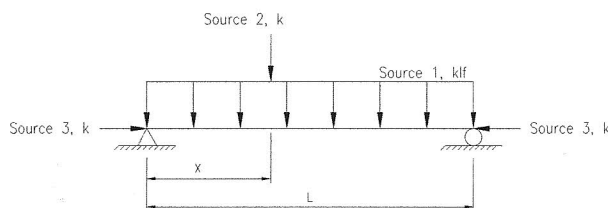


Load Combination Example Problem

Given: The simply supported floor beam shown gets loads from the following sources:

- (Source 1) floor loads (acting as a uniform load over the entire span). This load consists of 1.15 k/ft dead load, 1.85 k/ft of live load.
- (Source 2) a column located a distance "X" from one end. This is a point load source. The column load consists of 8.00 k dead load, 4.80 k roof live load, and 10.0 k snow load.
- (Source 3) an axial force (the member is part of the lateral force resisting system for the structure) that consists of 15.0 k wind load or 25 k earthquake load.



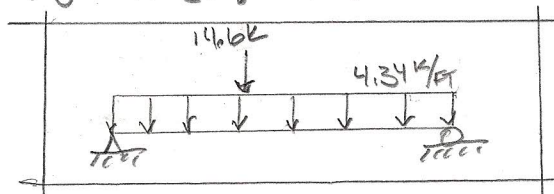
Wanted: Draw the load diagrams for LRFD-LC2b and LRFD-LC5a

Solution: LRFD-LC2b: $1.2D + 1.6L + .5S$

$$\text{SOURCE \#1: } W_u = 1.2(1.15 \text{ k/ft}) + 1.6(1.85 \text{ k/ft}) + .5(0) = 4.34 \text{ k/ft}$$

$$\text{SOURCE \#2: } P_u = 1.2(8.0 \text{ k}) + 1.6(0) + .5(10 \text{ k}) = 14.6 \text{ k}$$

$$\text{SOURCE \#3: } P_u = 1.2(0 \text{ k}) + 1.6(0 \text{ k}) + .5(0 \text{ k}) = 0 \text{ k}$$



LRFD-LC5a: $1.2D + E + L + 0.2S$

$$\text{SOURCE \#1: } W_u = 1.2(1.15 \text{ k/ft}) + (0) + (1.85 \text{ k/ft}) + 0.2(0) = 3.23 \text{ k/ft}$$

$$\text{SOURCE \#2: } P_u = 1.2(8.0 \text{ k}) + (0) + (0) + 0.2(10 \text{ k}) = 11.6 \text{ k}$$

$$\text{SOURCE \#3: } P_u = 1.2(0) + (25 \text{ k}) + (0) + 0.2(0) = 25.0 \text{ k}$$

