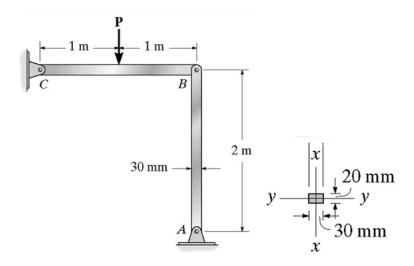
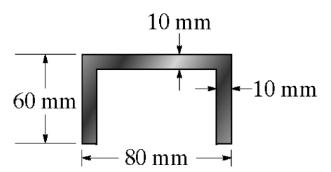
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1. Determine if the frame can support a load of P = 20 kN if the factor of safety for member AB is 3. Assume that AB is made of steel and is pinned at its ends for x-x axis buckling and fixed at its ends for y-y axis buckling. $E_{st} = 200$ GPa, $\sigma_p = 194$ MPa, $\sigma_Y = 222$ MPa, $\sigma_{cr} = 227$ - $0.0033\lambda^2$ for intermediate columns.

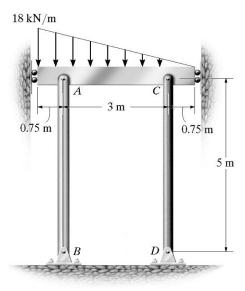


2. A steel column has a length of 5 m and is free at one end and fixed at the other end. If the cross sectional area has the dimensions shown, determine the critical load. $E_{st} = 200$ GPa, $\sigma_p = 194$ MPa, $\sigma_Y = 222$ MPa, $\sigma_{cr} = 227 - 0.0033\lambda^2$ for intermediate columns.



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3. The distributed loading is supported by two pin-connected columns, each having a solid circular cross section. If AB is made of aluminum and CD of steel, determine the required diameter of each column so that both will be on the verge of buckling at the same time. $E_{st} = 200 \text{ GPa}$, $(\sigma_p)_{st} = 194 \text{ MPa}$, $E_{al} = 70 \text{ GPa}$, $(\sigma_p)_{al} = 100 \text{ MPa}$.



4. The steel bar AB has a rectangular cross section. If it is assumed to be pin connected at its ends, determine if member AB will buckle if the distributed load w = 2 kN/m. Use a factor of safety with respect to buckling of 1.5. $E_{st} = 200$ GPa, $\sigma_p = 194$ MPa.

