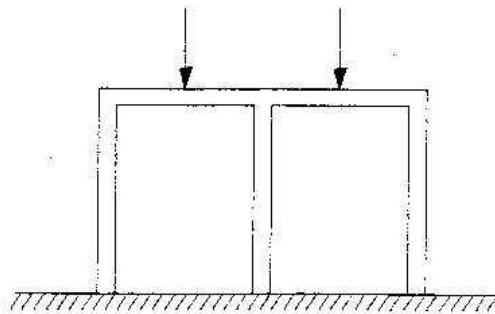


Reinforced Concrete Design
CIE 429 Midterm Examination Fall 1997
Open Book, Notes & other stuff.
No Neighborly Participation

Problem #1: (30 points)

For the frame shown in the sketch



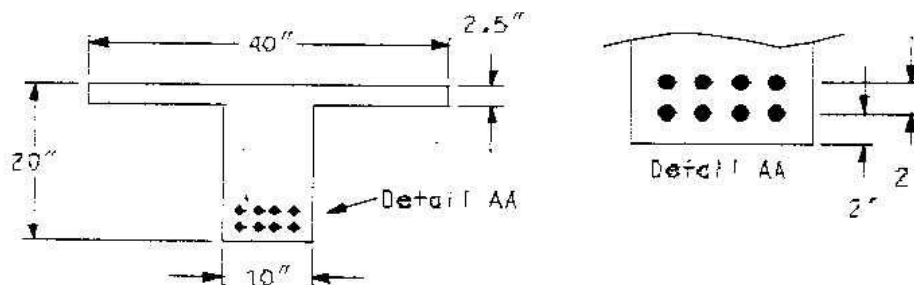
Determine:

- a) The deflected shape
- b) The moment diagram
- c) The shear diagram

Indicate the critical points. There should be no calculations. Indicate moments on the tension side and indicate the shear force pair (sign) for orientation.

Problem #2: (40 points)

Determine the Moment capacity (M_n) of the section shown in the sketch.



- a) If the reinforcement is 4 #9 bars (The bottom layer of rebar shown).
- b) If the reinforcement is 8 #9 bars (Both of the layers of rebar shown).

For both cases, check to see if the section is adequate to the ACI code. (ACI 1995)

Parameters:

$$f'_c = 4 \text{ ksi} \quad f_y = 60 \text{ ksi} \quad k_{max} = .75 k_{bal} \quad \rho_{min} = 200/f_y$$

