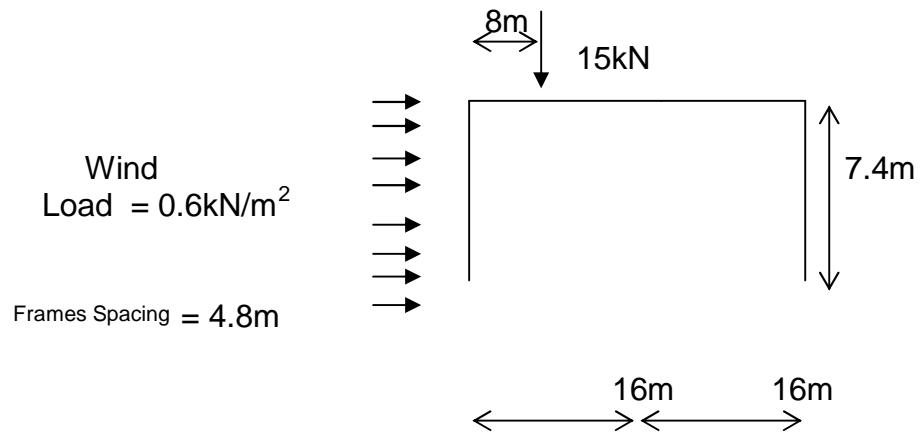
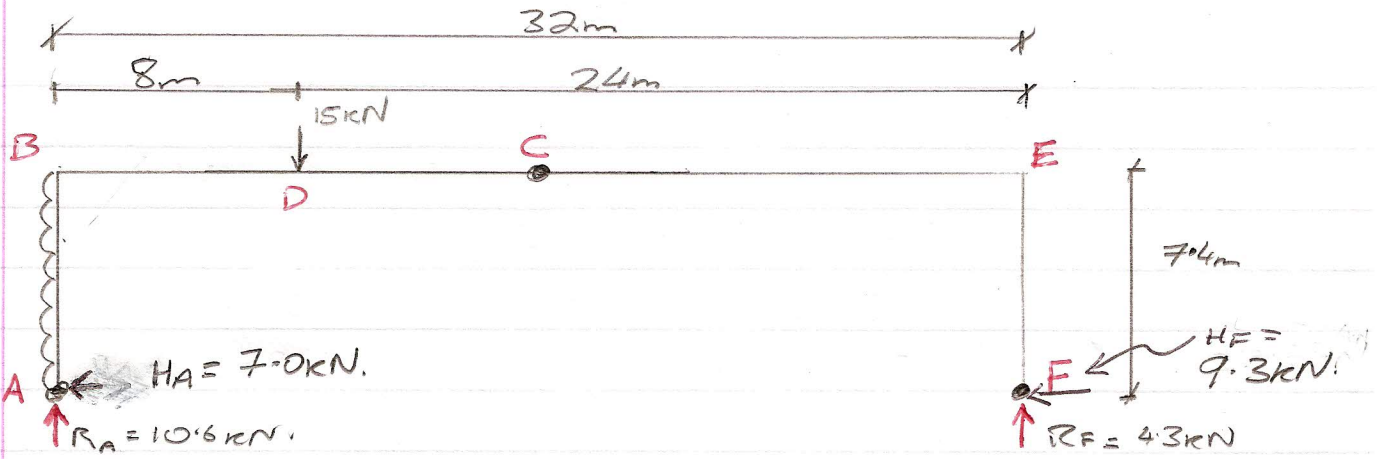


Calculate the bending moments and shear forces in a 3 pinned frame shown in Figure 2 and draw the SFD and the BMD



**FIGURE 1**

Q2.



$\curvearrowright M_A$

$$(0.6 \times 7.4 \times 3.7) + (8 \times 15) = R_F \times 32$$

$$R_F = 4.3 \text{ kN}$$

$\curvearrowright M_F$

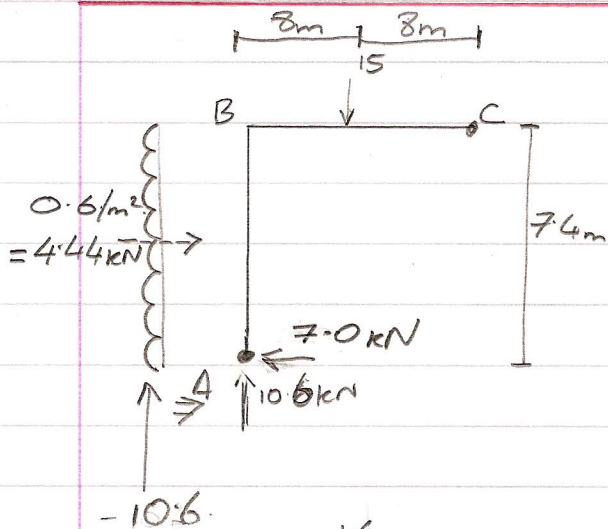
$$32 R_A + (0.6 \times 7.4 \times 3.7) = 15 \times 2.4$$

$$R_A = 10.6$$

CHECK FOR VERTICAL Equil.

$\Downarrow$

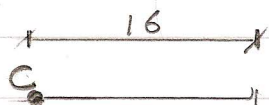
$$15 = 4.3 + 10.6 \quad \therefore \text{OK}$$



$\curvearrowright M_C$        $\curvearrowright$        $\curvearrowleft$

$$7.4 H_A + (10.6 \times 8) = (0.6 \times 7.4 \times 3.7) + (8 \times 15)$$

$$H_A = 7.0 \text{ kN}$$

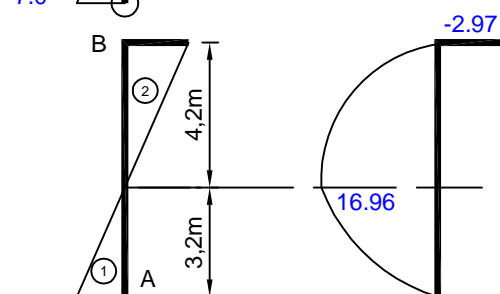
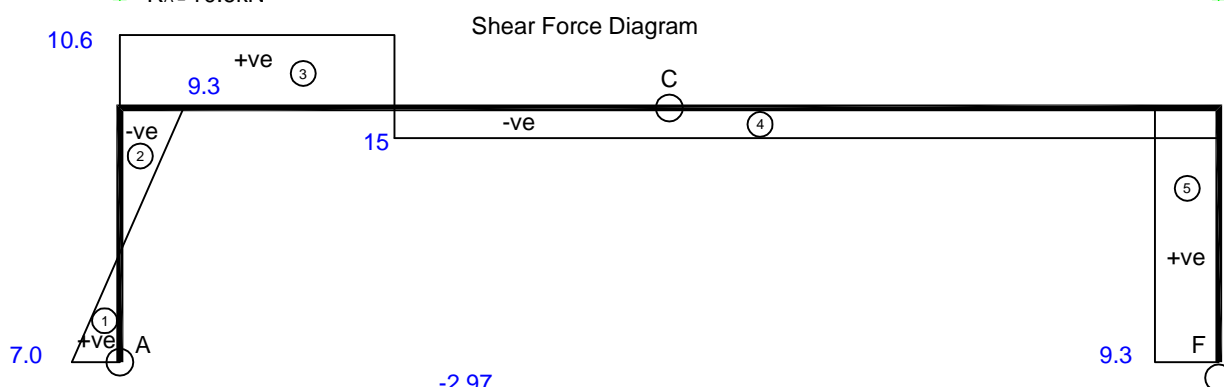
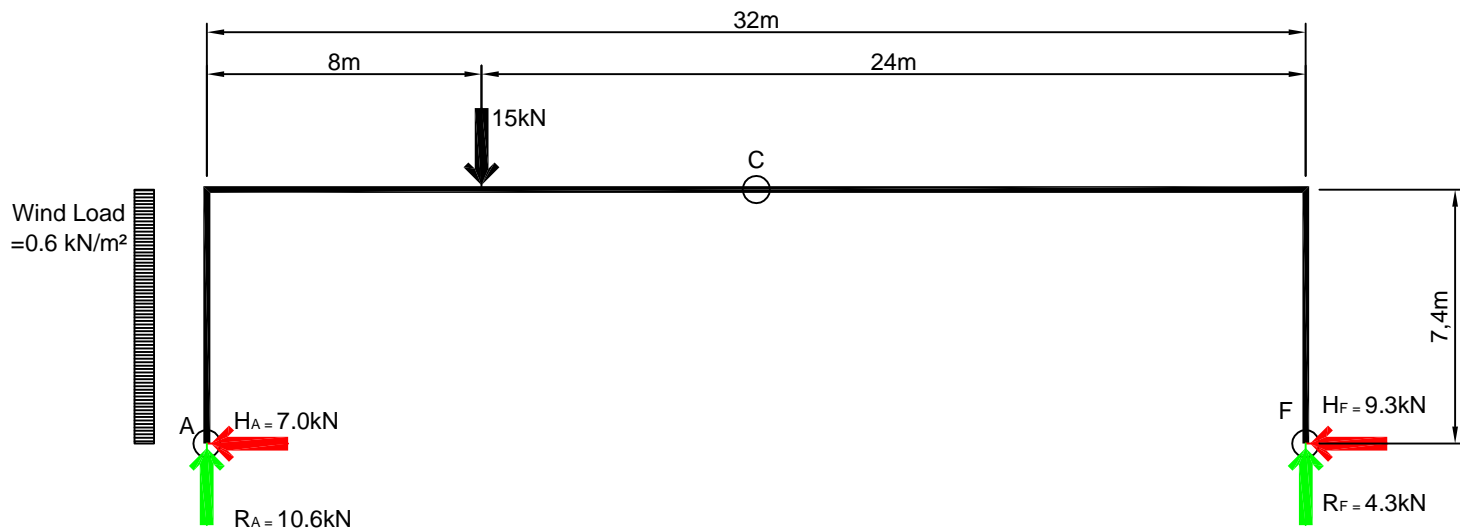


$\curvearrowright M_C$        $\curvearrowleft$

$$1.4 (H_F \times 7.4) = (4.3 \times 16)$$

$$H_F = 23$$

$$R_F = 4.3 \text{ kN}$$



| Block | Area (kN/m)                          | Total BM (kN/m) |
|-------|--------------------------------------|-----------------|
| 1     | $\frac{1}{2} \times 10.6 \times 3.2$ | 16.96           |
| 2     | $-\frac{1}{2} \times 9.3 \times 4.2$ | -2.97           |
| 3     | $10.96 \times 8$                     | 84.71           |
| 4     | $24 \times -4.4$                     | -20.89          |
| 5     |                                      |                 |

