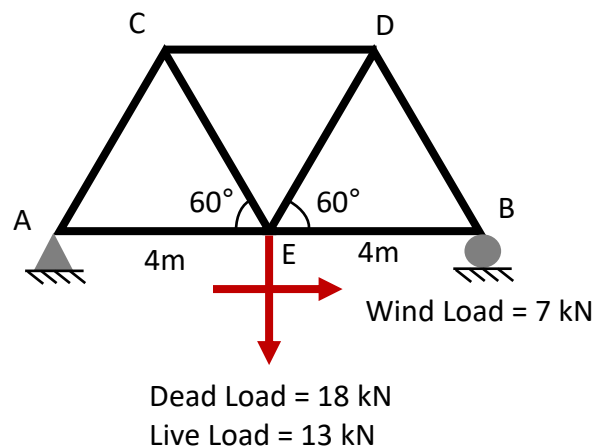


CWC Wood Design Midterm (Modules 1-7)

QUESTION 1

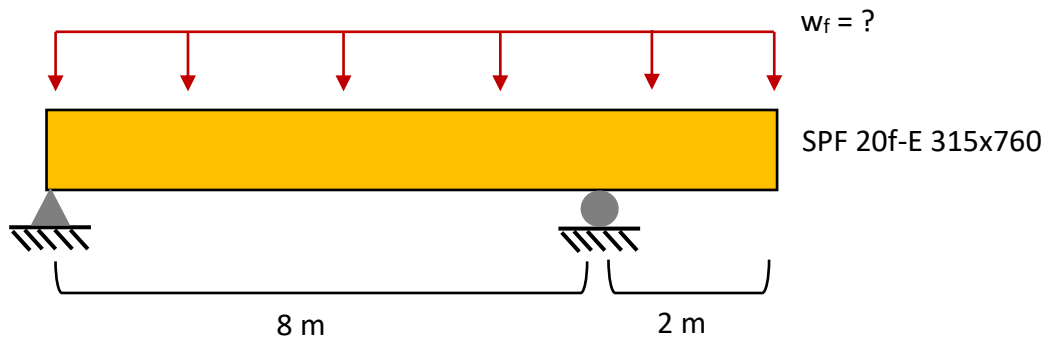
A timber truss system is subjected to an unfactored dead load of 18 kN, an unfactored live load of 13 kN, and an unfactored wind load of 7 kN at node E. Assuming dry conditions and untreated wood:

- a) Indicate the governing factored load case for the axial design of member CE. Explain your reasoning.
- b) Select a suitable Northern grade No. 1 member to resist the loads subjected to member CE. Achieve at least 85% utilization. Assume the net area is 75% of the gross area. Selection tables can be used for initial selections, but you must show the full design check.
- c) Assess if your chosen member from part B is sufficient for member BD.



QUESTION 2

A cantilever 315x760 mm SPF 20f-E beam supports a floor slab that continuously braces the beam along its length. The main span of the beam is 8 meters and the cantilever span is 2 meters. Assuming the width of the beam's laminates are half of the beam's total width, what is the maximum factored distributed load that can be applied to the beam given the configuration below? Ignore deflection requirements. Assume wet service conditions and a standard term load duration factor.





QUESTION 3

Two 143x343 D. Fir-L No. 1 members of a roof frame are connected at their peak. For the loading configuration below, bearing occurs between the ends of the members. a) Determine the maximum distributed factored load w_f that can be applied based on the bearing capacity at this region. The grain direction is parallel to the longitudinal axis of the member. b) Do you think the bearing capacity of the member determined in Part A will govern the overall system? Why or why not? Assume standard term load duration, dry service conditions, and no treatment.

