

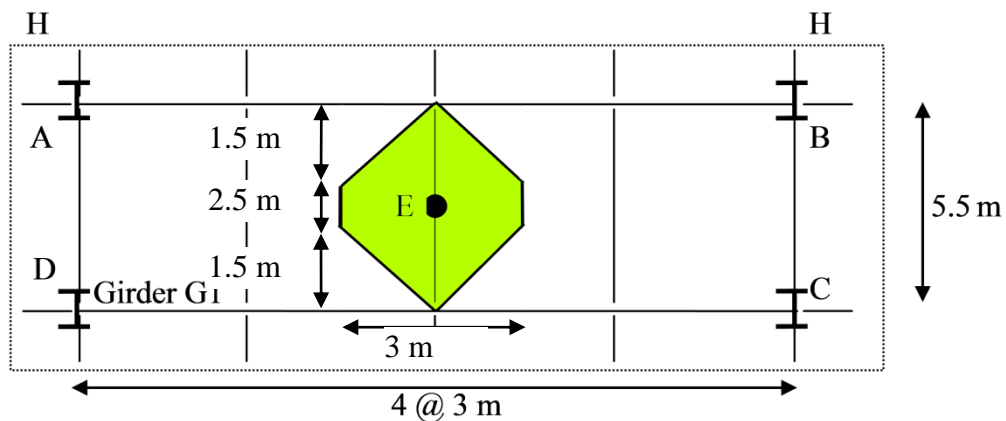


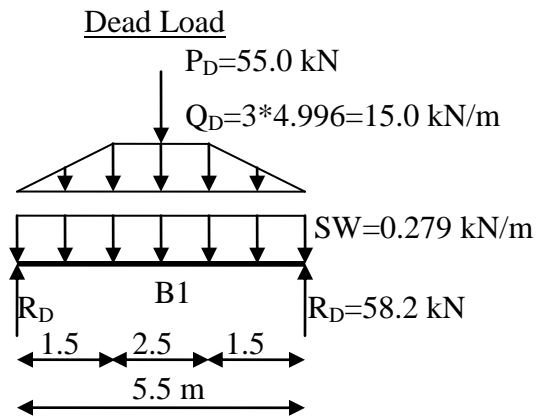
CIVE 3204 Introduction to Structural Design (Fall 2014)

Solution Assignment #3: (out of 100)

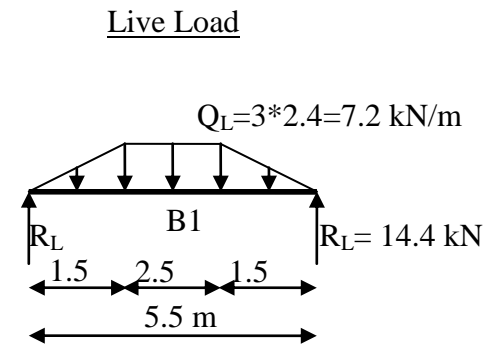
Question 1: Two-way slab

1.a) Loads acting on beam B1:



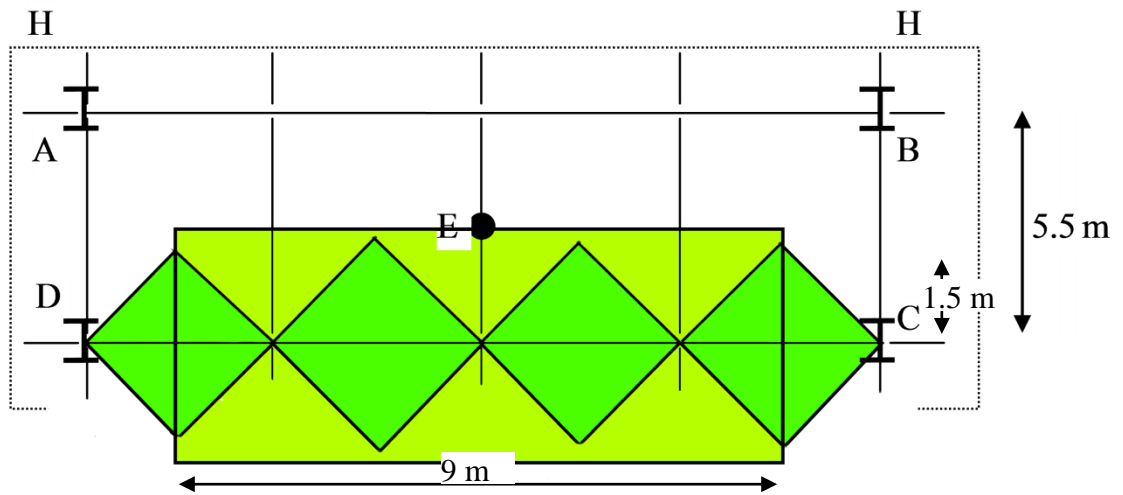


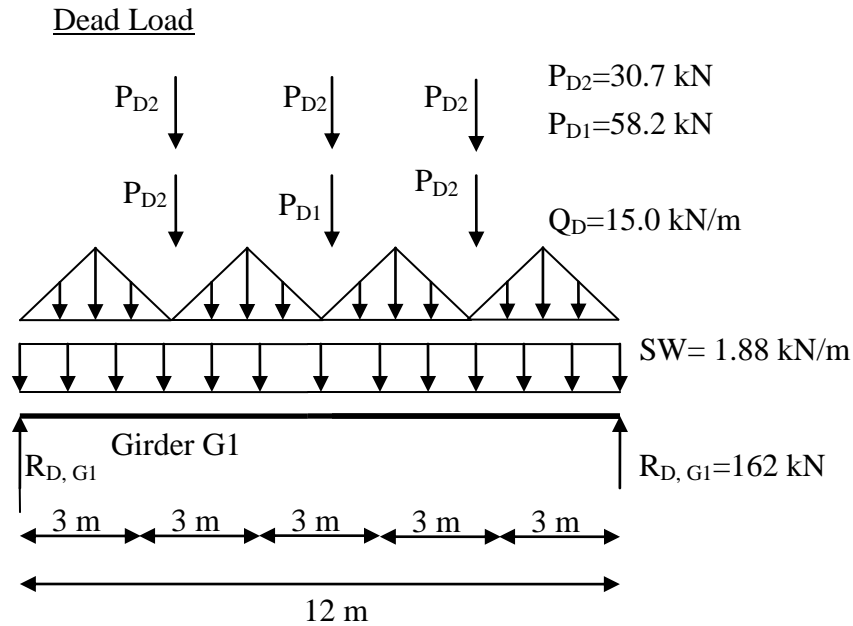
$$R_D = [0.279 * 5.5 + (3 * 4.996) * (2.5 + 5.5) / 2 + 55] / 2 = 58.2 \text{ kN}$$



$$R_L = [7.2 * (2.5 + 5.5) / 2] / 2 = 14.4 \text{ kN}$$

1.b) Loads acting on girder G1:



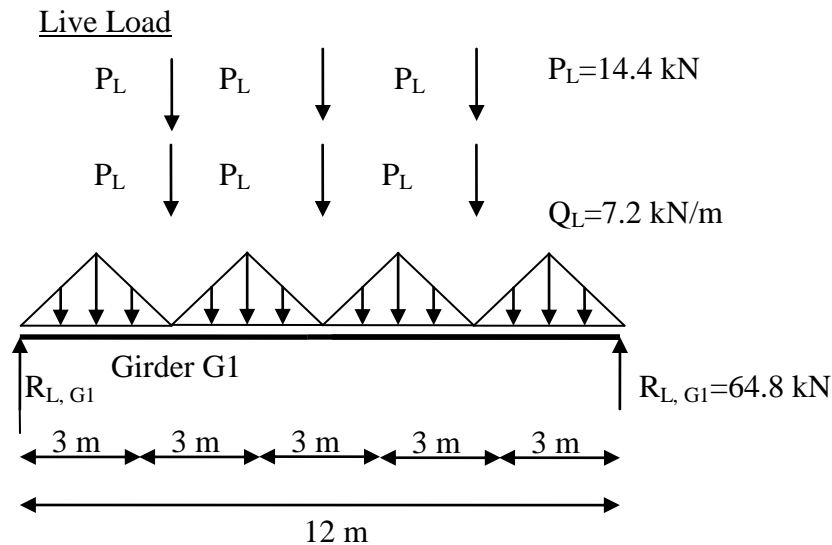


$Q_D=3*4.996=15.0 \quad \text{kN/m} \quad \leftarrow$ Acting directly on the girder from the dead load on the slab

$P_{D1}=R_{D, B1}=58.2 \quad \text{kN} \quad \leftarrow$ From the reaction of beams with the 55 kN point load

$P_{D2}=R_{D, B1} - 55/2=30.7 \text{ kN} \quad \leftarrow$ From the reaction of beams without the 55 kN point load

$R_{D, G1} = [1.88*12+ 4*(15*3/2)+ 58.2+5*30.7]/2 = 162.13 \text{ kN}$



$Q_L=3*2.4=7.2 \text{ kN/m} \quad \leftarrow$ Acting directly on the girder from the live load on the slab

$P_L=R_{L, B1}=18.9 \text{ kN} \quad \leftarrow$ From the reaction of the beams

$R_{L, G1} = [4*(7.2*3/2)+6*14.4]/2 = 64.8 \text{ kN}$