Loading

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It is important to note that, per NEMA Standard VE1, cable tray is not designed to support personnel. The user should display appropriate warnings to prevent the use of cable tray as walkways.

Cable Loads

The cable load is the total weight, expressed in kg/m or lb/ft, of all the cables that will be placed in the cable tray.

Seismic Loads

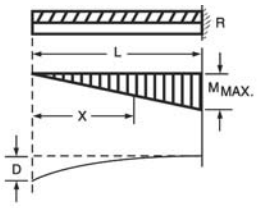
It is now known that cable tray systems can withstand stronger earthquakes than previously thought. The tray itself and the support material are highly ductile, and the cables moving within the tray tend to dissipate energy. However, if you have specific seismic specifications for selected cable tray, please consult T&B to ensure your specifications are met.

Load Diagrams for Beams

CANTILEVER BEAMS

Uniform Load
w per unit of length: total load w
Reaction R = wL = W

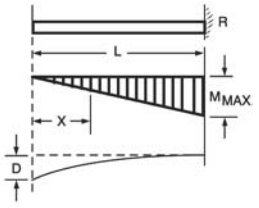
Moment at any point: M = $\frac{WX^2}{2} = \frac{WX^2}{2L}$
Maximum moment Mmax = $\frac{wL^2}{2} = \frac{WL}{2}$
Maximum deflection, D = $\frac{wL^4}{BEI} = \frac{WL^3}{BEI}$
Maximum Shear, V = wL



Concentrated Load at Free End

Reaction; R = P
Moment at any point: M = Px
Maximum moment, Mmax = PL
Maximum deflection, D = $\frac{PL^3}{3EI}$

Maximum Shear, V = P



CONTINUOUS BEAMS

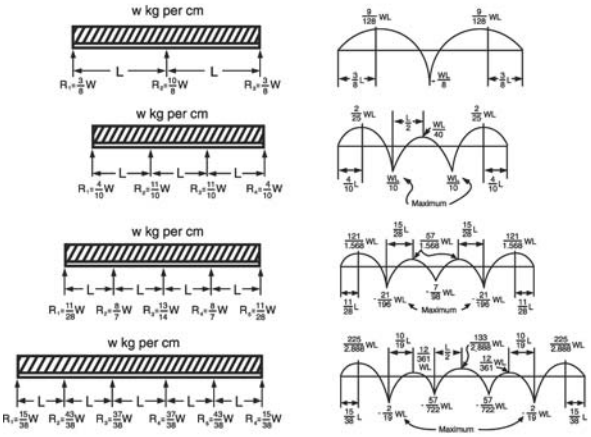
Two Span

W = wL
R = Reaction, kg
L = Span Length, cm R1 = cw

Three Span

Four Span

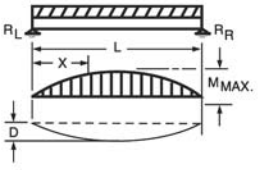
Five Span



SIMPLE BEAMS

Uniform Load

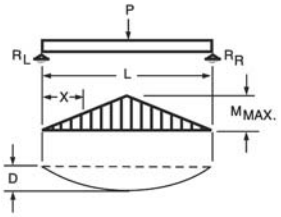
w per unit of length, total load w
ReactionS: Rl = Rr = $\frac{WL}{2} = \frac{W}{2}$
Moment at any point: M = $\frac{wX(L-X)}{2} = \frac{WX(L-X)}{2L}$
Maximum moment, AT CENTRE Mmax = $\frac{wL^2}{8} = \frac{WL}{8}$
Maximum deflection: D = $\frac{5wL^4}{384EI} = \frac{5WL^3}{384EI}$
Maximum Shear: V = $\frac{WL}{2}$



Concentrated Load at Center

Reaction Rl = Rr = $\frac{P}{2}$
Moment at any point: X <= $\frac{L}{2}$, M = $\frac{PX}{2}$
X > = $\frac{L}{2}$, M = $\frac{P\ (L-X)}{2}$
Maximum moment, At Center, Mmax = $\frac{PL}{4}$

Maximum deflection, D = $\frac{PL^3}{384EI}$
Maximum Shear, V = $\frac{P}{2}$



Concentrated Load at any Point

Reaction: RL = $\frac{Pb}{L}$, Rr = $\frac{Pa}{L}$
Moment at any point: X <= a,M = RlX = $\frac{PbX}{L}$
X >= a,M = Rr (L-X) = $\frac{Pa\ (L-X)}{L}$
Maximum moment, At X = a, Mmax = $\frac{Pab}{L}$
Maximum deflection, D = $\frac{Pab(L+b)3a(L+b)}{27EIL}$
Maximum Shear, V = $\frac{Pa}{L}$, WHEN a > b