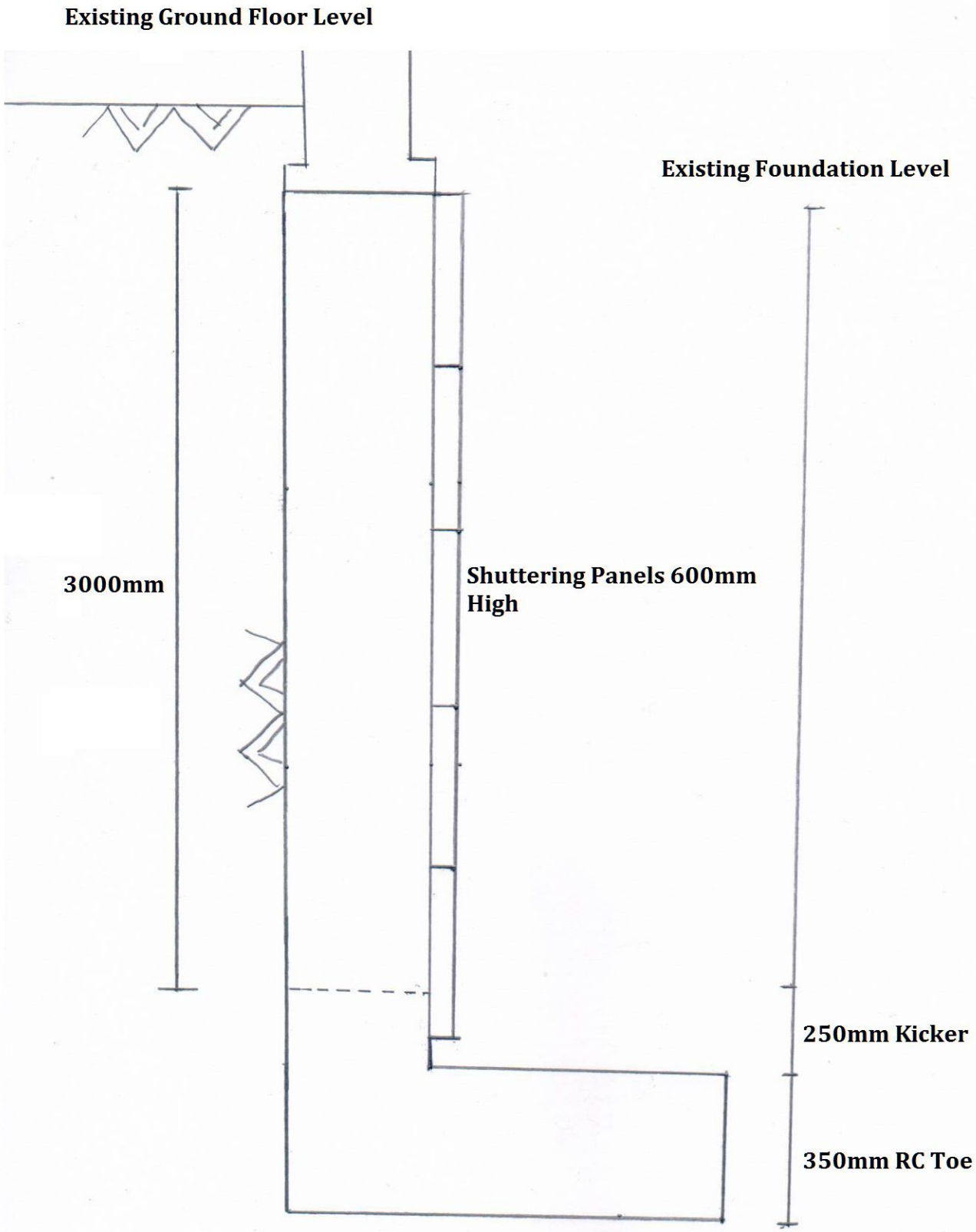
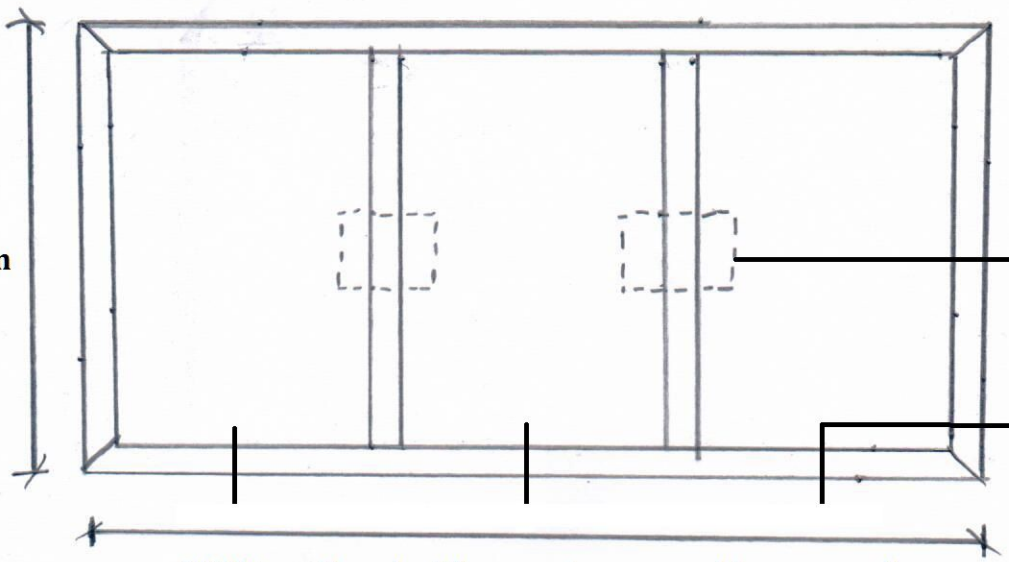
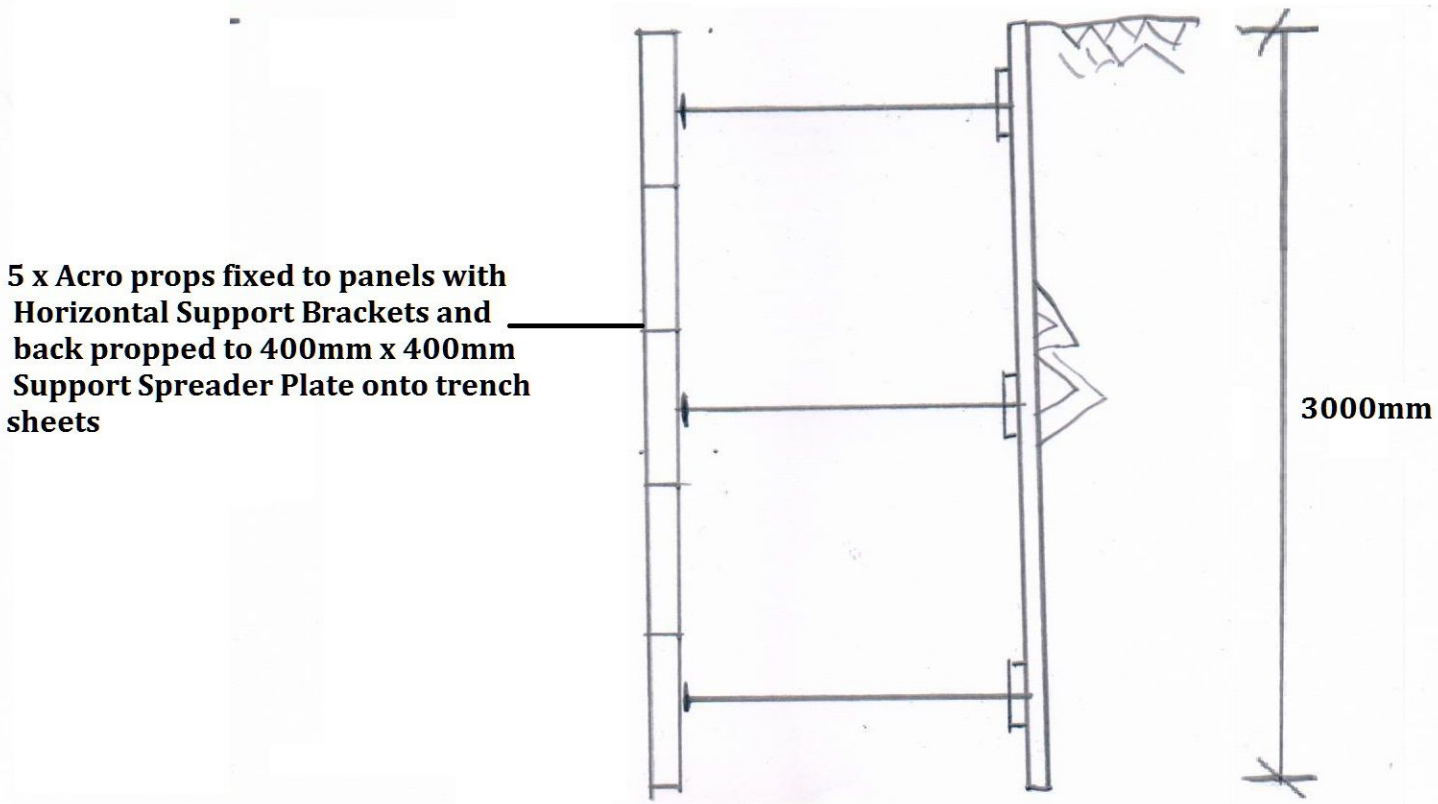
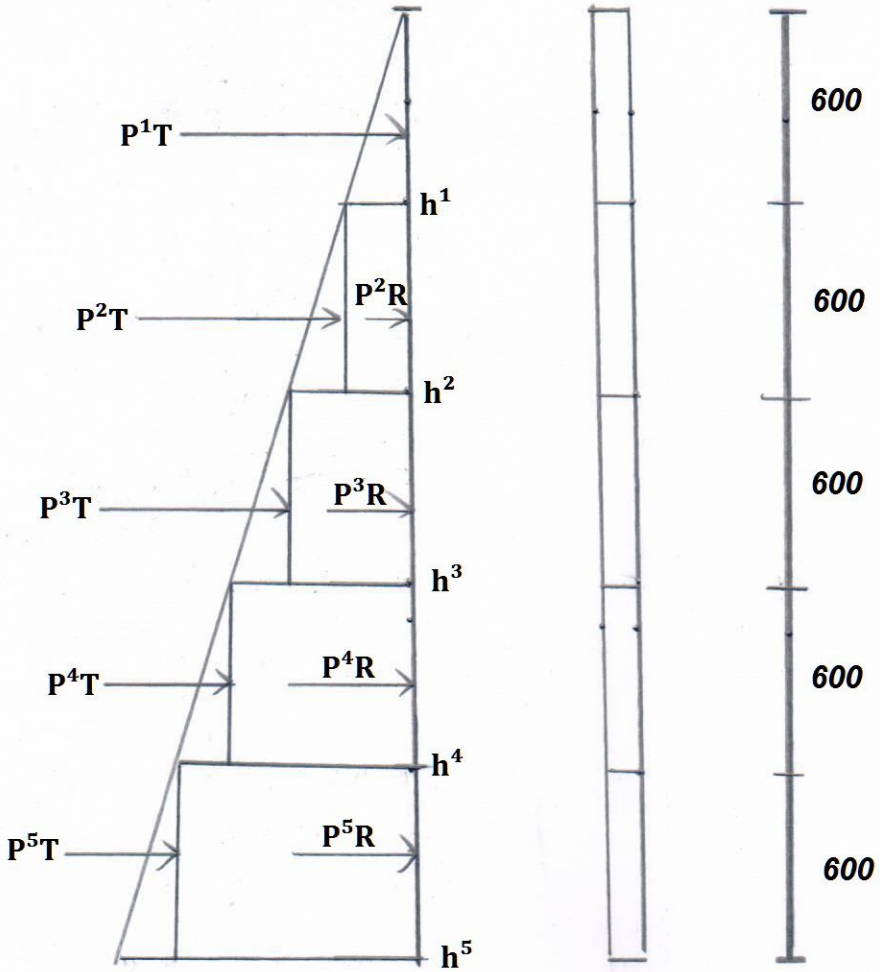
**P = Wet Concrete = 24kN**




RHS 40 x 80 x 3.2 fully welded
Ply fixed to the external face
600mm
Acro prop location
3 x 16mm Dywidag bolts with 100mm x 80mm x 12mm washer plates
1200mm Panel with a maximum working span of 1000mm retained


5 x Acro props fixed to panels with Horizontal Support Brackets and back propped to 400mm x 400mm Support Spreader Plate onto trench sheets
3000mm

## Panel Triangulation Load P = Concrete = 24kN /$m^3$




## Panel Triangulation load

$P^1T = ½ Ph,^2 = ½ \times 24 \times 0.6^2 = 4.3kn$

**Panel 2 Rectangular Load**

$P^2R = Ph, \times (h^2 - h^1) = 24 \times 0.6 \times 0.6 = 8.6kN$

$P^2T = (Ph^2 - PH^1) \times (h^2 - h^1) \times ½$
$= (24 \times 1.2 - 24 \times 0.6) \times (1.2 - 0.6) \times ½ = 4.3kN$

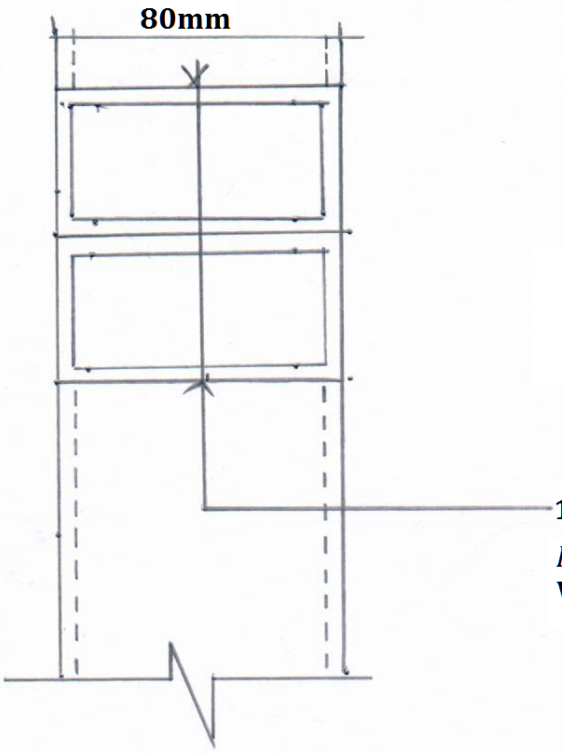
$P^3R = Ph2 \times (h^3 - h^2) - 24 \times 1.2 \times 0.6 = 7.3kN$

$P^3T = (Ph^3 - Ph2) \times (h^3 - h^2) \times ½ =$
$= (24 \times 1.8 - 24 \times 1.2) \times (0.6) \times ½ = 4.3kN$

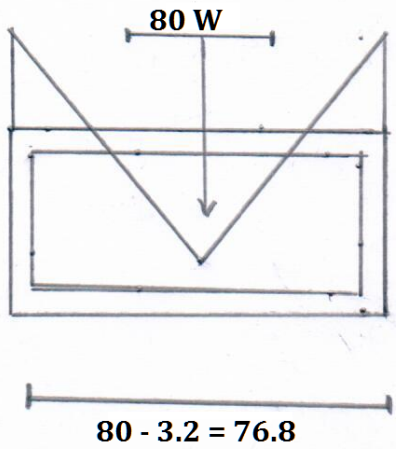
$P^4R = 24 \times 1.8 \times 0.6 = 25.9kN$

$P^4T = 4.3kN$

$P^5R = 34.6kN$ P5T = 4.3kN




M= 90 x $\frac{0.08}{2}$ = 3.6kNm per rod
x 3 10.8kNm working load per panel

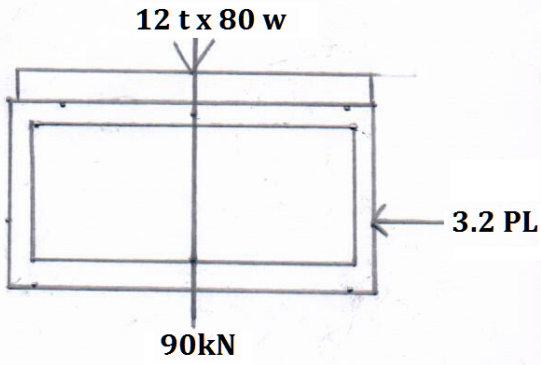



M= $\frac{PL}{8}$ = $\frac{90 \times 0.0768}{8}$ = 0.864kNm x 3 x 2.5

SAY 80 W Width

M= $\frac{6t^2}{6}$ x 355 x 106 = 0.864kN

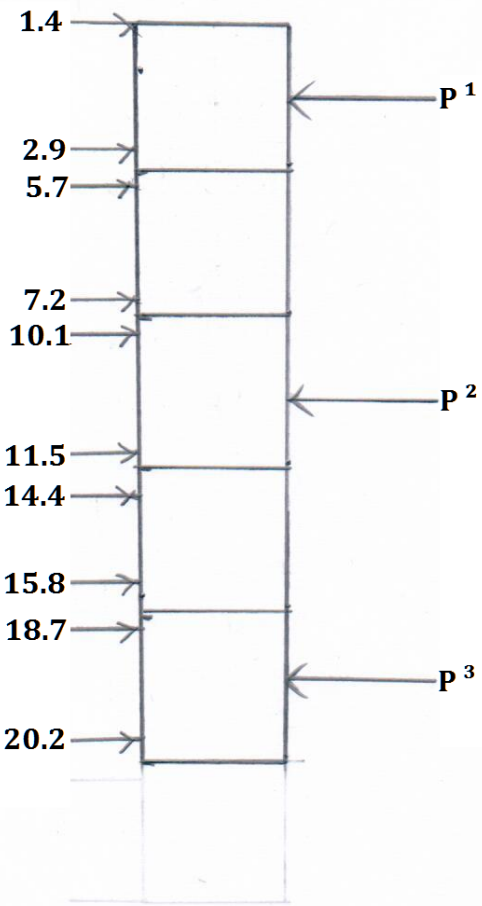
$\sqrt{\frac{864 \times 6}{355 \times 106 \times 0.08}}$ = t = 13mm




M x 40 x 80 x 3.2 RHS =>
Zp = 11.0cm$^3$ = 11000m$^3$ = 1.1 x 10$^{-5}$ m$^4$

Mp = 1.1 x 10$^{-5}$ x 3.55 x 10$^6$ = 3.9kNm

Mp :. 4 no = 3.9 x 4 = 15.6kN > 10.35 kN :. Panels ok

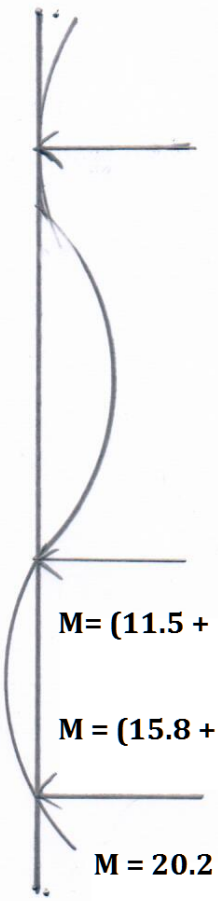



$P^1 \approx 1.4 + 2.9 + 5.7 \approx 10kN$

$P^2 \approx 7.2 + 10.1 + 11.5 + 14.4$
$\approx 43.2kN$

$P^3 \approx 15.8 + 18.7 + 20.2$
$\approx 54.7kN$ per 2 props – 27.4 / prop

Acrow Props : 32kN :.
Concentric + $1.5^0$ max out of Plumb



M= (11.5 + 14.4) x 0.3 = 7.77

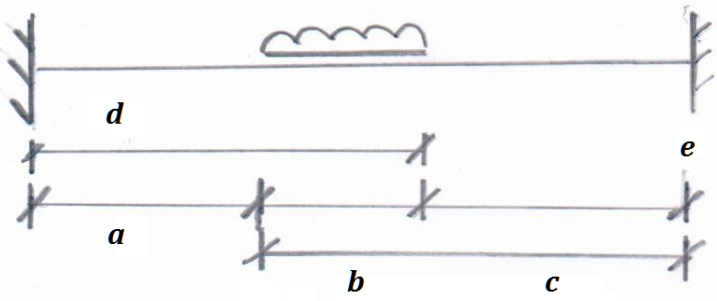
M = (15.8 + 18.7) x 0.3 = 10.35 > 2.59kN / Panel
< 10.8kN / 3 Dywidag

M = 20.2 x 0.3 = 6.06 kNm

**Use increased width of Dywidag Washer**

**SAY 50mm**

***W = 90kN***




**L = 80 – 3.2 = 76.8**

**a = 13.4**
**c = 13.4**
**b = 50**
**d = 63.4**
**e = 63.4**

**Ra = 90 / 2 = 45kN**

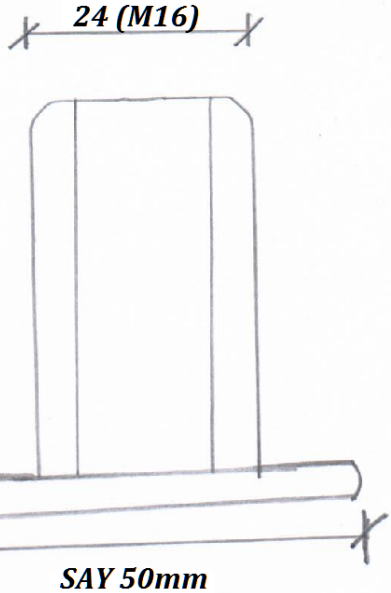
**Ma - $\frac{W}{12L^2b}(e^3 (4L - 3e) - c^3 (4L - 3c))$**

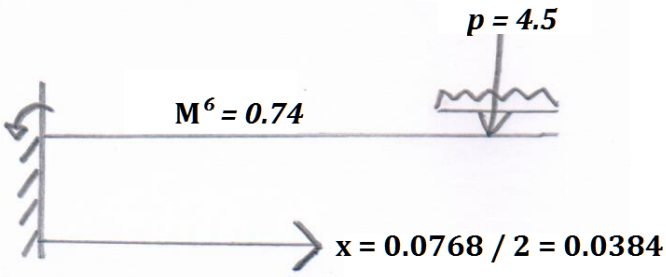
**$= \frac{-90}{12 \times 0.0768^2 \times 0.05}(0.063^3 (4 \times 0.0768 - 3 \times 0.06^3)$**

**$- 0.013^3 (4 \times 0.0768 - 3 \times 0.013)$**

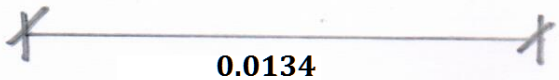
**$= 25431 \times (2.96 \times 10^{-5} - 5.9 \times 10^{-7})$**

**Mb = 0.74kNm**




**Ra = 45kN**




**Mc = - 0.74 + 0.0384 – 45 x 0.0125**
**= 0.43kNm**

**:. Mb Critical = 0.74kNm**

**Mp = 0.1 x 2 / 6 x 355 x $10^6$**
**SAY USE WIDE PLATE WASHER**

**0.74 = 01 $t^2$ / 6 x 355 x $10^6$**

**T = 0.011 :. 12mm**