ACCUFORM METAL LTD.
TECHNICAL ROOF DECK INFORMATION
IMPERIAL UNITS

General – Load table contains factored strength and specified deflection uniformly distributed loads.

Steel - Conforms to ASTM A653 or ASTM A792, Grade 33 yield stress 33 ksi, tensile strength 45 ksi; Grade 40 yield stress 40 ksi, tensile strength 55.

Finishes - A25, G60, G90. For heavier metallic coatings, refer to ASTM A653 or ASTM A792.

Strength – The uniformly distributed factored strength load from the table must be equal to or greater than **[1.25(DL) + 1.50(LL)]**. Where **DL** is the specified dead load and **LL** is the specified live load.

Deflection (Serviceability) – The uniformly distributed specified deflection load from the table must be equal to or greater than the specified deflection live load. The effective moment of inertia for deflection determination was calculated at an assumed specified live load stress of $0.6F_y$.

EXAMPLE (Use of Table)

Given: AFRD 15-36 33 ksi

- Deck thickness, t = 0.048 in.
- Yield stress, F_y = 33 ksi
- 2- span continuous, L = 8.5 ft each span
- L/300 deflection limit (table is based on L/240)
- Specified loads
  1) Dead load (DL)
     a) Deck 3.0 psf
     b) Superimposed 11.5 psf; DL = 14.5 psf
  2) Live load (LL) LL = 45.0 psf

Solution:

Strength "S"

1) Factored load [1.25(14.5) + 1.50(45)] = ***85.6 psf***
2) Maximum factored load from load table is ***89 psf***
   Since ***89 > 85.6*** ∴ OK
3) Check web crippling
   a) End reaction = 0.375(85.6)8.5 = ***273 lb/ft***
      Assume bearing length N = 1.5 in.
      From section property table,
      $P_e = P_{e1} + P_{e2}\,[N/t]^{1/2}$
      $= 731 + 183[1.5/0.048]^{1/2}$ = ***1754 lb/ft***
      Since ***1754 > 273*** ∴ OK
   b) Interior reaction = 1.25(85.6)8.5 = ***910 lb/ft***
      Assume bearing length N = 3 in.
      From section property table,
      $P_i = P_{i1} + P_{i2}\,[N/t]^{1/2}$
      $= 1395 + 237[3/0.048]^{1/2}$ = ***3269 lb/ft***
      Since ***3269 > 910*** ∴ OK

Deflection "D"

From table, L/240 = ***75 psf > 45 psf*** ∴ OK
For L/300, multiply 75 by 240/300 = ***60.0 psf***
Since ***60.0 > 45*** ∴ OK

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TECHNICAL ROOF DECK INFORMATION
METRIC UNITS

General – Load table contains factored strength and specified deflection uniformly distributed loads.

Steel - Conforms to ASTM A653M or ASTM A792M, Grade 230 yield stress 230 MPa, tensile strength 310 MPa; Grade 275 yield stress 275 MPa, tensile strength 380 MPa.

Finishes – ZF75, Z180, Z275 or AZM150. For heavier metallic coatings, refer to ASTM A653M or ASTM A792M.

Strength - The uniformly distributed factored strength load from the table must be equal to or greater than **[1.25(DL) + 1.50(LL)]**. Where **DL** is the specified dead load and **LL** is the specified live load.

Deflection (Serviceability) – The uniformly distributed specified deflection load from the table must be equal to or greater than the specified deflection live load. The effective moment of inertia for deflection determination was calculated at an assumed specified live load stress of $0.6F_y$.

EXAMPLE (Use of Table)

Given: AFRD 3-26 275 MPa

- Deck thickness, t = 0.914 mm
- Yield stress, F_y = 275 MPa
- 3- span continuous, L = 3.6 m each span
- L/180 deflection limit (table is based on L/240)
- Specified loads
  1) Dead load (DL)
     a) Deck 0.20 kPa
     b) Superimposed 0.45 kPa; DL = 0.65 kPa
  2) Live load (LL) LL = 3.0 kPa

Solution:

Strength "S"

1) Factored load [1.25(0.65) + 1.50(3.0)] = ***5.31 kPa***
2) Maximum factored load from load table is ***5.82 kPa***
   Since ***5.82 > 5.31*** ∴ OK
3) Check web crippling
   a) End reaction = 0.40(5.31)3.6 = ***7.65 kN/m***
      Assume bearing length N = 75 mm
      From section property table,
      $P_e = P_{e1} + P_{e2}\,[N/t]^{1/2}$
      $= 6.35 + 1.59[75/0.914]^{1/2}$ = ***20.8 kN/m***
      Since ***20.8 > 7.65*** ∴ OK
   b) Interior reaction = 1.10(5.31)3.6 = ***21.0 kN/m***
      Assume bearing length N = 100 mm
      From section property table,
      $P_i = P_{i1} + P_{i2}\,[N/t]^{1/2}$
      $= 13.0 + 2.21[100/0.914]^{1/2}$ = ***36.1 kN/m***
      Since ***36.1 > 21.0*** ∴ OK

Deflection "D"

From table, L/240 = ***3.53 kPa > 3.0 kPa*** ∴ OK
For L/180, multiply 3.53 by 240/180 = ***4.71 kPa***
Since ***4.71 > 3.0*** ∴ OK