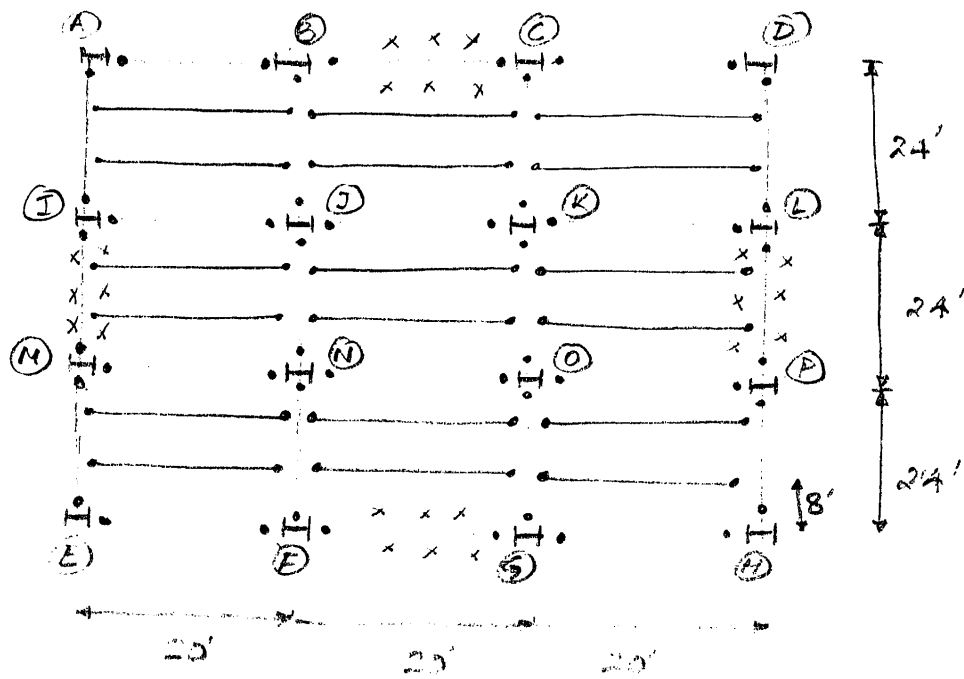


LAB 1 CE 470:



Assume $DL = 75 \text{ lb/ft}^2$

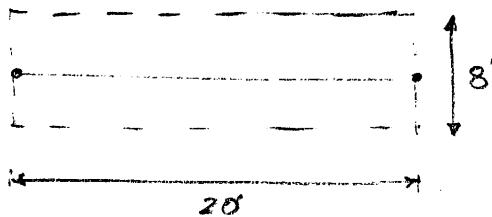
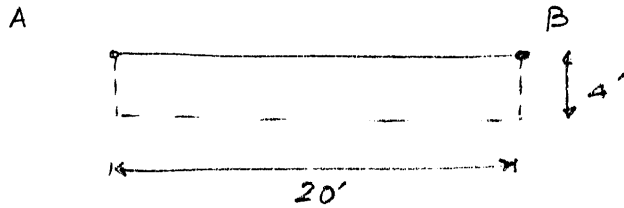
$LL = 50 \text{ lb/ft}^2$

Q1 ① Develop the loading ($1.2D + 1.6L$) for Frame BJNF

- ② All the frames in the structure are braced.
- ③ Assume the structural floor plan is always the same.
- ④ Assume structure has 6-stories of 12 ft. height

Q2 ② What is the design load for Column B & N directly. Compare these with the values you get from above (beam focused analysis)

Solution



$$A_T = 80 \text{ ft}^2$$

$$K_{LL} = 2.0$$

$$\frac{CF}{\gamma}$$

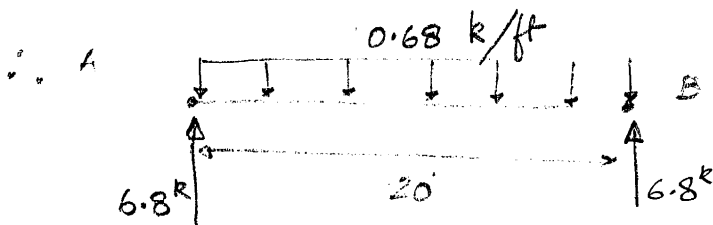
$$= 0.25 + \frac{15}{\sqrt{K_{LL} A_T}}$$

$$\leq 1.0$$

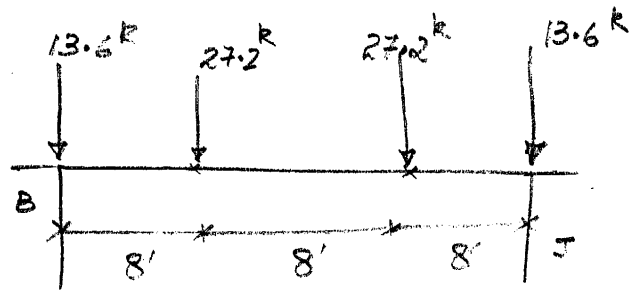
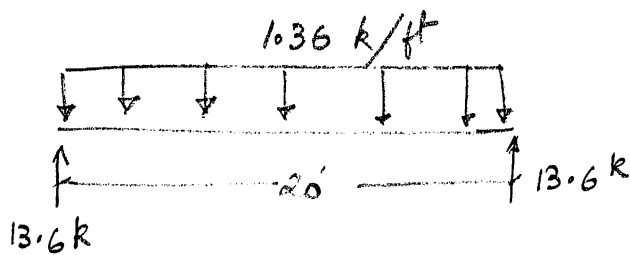
$$A_T = 160 \text{ ft}^2$$

$$K_{LL} = 2.0$$

$$\leq 1.0$$



$$1.2 D + 1.6 L = 170 \text{ lb/ft}^2$$



Column (E)

$$A_T = 20 \times 12 = 240 \text{ ft}^2$$

$$K_{LL} = 4.0$$

$$\therefore R_F = 0.73$$

$$\therefore P_u = 170 \times 240 \times 0.73 = 29.8 \text{ K} = 35.7 \text{ K}$$

Column (N)

$$A_T = 24 \times 20 = 480 \text{ ft}^2$$

$$K_{LL} = 4.0$$

$$\therefore R_F = 0.59$$

$$P_u = 170 \times 480 \times 0.59 = 48.1 \text{ K} = 65.9 \text{ K}$$

83 What should you do when modeling the structure for analysis?

35.7 K

65.9 K