



Material Properties:

- Steel: Grid can be constructed using A709 Gr. 36/50/50W, A36, or A588 Steel
- Concrete: 145 pcf normal weight concrete with a compressive strength of 4000 psi

Steel Grid Components:

- Main Rails: 5-3/16" rolled section
- Bottom Rebar: #5 spaced 8" center-to-center
- Cross Bars: 1/4"x2" spaced 4" center-to-center
- Supplemental Bars: 5/16"x1" spaced 2" center-to-center between Main Rails
- Top Rebar: None
- Trim Bars: 1/4"x2" or 1/4" x 5" (Optional)

Geometric Profile

- Total height of grid deck = 5-3/16" (flush-filled) or 7-3/16" (with 2-inch overfill)
- Concrete overfill above main rail = 0 inches (flush filled), 2 inches (overfilled)
- Total thickness of concrete = 5-3/16 inches (flush-filled) or 7-3/16 inches (with 2-inch overfill)

| Component Code | Deck Parameters | | | | | Steel Only | | | | Positive Moment Region | | | Negative Moment Region | | |
|----------------|------------------------|------------------------------|------------------|-----------------|-------------------|---|---------------------------------------|--------------|---|---------------------------------------|--------------|---|---------------------------------------|---------------|--|
| | Main Rail Spacing (in) | Total Concrete Overfill (in) | Num of Supp Bars | Num of #3 Rebar | Total Height (in) | Moment of Inertia (in ⁴ /ft) | Section Modulus (in ³ /ft) | | Moment of Inertia (in ⁴ /ft) | Section Modulus (in ³ /ft) | | Moment of Inertia (in ⁴ /ft) | Section Modulus (in ³ /ft) | | |
| | | | | | | | Top of Steel | Bot of Steel | | Top of Concr. | Bot of Steel | | Top of Steel | Bot of Concr. | |
| FDS5S-06 | 6 | 0 | 2 | 0 | 5 3/16 | 14.70 | 6.44 | 5.06 | 18.47 | -86.19 | 5.32 | 21.83 | 7.01 | -84.25 | |
| FDS5S-06 | 6 | 2 | 2 | 0 | 7 3/16 | 14.70 | 6.44 | 5.06 | 28.87 | -91.05 | 6.96 | 21.83 | 7.01 | -84.25 | |
| FDS5S-08 | 8 | 0 | 3 | 0 | 5 3/16 | 12.34 | 6.07 | 3.92 | 15.00 | -78.87 | 4.09 | 20.70 | 6.79 | -77.49 | |
| FDS5S-08 | 8 | 2 | 3 | 0 | 7 3/16 | 12.34 | 6.07 | 3.92 | 23.57 | -80.95 | 5.41 | 20.70 | 6.79 | -77.49 | |
| FDS5S-10 | 10 | 0 | 4 | 0 | 5 3/16 | 10.68 | 5.78 | 3.20 | 12.67 | -73.34 | 3.33 | 20.00 | 6.65 | -73.37 | |
| FDS5S-10 | 10 | 2 | 4 | 0 | 7 3/16 | 10.68 | 5.78 | 3.20 | 20.06 | -73.46 | 4.45 | 20.00 | 6.65 | -73.37 | |

(-) Negative value indicates compression

| HS 20 (MS 18) and HS 25 (MS 22) LOAD TABLE | | | | | | | | | | | | | | | | | | |
|--|------------------------|------------------------------|---|--------|---------------------|--------|------------------|-------------------|---|-----------------------|--------|---------------------|--------|------------------|--------------------------|-----|-------------------|-------------------|
| Component Code | Main Rail Spacing (in) | Total Concrete Overfill (in) | HS20 - Maximum Continuous Clear Span (ft) | | | | | | HS25 - Maximum Continuous Clear Span (ft) | | | | | | Approximate Weight (psf) | | | |
| | | | Transverse to Traffic | | Parallel to Traffic | | Deflection L/800 | Deflection L/1000 | Deflection L/1200 | Transverse to Traffic | | Parallel to Traffic | | Deflection L/800 | | | Deflection L/1000 | Deflection L/1200 |
| | | | 36 ksi | 50 ksi | 36 ksi | 50 ksi | | | | 36 ksi | 50 ksi | 36 ksi | 50 ksi | | | | | |
| FDS5S-06 | 6 | 0 | 12.7 | 16.7 | 9.0 | 11.8 | 8.2 | 7.3 | 6.6 | 10.5 | 14.1 | 7.5 | 9.8 | 7.3 | 6.5 | 5.9 | 22.88 | 79.23 |
| FDS5S-06 | 6 | 2 | 14.6 | 18.7 | 10.9 | 12.2 | 10.4 | 9.2 | 8.4 | 12.6 | 15.5 | 9.2 | 9.9 | 9.2 | 8.2 | 7.4 | 22.88 | 103.35 |
| FDS5S-08 | 8 | 0 | 9.9 | 13.2 | 7.1 | 9.4 | 7.3 | 6.5 | 5.9 | 8.0 | 10.9 | 5.9 | 7.7 | 6.5 | 5.8 | 5.3 | 20.77 | 77.74 |
| FDS5S-08 | 8 | 2 | 11.8 | 15.3 | 8.8 | 11.3 | 9.3 | 8.3 | 7.5 | 10.0 | 13.2 | 7.4 | 9.1 | 8.3 | 7.4 | 6.7 | 20.77 | 101.87 |
| FDS5S-10 | 10 | 0 | 8.0 | 10.9 | 5.9 | 7.8 | 6.7 | 6.0 | 5.4 | 6.3 | 8.9 | 4.9 | 6.4 | 6.0 | 5.3 | 4.8 | 19.51 | 76.85 |
| FDS5S-10 | 10 | 2 | 9.9 | 13.0 | 7.4 | 9.6 | 8.5 | 7.6 | 6.9 | 8.3 | 11.1 | 6.2 | 8.1 | 7.6 | 6.8 | 6.1 | 19.51 | 100.97 |

Design Notes:

1. Designs are in accordance with AASHTO (17 Edition - 2002) Allowable Stress Design Method.
2. Reference IDSI FDS5S Series Grid Deck Drawings for further geometric details.
3. Assumes at least a 7 inch wide flange width for the supporting beams.
4. Concrete overfill is the amount of concrete above the top of the decking main rail (1-1/2" integral & 1/2"sacrificial for 2-inch overfill designs).
5. Steel only weights include the weight of the form pans.
6. Designs valid for Maximum Continuous Clear Spans based upon the following criteria.
 - a) 36 or 50 ksi minimum yield steel.
 - b) Steel strength stress limit of 27 ksi for 50 ksi yield steel or 20 ksi for 36 ksi yield steel.
 - c) 4000 psi concrete limited to a maximum allowable concrete stress of 1.6 ksi.
7. Deflection span limits as shown above are independent of the main rail orientation for AASHTO ASD methods of analysis & the results shown are independent of the steel strength stress limits. (i.e. For this chart, it is possible that the grid system is overstressed for a given deflection criteria. Both stresses and deflection must be analyzed together by the user prior to final design decision.)
8. All punched holes or slots in steel members are deducted when computing section properties.
9. Fatigue not considered for above published span limits.