CIVL 4135
HOMEWORK SET 8

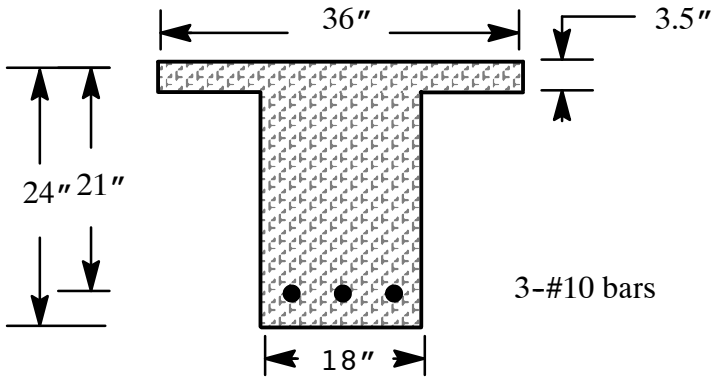
A. Consider the reinforced concrete T-beam shown below. Assume that #3 bars are used for all stirrups.

a. Determine if the cross-section satisfy the ACI 318 provisions for spacing, cover, and amount of reinforcement.

b. Calculate the design flexural capacity, ϕM_n, if the cross-section satisfies part a.

$f_c' = 4{,}000\ psi$

$f_y = 40\ ksi$



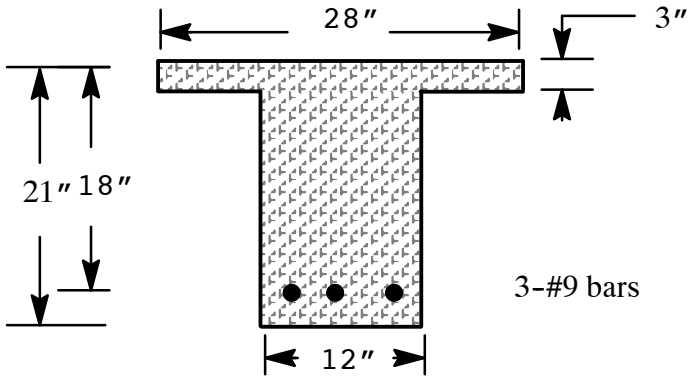
B. Consider the reinforced concrete T-beam shown below. Assume that #3 bars are used for all stirrups.

a. Determine if the cross-section satisfy the ACI 318 provisions for spacing, cover, and amount of reinforcement.

b. Calculate the design flexural capacity, ϕM_n, if the cross-section satisfies part a.

$f_c' = 3{,}000\ psi$

$f_y = 60\ ksi$



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C Prob 3.13 of Nilson's Book.
A concrete floor system consists of parallel T beams spaced 10 ft on centers and spanning 32 ft between supports. The 6 in. thick slab is cast monolithically with T beam webs having width $b_w = 14$ in. and total depth, measured from the top of the slab, of $h = 28$ in. The effective depth will be taken 3 in. less than the total depth. In addition to its own weight, each T beam must carry a superimposed dead load of 50 psf and service live load of 225 psf. Material strength are

$$f_c' = 3,000 \ psi$$

$$f_y = 60 \ ksi$$

Determine the required tensile steel area and select the reinforcedment needed for a typical member