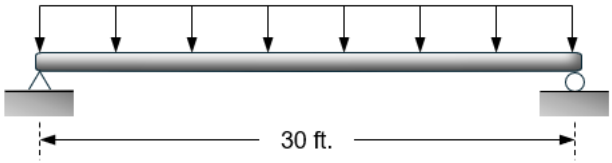
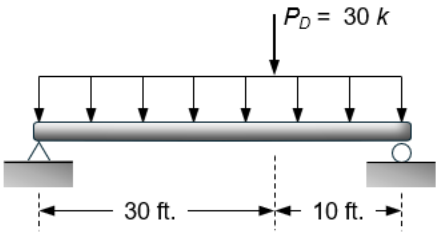
Classroom Problem 5.5-1: The beam shown is a **W16 x 77** of **A992** steel with F_y = 50 *ksi*; F_u = 65 *ksi*. It supports a reinforced concrete floor slab that provides continuous lateral support of the compression flange. The service dead load is 1 *k/ft*. This load is superimposed on the beam; it does not include the beam's weight. The service live load is 2 *k/ft*.

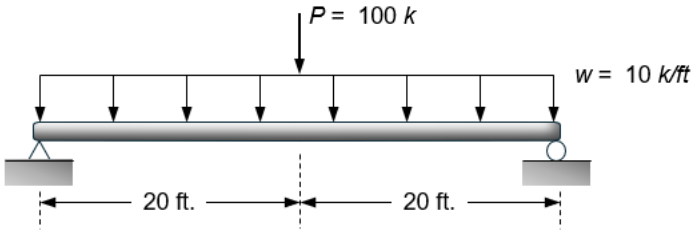


Classroom Problem 5.5-2: The beam shown is a **W30 x 108** of **A992** steel with F_y = 50 *ksi*; F_u = 65 *ksi*. It supports a reinforced concrete floor slab that provides continuous lateral support of the compression flange. The service dead load is 1 *k/ft*. This load is superimposed on the beam; it does not include the beam's weight. The service live load is 2.5 *k/ft*.

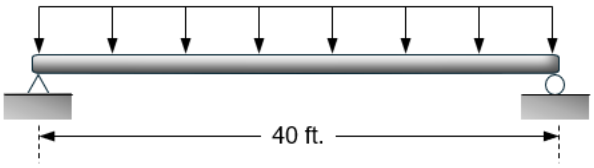


Classroom Problem 5.5-3: Determine the flexural strength of a **W16 x 100** of **A572 Grade 50** steel (F_y = 50 *ksi*; F_u = 65 *ksi*) subject to: a) continuous lateral support, b) an unbraced length of 30 ft. with C_b = 1.0, and c) an unbraced length of 40 ft. with C_b = 1.0.

Classroom Problem 5.5-4: Determine C_b for a simply supported beam with lateral support at its ends and the middle.



Classroom Problem 5.5-5: A **W18 x 86** of **A992** steel with F_y = 50 *ksi*; F_u = 65 *ksi* is used as a simply supported beam. The only additional load, in addition to the beam weight, is a uniform live load. If lateral support is provided at 10-foot intervals, what is the maximum service load that can be supported?



Classroom Problem 5.5-6: A **W18 x 86** of **A992** steel with F_y = 50 *ksi*; F_u = 65 *ksi* is used as a simply supported beam. The point loads are P_D = 6 *k* and P_L = 15 *k.* Ignore the beam weight. Also, the beam is laterally supported at each end and at 20 ft. Using *LRFD*, does this beam have adequate moment capacity?