

LIVE LOAD CALCULATION :-

[1] CLASS AA TRACKED VEHICLE :-

(a) Dispersion width along the span

According to clause 305.13 IRC- 21-2000

= Length of Contact + 2 (Wearing coat + depth of Slab)

$$= 3.6 + 2 (0.075 + 0.775)$$

$$= 5.3 \text{ M}$$

(b) Dispersion width across the span

According to clause 305.13 IRC- 21-2000

$$b_e = K \times (1 - x/L_e) + b_w$$

K = A Constant having the value depending upon the ratio (L1/L_e where.

b_e = the effective width of the slab on which the load acts.

L_e = Effective Span

x = the distance of c.g. of concentrate load from the near support

b_w = The breadth of concentration area of the load i.e. Dimension of the tyre or track contact area over the road surface

Here ,

$$L_e = 10.00 \text{ M} \quad \& \quad L_1 = 7.00 \text{ M}$$

$$= \frac{L_1}{L_e} = \frac{7.00}{10.0} = 0.7$$

$$\text{Value of } K = 2.4$$

$$b_w = 0.85 + 2 \times 0.075 = 1.0 \text{ M}$$

$$X = \frac{L}{2} = \frac{10}{2} = 5.0 \text{ M}$$

$$b_e = 2.4 \times 4 (1 - 5/10) + 1$$

$$= 5.8 \text{ M}$$

Impact factor is 13.75% as per IRC Section-II, Clause - 211-3 (a) (i)

DISPERSION ACROSS SPAN (CLASS AA TRACKED VEHICAL)

The tracked vehicle is placed at a distance of minimum clearance of 1-2 m from Kerb

Dispersion across span

= C/C distance between wheels

+ width from centre of wheel on clearance side

+ Least on other side or half the dispersion of one wheel.

$$= 2.05 + 1.93 + \text{Least of } 2.715 \text{ OR } 5.8/2$$

$$= 2.05 + 1.93 + 2.715$$

$$= 6.695$$

Impact factor = 1.1375

Total load with impact

$$= 70 \times 1.1375$$

$$= 79.63 \text{ T}$$

= Intensity of Load

$$= \frac{79.63}{5.30 \times 6.695} = 2.24 \text{ T/M}$$

Maximum Reaction

For Maximum reaction at support the Centre of gravity of the loads should be adjacent to one support should be adjacent to one support

$$\text{Reaction } R_A = 2.24 \times 3.00 \times 1.50 / 10.00$$

$$= 1.01 \text{ T}$$

$$\text{Reaction } R_B = 2.24 \times 3.00 - 1.01$$

$$= 5.71 \text{ T}$$

DISPERSION ALONG SPAN (CLASS AA TRACKED VEHICLE)

(a) Dispersion width along the span :-

$$t_p = t_c = 2 (t_w + t_s)$$

t_p = width of dispersion **parallel** to span

t_c = width of tyre contact area **parallel** to span

t_s = Overall depth of slab

t_w = Thickness of Wearing coat

Dispersion along the span

$$= 0.15 + 2 (0.075 + 0.775)$$

$$= 1.9 \text{ M}$$

Dispersion between two wheel is overlapping hence restricted to 1-2 M

= Dispersion combined for two wheels

$$= \text{C/c distance between two wheels} + \text{Longitudinal dispersion}$$

$$= 1-2 + 1.9$$

$$= 3.1 \text{ M (along the span)}$$

Impact factor = 1.1375

Total load with impact

$$= 70 \times 1.1375$$

$$= 79.63 \text{ T}$$

= Intensity of Load

$$= \frac{79.63}{1.90 \times 5.30} = 7.91 \text{ T/M}$$

Maximum Reaction

For Maximum reaction at support the Centre of gravity of the loads should be adjacent to one support should be adjacent to one support

$$\text{Reaction } R_A = 7.91 \times 3.00 \times 1.50 / 10.00$$

$$= 3.56 \text{ T}$$

$$\text{Reaction } R_B = 7.91 \times 3.00 - 3.56$$

$$= 20.17 \text{ T}$$