

GENERAL INFORMATION

General

Presented in these load tables are maximum uniformly distributed specified loads.

❖ Limit States Design (LSD)

Strength - Limit States Design principles were used in the development of the load tables in accordance with CSA-S136-01, North American Specification for the Design of Cold Formed Steel Structural Members and the National Building Code of Canada. The factored resistance under consideration, ϕR , must be equal to or greater than the effect of the factored loads, i.e.,

$$\phi R \geq \text{Effect of Factored Loads.}$$

Hence, a short calculation must be carried out to compute the specified live load. See example.

Serviceability – Maximum specified deflection loads given in the tables must be compared with their respective specified live loads.

❖ Steel

Specification - Conforms to ASTM A653M grade 230; Yield strength 230 MPa (33 ksi) and tensile strength of 310 MPa (45 ksi).

Finishes – ZF 075 (A25) or Z275 (G90). For heavier galvanizing, refer to ASTM A653-A653M.

❖ Design Considerations

Strength - The maximum uniformly distributed specified load obtained from the load table must be equal to or greater than (*Specified live load + 0.833 times the specified dead load*).
Where $0.833 = 1.25/1.5$.

Conservative Strength Approach - The maximum uniformly distributed specified load obtained from the load table must be equal to or greater than (*Specified live load + specified dead load*).

Web Crippling Check – If $n/t > 210$, use $n/t = 210$.

Serviceability (Deflection) – The effective moment of inertia for deflection determination has been calculated at an assumed specified live load stress of $0.6F_y$.

EXAMPLE

38 mm (1 1/2") DECK (METRIC)

Given:

- ❑ Triple span continuous, $L = 2.4$ m each span
- ❑ Deck thickness, $t = 0.762$ mm
- ❑ L/180 deflection limit (data in tables are based on L/240)
- ❑ Bearing length, $n = 50$ mm
- ❑ Specified loads
 - 1) Dead loads (DL)
 - a) deck 0.1 kPa
 - b) superimposed 0.4 kPaDL = 0.5 kPa
 - 2) Live load (LL)
LL = 2.0 kPa

Solution:

▪ Strength

- 1) Specified loads
[LL + 0.833 DL]
[2.0 + 0.833 (0.5)] = 2.42 kPa
 - 2) Maximum specified load (from Table under “S”) is 2.50 kPa
Since $2.50 > 2.42 \therefore$ OK
 - 3) Check end web crippling ($n = 50$ mm)
 - a) Specified end reaction
 $0.400(2.42)2.4 = 2.32$ kN/m
 - b) Maximum specified end reaction (from Section Property Table)
 $P_e = P_{e1} + P_{e2} \sqrt{n/t}$
 $P_e = 2.57 + 0.642 \sqrt{50/0.762} = 7.77$ kN/m
Since $7.77 > 2.32 \therefore$ OK
 - 4) Check interior web crippling ($n = 50$ mm)
 - a) Specified interior reaction
 $1.10(2.42)2.4 = 6.39$ kN/m
 - b) Maximum specified interior reaction (from Section Property Table)
 $P_i = P_{i1} + P_{i2} \sqrt{n/t}$
 $P_i = 4.50 + 0.766 \sqrt{50/0.762} = 10.7$ kN/m
Since $10.7 > 6.39 \therefore$ OK
- ##### ▪ Deflection
- From Table under “D” (L/240) = 2.10 kPa
For L/180, multiply 2.10 by $240/180 = 2.8$ kPa
Since 2.8 is $> 2.0 \therefore$ OK



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