

* Roadway bridge :- (2 span) (continuous bridge)
 Span = 36m ST 52 (M-9) ST 37 floor sys. + bracing

Q1

Spacing bet. X-G = 3m

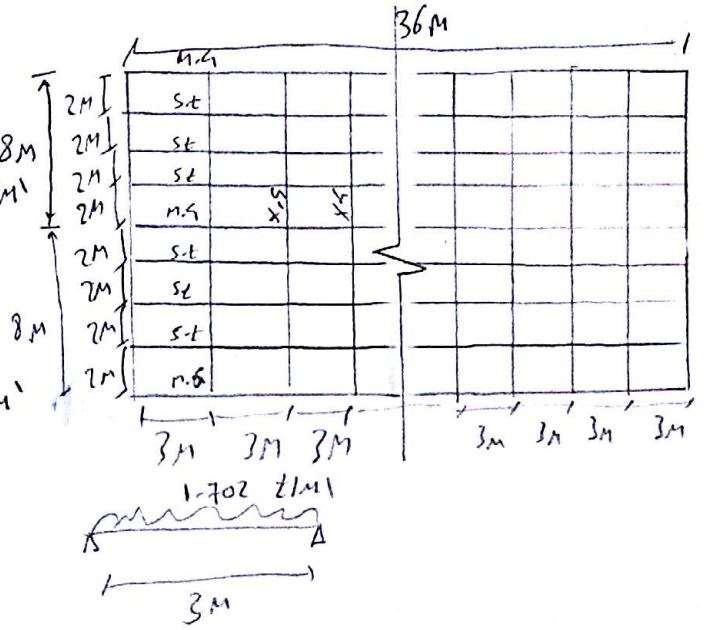
For stringers :-

D.L

$E_s = 250 \text{ mm}, t_{w.s} = 80 \text{ mm}, \text{ assume } 0.1 \text{ t/m}^2$

$$W_{D.L} = W_{o.w} + W_{conc} + W_{w.s}$$

$$= 0.1 + 2.5 \times 0.25 \times 2 + 2.2 \times 0.08 \times 2 = 1.702 \text{ t/m}^2$$



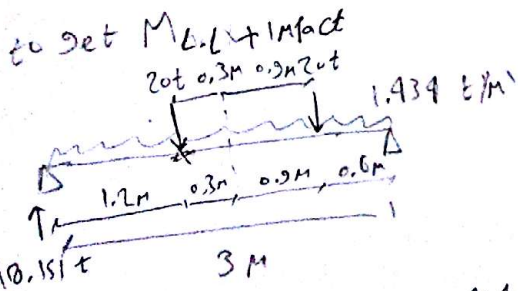
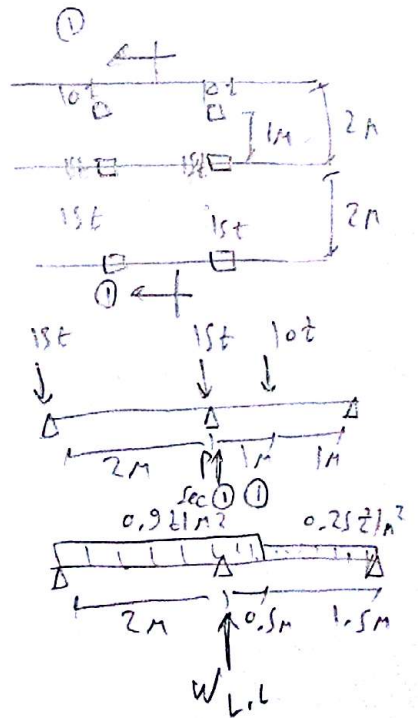
$$M_{D.L} = 1.702 \times \frac{3^2}{8} = 1.915 \text{ t.m}$$

$$Q_{D.L} = 1.702 \times \frac{3}{2} = 2.55 \text{ t}$$

L.L + Impact

$$P = 15 + 10 \times 0.5 = 20 \text{ t}$$

$$W_{L.L} = 0.9 \times 1 + 0.9 \times \frac{1.75}{2} \times 0.5 + 0.25 \times \frac{0.75}{2} \times 1.5 = 1.434 \text{ t/m}$$



$$M_{L.L + Impact} = 18.151 \times 1.2 - 1.434 \times \frac{1.2^2}{2} = 20.75 \text{ t.m}$$

to get Q_{max}



$$Q_{L.L + Impact} = 20 + 20 \times \frac{1.8}{3} + 1.434 \times 1.5 = 34.151 \text{ t}$$

∴ Max S.A.s-

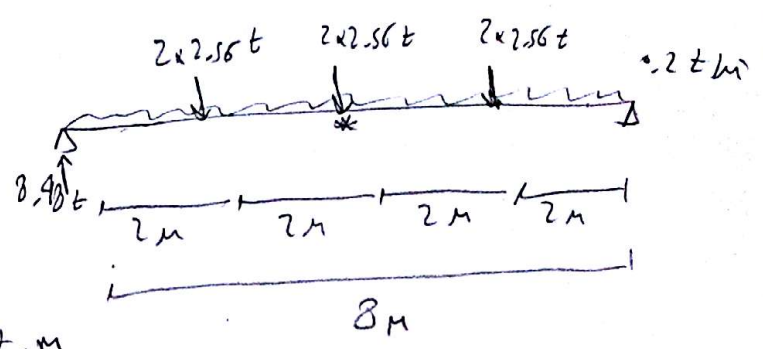
$$M_{max} = 1.915 + 20.75 = 22.67 \text{ t.m}$$

$$Q_{max} = 2.56 + 34.151 = 36.71 \text{ t}$$

For x.c :-

D.L

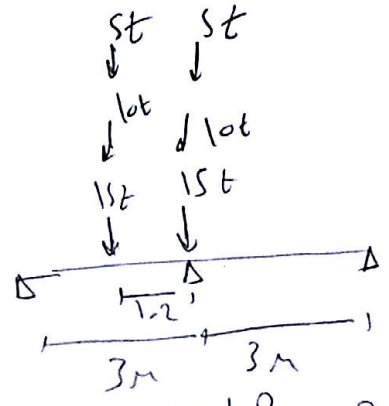
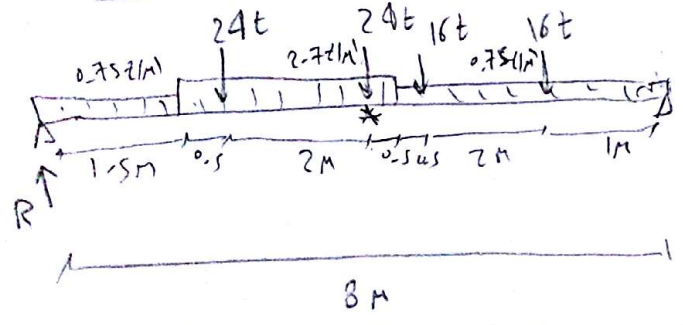
assume $\sigma w = 0.2 \text{ t/m}^2$



$$M_{D.L} = 8.48 \times 4 - 2 \times 2.56 \times 2 - 0.2 \times \frac{8^2}{2} = 22.00 \text{ t.m}$$

$$Q_{L.L} = 8.48 \text{ t}$$

L.L + I



$$P_1 = 15 + 15 \times \frac{1.8}{3} = 24 \text{ t}$$

$$P_2 = 24 \times \frac{1.0}{1.5} = 16 \text{ t}$$

$$P_3 = 24 \times \frac{0.5}{1.5} = 8 \text{ t}$$

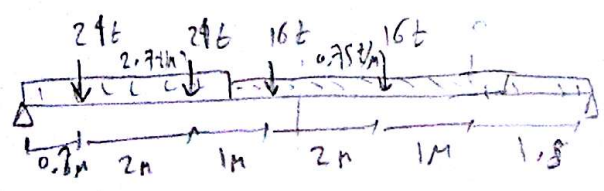
$$w_1 = 0.9 \times 3 = 2.7 \text{ t/m}$$

$$w_2 = w_3 = 0.25 \times 3 = 0.75 \text{ t/m}$$

$$R = 24 \times \frac{6}{8} + 24 \times \frac{4}{8} + 16 \times \frac{3}{8} + 16 \times \frac{1}{8} + 0.75 \times 1.5 \times \frac{7.25}{8} + 2.7 \times 3 \times \frac{5}{8} + 0.75 \times 3.5 \times \frac{1.75}{8} = 44.656 \text{ t}$$

$$M_{L.L+I} = 44.656 \times 4 - 24 \times 2 - 0.75 \times 1.5 \times 3.25 - 2.7 \times 2.5 \times 1.25 = 118.53 \text{ t.m}$$

to get Q_{max}



$$Q_{max} = 24 \times \frac{7.8}{8} + 24 \times \frac{5.8}{8} + 16 \times \frac{4.8}{8} + 16 \times \frac{2.8}{8} + 2.7 \times 2.7 \times \frac{6.65}{8} + 0.75 \times 8 \times \frac{2.65}{8} = 63.38 \text{ t}$$

∴ for x.c :-

(3)

$$M_{\max} = 22.08 + 118.53 = 140.61 \text{ t-m}$$

$$Q_{\max} = 8.48 + 63.38 = 71.86 \text{ t}$$

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