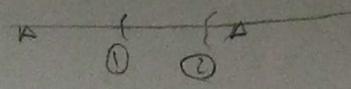


Design of M.9 (St 52)

$M_1 = 1908.53 \text{ t.m}$   
 $M_2 = 11590.43 \text{ t.m}$   
 $Q_2 = 236.8 \text{ t}$



→ web depth:-

$$d_w = (0.25 \sim 0.3) \sqrt{\frac{1908.53}{2.1}} = 2.42 \text{ m} \sim 2.91 \text{ m}$$

let  $d_w = 2.5 \text{ m}$

→ web thickness:-

(unstiffened)

$$t_w^2 = \frac{236.8}{41.65 \sqrt{2.6}} = 2.38 \rightarrow t_w = 1.73 \text{ cm}$$

let  $t_w = 1.8 \text{ cm}$

using VL stiffeners at X.G location

$$\therefore d_1 = 3 \text{ m}$$

$$\alpha = \frac{3}{2.5} = 1.271$$

$$V_Q = 5.34 + \frac{4}{1.2} = 8.118$$

$$\lambda_Q = \sqrt{\frac{3.6/\sqrt{3}}{8.118 \times 1898 \times (\frac{1.8}{25})^2}} = 1.61371.2$$

$$q_{all} = \frac{0.9}{1.613} \times 0.35 \times 3.6 = 0.703 \text{ t/cm}^2$$

$$q_{act} = \frac{236.8}{250 \times 1.8} = 0.533 \text{ t/cm}^2 < q_{all} \text{ (o.k)}$$

∴ web buckling against shear is safe

→ check of web buckling due to B.M:-

$$\frac{d_w}{t_w} = \frac{250}{1.8} = 138.8 > \frac{190}{\sqrt{3.6}} = 100.14$$

$$< \frac{320}{\sqrt{3.6}} = 168.65$$

∴ use one long. stiffener @  $\frac{d}{5}$  from comp. flange