

Submission Date: **29.03.2019**

A one story structure given in Figure 1 as plan view is subjected to dead, live and earthquake loads. Section view of the A-A grid of the structure is given in Figure 2. AB column is designed by encased composite member, CD column by filled composite member, BC beam by composite beam with steel anchors. Typical sections of the members are given in Figure 3. Internal force diagrams under unit load are given in Figures 4-6. Design the AB, CD and BC members considering external loads using $1.2D+1.0L\pm 1.0E$ load combination. All design parameters including materials will be defined by student.

Note: Do not consider axial forces to design of BC beam.

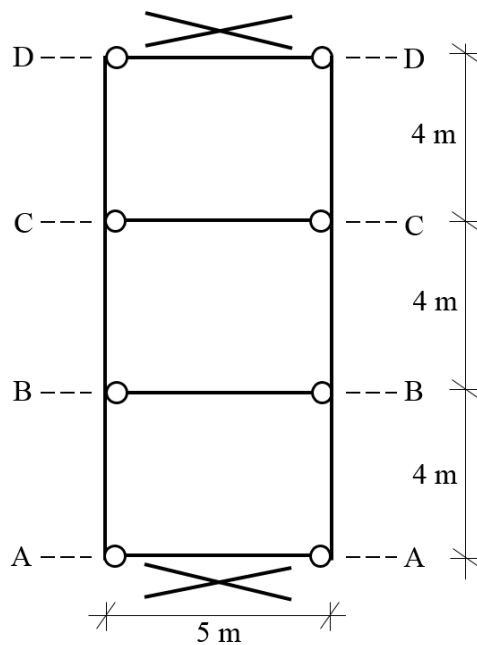


Figure 1. Plan view of the structure

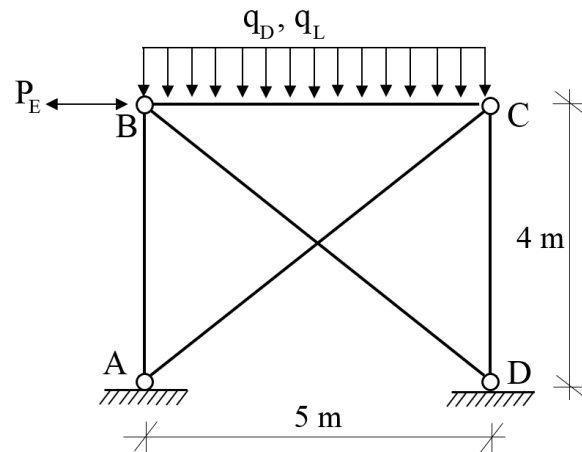


Figure 2. Section view of A-A grid of the structure

	A	B	C	D	E	F	G	H
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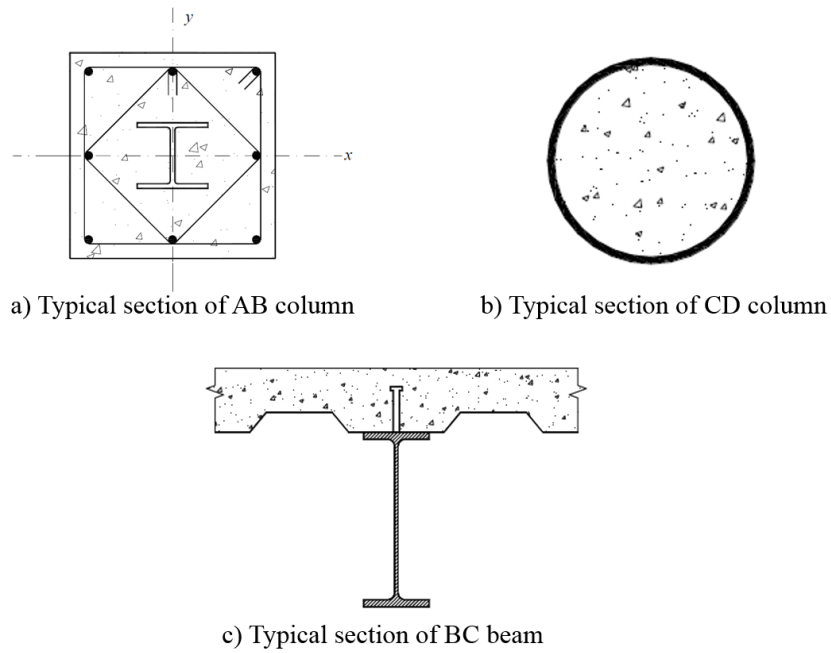


Figure 3. Typical sections of the members

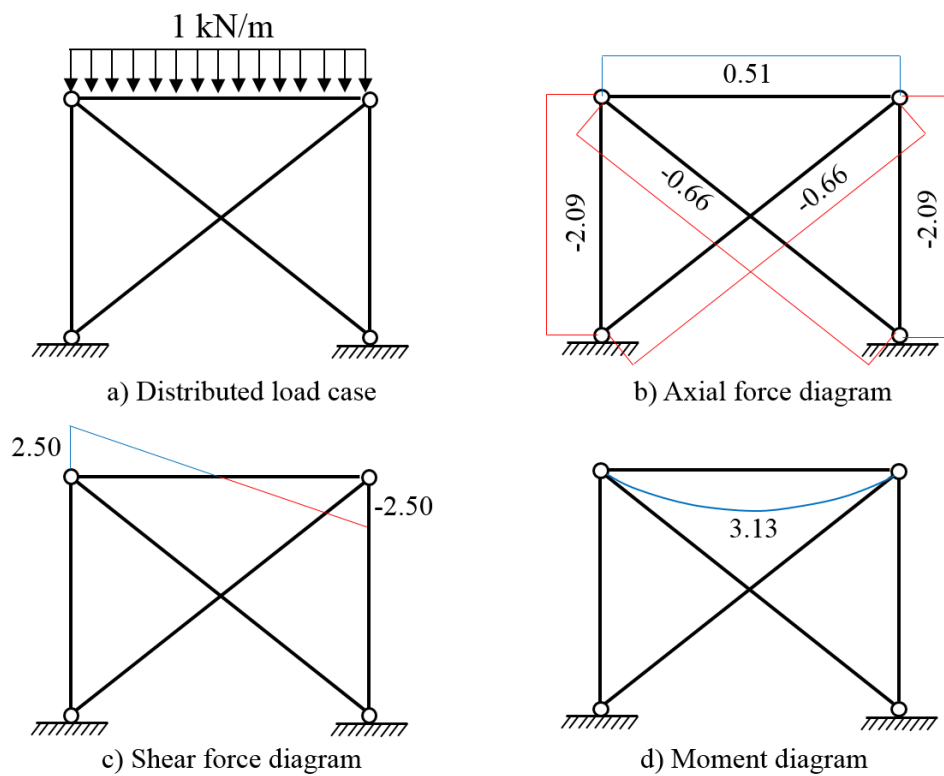


Figure 4. Internal force diagrams under unit distributed load

	A	B	C	D	E	F	G	H
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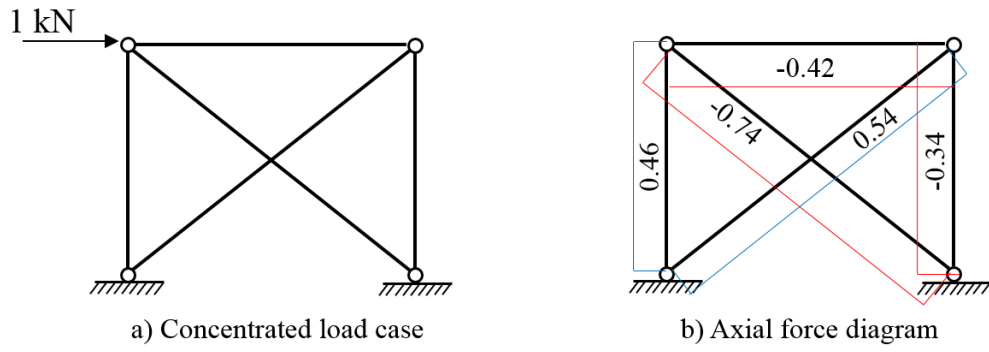


Figure 5. Internal force diagram under unit concentrated load

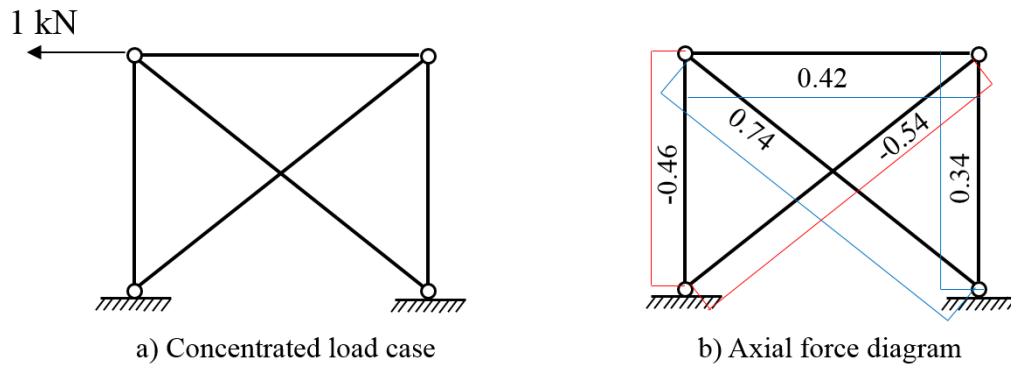


Figure 6. Internal force diagram under unit concentrated load

Load parameters:

Dead load: $q_D = 90 + 50F + 10G + 20H$ (kN/m)

Live load: $q_L = 110 + 40F + 15G + 20H$ (kN/m)

Earthquake load: $P_E = 4000 + 10B + 100F + 50G + 90H$ (kN)

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