¼" x 1¼" x 7/64" (32 x 3) |
| 80" (2032) | 4'- 8" (1422) | 1¼" x 1¼" x 7/64" (32 x 3) |
| 88" (2235) | 5'- 1" (1549) | 1 ½" x 1 ½" x 7/64" (38 x 3) |
| 96" (2438) | 5'- 7" (1702) | 1 ½" x 1 ½" x 7/64" (38 x 3) |
| 104" (2642) | 6'- 0" (1829) | 1 ¾" x 1 ¾" x 7/64" (44 x 3) |
| 112" (2845) | 6'- 6" (1981) | 1 ¾" x 1 ¾" x 7/64" (44 x 3) |
| 120" (3048) | 7'- 0" (2134) | 2" x 2" x1/8" (51 x 3) |

*NOTE: WHEN THE JOIST SPACING IS LESS THAN 0.70 x JOIST DEPTH, BOLTED HORIZONTAL BRIDGING SHALL BE USED IN ADDITION TO DIAGONAL BRIDGING.

## TABLE 2.7-5

| BOLT SIZES WHICH MEET BOLTED BRIDGING CONNECTION REQUIREMENTS | | |
|---|---|---|
| **JOIST SERIES** | **SECTION NUMBER*** | **BOLT DIAMETER** |
| K | ALL | 3/8" (10 mm) A307 |
| LH/DLH | 2 – 12 | 3/8" (10 mm) A307 |
| LH/DLH | 13 – 17 | 1/2" (13 mm) A307 |
| LH/DLH | 18 – 20 | 5/8" (16 mm) A307 |
| LH/DLH | 21 – 22 | 5/8" (16 mm) A325 |
| LH/DLH | 23 – 25 | 3/4" (19 mm) A325 |

*REFER TO LAST DIGIT(S) OF JOIST DESIGNATION

NOTE: WASHERS SHALL BE USED WITH SLOTTED OR OVERSIZED HOLES. BOLTS SHALL BE TIGHTENED TO A MINIMUM SNUG TIGHT CONDITION.

**2.8 HEADERS**

Where the end reaction of a steel joist is supported by a header, as outlined and defined in Section 5.2(a), and is not more than 10,000 pounds (44482 N), the header shall be furnished by the Seller. Such headers shall be any type standard with the joist manufacturer. Conditions involving headers shall be investigated during erection and, if necessary, provisions made to provide a safe condition. Headers are not provided for steel joists with end reactions greater than 10,000 pounds (44482 N).

**2.9 BOTTOM CHORD LATERAL BRACING FOR JOIST GIRDERS**

Bottom chord lateral bracing shall be furnished as required to prevent lateral movement of the bottom chord of the Joist Girder and to prevent the ratio of chord length to chord radius of gyration from exceeding that specified in the Steel Joist Institute Standard Specifications of latest adoption. The lateral bracing shall be that which is standard with the joist manufacturer, and shall be sufficient to properly brace the bottom chord of the Joist Girder.

**2.10 CONNECTIONS**

The adequacy of the end anchorage connection (bolted or welded) between the joist or Joist Girder bearing seat and the supporting structure is the responsibility of the *specifying professional*. The contract documents shall clearly illustrate the end anchorage connection. Forces to be considered include end moments, axial loads, and diaphragm boundaries. Particular attention is required where there is net uplift.

**Welded End Anchorage for Uplift**
The strength of the joist bearing seat for an uplift loading combination is a function of both the joist seat thickness and length of the end anchorage welds. The minimum end anchorage welds as shown in the Steel Joist Institute Standard Specifications Table 5.7-1 may not develop the full capacity of the joist seat assembly for the specified uplift resistance. When the support dimensions allow, it is recommended the *specifying professional* use a small fillet weld thickness in conjunction with a longer weld length for the connection design to facilitate the design of the joist bearing seat. The joist manufacturer will provide a seat of sufficient thickness and strength to resist the uplift end reaction resulting from the specified uplift. For additional information, including tables for welded end anchorage uplift capacities, refer to Steel Joist Institute Technical Digest 6, “Structural Design of Steel Joist Roofs to Resist Uplift Loads”

**Bolted End Anchorage for Uplift**
Typically, joists and Joist Girders with bolted end anchorage also require a final connection by welding in order to provide lateral stability to the supporting member. However, only the bolts are relied on to provide uplift anchorage. The bolt type and diameter designed by the *specifying professional* shall provide sufficient tensile strength to resist the uplift end reaction resulting from the specified uplift. Bolts of higher strength than the minimum required by the Steel Joist Institute Standard Specifications may be required.

When the bearing seats are detailed for a bolted connection, bolts shall be installed. If the bolts are not installed, an equivalent welded connection may be permitted by the *specifying professional*, provided the weld is deposited in the slot on the side farthest from the edge of the seat. Additional weld required to meet that specified for the welded connection shall be placed at a location on the seat away from the outer edge of the slot as shown in Figure 2.10-1.
For additional information, including tables for bolted end anchorage uplift capacities, refer to Steel Joist Institute Technical Digest 6, “Structural Design of Steel Joist Roofs to Resist Uplift Loads”

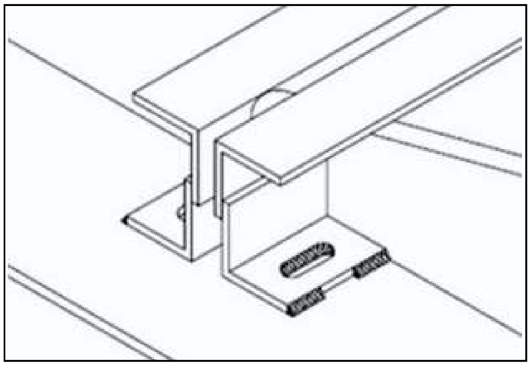

**Figure 2.10-1**

SECTION 3.
# MATERIALS

**3.1 STEEL**

The steel used in the manufacture of joists and Joist Girders shall comply with the Steel Joist Institute Standard Specifications of latest adoption.

**3.2 PAINT**

(a) Standard Shop Paint - The shop coat of paint, when specified, shall comply with the Steel Joist Institute Standard Specifications of latest adoption.

(b) Disclaimer - The typical shop applied paint that is used to coat steel joists and Joist Girders is a dip applied, air dried paint. The paint is intended to be an impermanent and provisional coating which shall protect the steel for only a short period of exposure in ordinary atmospheric conditions.

Since most joists and Joist Girders are painted using a standard dip coating, the coating shall be permitted to not be uniform and shall be permitted to include drips, runs, and sags. Compatibility of any coating including fire protective coatings applied over the standard shop paint shall be the responsibility of the specifier and/or painting contractor.

The shop applied paint may require field touch-up/repair as a result of, but not limited to, the following:

1. Abrasions from: Bundling, banding, loading and unloading, chains, dunnage during shipping, cables and chains during erection, bridging, installation, and other handling at the jobsite.
   NOTE: Rusting should be expected at any abrasion.
2. Dirt.
3. Diesel smoke.
4. Road salt.
5. Weather conditions during storage.

The joist manufacturer shall not be responsible for the condition of the paint if it is not properly protected after delivery.

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SECTION 4.

# INSPECTION

Inspections shall be made in accordance with Section 5.14 of the Steel Joist Institute Standard Specifications of latest adoption.

SECTION 5.

# ESTIMATING

## 5.1 PLANS FOR BIDDING

Plans to serve as the basis for bids shall show the character of the work with sufficient clarity to permit making an accurate estimate and shall show the following:

- Designation and location of Materials [see Section 5.2(a)], including any special design or configuration requirements
- Locations and elevations of all steel and concrete supporting members and bearing walls
- Location and length of joist extended ends
- Location and size of all openings in floors and roofs
- Location of all partitions
- Loads and their locations as defined in Section 6.1
- Construction and thickness of floor slabs, roof deck, ceilings and partitions
- Joists or Joist Girders requiring extended bottom chords
- Paint, if other than manufacturer's standard

## 5.2 SCOPE OF ESTIMATE

(a) Unless otherwise specified, the following items shall be included in the estimate, and requirements shall be determined as outlined in Section 6.1:

- Steel Joists
- Joist Girders
- Joist Substitutes
- Joist Extended Ends
- Ceiling Extensions
- Extended bottom chord used as strut
- Bridging
- Joist Girder bottom chord bracing
- Headers which are defined as members supported by and carrying Open Web Steel Joists with end reactions of no more than 10,000 lbs. (44482 N)
- One shop coat of paint, when specified, shall be in accordance with Section 3.2

(b) The following items shall not be included in the estimate but shall be permitted to be quoted and identified by the joist manufacturer as separate items:

- Headers carrying Open Web Steel Joists with end reactions greater than 10,000 lbs. (44482 N)
- Headers for Deep Longspan Steel Joists, **DLH**-Series

- Reinforcement in slabs over joists
- Centering material, decking, and attachments
- Miscellaneous framing between joists for openings at ducts, dumbwaiters, ventilators, skylights, etc.
- Loose individual or continuous bearing plates and bolts or anchors for such plates
- Erection bolts for joist and Joist Girder end anchorage
- Horizontal bracing in the plane of the top and bottom chords from joist to joist or joist to structural framing and walls
- Bridging anchors and anchorage
- Wood nailers
- Moment plates
- Special joist configuration or bridging layouts for ductwork or sprinkler systems
- Shear studs

## SECTION 6.
## PLANS AND SPECIFICATIONS

### 6.1 PLANS FURNISHED BY BUYER

The Buyer shall furnish the Seller plans and specifications as prepared by the *specifying professional* showing all Material requirements and steel joist and/or steel Joist Girder designations, the layout of walls, columns, beams, girders and other supports, as well as floor and roof openings and partitions correctly dimensioned. The elevation of finished floors, roofs, and bearings shall be shown.

**(a) Loads**

The *specifying professional* shall clearly provide all design loads as described in Section 2.4 This includes the live loads to be used, the wind uplift if any, the weights of partitions and the location and amount of any special loads, such as monorails, fans, blowers, tanks, etc.

**(b) Connections**

Minimum end anchorage for simple span gravity loading shall be in accordance with Steel Joist Institute Standard Specifications of latest adoption, Section 5.7. The end anchorage of a steel joist or Joist Girder is the connection of the joist or Joist Girder bearing seat to the support of the joist or Joist Girder.

The adequacy of the end anchorage connection (bolted or welded) between the joist or Joist Girder bearing seat and the supporting structure is the responsibility of the *specifying professional*. The contract documents shall clearly illustrate the end anchorage connection.

The joist manufacturer is responsible for the design of the bearing seats of joists or Joist Girders for the loads designated by the *specifying professional* in the contract documents.

The *specifying professional* is responsible for bridging termination connections. The contract documents shall clearly illustrate these termination connections.

**(c) Special Considerations**

The *specifying professional* shall indicate on the construction documents special considerations including:

1) Profiles for non-standard joist and Joist Girder configurations (Standard joist and Joist Girder configurations are as indicated in the Steel Joist Institute Standard Specifications of latest adoption).
2) Oversized or other non-standard web openings
3) Extended Ends

4) Deflection criteria for live and total loads for non-SJI standard joists
5) Non-SJI standard bridging

**6.2 PLANS FURNISHED BY SELLER**

The Seller shall furnish the buyer with steel joist placement plans to show the material as specified on the construction documents and are to be utilized for field installation in accordance with specific project requirements as stated in Section 6.1. Steel placement plans shall include, at a minimum, the following:

a) Listing of all applicable loads as stated in Section 6.1 and used in the design of the steel joists and Joist Girders as specified in the construction documents.

b) Profiles for non-standard joist and Joist Girder configurations (standard joist and Joist Girder configurations are as indicated in the Steel Joist Institute Standard Specifications of latest adoption).

c) Connection requirements for:

   1) Joist supports
   2) Joist Girder supports
   3) Field splices
   4) Bridging attachments

d) Deflection criteria for live load and total loads for non-SJI standard joists.

e) Size, location, and connections for all bridging

f) Joist headers

All Material shall be identified with its mark which also appears on the Bill of Materials. The shop paint shall be as noted on the joist placement plans. **Steel joist placement plans do not require the seal and signature of the joist manufacturer's registered design professional**.

**6.3 DISCREPANCIES**

The *specifying professional's* bid plans and specifications shall be assumed to be correct in the absence of written notice from the Buyer to the contrary. When plans are furnished by the Buyer that do not agree with the Architect's bid plans, such detailed plans shall be considered as a written notice of change of plans. However, it shall be the Buyer's responsibility to advise the Seller of those changes which affect the joists or Joist Girders.

**6.4 APPROVAL**

When joist placement plans are furnished by the Seller, they are submitted to the Buyer and owner for examination and approval. The Seller allows a maximum of fourteen (14) calendar days in their schedule for the return of placement plans noted with the owner's and customer's approval, or approval subject to corrections as noted. The Seller makes the corrections, furnishes corrected prints for field use to the owner/customer and is released by the owner/customer to start joist manufacture.

Approval by the owner/customer of the placement plans, sections, notes and joist schedule prepared by the Seller indicates that the Seller has correctly interpreted the contract requirements, and is released by the owner/customer to start joist manufacture. This approval constitutes the owner's/customer's acceptance of all responsibility for the design adequacy of any detail configuration of joist support conditions shown by the Seller as part of the preparation of these placement plans.

Approval does not relieve the Seller of the responsibility for accuracy of detail dimensions on the plans, nor the general fit-up of joists to be placed in the field.

**6.5 CHANGES**

When any changes in plans are made by the Buyer (or the buyer's representative) either prior to or after approval of detailed plans, or when any Material is required and was not shown on the plans used as the basis of the bid, the cost of such changes and/or extra Material shall be paid by the Buyer at a price to be agreed upon between Buyer and Seller.

**6.6 CALCULATIONS**

The Seller shall design the steel joists and/or steel Joist Girders in accordance with the current Steel Joist Institute Standard Specifications of latest adoption to support the load requirements of Section 6.1. The *specifying professional* may require submission of the steel joist and Joist Girder calculations as prepared by a registered design professional responsible for the product design. If requested by the *specifying professional*, the steel joist manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's registered design professional. In addition to standard calculations under this seal and signature, submittal of the following shall be included:

a) Non-SJI standard bridging details (e.g. for cantilevered conditions, net uplift, etc.)

b) Connection details for:

    1) Non-SJI standard connections (e.g. flush framed or framed connections)
    2) Field splices
    3) Joist headers

## SECTION 7.
## HANDLING AND ERECTION

The Buyer and Erector shall comply with the requirements of the Steel Joist Institute Standard Specifications of latest adoption in the handling and erection of Material. For additional coverage of this topic, refer to the Steel Joist Institute's Technical Digest 9, "Handling and Erection of Steel Joists and Joist Girders".

The Buyer and/or Erector shall check all materials on arrival at job site and promptly report to Seller any discrepancies and/or damages.

When joists cannot be delivered as a single piece, they shall be permitted to be delivered in several pieces therefore requiring the pieces to be spliced together in the field. The manufacturer's instructions SHALL be followed to ensure matching pieces are joined, proper bolts are used, and any required bolt tensioning is incorporated.

All joists shall be handled by methods which avoid damage to any part of the joist. For long **LH**-Series joists, **DLH**-Series joists, or Joist Girders this may require the use of spreader bars, multiple hoisting cables, or multiple cranes as necessary to safely handle the joist. Hoisting cables shall be attached at panel points and shall be at panel point locations selected to minimize erection stresses.

The current OSHA, 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R- Steel Erection, refers to certain joists at or near columns to be designed with sufficient strength to allow one employee to release the hoisting cable without the need for erection bridging. **This STANDARD shall not be interpreted that any joist at or near a column line is safe to support an employee without bridging installed.** Many limitations exist that prevent these joists from being designed to safely allow an employee on an un-bridged joist. Because of these limitations these joists shall be erected by incorporating erection methods ensuring joist stability and either:

1) Installing bridging or otherwise stabilizing the joist prior to releasing the hoisting cable, or
2) Releasing the hoisting cable without having a worker on the joist.

A steel joist or Joist Girder shall not be placed on any support structure unless such structure is stabilized. When steel joists or Joist Girders are landed on a structure, they shall be secured to prevent unintentional displacement prior to installation.

A bridging terminus point shall be established before joist bridging is installed.

Steel joist and Joist Girders shall not be used as anchorage points for a fall arrest system unless written directions to do so is obtained from a "qualified person". (For definition of "qualified person" see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R- Steel Erection, §1926.751 Definitions, January 18, 2001, Washington, D.C.)

No modification that affects the strength of a steel joist or Joist Girder shall be made without the written approval of the project engineer of record.

The Seller shall not be responsible for the condition of paint finish on Material if it is not properly protected after delivery.

The Seller shall not be responsible for improper fit of Material due to inaccurate construction work.

# SECTION 8. **BUSINESS RELATIONS**

### 8.1 PRESENTATION OF PROPOSALS

All proposals for furnishing Material shall be made on a sales contract form. After acceptance by the Buyer, these proposals shall be approved or executed by a qualified official of the Seller. Upon such approval the proposal becomes a contract.

### 8.2 ACCEPTANCE OF PROPOSALS

All proposals are intended for prompt acceptance and are subject to change without notice.

### 8.3 BILLING

Contracts on a lump sum basis are to be billed proportionately as shipments are made.

### 8.4 PAYMENT

Payments shall be made in full on each invoice without retention.

### 8.5 ARBITRATION

All business controversies which cannot be settled by direct negotiations between Buyer and Seller shall be submitted to arbitration. Both parties shall sign a submission to arbitration and if possible agree upon an arbitrator. If they are unable to agree, each shall appoint an arbitrator and these two shall appoint a third arbitrator. The expenses of the arbitration shall be divided equally between the parties, unless otherwise provided for in the agreements to submit to arbitration. The arbitrators shall pass final judgment upon all questions, both of law and fact, and their findings shall be conclusive.

American National Standard SJI 100 - 2020

# STANDARD SPECIFICATION

## FOR K-SERIES, LH-SERIES, AND DLH-SERIES OPEN WEB STEEL JOISTS AND FOR JOIST GIRDERS.

K-Series Adopted by the Steel Joist Institute November 4, 1985
LH/DLH-Series Adopted by the Steel Joist Institute May 10, 2006
Joist Girders Adopted by the Steel Joist Institute November 4, 1985
Revised to April 27, 2020, Effective July 1, 2020

## SECTION 1.
## SCOPE AND DEFINITIONS

### 1.1 SCOPE

The *Standard Specification for* K-*Series*, LH-*Series,* DLH-*Series Open Web Steel Joists and for Joist Girders*, hereafter referred to as the Specification, covers the design, manufacture, application, and erection stability and handling of Joist Girders and Open Web Steel Joists K-Series, LH-Series, and DLH-Series in buildings or other structures, where other structures are defined as those structures designed, manufactured, and erected in a manner similar to buildings. Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be designed using Allowable Stress Design (ASD) or Load and Resistance Factor Design (LRFD) in accordance with this Specification. Included as part of this Specification are KCS joists, K-Series; Joist Substitutes, K-Series; and Top Chord Extensions and Extended Ends, K-Series.

### 1.2 OTHER REGULATIONS

Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be erected in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection, Subpart R – Steel Erection. The erection of Joist Girders and K-Series, LH-Series, and DLH-Series joists 144 ft. (43.9 m) or less in length shall be in accordance with the requirements of Section 1926.757, Open Web Steel Joists. Joist Girders and DLH–Series joists greater than 144 ft. (43.9 m) in length shall be in accordance with the requirements of Section 1926.756 Beams and Columns.

### 1.3 APPLICATION

This Specification includes Section 1 through Section 6. The user notes shall not be part of the Specification.

**User Note:** User notes are intended to provide practical guidance in the use and application of this Specification.

### 1.4 DEFINITIONS

The following terms shall, for the purposes of this Specification, have the meanings shown in this Section. Where terms are not defined in this Section, those terms shall have their ordinary accepted meanings in the context in which it applies.

Joist Girders, K-Series, LH-Series, and DLH-Series shall be open web, in-plane load-carrying steel members utilizing hot-rolled or cold-formed steel, including cold-formed steel whose yield strength has been attained by cold working.

Joist Girders shall be open web steel trusses used as primary framing members designed as simple spans supporting in-plane concentrated loads for a floor or roof system. These concentrated loads shall be considered to act at the top chord panel points of the Joist Girders unless otherwise specified.

 

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The Joist Girder standard designation in ASD shall be established by its nominal depth in inches (mm), the letter "G", followed by the number of joist spaces, the letter "N", the load in kips (kN) at each panel point, and the letter "K". The Joist Girder standard designation in LRFD shall be established by its nominal depth in inches (mm), the letter "G", followed by the number of joist spaces, the letter "N", the factored load in kips (kN) at each panel point, and the letter "F". Joist Girders shall be designed in accordance with this Specification to support the loads defined by the specifying professional.

Joist Girders shall be designed and manufactured as either simple framing members with underslung ends and bottom chord extensions or as part of an ordinary steel moment frame (OMF). Where used as part of an OMF the specifying professional shall be responsible for carrying out all the required frame analyses (i.e. first-order and second-order), provide all the required load information and stiffness data to the joist manufacturer, and indicate the type of **Joist Girder** to column connections that are being designed on the structural drawings.

**User Note:** Joist Girders have been standardized in depths from 20 inches (508 mm) through 120 inches (3048 mm), for spans from 20 feet (6096 mm) through 120 feet (36576 mm).

Where this Specification refers to "steel joists", this shall mean the K-Series, LH-Series, and DLH-Series joists.

**User Note:** Joists are suitable for the direct support of floors and roof slabs or decks. The K-Series joists are standardized in depths from 10 inches (254 mm) through 30 inches (762 mm), for spans up through 60 feet (18288 mm). The LH-Series joists are standardized in depths from 18 inches (457 mm) through 48 inches (1219 mm), for spans up through 96 feet (29261 mm). The DLH-Series joists are standardized in depths from 52 inches (1321 mm) through 120 inches (3048 mm), for spans up through 240 feet (73152 mm).

The K-Series, LH-Series and DLH-Series standard joist designations shall be established by their nominal depth, followed by the letters K, LH or DLH as appropriate, and then by the Section Number designation assigned. The Section Number designations shall range from 01 to 25. The K-Series, LH-Series and DLH-Series standard joist designations listed in the following Standard Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

Standard LRFD Load Table Open Web Steel Joists, K-Series – U.S. Customary Units
Standard ASD Load Table Open Web Steel Joists, K-Series – U.S. Customary Units
Standard LRFD Load Table Longspan Steel Joists, LH-Series – U.S. Customary Units
Standard ASD Load Table Longspan Steel Joists, LH-Series – U.S. Customary Units
Standard LRFD Load Table Deep Longspan Steel Joists, DLH-Series – U.S. Customary Units
Standard ASD Load Table Deep Longspan Steel Joists, DLH-Series – U.S. Customary Units
Standard LRFD Load Table Open Web Steel Joists, K-Series – S.I. Units
Standard ASD Load Table Open Web Steel Joists, K-Series – S.I. Units
Standard LRFD Load Table Longspan Steel Joists, LH-Series – S.I. Units
Standard ASD Load Table Longspan Steel Joists, LH-Series – S.I. Units
Standard LRFD Load Table Deep Longspan Steel Joists, DLH-Series – S.I. Units
Standard ASD Load Table Deep Longspan Steel Joists, DLH-Series – S.I. Units

Wherever a standard SJI Section Number is specified in the joist designation (e.g. 18K4, 32LH10) and other design load cases are also specified for the joist, the steel joist shall be designed for the corresponding total load as shown in the Standard Load Tables as a minimum.

**User Note:** Six standard types of K-Series, LH-Series and DLH-Series joists are designed and manufactured. These types are underslung (top chord bearing) or square-ended (bottom chord bearing), with parallel chords or with single or double pitched top chords. The Standard Load Tables apply for a pitched top chord up to 1/2 inch per foot (1:24).

The steel joist or Joist Girder designation depth shall be the depth at mid-span.

An alternate method of specifying a standard K-Series, LH-Series, or DLH-Series joist shall be permitted by providing the designation in a "load/load" sequence. The format used shall be ddKtl/ll, ddLHtl/ll, or ddDLHtl/ll where:

dd is the nominal depth of the joist in inches (mm)
tl is the total uniformly distributed load applied to the joist top chord, plf (kN/m)
ll is the uniform live load for which the deflection shall be checked and limited as required by this Specification, plf (kN/m)

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**User Note:** The load/load K-Series, LH-Series, or DLH-Series joists can be specified in depths from 10 inches (254 mm) through 120 inches (3048 mm) and spans up through 240 feet (73152 mm). The maximum uniformly distributed load-carrying capacity of 2400 plf (35.03 kN/m) in ASD and 3600 plf (52.54 kN/m) in LRFD has been established for this alternate K-Series, LH-Series, or DLH-Series format. The maximum capacity for any given load/load joist designation is a function of span, depth and chord member size. When requirements exceed the standard K-Series load table limitations for loading, span, and depth, an LH-Series designation is recommended to facilitate the proper determination of minimum seat depth, end anchorage, bridging size, deck attachment, etc. Thus, any joist exceeding a 30 inch depth, a span of 60 feet, an in-kip moment of Depth x 61 kips in ASD or Depth x 91.5 kips in LRFD, or an end reaction of 9.2 kips in ASD or 13.8 kips in LRFD should be designated as an LH-Series which allows for a cross-reference with a standard LH designation as listed in this Specification for seat, end anchorage, bridging, attachment tables, etc.

A KCS Joist is a particular type of K-Series joist, and shall be designed in accordance with this Specification based on an envelope of moment and shear capacity, rather than uniform load capacity, to support uniform plus concentrated loads or other non-uniform loads. The KCS Joists shall be selected from standardized depths from 10 inches (254 mm) through 30 inches (762 mm), for spans up through 60 feet (18288 mm). The maximum total safe uniformly distributed load-carrying capacity of a KCS Joist, K-Series, shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD. A KCS Joist shall be parallel chord only and shall be permitted to be underslung or bottom chord bearing.

The KCS Joists, K-Series, standard designations shall be established by their nominal depth, followed by the letters “KCS”, and then by the Section Number designation assigned. The Section Number designations shall range from 1 to 5. A KCS Joist shall not be designated using the alternate “load/load” method. The KCS Joists, K-Series, standard designations listed in the following Standard Load Tables shall provide the moment capacity and shear capacity as listed in the applicable tables:

Standard LRFD Load Table for KCS Open Web Steel Joists – U.S. Customary Units
Standard ASD Load Table for KCS Open Web Steel Joists – U.S. Customary Units
Standard LRFD Load Table for KCS Open Web Steel Joists – S.I. Units
Standard ASD Load Table for KCS Open Web Steel Joists – S.I. Units

Where an open web configuration becomes impractical, a Joist Substitute, K-Series, shall be designed in accordance with this Specification to support uniform loads when the span is less than 10 feet (3048 mm). The maximum total safe uniformly distributed load-carrying capacity of a Joist Substitute shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD.

The Joist Substitutes, K-Series, standard designations shall be established by their nominal depth, e.g. 2.5, followed by the letter “K” and then by the chord size designation assigned. The chord size designations shall range from 1 to 3. The Joist Substitutes, K-Series, standard designations listed in the following Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

**User Note:** The Joist Substitutes, K-Series, are standardized as 2.5 inch (64 mm) deep sections for spans up through 10’-0” (3048 mm).

LRFD Simple Span Load Table for 2.5 Inch K–Series Joist Substitutes – U.S. Customary Units
ASD Simple Span Load Table for 2.5 Inch K–Series Joist Substitutes – U.S. Customary Units
LRFD Simple Span Load Table for 64 mm K–Series Joist Substitutes – S.I. Units
ASD Simple Span Load Table for 64 mm K–Series Joist Substitutes – S.I. Units

LRFD Outriggers Load Table for 2.5 Inch K–Series Joist Substitutes – U.S. Customary Units
ASD Outriggers Load Table for 2.5 Inch K–Series Joist Substitutes – U.S. Customary Units
LRFD Outriggers Load Table for 64 mm K–Series Joist Substitutes – S.I. Units
ASD Outriggers Load Table for 64 mm K–Series Joist Substitutes – S.I. Units

A Top Chord Extension or Extended End, K-series, shall be a joist accessory that shall be designed in accordance with this Specification to support uniform loads when one or both ends of an underslung joist needs to be cantilevered beyond its bearing seat.

**User Note:** The Top Chord Extensions and Extended Ends are standardized as an “S” Type (top chord angles extended only) and an “R” Type (top chord and bearing seat angles extended), respectively.

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Standard designations for the "S" Type shall range from S1 to S12 for spans from 0'-6" to 4'-6" (152 to 1372 mm). Standard designations for the "R" Type shall range from R1 to R12 for spans from 0'-6" to 6'-0" (152 to 1829 mm). The maximum total safe uniformly distributed load-carrying capacity of either an "R" or "S" Type extension shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD. The "S" Type Top Chord Extensions and "R" Type Extended Ends listed in the following Standard Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

LRFD Top Chord Extension Load Table (S Type) – U.S. Customary Units
ASD Top Chord Extension Load Table (S Type) – U.S. Customary Units
LRFD Top Chord Extension Load Table (R Type) – U.S. Customary Units
ASD Top Chord Extension Load Table (R Type) – U.S. Customary Units
LRFD Top Chord Extension Load Table (S Type) – S.I. Units
ASD Top Chord Extension Load Table (S Type) – S.I. Units
LRFD Top Chord Extension Load Table (R Type) – S.I. Units
ASD Top Chord Extension Load Table (R Type) – S.I. Units

**1.5 STRUCTURAL DESIGN DRAWINGS AND SPECIFICATIONS**

The structural design drawings and specifications shall meet the requirements in the *Code of Standard Practice for Steel Joists and Joist Girders*, except for deviations specifically identified in the design drawings and/or specifications.

## SECTION 2.
## REFERENCED SPECIFICATIONS, CODES AND STANDARDS

**2.1 REFERENCES**

The standards listed below shall be considered as part of the requirements of this Specification. Where conflicts occur between this Specification and a referenced standard, the provisions of this Specification shall take precedence unless otherwise stated. This section lists the standards that are referenced in this Specification. The standards are listed in alphabetical order by name of standards developer organization, with the specific standard designations, title and dates of each of the referenced standards below.

American Institute of Steel Construction, Inc. (AISC), Chicago, IL

ANSI/AISC 360-10 *Specification for Structural Steel Buildings*

American Iron and Steel Institute (AISI), Washington, DC

ANSI/AISI S100-2012 *North American Specification for the Design of Cold-Formed Steel Structural Members*

American Society of Civil Engineers (ASCE), Reston, VA

SEI/ASCE 7-10 *Minimum Design Loads for Buildings and Other Structures*

American Society of Testing and Materials, ASTM International (ASTM), West Conshohocken, PA

ASTM A6/A6M-13A, *Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling*

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ASTM A36/A36M-12, *Standard Specification for Carbon Structural Steel*

ASTM A242/242M-13, *Standard Specification for High-Strength Low-Alloy Structural Steel*

ASTM A307-12a, *Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength*

ASTM A325/325M-13, *Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi [830 MPa] Minimum Tensile Strength*

ASTM A370-12a, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*

ASTM A500/A500M-13, *Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes*

ASTM A501-07 *Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing* ASTM

A529/A529M-05(2009), *Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality* ASTM

A572/A572M-13a, *Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel*

ASTM A588/A588M-10, *Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance*

ASTM A606/A606M-09a, *Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance*

ASTM A992/A992M-11, *Standard Specification for Structural Steel Shapes*

ASTM A1008/A1008M-13, *Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable*

ASTM A1011/A1011M-13, *Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength*

ASTM A1065/A1065M-09(2014) *Standard Specification for Cold-Formed Electric-Fusion (ARC) Welded High-Strength Low-Alloy Structural Tubing in Shapes with 50 ksi (345 MPA) Minimum Yield Point*

ASTM A1085-13 *Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)*

American Welding Society (AWS), Miami, FL

AWS A5.1/A5.1M-2012, *Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding*

AWS A5.5/A5.5M:2006, *Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding*

AWS A5.17/A5.17M-97:R2007, *Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding*

AWS A5.18/A5.18M:2005, *Specification for Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding*

AWS A5.20/A5.20M:2005, *Specification for Carbon Steel Electrodes for Flux Cored Arc Welding*

AWS A5.23/A5.23M:2011, *Specification for Low-Alloy Steel Electrodes and Fluxes for Submerged Arc Welding*

AWS A5.28/A5.28M:2005, *Specification for Low-Alloy Steel Electrodes and Rods for Gas Shielded Arc Welding*

AWS A5.29/A5.29M:2010, *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*

AWS D1.1/D1.1M:2015, *Structural Welding Code - Steel*

AWS D1.3/D1.3M:2008, *Structural Welding Code Sheet Steel*

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**User Note**: The following informative references provide practical guidance in the use and application of this Specification:


Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection; January 18, 2001, Washington, D.C.

Steel Joist Institute (SJI), Florence, SC

SJI-COSP-2015, *Code of Standard Practice for Steel Joists and Joist Girders*

Technical Digest No. 3 (2007), *Structural Design of Steel Joist Roofs to Resist Ponding Loads*

Technical Digest No. 5 (2015), *Vibration of Steel Joist-Concrete Slab Floors*

Technical Digest No. 6 (2012), *Structural Design of Steel Joist Roofs to Resist Uplift Loads*

Technical Digest No. 8 (2008), *Welding of Open Web Steel Joists and Joist Girders*

Technical Digest No. 9 (2008), *Handling and Erection of Steel Joists and Joist Girders*

Technical Digest No. 10 (2003), *Design of Fire Resistive Assemblies with Steel Joists*

Technical Digest No. 11 (2007), *Design of Lateral Load Resisting Frames Using Steel Joists and Joist Girders*

Technical Digest No. 12 (2007), *Evaluation and Modification of Open-Web Steel Joists and Joist Girders*

The Society for Protective Coatings (SSPC), *Steel Structures Painting Manual, Volume 2, Systems and Specifications*, Paint Specification No. 15, Steel Joist Shop Primer, May 1, 1999, Pittsburgh, PA.

Van Malssen, S.H. (1984), *The Effects of Arc Strikes on Steel Used in Nuclear Construction,* Welding Journal, American Welding Society, Miami, FL, July 1984.


## SECTION 3.
## MATERIALS

### 3.1 STEEL

The steel used in the manufacture of Joist Girders and K-Series, LH-Series, and DLH-Series joists shall conform to one of the following ASTM specifications:

ASTM A36/A36M, Carbon Structural Steel

ASTM A242/A242M, High-Strength Low-Alloy Structural Steel

ASTM A500/A500M, Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

ASTM A529/A529M, High-Strength Carbon-Manganese Steel of Structural Quality

ASTM A572/A572M, High-Strength Low-Alloy Columbium-Vanadium Structural Steel

ASTM A588/A588M, High-Strength Low-Alloy Structural Steel up to 50 ksi [345 MPa] Minimum Yield Point with Atmospheric Corrosion Resistance

ASTM A606/A606M, Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

ASTM A992/A992M, Structural Steel Shapes

ASTM A1008/A1008M, Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

ASTM A1011/A1011M, Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

ASTM A1018/A1018M, Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength

EXCEPTION: Steel used in the manufacture of Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be permitted to be of suitable quality ordered or produced to other than the listed ASTM specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proven by tests performed by the producer or manufacturer to have properties, in accordance with Section 3.2.

**3.2 MECHANICAL PROPERTIES**

**3.2.1 Minimum Yield Strength:** Steel used for Joist Girders and K-Series, LH-Series, and DLH-Series joists shall have a minimum yield strength determined in accordance with one of the procedures specified in this section, which is equal to the yield strength assumed in the design.

**User note:** The term "Yield Strength" as used herein designates the yield level of a material as determined by the applicable method outlined in paragraph 13.1 “Yield Point”, and in paragraph 13.2 “Yield Strength”, of ASTM A370, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*, or as specified in Section 3.2.3.

Evidence that the steel furnished meets or exceeds the design yield strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

For material used without consideration of increase in yield strength resulting from cold forming, the specimens shall be taken from as-rolled material. In the case of such material, the mechanical properties of which conform to the requirements of one of the listed ASTM specifications in Section 3.1, the test specimens and procedures shall conform to those of the applicable ASTM specification and to ASTM A370.

**3.2.2 Other Materials:** For materials where the mechanical properties do not conform to the requirements of one of the ASTM specifications listed in Section 3.1, these materials shall conform to the following requirements:

a) The specimens shall comply with ASTM A370,
b) The specimens shall exhibit a yield strength equal to or exceeding the design yield strength,
c) The specimens shall have an elongation of not less than 20 percent in 2 inches (51 mm) for sheet strip, or 18 percent in 8 inches (203 mm) for plates, shapes and bars with adjustments for thickness for plates, shapes and bars as prescribed in either ASTM A36/A36M, A242/A242M, A500/A500M, A529/A529M, A572/A572M, A588/A588M, or A992/A992M, whichever ASTM specification is applicable, on the basis of design yield strength.
d) The number of tests for a), b), and c) above shall be as prescribed in ASTM A6/A6M for plates, shapes, and bars; and ASTM A606/A606M, A1008/A1008M and A1011/A1011M for sheet and strip.

**3.2.3 As-Formed Strength:** If as-formed strength is utilized, the test reports shall show the results of tests performed on full section specimens in accordance with the provisions of the AISI S100. The reports shall also indicate compliance with the following additional requirements:

a) The yield strength calculated from the test data shall equal or exceed the design yield strength.
b) Where tension tests are made for acceptance and control purposes, the tensile strength shall be at least 8 percent greater than the yield strength of the section.
c) Where compression tests are used for acceptance and control purposes, the specimen shall withstand a gross shortening of 2 percent of its original length without cracking. The length of the specimen shall be not greater than 20 times the least radius of gyration.
d) If any test specimen fails to pass the requirements of the subparagraphs (a), (b), or (c) above, as applicable, two retests shall be made of specimens from the same lot. Failure of one of the retest specimens to meet such requirements shall be the cause for rejection of the lot represented by the specimens.

**3.3 WELDING ELECTRODES**

**3.3.1 Welding Electrodes:** The welding electrodes used for arc welding shall be in accordance with the following:

a) For connected members both having a specified minimum yield strength greater than 36 ksi (250 MPa), one of the following electrodes shall be used:

| | |
|---|---|
| AWS A5.1: | E70XX |
| AWS A5.5: | E70XX-X |
| AWS A5.17: | F7XX–EXXX, F7XX–ECXXX flux electrode combination |
| AWS A5.18: | ER70S-X, E70C-XC, E70C-XM |
| AWS A5.20: | E7XT-X, E7XT-XM |
| AWS A5.23: | F7XX–EXXX-XX, F7XX–ECXXX-XX |
| AWS A5.28: | ER70S-XXX, E70C-XXX |
| AWS A5.29: | E7XTX-X, E7XTX-XM |

b) For connected members both having a specified minimum yield strength of 36 ksi (250 MPa) or one having a specified minimum yield strength of 36 ksi (250 MPa), and the other having a specified minimum yield strength greater than 36 ksi (250 MPa), one of the following electrodes shall be used:

| | |
|---|---|
| AWS A5.1: | E60XX |
| AWS A5.17: | F6XX-EXXX, F6XX-ECXXX flux electrode combination |
| AWS A5.20: | E6XT-X, E6XT-XM |
| AWS A5.29: | E6XTX-X, E6XTX-XM |

or any of those listed in Section 3.3.1(a).

**3.3.2 Other Welding Methods**: Other welding methods, providing equivalent strength as demonstrated by tests, shall be permitted to be used.

**3.4 PAINT**

The standard shop paint shall be considered an impermanent and provisional coating.

**User Note:** The standard shop paint is intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions.

When specified, the standard shop paint shall conform to one of the following:

a) The Society for Protective Coatings, SSPC Paint Specification No. 15.

b) Or, shall be a shop paint which meets the minimum performance requirements of SSPC Paint Specification No. 15.

## SECTION 4.
## DESIGN AND MANUFACTURE

**4.1 METHOD**

Joist Girders support steel joists or other secondary members and shall be designed in accordance with this Specification as simply-supported primary load-carrying members for in-plane loading. Steel joists shall be designed in accordance with this Specification as simply-supported trusses supporting a floor or roof deck so constructed as to brace the top chord of the steel joists against lateral buckling. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following Specifications:

a) Where the steel used consists of hot-rolled shapes, bars or plates, AISC 360.

b) For members which are cold-formed from sheet or strip steel, AISI S100.

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**4.1.1 Design Basis:**

Steel joist and Joist Girder designs shall be in accordance with the provisions in this Specification using Load and Resistance Factor Design (LRFD) or Allowable Strength Design (ASD) as specified by the specifying professional for the project.

**4.1.2 Loads, Forces and Load Combinations:**

The loads and forces used for the steel joist and Joist Girder design shall be calculated by the specifying professional in accordance with the applicable building code and specified and provided on the structural drawings.

For nominal concentrated loads, which have been accounted for in the specified uniform loads, the addition of chord bending moments or an added shop or field web member due to these nominal concentrated loads shall not be required provided that the sum of the concentrated loads within a chord panel does not exceed 100 pounds and the attachments are concentric to the chord. When exact dimensional locations for concentrated loads which do not meet the above criteria are provided by the specifying professional, the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

The load combinations shall be specified by the specifying professional on the structural drawings in accordance with the applicable building code. In the absence of an applicable building code, the load combinations shall be those stipulated in SEI/ASCE 7 Section 2.3 and Section 2.4 as appropriate. For LRFD designs, the load combinations in SEI/ASCE 7, Section 2.3 shall apply. For ASD designs, the load combinations in SEI/ASCE 7, Section 2.4 shall apply.

## 4.2 DESIGN AND ALLOWABLE STRESSES

**4.2.1 Design Using Load and Resistance Factor Design (LRFD)**

Joists and Joist Girders shall have their components so proportioned that the required stresses, $f_u$, shall not exceed $\phi F_n$ where

| | | |
|---|---|---|
| $f_u$ | = required stress | ksi (MPa) |
| $F_n$ | = nominal stress | ksi (MPa) |
| $\phi$ | = resistance factor | |
| $\phi F_n$ | = design stress | ksi (MPa) |

**4.2.2 Design Using Allowable Strength Design (ASD)**

Joists and Joist Girders shall have their components so proportioned that the required stresses, f, shall not exceed $F_n / \Omega$ where

| | | |
|---|---|---|
| $f$ | = required stress | ksi (MPa) |
| $F_n$ | = nominal stress | ksi (MPa) |
| $\Omega$ | = safety factor | |
| $F_n/\Omega$ | = allowable stress | ksi (MPa) |

**4.2.3 Stresses:**

The calculation of design stress or allowable stress for chords shall be based on a yield strength, $F_y$, of the material used in manufacturing equal to 50 ksi (345 MPa). The calculation of design stress or allowable stress for all other joist elements shall be based on a yield strength, $F_y$, of the material used in manufacturing, but shall not be less than 36 ksi (250 MPa) nor greater than 50 ksi (345 MPa).Yield strengths greater than 50 ksi shall not be used for the design of any members.

**4.2.3.1 Tension:** $\phi_t = 0.90$ (LRFD), $\Omega_t = 1.67$ (ASD)

$$\text{Design Stress} = 0.9F_y \ \text{(LRFD)} \quad (4.2\text{-}1)$$

$$\text{Allowable Stress} = 0.6F_y \ \text{(ASD)} \quad (4.2\text{-}2)$$

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**4.2.3.2 Compression:** $\phi_c$ = 0.90 (LRFD), $\Omega_c$ = 1.67 (ASD)

Design Stress = $0.9F_{cr}$ (LRFD) (4.2-3)

Allowable Stress = $0.6F_{cr}$ (ASD) (4.2-4)

Where:

For members with $k\ell/r \le 4.71\sqrt{E/QF_y}$

$$F_{cr} = Q\left[0.658^{\left(QF_y/F_e\right)}\right]F_y \qquad (4.2\text{-}5)$$

For members with $k\ell/r > 4.71\sqrt{E/QF_y}$

$$F_{cr} = 0.877F_e \qquad (4.2\text{-}6)$$

Where $F_e$ = Elastic buckling stress determined in accordance with Equation 4.2-7

$$F_e = \frac{\pi^2 E}{\left(k\ell/r\right)^2} \qquad (4.2\text{-}7)$$

In the above equations, $\ell$ is the length, k is the effective length factor, and r is the corresponding radius of gyration of the member as defined in Section 4.3. E is equal to 29,000 ksi (200,000 MPa).

For hot-rolled sections and cold-formed angles, Q shall be taken as the full reduction factor for slender compression members as determined in accordance with AISC 360-10.

Exception: Where a compression web member is a crimped-end angle member intersecting at the first bottom chord panel point, whether hot-rolled or cold-formed, then Q shall be determined as follows:

$$Q = [5.25/(w/t)] + t \le 1.0 \qquad (4.2\text{-}8a)$$

Where: w = angle leg length, inches
t = angle leg thickness, inches

or,

$$Q = [5.25/(w/t)] + (t/25.4) \le 1.0 \qquad (4.2\text{-}8b)$$

Where: w = angle leg length, millimeters
t = angle leg thickness, millimeters

For all other cold-formed sections the method of calculating the nominal compression strength shall be in accordance with AISI S100.

**4.2.3.3 Bending:** $\phi_b$ = 0.90 (LRFD), $\Omega_b$ = 1.67 (ASD)

Bending calculations shall be based on the elastic section modulus.

For chords and web members other than solid rounds: $F_n = F_y$

Design Stress = $\phi_b F_n = 0.9F_y$ (LRFD) (4.2-9)

Allowable Stress = $F_n/\Omega_b = 0.6F_y$ (ASD) (4.2-10)

For web members of solid round cross section: $F_n = 1.6\ F_y$

Design Stress = $\phi_b F_n = 1.45F_y$ (LRFD) (4.2-11)

Allowable Stress = $F_n/\Omega_b = 0.95F_y$ (ASD) (4.2-12)

For bearing plates used in joist seats: $F_n = 1.5\ F_y$

Design Stress = $\phi_b F_n = 1.35F_y$ (LRFD) (4.2-13)

Allowable Stress = $F_n/\Omega_b = 0.90F_y$ (ASD) (4.2-14)

**4.2.3.4 Weld Strength:**

Shear at throat of fillet welds, flare bevel groove welds, partial joint penetration groove welds, and plug/slot welds shall be determined as follows:

Nominal Shear Stress = $F_{nw} = 0.6F_{exx}$ (4.2-15)

**LRFD**: $\phi_w = 0.75$

Design Shear Strength = $\phi R_n = \phi_w F_{nw} A = 0.45F_{exx} A_w$ (4.2-16)

**ASD**: $\Omega_w = 2.0$

Allowable Shear Strength = $R_n/\Omega_w = F_{nw}A/\Omega_w = 0.3F_{exx} A_w$ (4.2-17)

Where:

$F_{exx}$ is determined as follows:

E70 series electrodes or F7XX-EXXX flux-electrode combinations $F_{exx}$ = 70 ksi (483 MPa)

E60 series electrodes or F6XX-EXXX flux-electrode combinations $F_{exx}$ = 60 ksi (414 MPa)

$A_w$ = effective throat area, where:

For fillet welds, $A_w$ = effective throat area

Other design methods demonstrated to provide sufficient strength by testing shall be permitted to be used.

For flare bevel groove welds, the effective weld area is based on a weld throat width, T, where:

T (inches) = 0.12D + 0.11 (4.2-18a)

Where D = web diameter, inches

or,

T (mm) = 0.12D + 2.8 (4.2-18b)

Where D = web diameter, mm

For plug/slot welds, $A_w$ = cross-sectional area of the hole or slot in the plane of the faying surface provided that the hole or slot meets the requirements of AISC 360.

**User Note:** For more on plugs/slot welds see Steel Joist Institute Technical Digest No. 8, “Welding of Open-Web Steel Joists and Joist Girders”.

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Strength of resistance welds and complete-joint-penetration groove or butt welds in tension or compression (only where the stress is normal to the weld axis) shall be equal to the base metal strength:

$\phi_t = \phi_c = 0.90$ (LRFD) $\Omega_t = \Omega_c = 1.67$ (ASD)

Design Stress = 0.9 $F_y$ (LRFD) (4.2-19)

Allowable Stress = 0.6 $F_y$ (ASD) (4.2-20)

**4.3 MAXIMUM SLENDERNESS RATIOS**

The slenderness ratios, $1.0\ell/r$ and $1.0\ell_s/r$ of members as a whole or any component part shall not exceed the values given in Table 4.3-1, Part A.

**4.3.1 Effective Slenderness Ratios:** The effective slenderness ratio, $k\ell/r$ to be used in calculating the nominal stresses, $F_{cr}$ and $F'_e$, is the largest value as determined from Table 4.3-1, Part B and Part C, and modified where required with equation 4.3-1. The effective length k shall be taken as 1.0 for all components in Joist Girders.

**4.3.2 Compressive Members:** In compression members where fillers or ties are used, they shall be spaced so that the $\ell_s/r_z$ ratio of each component does not exceed the governing $\ell/r$ ratio of the member as a whole. The terms used in Table 4.3-1 shall be defined as follows:

$\ell$ = length center-to-center of panel points, except $\ell$ = 36 inches (914 millimeters) for calculating $\ell/r_y$ of the top chord member for joists, and for Joist Girders this distance shall be the unbraced length between joists which are positively attached to the top chord, in. (mm).

$\ell_s$ = maximum length center-to-center between panel point and filler (tie), or between adjacent fillers (ties), in. (mm).

$r_x$ = member radius of gyration about the horizontal axis of the joist or Joist Girder cross section, in. (mm).

$r_y$ = member radius of gyration about the vertical axis of the joist or Joist Girder cross section, in. (mm).

$r_z$ = least radius of gyration of a member component, in. (mm).

Compression web members shall be those web members subject to compressive axial loads under gravity loading.

**4.3.3 Tension Members:** Tension web members shall be those web members subject to tension axial loads under gravity loading, and which shall be permitted to be subject to compressive axial loads under alternate loading conditions

**User Note:** An example of a non-gravity alternate loading condition is net uplift.

**4.3.4 Top Chords:** For top chords, the end panel(s) shall be the panels between the bearing seat and the first primary interior panel point comprised of at least two intersecting web members.

**4.3.5 Built-Up Web Members:** For built-up web members composed of two interconnected shapes, where $\ell_s/r_z > 40$, a modified slenderness ratio $\left(\frac{k\ell}{r_y}\right)_m$ shall replace $\frac{k\ell}{r_y}$ in equations 4.2-5, 4.2-6, and 4.2-7, where:

$$\left(\frac{k\ell}{r_y}\right)_m = \sqrt{\left(\frac{k\ell}{r_y}\right)^2 + \left(\frac{k_i\ell_s}{r_z}\right)^2} \qquad (4.3\text{-}1)$$

and,

$k_i$ = 0.50 for angles back-to-back
= 0.75 for channels back-to-back

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**TABLE 4.3-1**

**MAXIMUM AND EFFECTIVE SLENDERNESS RATIOS[1]**

| Description | $k\ell/r_x$ | $k\ell/r_y$ | $k\ell/r_z$ | $k\ell_s/r_z$ |
|---|---|---|---|---|
| **I. TOP CHORD INTERIOR PANELS** | | | | |
| A. The slenderness ratios, $1.0\ell/r$ and $1.0\ell_s/r$, of members as a whole or any component part shall not exceed 90. | | | | |
| B. The effective slenderness ratio for joists, $k\ell/r$, to determine $F_{cr}$ where k is: | | | | |
| 1. Two shapes with fillers or ties | 0.75 | 0.94 | --- | 1.0 |
| 2. Two shapes without fillers or ties | --- | --- | 0.75 | --- |
| 3. Single component members | 0.75 | 0.94 | --- | --- |
| C. For bending, the effective slenderness ratio, $k\ell/r$, to determine $F'_e$ where k is: | 0.75 | --- | --- | --- |
| **II. TOP CHORD END PANELS** | | | | |
| A. The slenderness ratios, $1.0\ell/r$ and $1.0\ell_s/r$, of members as a whole or any component part shall not exceed 120. | | | | |
| B. The effective slenderness ratio for joists, $k\ell/r$, to determine $F_{cr}$ where k is: | | | | |
| 1. Two shapes with fillers or ties | 1.0 | 0.94 | --- | 1.0 |
| 2. Two shapes without fillers or ties | --- | --- | 1.0 | --- |
| 3. Single component members | 1.0 | 0.94 | --- | --- |
| C. For bending, the effective slenderness ratio, $k\ell/r$, to determine $F'_e$ where k is: | 1.0 | --- | --- | --- |
| **III. ALL BOTTOM CHORD PANELS** | | | | |
| A. The slenderness ratios, $1.0\ell/r$ and $1.0\ell_s/r$, of members as a whole or any component part shall not exceed 240. | | | | |
| B. For members subject to compression, the effective slenderness ratio for joists, $k\ell/r$, to determine $F_{cr}$ where k is: | | | | |
| 1. Two shapes with fillers or ties | 0.9 | 0.94 | --- | 1.0 |
| 2. Two shapes without fillers or ties | --- | --- | 0.9 | --- |
| 3. Single component members | 0.9 | 0.94 | --- | --- |
| C. For bending, the effective slenderness ratio, $k\ell/r$, to determine $F'_e$ where k is: | 0.9 | --- | --- | --- |
| **IV. WEB MEMBERS** | | | | |
| A. The slenderness ratios, $1.0\ell/r$ and $1.0\ell_s/r$, of members as a whole or any component part shall not exceed 240 for a tension member or 200 for a compression member. | | | | |
| B. For members subject to compression, the effective slenderness ratio for joists, $k\ell/r$, to determine $F_{cr}$ where k is: | | | | |
| 1. Two shapes with fillers or ties | 0.75 | 1.0 | --- | 1.0 |
| 2. Two shapes without fillers or ties | --- | --- | 1.0 | --- |
| 3. Single component members | 0.75 | 0.9* | --- | --- |
| *For end tension web members subject to compression, k shall equal 0.8 | | | | |

**(1) The effective length k shall equal 1.0 for all components of Joist Girders.**

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## 4.4 MEMBERS

### 4.4.1 Chords

The joist and Joist Girder bottom chord shall be designed as an axially loaded tension member.

For Joist Girders, the radius of gyration of the bottom chord about its vertical axis shall not be less than $\ell/240$ where $\ell$ is the distance between lines of bracing. The radius of gyration of a Joist Girder top chord about the vertical axis shall not be less than Span/575.

For steel joists, the radius of gyration of the top chord about its vertical axis shall not be less than the results of equation 4.4-1 or 4.4-2:

$$r_y \geq \ell_{br} \Big/ \left(124+0.67\,d_j+28\frac{d_j}{L}\right), \text{ in.} \quad (4.4\text{-}1a)$$

$$r_y \geq \ell_{br} \Big/ \left(124+0.026\,d_j+0.34\frac{d_j}{L}\right), \text{ mm} \quad (4.4\text{-}1b)$$

or,

$$r_y \geq \ell_{br}/170 \quad (4.4\text{-}2)$$

Where:

$d_j$ is the steel joist depth, in. (mm)

L is the joist span length, ft. (m)

$r_y$ is the radius of gyration of the top chord about the vertical axis of the joist cross section, in. (mm)

$\ell_{br}$ is the spacing in inches (millimeters) between lines of bridging as specified in Section 5.5.3.1.

A steel joist top chord shall be considered as laterally braced by the floor slab or roof deck provided the requirements of Section 5.9 are met.

A Joist Girder top chord shall be considered as laterally braced by the steel joists provided positive attachment is made. The outstanding part of the top chord member shall be designed such that the allowable reaction from a single joist shall not exceed equation 4.4-3 or 4.4-4:

$$\phi P_p \text{ and } \phi P_p\,(1.6 - f_{au}/\phi Q F_y) \quad (\text{LRFD}, \phi = 0.9) \quad (4.4\text{-}3)$$

$$P_p/\Omega \text{ and } P_p/\Omega\,(1.6 - \Omega f_a/QF_y) \quad (\text{ASD}, \Omega = 1.67) \quad (4.4\text{-}4)$$

Where:

$F_y$ = Specified minimum yield strength, ksi (MPa)

$P_p$ = Plastic failure mode = $[(t^2F_y)/[2(b-k)]][g+5.66(b-k)]$, kips (N)

Q = Form factor defined in Section 4.2.3.2

b = width of the outstanding part of the top chord member, in. (mm)

$f_{au}$ = $P_u/A$ = Required compressive stress, ksi (MPa)

$f_a$ = P/A = Required compressive stress, ksi (MPa)

g = width of bearing seat, in. (mm)

k = value from angle properties or similar dimension for other members, in (mm)

t = thickness of the outstanding part of the top chord member, in. (mm)

The top chord of a steel joist or Joist Girder shall be designed as a continuous member subject to combined axial and bending stresses, except a Joist Girder loaded only at panel points shall be designed as an axial loaded compression member. For combined stresses the top chord shall be so proportioned that:

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For **LRFD**:

at the panel point:

$$f_{au} + f_{bu} \le 0.9F_y \qquad (4.4\text{-}5)$$

at the mid panel:

for, $\dfrac{f_{au}}{\phi_c F_{cr}} \ge 0.2$,

$$\frac{f_{au}}{\phi_c F_{cr}} + \frac{8}{9}\left[\frac{C_m f_{bu}}{\left[1-\left(\frac{f_{au}}{\phi_c F'_e}\right)\right] Q \phi_b F_y}\right] \le 1.0 \qquad (4.4\text{-}6)$$

for, $\dfrac{f_{au}}{\phi_c F_{cr}} < 0.2$,

$$\frac{f_{au}}{2\phi_c F_{cr}} + \left[\frac{C_m f_{bu}}{\left[1-\left(\frac{f_{au}}{\phi_c F'_e}\right)\right] Q \phi_b F_y}\right] \le 1.0 \qquad (4.4\text{-}7)$$

$f_{au}$ = $P_u/A$ = Required compressive stress using LRFD load combinations, ksi (MPa)
$P_u$ = Required axial strength using LRFD load combinations, kips (N)
A = Area of the top chord, in.$^2$ (mm$^2$)
$f_{bu}$ = $M_u/S$ = Required bending stress at the location under consideration using LRFD load combinations, ksi (MPa)
$M_u$ = Required flexural strength using LRFD load combinations, kip-in. (N-mm)
S = Elastic Section Modulus, in.$^3$ (mm$^3$)
$F_{cr}$ = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r$ as defined in Section 4.3
$C_m$ = $1 - 0.3\, f_{au}/\phi_c F'_e$ for end panels
$C_m$ = $1 - 0.4\, f_{au}/\phi_c F'_e$ for interior panels
Q = Form factor defined in Section 4.2.3.2
$\phi_c$ = Resistance factor for compression = 0.9
$\phi_b$ = Resistance factor for flexure = 0.9
$F_y$ = Specified minimum yield strength, ksi (MPa)
$F'_e$ = $\dfrac{\pi^2 E}{(k\ell/r_x)^2}$, ksi (MPa),

where $\ell$ is the length, *k* is the effective length factor, and $r_x$ is the corresponding radius of gyration of the member as defined in Section 4.3

E = Modulus of elasticity, 29,000 ksi (200,000 MPa)

For **ASD**:

at the panel point:

$$f_a + f_b \leq 0.6F_y \tag{4.4-8}$$

at the mid panel:

for, $\frac{f_a}{F_a} \geq 0.2$,

$$\frac{f_a}{F_a} + \frac{8}{9}\left[\frac{C_m f_b}{\left[1-\left(\frac{1.67f_a}{F'_e}\right)\right]QF_b}\right] \leq 1.0 \tag{4.4-9}$$

for $\frac{f_a}{F_a} < 0.2$,

$$\left(\frac{f_a}{2F_a}\right) + \left[\frac{C_m f_b}{\left[1-\left(\frac{1.67f_a}{F'_e}\right)\right]QF_b}\right] \leq 1.0 \tag{4.4-10}$$

$f_a$ = P/A required compressive stress using ASD load combinations, ksi (MPa)

A = Area of the top chord, in.$^2$ (mm$^2$)

P = Required axial strength using ASD load combinations, kips (N)

$f_b$ = M/S = required bending stress at the location under consideration using ASD load combinations, ksi (MPa)

S = Elastic Section Modulus, in.$^3$ (mm$^3$)

M = Required flexural strength using ASD load combinations, k-in. (N-mm)

$F_a$ = Allowable axial compressive stress based on $k\ell/r$ as defined in Section 4.3; $0.6F_{cr}$, ksi (MPa)

$F_b$ = Allowable bending stress; $0.6F_y$, ksi (MPa)

$C_m$ = 1 - 0.50 $f_a/F'_e$ for end panels

$C_m$ = 1 - 0.67 $f_a/F'_e$ for interior panels

Q = Form factor defined in Section 4.2.3.2

$F'_e$ = $\frac{\pi^2 E}{(k\ell/r_x)^2}$, ksi (MPa),

where $\ell$ is the length, *k* is the effective length factor, and $r_x$ is the corresponding radius of gyration of the member as defined in Section 4.3

E = Modulus of elasticity, 29,000 ksi (200,000 MPa)

The top chord and bottom chord shall be designed such that at each joint complies with equation 4.4-11 or 4.4-12:

$$f_{vmod} \leq \phi_v F_n \qquad \text{(LRFD, } \phi_v = 1.00\text{)} \qquad (4.4\text{-}11)$$

$$f_{vmod} \leq F_n/\Omega_v \qquad \text{(ASD, } \Omega_v = 1.50\text{)} \qquad (4.4\text{-}12)$$

$F_n$ = nominal shear stress = $0.6F_y$, ksi (MPa)

$f_t$ = axial stress = P/A, ksi (MPa)

$f_v$ = shear stress = V/bt, ksi (MPa)

$f_{vmod}$ = modified shear stress = $\left(\frac{1}{2}\right)\sqrt{f_t^2 + 4f_v^2}$

b = length of vertical part(s) of cross section, in. (mm)

t = thickness of vertical part(s) of cross section, in. (mm)

It shall not be necessary to design the top chord and bottom chord for the modified shear stress, $f_{vmod}$, where a round bar web member is continuous through a joint. The minimum required shear of section 4.4.2 (25 percent of the maximum end reaction) shall not be required when evaluating Equation 4.4-11 or 4.4-12.

KCS Joist, K-Series, chords shall be designed for a flat positive bending moment envelope where the moment capacity is constant at all interior panels. The top chord end panel(s) shall be designed for an axial load based on the force in the first tension web resulting from the specified shear. A uniform load of 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD shall be used to check bending in the end panel(s). The top chord interior panels shall be designed for an axial stress resulting from the constant moment capacity plus the bending stress. The bending stress shall be determined from the smaller uniform load derived from the constant moment and constant shear, not to exceed 550 plf (ASD) or 825 plf (LRFD). The constant moment and shear shall be those values as listed in the Standard Load Table for KCS Steel Joists.

**4.4.2 Web**

The vertical shears to be used in the design of the web members shall be determined by including all loads, but such vertical shears shall be not less than 25 percent of the maximum end reaction from the design load combinations.

**4.4.2.1 Redundant Web Members:** Redundant web members used in modified Warren type web systems shall be designed to resist the gravity loads supported by the member plus an additional axial load of ½ of 1.0 percent of the top chord axial force. For a **Joist Girder**, this total axial load shall not be less than 2 percent of the top chord axial force.

**4.4.2.2 Joist Girders:** For Joist Girders, the tension web members shall be designed to resist at least 25 percent of their axial force in compression.

**4.4.2.3 KCS Joist Web Forces:** KCS Joist web forces shall be determined based on a flat shear envelope, and the following:

a) All webs shall be designed for a vertical shear equal to the specified shear capacity.
b) All webs shall be designed for 100 percent stress reversal except for the first tension web which remains in tension under all simple span gravity loads.

**4.4.2.4 Single Component Web Member:** In those cases where a single component web member is attached to the outside of the stem of a tee or double angle chord or any other orientation of a single web member which creates an out-of-plane moment, the web member design shall account for the stresses due to eccentricity.

**4.4.2.4.1 Uncrimped Single Angle Web Members**

For 1 inch uncrimped single angle web members where one leg is placed flat against one chord member in the gap, the resulting eccentricities and the effects in loading shall be considered in the design. A minimum of 50 percent of the required weld shall be deposited to each chord angle.

For angles subjected to tensile loading, the following requirements shall be met:

For **LRFD**: combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-5.

For **ASD**: combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-8.

For angles subjected to compression loading, the following requirements shall be met:

For **LRFD**:

at the panel point, combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-5.

at the mid length, the strength shall meet Eqs. 4.4-6 or 4.4-7, and 4.4-13:

$$\frac{f_{au}}{\phi_c F_{crz}} \leq 1.0 \qquad (4.4\text{-}13)$$

where

$f_{au}$ = $P_u/A$ = Required tensile or compressive stress, ksi (MPa)

$P_u$ = Required axial strength using LRFD load combinations, kips (N)

A = Area of the uncrimped angle web, in.$^2$, (mm$^2$)

$f_{bu}$ = $M_u/S$ = required bending stress, ksi (MPa)

$M_u$ = Required flexural strength = $0.5\,P_u\left(\frac{\text{chord gap}}{2} - \bar{y}\right)$, kip-in. (N-mm)

S = Minimum Elastic Section Modulus, in.$^3$ (mm$^3$)

$F_{cr}$ = $F_{crx}$, ksi (MPa)

$F_{crx}$ = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_x$,
where $\ell$ is the length, $k$ is the effective length factor, and $r_x$ is the corresponding radius of gyration of the member as defined in Section 4.3

$F_{crz}$ = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_z$
where $k$ = 1.0

$C_m$ = 1.0

$F_y$ = Specified minimum yield strength, ksi (MPa)

$F'_e$ = $\dfrac{\pi^2 E}{(k\ell/r_x)^2}$, ksi (MPa)

Q = Form factor defined in Section 4.2.3.2

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For **ASD**:

at the panel point, combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-8.

at the mid length the strength shall meet Eqs. 4.4-9 or 4.4-10, and 4.4-14:

$$\frac{f_a}{F_{az}} \leq 1.0 \qquad (4.4\text{-}14)$$

where

$f_a$ = P/A = Required tensile or compressive stress, ksi (MPa)

P = Required axial strength using ASD load combinations, kips (N)

A = Area of the uncrimped angle web, in.$^2$, (mm$^2$)

$f_b$ = M/S = required bending stress, ksi (MPa)

S = Minimum Elastic Section Modulus, in.$^3$ (mm$^3$)

M = Required flexural strength = $0.5\,P\left(\frac{\text{chord gap}}{2} - \bar{y}\right)$, kip-in. (N-mm)

$F_a$ = $F_{ax}$, ksi (MPa)

$F_{ax}$ = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_x$, where $\ell$ is the length, $k$ is the effective length factor, and $r_x$ is the corresponding radius of gyration of the member as defined in Section 4.3

$F_{az}$ = Nominal axial compressive stress in ksi (MPa) based on $K\ell/r_z$, where $k$ = 1.0

$F_b$ = Allowable bending stress; $0.6F_y$, ksi (MPa)

Alternate methods of design shall be permitted provided they provide strength equal to or greater than those given. Alternate design procedures shall be submitted to the Steel Joist Institute's consulting engineer for approval.

**4.4.3 Fillers and Ties**

Fillers or ties added on chord or web compression members shall be designed and connected for a force equal to 2 percent of the required member axial force.

**4.4.4 Joist and Joist Girder Extensions**

Joist and Joist Girder extensions shall be designated as one of three extension types, as follows: top chord extensions (TCX), extended ends, or full depth cantilevers.

Design criteria for joist extensions shall be specified using one of the following methods:

a) A joist top chord extension (TCX), extended end, or full depth cantilevered end shall be designed for the load from the Standard Load Tables based on the design length and designation of the specified joist. In the absence of other design information, the joist manufacturer shall design the joist extension for this loading as a default.

b) A loading diagram shall be provided for the joist extension, extended end, or full depth cantilevered end. The diagram shall include the magnitude and location of the loads to be supported, as well as the applicable load combinations.

c) 2½” deep steel joist extensions shall be permitted to be specified using extension designations found in the Top Chord Extension Load Table (S Type) for TCXs or the Top Chord Extension Load Table (R Type) for extended ends.

Any deflection requirements or limits due to the accompanying loads and load combinations on the steel joist or Joist Girder extension shall be provided by the specifying professional, regardless of the method used to specify the extension. Unless otherwise specified, the joist manufacturer shall check the extension for the specified deflection limit under uniform live load acting simultaneously on both the joist base span and the extension.

The joist manufacturer shall consider the effects of steel joist or Joist Girder extension loading on the base span of the steel joist or Joist Girder. This shall include carrying the design bending moment due to the loading on the extension into the top chord end panel(s), and the effect on the overall steel joist or Joist Girder chord and web axial forces. In the case of a K-Series Standard Type ‘R’ Extended End or ‘S’ TCX, the design bending moment shall be determined by the tabulated extension section modulus (S) multiplied by the appropriate allowable (ASD) or design (LRFD) flexural stress.

Bracing of extensions shall be clearly indicated on the structural drawings.

## 4.5 CONNECTIONS

### 4.5.1 Methods

Member connections and splices shall be made by attaching the members to one another by arc or resistance welding or other accredited methods in accordance with the following:

a) Steel joist and Joist Girder arc welded joints shall be in accordance with the American Welding Society, “Structural Welding Code-Steel”, D1.1, and/or the “Structural Welding Code Sheet Steel”, D1.3 with the following seven modified acceptance criteria as permitted by AWS D1.1 Clause 6.8:

1) Undercut shall not exceed 1/16 inch (2 mm) for welds oriented parallel to the principal stress.

**User Note:** The typical diagonal web member connection to one leg of a chord angle is considered to be parallel to the principal stress.

2) Discontinuities outside of the weld design length shall be permitted provided no cracks exist and undercut does not exceed the limits of item 1).

**User Note:** The weld design length is the minimum weld length needed for the connection force and weld thickness. Portions of the actual weld length with imperfections or discontinuities such as porosity or lack of a full profile are not included when comparing the actual weld length to the weld design length.

3) One unrepaired arc strike shall be permitted per joint provided it does not result in other unacceptable defects.

**User Note:** Minor arc strikes do not reduce the strength of AWS Group II materials (refer to Van Malssen, 1984).

4) The effective throat for flare bevel groove welds shall be calculated in accordance with equation 4.2-18.

**User Note:** The effective weld throat used by the SJI with round bars is based on SJI research and is more conservative than AWS D1.1 for GMAW for round bars in excess of 9/16” (14 mm). See Steel Joist Institute Technical Digest 8, “Welding of Open Web Steel Joists and Joist Girders”.

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5) Tack welds that are discontinuous from other welds shall meet the criteria for undercut, but shall be exempt from all other acceptance criteria.

**User Note:** Joist manufacturers use tack welds in the assembly process, and so long as they do not diminish the strength of the base metal and are not incorporated into the final weld for strength, they are not required to meet other inspection criteria.

6) The weld profile shall be considered acceptable provided neither the weld leg nor the weld throat is undersized less than AWS D1.1 limits within the weld design length.

7) For material with thickness less than 1/8", AWS D1.1 or D1.3 shall be considered appropriate.

**User Note:** AWS D1.1 does not address thicknesses less than 1/8" for hot rolled material and AWS D1.3 does not address hot rolled material, thus SJI has extended the ranges to include these material thicknesses.

b) Steel joist and Joist Girder resistance welded joints shall follow a preproduction validation procedure and a production checking procedure and shall meet the strength requirements of this Specification.

**User Note:** Spot, flash or upset resistance welds should have a written welding procedure qualification record and a systematic quality plan. For further information, see Steel Joist Institute Technical Digest 8, "Welding of Open Web Steel Joists and Joist Girders".

c) Welded Connections for Crimped-End Angle Web Members

1) The connection of each end of a crimped angle web member to each side of the chord shall consist of a weld group made of more than a single line of weld. The design weld length shall include an end return of no less than two times the nominal weld size.

d) Welding Program

1) The manufacturer's welders shall be qualified in accordance with either AWS D1.1 or AWS D1.3 for the applicable weld type, position, and material.

2) Manufacturers shall have a program for establishing weld procedures and operator qualification, and for weld sampling and testing. Each manufacturing facility shall have trained inspectors, and an engineer responsible for all welding procedures.

e) Weld Inspection by Outside Agencies (See Section 5.14)

1) The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 4.5.1.

**User Note:** Ultrasonic, X-ray, and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

**4.5.2 Strength**

**4.5.2.1 Joint Connections:** Joint connections shall develop the maximum force due to any of the design loads, but not less than 50 percent of the strength of the member in tension or compression, whichever force is the controlling factor in the selection of the member.

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**4.5.2.2 Shop Splices:** Shop splices shall be permitted to occur at any point in chord or web members. Splices shall be designed for the member force, but not less than 50 percent of the member strength. All component parts comprising the cross section of the chord or web member (including reinforcing plates, rods, etc.) at the point of the splice shall develop a nominal tensile strength of at least 1.2 times the product of the yield strength and the full design area of the chord or web. The "full design area" shall be defined as the minimum required area such that the required stress will be less than the design (LRFD) or allowable (ASD) stress.

**User Note:** For more information on welding, see Steel Joist Institute Technical Digest 8, "Welding of Open Web Steel Joists and Joist Girders".

**4.5.3 Field Splices**

Field Splices shall be designed by the manufacturer and shall be either bolted or welded. Splices shall be designed for the member force, but not less than 50 percent of the member strength.

**4.5.4 Eccentricity**

Members connected at a joint shall have their center of gravity lines meet at a point, where practical. Ends of joists or Joist Girders shall be proportioned to resist bending produced by eccentricity at the support.

For a single component web member, the eccentricity shall be permitted to be neglected where it does not exceed the lesser of three-quarters of the over-all dimension of the chord or 2" (51 mm). This eccentricity, measured in the plane of the joist, shall be the perpendicular distance from the centroidal axis of that web member to the point on the centroidal axis of the chord which is vertically above or below the intersection of the centroidal axis of the web member(s) forming the joint in accordance with Figure 4.5-1.

For a web member composed of at least two shapes, the eccentricity on either side of the neutral axis of chord members, measured in the plane of the joist at the joint work point, shall be permitted to be neglected where the web intersect point does not exceed one and one-half times the distance between the neutral axis and the back of the chord in accordance with Figure 4.5-2.

If these limits are exceeded, provision shall be made for the stresses due to eccentricity.

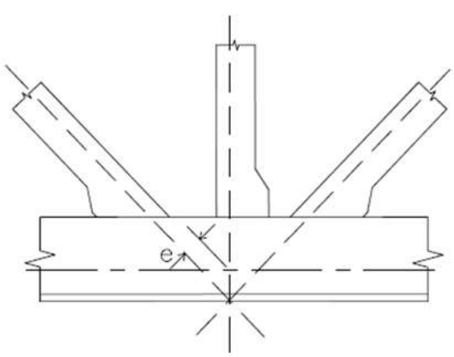


**FIGURE 4.5-1**

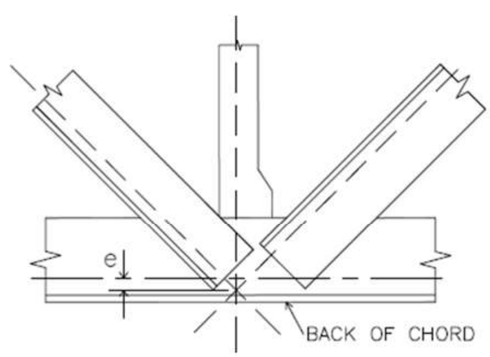


**FIGURE 4.5-2**

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**4.6 CAMBER**

Steel joists and Joist Girders 100'-0" or less shall have a manufactured camber in accordance with Table 4.6-1:

**TABLE 4.6-1**

| TOP CHORD LENGTH | | APPROXIMATE CAMBER | |
|---|---|---|---|
| 20'-0" | (6096 mm) | 1/4" | (6 mm) |
| 30'-0" | (9144 mm) | 3/8" | (10 mm) |
| 40'-0" | (12192 mm) | 5/8" | (16 mm) |
| 50'-0" | (15240 mm) | 1" | (25 mm) |
| 60'-0" | (18288 mm) | 1 1/2" | (38 mm) |
| 70'-0" | (21336 mm) | 2" | (51 mm) |
| 80'-0" | (24384 mm) | 2 3/4" | (70 mm) |
| 90'-0" | (27432 mm) | 3 1/2" | (89 mm) |
| 100'-0" | (30480 mm) | 4 1/4" | (108 mm) |

For lengths exceeding 100'-0", manufactured camber equal to Span/300 shall be used.

**User Note:** The specifying professional shall give consideration to coordinating this approximate camber with adjacent framing.

**4.7 VERIFICATION OF DESIGN AND MANUFACTURE**

**User Note:** This Section is included as part of this Specification since the verification of design and manufacture is a requirement of any Steel Joist Institute member company in order to be in compliance with this Specification. This Section applies only to a Steel Joist Institute member manufacturer.

**4.7.1 Design Calculations**

Companies manufacturing any K-Series, LH-Series, DLH-Series Joists or Joist Girders shall submit design data to the Steel Joist Institute, or an independent agency approved by the Steel Joist Institute, for verification of compliance with this Specification. Design data shall be submitted in detail and in the format specified by the Steel Joist Institute.

**4.7.2 Tests of Chord and Web Members**

Each manufacturer shall, at the time of design review by the Steel Joist Institute, verify by tests that the design, in accordance with Section 4.1 through Section 4.5, provides the theoretical strength of critical members. Such tests shall be evaluated considering the actual yield strength of the members of the test joists.

Material tests for determining mechanical properties of component members shall be conducted.

**4.7.3 Tests of Joints and Connections**

Each manufacturer shall, at the time of design review by the Steel Joist Institute, verify by shear tests on representative joints of typical joists that connections will meet the provision of Section 4.5.2. Chord and web members shall be permitted to be reinforced for such tests.

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**4.7.4 In-Plant Inspections**

Each manufacturer shall verify their ability to manufacture K-Series, LH-Series, DLH-Series Joists and Joist Girders through periodic In-Plant Inspections. Inspections shall be performed by an independent agency approved by the Steel Joist Institute. The frequency, manner of inspection, and manner of reporting shall be determined by the Steel Joist Institute. The plant inspections shall not represent a guarantee of the quality of any specific joists; this responsibility shall lie fully and solely with the individual manufacturer.

# SECTION 5. APPLICATION

**5.1 USAGE**

**5.1.1 Scope:** This Specification shall apply to any type of structure where floors or roofs are to be supported directly by steel joists installed as hereinafter specified or where steel joists are to be supported directly by Joist Girders installed as hereinafter specified. Where joists or Joist Girders are used other than on simple spans under uniformly distributed loading for joists, or under equal concentrated gravity loading for Joist Girders, as prescribed in Section 4.1, they shall be designed to limit the required stresses to those listed in Section 4.2. The magnitude and location of all loads and forces to be considered in the joist or Joist Girder design shall be provided on the structural drawings.

**5.1.2 Continuous Frame Action:** Where a rigid connection of the bottom chord is to be made to a column or other structural support, the steel joist or Joist Girder is then no longer simply-supported, and the system shall be investigated for continuous frame action by the specifying professional. The specifying professional shall design the supporting structure, including the design of columns, connections, and moment plates. This design shall account for the stresses caused by lateral forces and the stresses due to connecting the bottom chord to the column or other structural support.

The designed detail of a rigid type connection and moment plates shall be shown on the structural drawings by the specifying professional. The moment plates shall be furnished by other than the joist manufacturer.

**User Note:** For further reference concerning continuous frame action and their connections, refer to Steel Joist Institute Technical Digest No. 11, “Design of Lateral Load Resisting Frames Using Steel Joists and Joist Girders”.

**5.2 SPAN**

Except for joist substitutes, the span of a joist or Joist Girder shall not exceed 24 times the depth. Design length shall equal the span minus 4 inches (102 mm) as shown in Figure 5.2-1 “Definition of Span”.

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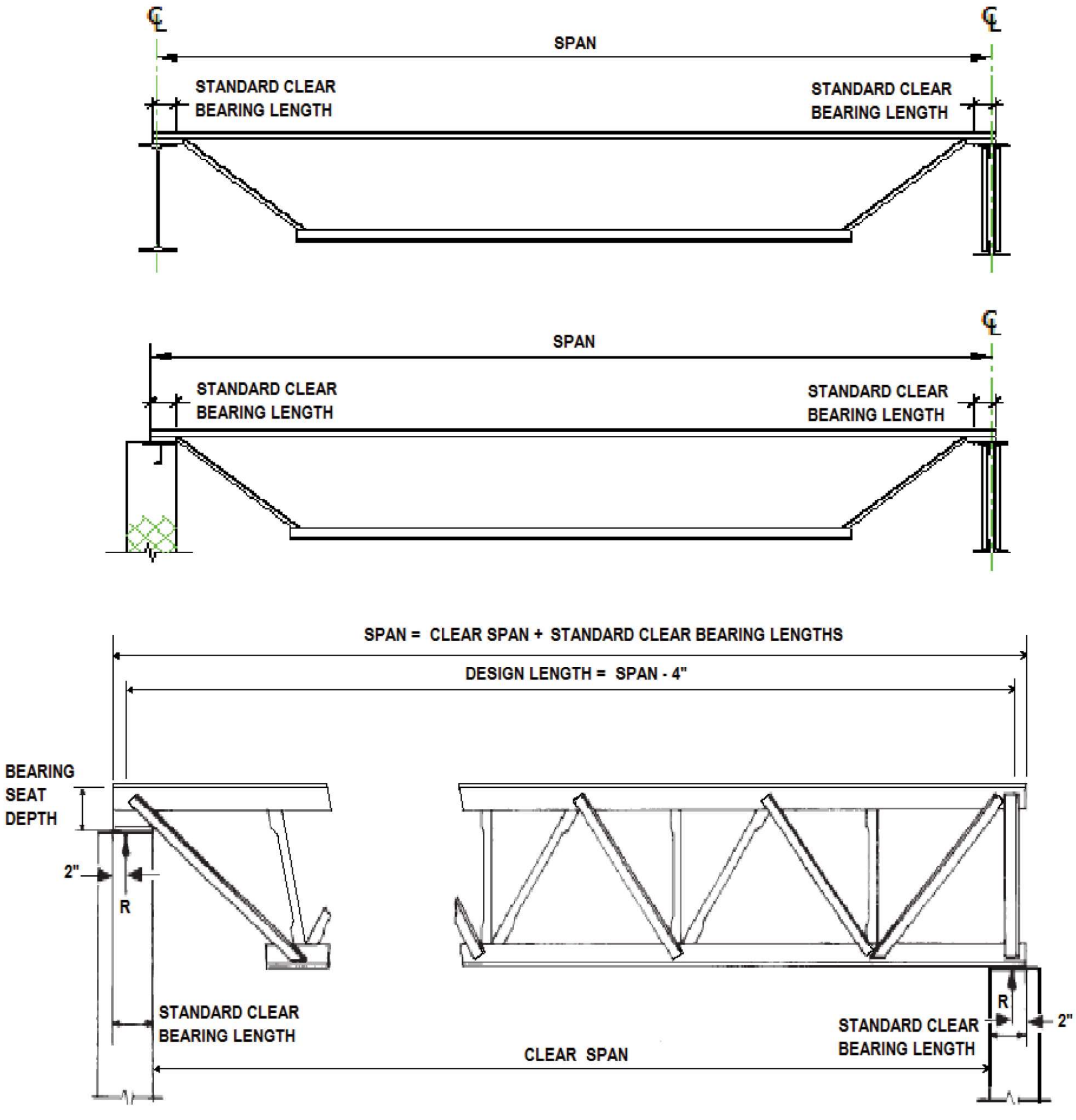
**Figure 5.2-1**
**DEFINITION OF SPAN**
**(U. S. Customary Units)**




NOTES:
1) DESIGN LENGTH = SPAN - 4"
2) MINIMUM BEARING LENGTHS SHALL MEET THE REQUIREMENTS OF SECTION 5.4. BEARING LENGTHS SHOWN MAY VARY BETWEEN STANDARD CLEAR BEARING AND MINIMUM BEARING LENGTH.
3) PARALLEL CHORD JOISTS INSTALLED TO A SLOPE GREATER THAN 1/2 INCH PER FOOT SHALL USE A SPAN DEFINED BY THE LENGTH ALONG THE SLOPE.

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**5.3 DEPTH**

Steel joists or Joist Girders shall have either parallel chords or a top chord pitch of up to 1/2 inch per foot (1:24). The steel joist or Joist Girder designation depth or nominal depth shall be the depth at mid-span, except for double pitched joists which shall be the depth at the ridge.

**5.4 END SUPPORTS**

Consideration of the reactions, vertical and lateral, shall be taken by the specifying professional in the design of the steel support, or the steel bearing plate on masonry or concrete. The standard location of the end reaction shall be 2" (51 mm) from the end of the span (exclusive of extensions) at each end of the steel joist or Joist Girder as shown in Figure 5.2-1 "Definition of Span". The standard end reaction location shall require the minimum bearing lengths shown in Table 5.4-1.

**TABLE 5.4-1**

| JOIST SECTION NUMBER[1] | STANDARD CLEAR BEARING LENGTH | MINIMUM BEARING LENGTH ON STEEL |
|---|---|---|
| K1-12 | 4" (102 mm) | 2 ½" (64 mm) |
| LH02-06 | 6" (152 mm) | 2 ½" (64 mm) |
| LH07-17, DLH10-17, JG | 6" (152 mm) | 4" (102 mm) |
| LH/DLH18-25, JG[2] | 6" (152 mm) | 6" (152 mm) |

(1) Last digit(s) of joist designation shown in Load Table.
(2) **Joist Girders** with a self weight greater than 50 plf (0.73 kN/m).

If the specifying professional requires the end reaction to be located at a distance from the face of support more than the standard clear bearing length values shown in Table 5.4-1 minus 2" (51 mm), the structural drawings shall indicate the required special location of the end reaction. The seat depth shall also be increased to the special minimum bearing seat depth per Table 5.4-3.

**5.4.1 Masonry and Concrete**

**5.4.1.1 Scope:** A K-Series, LH-Series, DLH-Series Joist or Joist Girder end supported by masonry or concrete shall bear on steel bearing plates and shall be designed as steel bearing.

**5.4.1.2 Bearing Length:** The ends of K-Series Joists shall extend a distance of not less than 4 inches (102 mm) over the face of masonry or concrete support unless it is deemed necessary to bear less than 4 inches (102 mm) over the support. The ends of LH-Series, DLH-Series Joists and Joist Girders shall extend a distance of not less than 6 inches (152 mm) over the face of masonry or concrete support unless it is deemed necessary to bear less than 6 inches (152 mm) over the support.

**5.4.1.3 Anchorage:** **K**-Series, **LH**-Series, **DLH**-Series Joists and **Joist Girders** shall be anchored to the steel bearing plate per Section 5.7.

The steel bearing plate shall be located not more than 1/2 inch (13 mm) from the face of the wall. If the steel bearing plate is located more than 1/2 inch (13 mm) from the face of the wall, or the minimum bearing over the masonry or concrete support cannot be provided as shown in Table 5.4-1, special consideration shall be given to the design of the steel bearing plate and the masonry or concrete by the specifying professional.

The steel bearing plate width shall not be less than that shown in Table 5.4-2 perpendicular to the length of the joist. The plate is to be designed by the specifying professional and shall be furnished by other than the joist manufacturer.

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## TABLE 5.4-2

| JOIST SECTION NUMBER[1] | MINIMUM BEARING PLATE WIDTH |
|---|---|
| K1-12, LH02-06 | 7” (178 mm) |
| LH07-17, DLH10-17, JG | 9” (229 mm) |
| LH/DLH18-25, JG[2] | 14” (356 mm) |

(1) Last digit(s) of joist designation shown in Load Table.
(2) Joist Girders with a self weight greater than 50 plf (0.73 kN/m).

### 5.4.2 Steel

The ends of K-Series, LH-Series, DLH-Series Joists and Joist Girders shall be anchored to the support per Section 5.7.

### 5.4.3 Bearing Depth

The standard non-sloping bearing seat depths shall be as shown in Table 5.4-3. If the steel joist slopes 3/8 inch per foot or greater, the high end bearing seat shall require additional depth due to the slope.

**User Note:** The Steel Joist Institute Code of Standard Practice provides guidance for determining additional seat depth requirements for sloped joists.

## TABLE 5.4-3

| JOIST SECTION NUMBER[1] | STANDARD BEARING SEAT DEPTH | STANDARD CLEAR BEARING LENGTH | SPECIAL MINIMUM BEARING SEAT DEPTH[2] |
|---|---|---|---|
| K1-12 | 2 ½” (64 mm) | 4” (102 mm) | 0.6 x (RP + 2 ½” (64 mm)) |
| LH02-17, DLH10-17 | 5” (127 mm) | 6” (152 mm) | 0.6 x (RP + 4” (102 mm)) |
| LH/DLH18-25 | 7 ½” (191 mm) | 6” (152 mm) | 0.6 x (RP + 4“ (102 mm)) + 2 ½” (64 mm) |
| JG | 7 ½” (191 mm) | 6” (152 mm) | RP + 4” (102 mm) |

(1) Last digit(s) of joist designation shown in Load Table.
(2) RP is equal to the distance the reaction is to occur from the face of the wall or leading edge of support member. The equation is not applicable for the high end of a sloped joist or Joist Girder.

When the specifying professional requires the steel joist or Joist Girder reaction to occur at or near the centerline of the wall or other support, a special bearing seat depth shall be required and a note shall be placed on the structural drawings identifying where the reaction is to occur. The specified bearing seat depth shall be increased according to Table 5.4-3 to allow for this special requirement.

### 5.5 BRIDGING or BRACING

**Joist Girders** shall be proportioned such that they can be erected without bridging. Therefore, the following requirements shall be met:

a) The ends of the bottom chord shall be restrained from lateral movement to brace the girder from overturning. For Joist Girders at columns in steel frames, restraint shall be provided by a stabilizer plate on the column.

b) No other loads shall be placed on the Joist Girder until the steel joists bearing on the Joist Girder are in place and positively attached to the Joist Girder.

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**User Note:** See Section 5.12 for bridging or bracing required for uplift forces.

Steel joist top and bottom chord bridging shall be required and shall consist of one or both of either horizontal or diagonal bridging.

### 5.5.1 Horizontal Bridging

Horizontal bridging lines shall consist of continuous horizontal steel members. The $\ell$/r ratio of the bridging member shall not exceed 300, where $\ell$ is the distance in inches (millimeters) between attachments and r is the least radius of gyration of the bridging member.

### 5.5.2 Diagonal Bridging

Diagonal bridging lines shall consist of cross-bracing with a $\ell$/r ratio of not more than 200, where $\ell$ is the distance in inches (millimeters) between connections and r is the least radius of gyration of the bracing member. Where cross-bracing members are connected at their point of intersection, the $\ell$ distance shall be taken as the distance in inches (millimeters) between connections at the point of intersection of the bridging members and the connections to the chords of the joists.

#### 5.5.2.1 Diagonal Erection Bridging

**User Note:** Joists exhibit varying degrees of stability dependent upon the span, depth, member sizes, self weight and other parameters. Bolted diagonal Erection Bridging which must be installed prior to releasing hoisting cables may be required.

Where required as identified below, bolted diagonal Erection Bridging shall be required and shall be in accordance with the following:

(a) For joist spans up through and including 60 feet (18288 mm) in length;

Welded horizontal bridging shall be permitted except where the row of bridging nearest the center is required to be bolted diagonal Erection Bridging as indicated by the Red shaded area in the Load Tables. Hoisting cables shall not be released until this row of bolted diagonal Erection Bridging is completely installed and anchored.

Bolted diagonal Erection Bridging shall be provided as required in the SJI Load Tables wherever a standard SJI Section Number designation is specified. For spans 60 feet (18288mm) or less, in the absence of a standard SJI Section Number designation, minimum bolted diagonal Erection Bridging requirements shall be determined by:

1) Matching the joist design to an equivalent standard SJI Section Number designation to determine the span at which Erection Bridging is needed as designated in the tables; or
2) Using Equation 5.5-1 to determine the joist stability and the need for Erection Bridging.

$$W = \frac{-b+\sqrt{b^2-4\cdot a\cdot c}}{2\cdot a} \quad ; \qquad \text{If , } \frac{w_u}{w_{actual}} > 1.00 \text{ Erection Bridging is not required.} \qquad (5.5\text{-}1)$$

$$a = \left(\frac{\pi^2+3}{24}\right)^2$$

$$b = P\cdot\frac{\pi^2+3}{12}\cdot\frac{\pi^2+4}{16} - \frac{\pi^4\cdot E\cdot I_y}{2\cdot(k\cdot L)^3}\cdot\left[\beta_x\cdot\left(\frac{\pi^2-3}{24}\right)-\frac{y_o}{2}\right]$$

$$c = (P)^2\left(\frac{\pi^2+4}{16}\right)^2 - \frac{\pi^4\cdot E\cdot I_y}{2\cdot(k\cdot L)^3}\cdot\left[P\cdot\left(\beta_x\cdot\frac{\pi^2-4}{16}-a_e\right)+\frac{\pi^4\cdot E\cdot C_w}{2\cdot(k\cdot L)^3}+\frac{\pi^2\cdot G\cdot J}{2\cdot k\cdot L}\right]$$

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Where:

| | | |
|---|---|---|
| $P$ | = Factored weight of erector = 1.2 x (assumed weight of 250 lbs.) = 300 lbs. (1334 N) | |
| $E$ | = Modulus of elasticity= 29,000,000 psi (200,000 MPa) | |
| $I_y$ | = Joist moment of inertia about y-axis, in.$^4$ (mm$^4$) | $I_y = I_{yt} + I_{yb}$ |
| $I_{yt}$ | = Top chord moment of inertia about y-axis, in.$^4$ (mm$^4$) | |
| $I_{yb}$ | = Bottom chord moment of inertia about y-axis, in.$^4$ (mm$^4$) | |
| $L$ | = Joist Span, in. (mm) | |
| $k$ | = Effective length factor = 0.85 | |
| $\beta_x$ | = Cross-Sectional parameter | $\beta_x = \frac{1}{I_x}\left[A_b \cdot (d_e - y)^3 - A_t \cdot y^3\right] - 2 \cdot y_o$ |
| $A_b$ | = Area of bottom chord, in.$^2$ (mm$^2$) | |
| $A_t$ | = Area of top chord, in.$^2$ (mm$^2$) | |
| $d_e$ | = Joist effective depth, in.(mm) | $d_e = d - y_t - y_b$ |
| $y_t$ | = Neutral axis of top chord, in. (mm) | |
| $y_b$ | = Neutral axis of bottom chord, in. (mm) | |
| $y$ | = Distance from centroid of top chord to centroid of cross section, in. (mm) | $y = \frac{A_b \cdot d_e}{A_t + A_b}$ |
| $I_x$ | = Joist moment of inertia about x-axis, in.$^4$ (mm$^4$) | $I_x = A_t y^2 + A_b (d_e - y)^2$ |
| $y_o$ | = Distance from centroid of cross section to shear center, in. (mm) | $y_o = -y + \frac{I_{yb} \cdot d_e}{I_y}$ |
| $a_e$ | = Vertical location of load P from shear center (locate at joist center of gravity), in. (mm), where $a_e = y_o$ | |
| $C_w$ | = Warping constant | $C_w = \frac{d_e^2 \cdot I_{yb} \cdot I_{yt}}{I_y}$ |
| $G$ | = Shear modulus, psi (MPa) | $G = 0.385E$ |
| $J$ | = St. Venant torsion constant, in.$^4$ (mm$^4$) | $J = \frac{1}{3}\left(A_t \cdot t_t^2 + A_b \cdot t_b^2\right)$ |
| $t_t$ | = Thickness of top chord, in. (mm) | |
| $t_b$ | = Thickness of top chord, in. (mm) | |
| $w_u$ | = Ultimate lateral buckling load | $w_u = \frac{W \cdot 12}{L}$, plf  $w_u = \frac{W}{L}$, (kN/m) |
| $w_{actual}$ | = Joist self-weight, plf (kN/m) | |

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b) For joist spans greater than 60 feet (18288 mm) in length;
Bolted diagonal Erection Bridging shall be used as indicated by the **Blue** and Gray shaded areas of the Load Tables. Hoisting cables shall not be released until all rows of bolted diagonal Erection Bridging are completely installed and anchored. Where the joist spacing is less than 0.70 x joist depth, bolted horizontal bridging shall be used in addition to bolted diagonal Erection Bridging.

c) The bolted diagonal Erection Bridging determined by Section 5.5.2.1a and Section 5.5.2.1b shall be considered a minimum. This bolted diagonal Erection Bridging shall be indicated on the placement plans.

**User Note:** Joists with special profiles having a higher center of gravity as compared to a parallel chord joist, joists which are canted, or joists having any condition which may create instability, may require additional bridging and/or special erection methods.

### 5.5.3 Quantity and Spacing of Bridging

**5.5.3.1 Scope:** Bridging shall be properly spaced and anchored to support the decking and the employees prior to the attachment of the deck to the top chord. The maximum spacing between lines of bridging, $\ell_{brmax}$ shall be the lesser of,

$$\ell_{brmax} = \left(124 + 0.67\, d_j + 28\frac{d_j}{L}\right) r_y \text{, in.} \qquad (5.5\text{-}2a)$$

$$\ell_{brmax} = \left(124 + 0.026\, d_j + 0.34\frac{d_j}{L}\right) r_y \text{, mm} \qquad (5.5\text{-}2b)$$

or,

$$\ell_{brmax} = 170\ r_y \qquad (5.5\text{-}3)$$

Where:

$d_j$ is the steel joist depth, in. (mm)
L is the joist span length, ft. (m)
$r_y$ is the radius of gyration of the top chord about the vertical axis of the joist cross section, in. (mm)

**5.5.3.2 Number of Rows:** The number of rows of top chord bridging shall not be less than as shown in Table 5.5-1 and the spacing shall meet the requirements of Equations 5.5-2 and 5.5-3. The number of rows of bottom chord bridging, including bridging required per Section 5.12, shall not be less than the number of top chord rows. Rows of bottom chord bridging shall be permitted to be spaced independently of rows of top chord bridging. The spacing of rows of bottom chord bridging shall meet the slenderness requirement of Section 4.3 and any specified strength requirements.

**5.5.3.3 DLH Joist Section 21 and Greater:** For DLH-Series joist Section Number 21 and greater, bridging shall be installed near a bottom chord panel point or an extra web member shall be furnished to brace the bottom chord for the vertical component of the bridging force equal to the horizontal bracing force.

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## TABLE 5.5-1

U.S. CUSTOMARY UNITS

**NUMBER OF ROWS OF TOP CHORD BRIDGING[2]**

| Section Number[1] | Joist Depth | 1 Row | 2 Rows | 3 Rows | 4 Rows | 5 Rows | 6 Rows | 7 Rows | 8 Rows | 9 Rows |
|---|---|---|---|---|---|---|---|---|---|---|
| K1 | All | 17 | >17 to 26 | >26 to 28 | | | | | | |
| K2 | All | 21 | >21 to 30 | >30 to 32 | | | | | | |
| K3 | All | 18 | >18 to 26 | >26 to 40 | | | | | | |
| K4 | All | 20 | >20 to 30 | >30 to 41 | >41 to 48 | | | | | |
| K5 | 12K to 24K | 20 | >20 to 30 | >30 to 42 | >42 to 48 | | | | | |
| | 26K | 28 | >28 to 41 | > 41 to 52 | | | | | | |
| K6 | 14K to 24K | 20 | >20 to 31 | >31 to 42 | >42 to 48 | | | | | |
| | 26K & 28K | 28 | >28 to 41 | >41 to 54 | >54 to 56 | | | | | |
| K7 | 16K to 24K | 23 | >23 to 34 | >34 to 48 | | | | | | |
| | 26K to 30K | 29 | >29 to 44 | >44 to 60 | | | | | | |
| K8 | 24K | 25 | >25 to 39 | >39 to 48 | | | | | | |
| | 26K to 30K | 29 | >29 to 44 | >44 to 60 | | | | | | |
| K9 | 16K to 24K | 22 | >22 to 34 | >34 to 48 | | | | | | |
| | 26K to 30K | 29 | >29 to 44 | >44 to 60 | | | | | | |
| K10 | 18K to 24K | 22 | >22 to 38 | >38 to 48 | | | | | | |
| | 26K to 30K | 29 | >29 to 48 | >48 to 60 | | | | | | |
| K11 | 22K | 24 | >24 to 39 | >39 to 44 | | | | | | |
| | 30K | 34 | >34 to 49 | >49 to 60 | | | | | | |
| K12 | 24K | 25 | >25 to 43 | >43 to 48 | | | | | | |
| | 26K to 30K | 29 | >29 to 47 | >47 to 60 | | | | | | |
| LH02-03 | All | 20 | >20 to 30 | >30 to 40 | >40 | | | | | |
| LH04-05 | All | 22 | >22 to 33 | >33 to 44 | >44 to 55 | >55 | | | | |
| LH06-08 | All | 26 | >26 to 45 | >45 to 60 | >60 to 75 | >75 | | | | |
| LH09 | All | 26 | >26 to 48 | >48 to 64 | >64 to 80 | >80 | | | | |
| LH/DLH10 | All | 28 | >28 to 54 | >54 to 72 | >72 to 90 | >90 | | | | |
| LH/DLH11 | All | 30 | >30 to 54 | >54 to 72 | >72 to 90 | >90 to 108 | >108 | | | |
| LH/DLH12 | All | 34 | >34 to 55 | >55 to 74 | >74 to 92 | >92 to 111 | >111 | | | |
| LH/DLH13 | All | 36 | >36 to 63 | >63 to 84 | >84 to 105 | >105 to 126 | >126 | | | |
| LH/DLH14 | All | 38 | >38 to 64 | >64 to 86 | >86 to 107 | >107 to 129 | >129 | | | |
| LH/DLH15 | All | 42 | >42 to 73 | >73 to 98 | >98 to 122 | >122 to 147 | >147 | | | |
| LH/DLH 16-17 | All | 44 | >44 to 75 | >75 to 100 | >100 to 125 | >125 to 150 | >150 to 175 | >175 | | |
| LH/DLH 18-20 | All | 52 | >52 to 78 | >78 to 104 | >104 to 130 | >130 to 156 | >156 to 182 | >182 to 208 | >208 to 234 | >234 |
| LH/DLH 21-25 | All | 60 | >60 to 90 | >90 to 120 | >120 to 150 | >150 to 180 | >180 to 210 | >210 | | |

(1) Last digit(s) of joist designation shown in Load Table.

(2) Distances are Joist Span lengths in feet – See "Definition of Span" Figure 5.2-1. Refer to the Joist Load Table and Specification Section 6 for required bolted diagonal bridging and additional stability requirements. See Section 5.12 for additional bridging required for uplift design.

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**5.5.4 Sizing of Bridging**

Horizontal and diagonal bridging shall be capable of resisting the nominal unfactored horizontal compressive force, $P_{br}$ given in Equation 5.5-4.

$$P_{br} = 0.0025\ n\ A_t\ F_{construction}\text{, kips (N)} \qquad (5.5\text{-}4)$$

Where:

n = 8 for horizontal bridging

n = 2 for diagonal bridging

$A_t$ = cross sectional area of joist top chord, in.$^2$ (mm$^2$)

$F_{construction}$ = assumed ultimate stress in top chord to resist construction loads, determined in accordance with the following:

$$F_{construction} = \left( \frac{\pi^2 E}{\left( \frac{0.9\,\ell_{brmax}}{r_y} \right)^2} \right) \geq 12.2\text{ ksi} \qquad (5.5\text{-}5a)$$

$$F_{construction} = \left( \frac{\pi^2 E}{\left( \frac{0.9\,\ell_{brmax}}{r_y} \right)^2} \right) \geq 84.1\text{ MPa} \qquad (5.5\text{-}5b)$$

Where:

E = Modulus of Elasticity of steel = 29,000 ksi (200,000 MPa)

and $\frac{\ell_{brmax}}{r_y}$ is determined from Equations 5.5-2 or 5.5-3

The bridging nominal horizontal unfactored compressive forces, $P_{br}$, shall be in accordance with Table 5.5-2.

**TABLE 5.5-2**

**BRIDGING NOMINAL HORIZONTAL UNFACTORED COMPRESSIVE FORCE**

| JOIST SECTION NUMBER[1] | HORIZONTAL BRIDGING $P_{br}$ (n=8) | | REQUIRED BRIDGING CONNECTION WELD[2] | DIAGONAL BRIDGING $P_{br}$ (n=2) | |
|---|---|---|---|---|---|
| | Lbs. | (N) | In. | Lbs. | (N) |
| K1-8 | 340 | (1512) | 1/8" x 1" (3mm x 25mm) | 85 | (378) |
| K9-10, LH02-03 | 450 | (2002) | | 113 | (503) |
| K11-12, LH04-05 | 560 | (2491) | | 140 | (623) |
| LH06-08 | 750 | (3336) | | 188 | (836) |
| LH09 | 850 | (3781) | | 213 | (945) |
| LH/DLH10 | 900 | (4003) | | 225 | (1001) |
| LH/DLH11 | 950 | (4226) | | 238 | (1056) |
| LH/DLH12 | 1100 | (4893) | | 275 | (1223) |
| LH/DLH13 | 1200 | (5338) | | 300 | (1334) |
| LH/DLH14 | 1300 | (5783) | | 325 | (1446) |
| LH/DLH15 | 1450 | (6450) | | 363 | (1612) |
| LH/DLH16-17 | 1850 | (8229) | 1/8" x 1 ½ " (3mm x 38mm) | 463 | (2057) |
| LH/DLH18-20 | 2350 | (10453) | | 585 | (2602) |
| LH/DLH21-22 | 3150 | (14012) | 1/8" x 2" (3mm x 51mm) | 790 | (3514) |
| LH/DLH23-24 | 4130 | (18371) | 1/8" x 3" (3mm x 76mm) | 1035 | (4604) |
| LH/DLH25 | 4770 | (21218) | | 1195 | (5316) |

(1) Last digit(s) of joist designation shown in Load Table.
(2) Or other connection type designed for the required force.

**5.5.5 Connections**

Connections to the joist chords shall be made by welding or mechanical means and shall be capable of resisting the unfactored or nominal horizontal force, $P_{br}$, of Equation 5.5-4 but not less than 700 pounds (3114 N).

**5.5.6 Bottom Chord Bearing Joists**

Where bottom chord bearing joists are utilized, a row of diagonal bridging shall be provided near the support(s). This bridging shall be installed and anchored before the hoisting cable(s) is released.

**5.6 INSTALLATION OF BRIDGING**

Bridging shall support the top and bottom chords against lateral movement during the construction period and shall hold the steel joists in the approximate position as shown on the joist placement plans.

The ends of all bridging lines terminating at walls or beams shall be anchored thereto.

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## 5.7 BEARING SEAT ATTACHMENTS

### 5.7.1 Masonry and Concrete

Ends of K-Series, LH-Series, and DLH-Series Joists and Joist Girders resting on steel bearing plates on masonry or structural concrete shall be attached thereto, as shown in Table 5.7-1, with a minimum of two fillet welds, or with two bolts, or the equivalent.

### 5.7.2 Steel

Ends of K-Series, LH-Series, and DLH-Series Joists and Joist Girders resting on steel supports shall be attached thereto, as shown in Table 5.7-1, with a minimum of two fillet welds, or with two bolts, or the equivalent. Where K-Series, LH-Series and DLH-Series Joists and Joist Girders are used to provide lateral stability to the supporting member, the final connection shall be made by welding or as designated by the specifying professional.

**TABLE 5.7-1**

| JOIST SECTION NUMBER [1] | MINIMUM FILLET WELD | MINIMUM BEARING SEAT BOLTS FOR ERECTION |
|---|---|---|
| K1-12 | 2– 1/8” x 2 1/2” (3 x 64 mm) | 2– 1/2” (13 mm) A307 |
| LH02-06 | 2– 3/16” x 2 1/2” (5 x 64 mm) | |
| LH07-17, DLH10-17, JG | 2– 1/4” x 2 1/2” (6 x 64 mm) | 2– 3/4” (19 mm) A307 |
| LH/ DLH18-25, JG[2] | 2– 1/4” x 4” (6 x 102 mm) | 2– 3/4” (19 mm) A325 |

(1) Last digit(s) of joist designation shown in load table.
(2) Joist Girders with a self weight greater than 50 plf (0.73 kN/m).

### 5.7.3 Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces and shall meet the requirements of Section 5.12.

## 5.8 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the design load (LRFD or ASD) for the particular joist designation and span as shown in the applicable load tables.

## 5.9 FLOOR AND ROOF DECKS

### 5.9.1 Material

Floor and roof decks shall be permitted to consist of cast-in-place or pre-cast concrete or gypsum, cold-formed steel, wood, or other suitable material capable of supporting the required load at the specified joist spacing.

### 5.9.2 Thickness

Cast-in-place slabs shall be not less than 2 inches (51 mm) thick.

**5.9.3 Centering**

Centering for cast-in-place slabs shall be permitted to be ribbed metal lath, corrugated steel sheets, paper-backed welded wire fabric, removable centering or any other suitable material capable of supporting the slab at the designated joist spacing.

Centering shall not cause lateral displacement or damage to the top chord of joists during installation or removal of the centering or placing of the concrete.

**5.9.4 Bearing**

Slabs or decks shall bear uniformly along the top chords of the joists.

**5.9.5 Attachments**

The spacing of attachments along the joist top chord shall not exceed 36 inches (914 mm). Such attachments of the slab or deck to the top chords of joists shall be capable of resisting the forces given in Table 5.9-1.

**TABLE 5.9-1**

| JOIST SECTION NUMBER[1] | NOMINAL FORCE REQUIRED[2] |
|---|---|
| K1-12 | 100 lbs/ft. (1.46 kN/m) |
| LH02-04 | 120 lbs/ft. (1.75 kN/m) |
| LH05-09 | 150 lbs/ft. (2.19 kN/m) |
| LH/DLH10-17 | 200 lbs/ft. (2.92 kN/m) |
| LH/DLH18-19 | 250 lbs/ft. (3.65 kN/m) |
| LH/DLH20-21 | 300 lbs/ft. (4.38 kN/m) |
| LH/DLH22-24 | 420 lbs/ft. (6.13 kN/m) |
| LH/DLH25 | 520 lbs/ft. (7.59 kN/m) |

(1) Last digit(s) of joist designation shown in Load Table.
(2) Nominal bracing force is unfactored.

**5.9.6 Wood Nailers**

Where wood nailers are used, such nailers in conjunction with deck or slab shall be firmly attached to the top chords of the joists in conformance with Section 5.9.5.

**5.9.7 Joist With Standing Seam Roofing or Laterally Unbraced Top Chords**

Where the roof systems do not provide lateral stability for the steel joists in accordance with Section 5.9.5 sufficient stability shall be provided to brace the steel joists laterally under the full design load. For this condition, the compression chord design shall include the effects of both the in-plane and out-of-plane buckling of the steel joist (e.g., buckling about the vertical axis of the steel joist cross section). In any case where the attachment requirement of Section 5.9.5 is not achieved, out-of-plane strength shall be achieved by adjusting the bridging spacing and/or increasing the compression chord area and the y-axis radius of gyration. The effective slenderness ratio about the vertical axis equals $0.94\ L/r_y$; where L is the bridging spacing in inches (millimeters) and $r_y$ is the radius of gyration of the top chord in inches (millimeters). The maximum bridging spacing shall not exceed that specified in Section 5.5.3.

**User Note:** Some examples of roof systems which may not provide adequate top chord lateral stability may be standing seam roofs, skylights, or other openings which do not provide top chord attachments per Section 5.9.5.

Horizontal bridging members attached to the compression chords and their anchorages shall be designed for a compressive axial force, $P_{br}$, given in Equation 5.9-1.

$$P_{br} = 0.001nP + 0.004P\sqrt{n} \geq 0.0025nP, \text{ kips (N)} \quad (5.9\text{-}1)$$

Where n is the number of joists between end anchors and P is the chord design force in kips (N)

The attachment force between the horizontal bridging member and the compression chord shall be 0.01P. Horizontal bridging attached to the tension chords shall be proportioned so that the slenderness ratio between attachments does not exceed 300. Diagonal bridging shall be proportioned so that the slenderness ratio between attachments does not exceed 200.

**5.10 DEFLECTION**

The deflection due to the design live load shall not exceed the following:

**Floors**: 1/360 of span.
**Roofs:** 1/360 of span where a plaster ceiling is attached or suspended, or
1/240 of span for all other cases.

The specifying professional shall give consideration to the effects of deflection and vibration in the selection of joists.

**User Note:** For further information on vibration, refer to Steel Joist Institute Technical Digest 5, "Vibration of Steel Joist-Concrete Slab Floors".

**5.11 PONDING**

The ponding investigation shall be performed by the specifying professional.

**User Note:** For further reference, refer to Steel Joist Institute Technical Digest 3, "Structural Design of Steel Joist Roofs to Resist Ponding Loads" and AISC 360.

**5.12 UPLIFT**

Where uplift forces due to wind are a design requirement, these forces shall be indicated on the structural drawings in terms of NET uplift in pounds per square foot (Pascals). The structural drawings shall indicate if the net uplift is based upon an LRFD or ASD load combination. When these forces are specified, they shall be considered in the design of joists, Joist Girders, and required bridging or bracing. Wherever uplift due to wind forces is a design consideration, the following shall be required:

a) For joists, a single line of **bottom chord** bridging shall be provided near the first bottom chord panel points.

b) For **Joist Girders**, if the ends of the bottom chord are not strutted and extended to column stabilizer plates, bracing shall be provided near the first bottom chord panel points.

**User Note:** For further reference, refer to Steel Joist Institute Technical Digest 6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads".

**5.13 DIAPHRAGMS AND COLLECTORS**

Where diaphragm collector forces due to wind or seismic forces are a design requirement, these forces shall be indicated on the structural drawings. The structural drawings shall indicate the nominal (unfactored) forces. The structural drawings shall also indicate the Seismic Design Category, and the Seismic Force Resisting System type, and applicable seismic design coefficients. When this data is specified, joist collectors or chords in horizontal diaphragm systems, shall be designed in conformance with the provisions of Section 4 through Section 6. End connections and splices in joists incorporated into Seismic Force Resisting System (SFRS) as horizontal diaphragms as collectors or chords shall adhere to the requirements stipulated by the applicable building code.

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**5.14 INSPECTION**

Joists shall be inspected by the manufacturer before shipment to verify compliance of materials and workmanship with the requirements of this Specification.

**User Note:** If the purchaser requires an inspection of the steel joists or Joist Girders by someone other than the manufacturer's own inspectors, they shall be permitted to reserve the right to do so in their "Invitation to Bid" or the accompanying "Job Specifications". Arrangements shall be made with the manufacturer for such inspection of the joists or Joist Girders at the manufacturing shop by the purchaser's inspectors at purchaser's expense.

**5.15 PARALLEL CHORD SLOPED JOISTS AND JOIST GIRDERS**

The span of a parallel chord sloped joist or Joist Girder shall be defined by the length along the slope. Minimum depth, load-carrying capacity, and bridging requirements shall be determined by the sloped definition of span. The Load Table capacity shall be the component normal to the joist.

## SECTION 6
## ERECTION STABILITY AND HANDLING

As a minimum, erection stability and handling of joists and Joist Girders shall meet the requirements of this Section 6.

**User Note:** Additional requirements for erection of steel joists and Joist Girders can be found in Steel Joist Institute Technical Digest No. 9, “Handling and Erection of Steel Joists and Joist Girders”.

**6.1 STABILITY REQUIREMENTS**

**User Note:** It is not recommended that an erector climb on unbridged joists, extreme caution shall be exercised since unbridged joists exhibit some degree of instability under the erector's weight.

a) In steel framing, where joists/Joist Girders are utilized at column lines, the joist/Joist Girder shall be field-bolted at the column. Before hoisting cables are released and before an employee is allowed on the joists/Joist Girder the following conditions shall be met:
   1) The seat at each end of the joist/Joist Girder is attached in accordance with Section 5.7. Where a bolted seat connection is used for erection purposes, as a minimum, the bolts shall be snug tightened. The snug tight condition shall be defined as the tightness that exists where all plies of a joint are in firm contact. This shall be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.
   2) Where stabilizer plates are required the joist/Joist Girder bottom chord shall engage the stabilizer plate.

   During the construction period, the contractor shall provide means for the adequate distribution of loads so that the carrying capacity of any joist or Joist Girder is not exceeded.

b) <u>Before an employee is allowed on the steel joist</u>: BOTH ends of joists at columns (or joists designated as column joists) shall be attached to its supports. For all other joists a minimum of one end shall be attached before the employee is allowed on the joist. The attachment shall be in accordance with Section 5.7.

   Where a bolted seat connection is used for erection purposes, as a minimum, the bolts shall be snug tightened. The snug tight condition shall be defined as the tightness that exists where all plies of a joint are in firm contact. This shall be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.

c) On steel joists that do not require erection bridging as shown by either the unshaded area of the Load Tables or as determined by Section 5.5.2.1, only one employee shall be allowed on the steel joist until all bridging is installed and anchored.

d) Where the span of the steel joist is within the Red shaded area of the Load Table, or in the absence of a standard SJI Section Number designation and Erection Bridging is required in accordance with Section 5.5.2.1, the following shall apply:

1) The row of bridging nearest the midspan of the steel joist shall be bolted diagonal Erection Bridging; and
2) Hoisting cables shall not be released until this bolted diagonal Erection Bridging is installed and anchored, unless an alternate method of stabilizing the joist has been provided; and
3) No more than one employee shall be allowed on these spans until all other bridging is installed and anchored.

e) Where the span of the steel joist is within the Blue shaded area of the Load Table, the following shall apply:

1) All rows of bridging shall be bolted diagonal bridging; and
2) Hoisting cables shall not be released until the two rows of bolted diagonal Erection Bridging nearest the third points of the steel joist are installed and anchored; and
3) No more than two employees shall be allowed on these spans until all bridging is installed and anchored.

f) Where the span of the steel joist is in the Gray shaded area of the Load Table, the following shall apply:

1) All rows of bridging shall be bolted diagonal bridging; and
2) Hoisting cables shall not be released until all bridging is installed and anchored; and
3) No more than two employees shall be allowed on these spans until all other bridging is installed and anchored.

g) Where permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points shall be required to provide lateral stability.

h) In the case of bottom chord bearing joists, the ends of the joist shall be restrained laterally per Section 5.5.6 before releasing the hoisting cables.

i) After the joist is straightened and plumbed, and all bridging is completely installed and anchored, the ends of the joists shall be fully connected to the supports in accordance with Section 5.7.

**6.2 LANDING AND PLACING LOADS**

a) Except as stated in Section 6.2(d), no "construction loads" shall be allowed on the steel joists until all bridging is installed and anchored, and all joist bearing ends are attached.

**User Note:** For definition of "construction load" see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.

b) During the construction period, loads placed on the steel joists shall be distributed so as not to exceed the capacity of the steel joists.

c) The weight of a bundle of joist bridging shall not exceed a total of 1000 pounds (454 kilograms). The bundle of joist bridging shall be placed on a minimum of three steel joists that are secured at one end. The edge of the bridging bundle shall be positioned within 1 foot (0.30 m) of the secured end.

d) No bundle of deck shall be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless the following conditions are met:

1) The contractor has first determined from a "qualified person" and documented in a site-specific erection plan that the structure or portion of the structure is capable of supporting the load;
2) The bundle of decking is placed on a minimum of three steel joists;

3) The joists supporting the bundle of decking are attached at both ends;
4) At least one row of bridging is installed and anchored;
5) The total weight of the decking does not exceed 4000 pounds (1816 kilograms); and
6) The edge of the bundle of decking is placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

**User Note:** For definition of "qualified person" see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.

e) The edge of the construction load shall be placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

**6.3 FIELD WELDING**

All field welding shall be performed in accordance with the structural drawings. Field welding shall not damage the joists or Joist Girders.

On cold-formed steel members whose yield strength has been attained by cold working, and whose as-formed strength is used in the design, the total length of weld at any one point shall not exceed 50 percent of the overall developed width of the cold-formed section.

**6.4 HANDLING**

Particular attention shall be considered for the handling and erection of K-Series, LH-Series, DLH-Series steel joists and Joist Girders. Damage to the joists and accessories shall be avoided. Hoisting cables shall be attached at panel point locations and those locations shall be selected to minimize erection stresses.

Each joist shall be adequately braced laterally before any loads are applied. If lateral support is provided by bridging, the bridging lines as defined in Section 6.1(c), 6.1(d), 6.1(e), and 6.1(f) shall be anchored to prevent lateral movement.

**6.5 FALL ARREST SYSYTEMS**

Steel joists and Joist Girders shall not be used as anchorage points for a fall arrest system unless written direction to do so is obtained from a "qualified person".

**User Note:** For definition of "qualified person" see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.