GENERAL INFORMATION AND USE OF ROOF LOAD TABLES

General

Presented in the Accuform Metalroof deck load tablesareallowable uniformly distributed loads.

❖ **Steel**

Specification - Conforms to ASTM A653 Grade 33; Yield stress 33 ksi and tensile stress of 45 ksi

Finishes–G60 or G90. For heavier galvanizing, refer to ASTM A653.

❖ **Design Considerations**

Strength–Allowable Strength Design (ASD) principles were used in the development of the allowable loads in accordance with AISI S100-16, *North American Specification for the Design of Cold Formed Steel Structural Members.* Bending, shear and web crippling are the strength considerations.
The allowable uniformly distributed strength load (S) in the table must be equal to or greater than

(Dead load, DL, + Live load, LL)

Web Crippling – The web crippling strength can vary with the bearing length. The allowable web crippling loads are based on an end bearing length, N_e = 1.5" and interior bearing length, N_i = 3.0". If the bearing lengths are less than the specified values, the allowable uniformly distributed loads must be checked for the bearing length under consideration (See Example).

Serviceability (Deflection) – The effective moment of inertia for deflection determination is calculated based on an assumed live load stress of $0.6F_y$.
The allowable uniformly distributed deflection load (D) in the table must be equal to or greater than

***(Live load, LL)*.**

Example (Use of Load Table)

1.5" ROOF DECK

Given:

- 3-SPAN continuous, L = 7.5ft each span
- Deck thickness, t = 0.0300 in; F_y = 33ksi
- L/240 deflection limit
- End bearing length, N_e = 1 in.
- Interior bearing length, N_i = 2 in.
- Nominal loads

1) Dead loads (DL)
   a) deck 2.0psf
   b) superimposed 10.0psf
DL = 12.0psf
2) Live load (LL)
LL = 40.0psf

Solution:

- ***Strength***

1) Total load
[LL + DL]
[40 + 12.0] = ***52.0psf***

2) Allowable load (from Table under "S")
is***55psf*** (Based on N_e = 1.5 in. and N_i = 3.0 in.)
Since ***55psf>52.0 psf*** OK

3) Check end web crippling (N_e = 1 in.)
a) End reaction
$0.400(w)7.5 = P_e$
b)Allowable end reaction (from Section Property Table)

$$P_e = P_{e1} + P_{e2}\sqrt{N/t}$$

$$P_e = 198 + 49.4\sqrt{1/0.0300} = 483\text{lb/ft}$$

w = 483/0.400/7.5 = ***161psf***

Since ***161psf>52.0 psf*** OK

4) Check interior web crippling (N_i = 2 in.)
a) Interior reaction
$1.10(w)7.5 = P_i$
b) Allowable interior reaction (from Section Property Table)

$$P_i = P_{i1} + P_{i2}\sqrt{N/t}$$

$$P_i = 392 + 66.7\sqrt{2/0.0300} = 937\text{lb/ft}$$

w = 937/1.10/7.5 = ***114psf***

Since ***114psf>52.0 psf*** OK

- ***Deflection***

From Table under "D" (L/180) = 67psf> 40 psf OK
For L/240, multiply 67 by (180/240) = ***50.3psf***
Since ***50.3psf> 40psf***OK