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ENCE 437
Final Exam

Q.1

Will deformed and be concave down shape and will be buckling (Lateral torsional Buckling) because the dim. section than indecate that have small moment of inertia about the axis have moment in the beam.
Lp too small

Q.2 inelastic Lateral torsional buckling will not reach Mp

Q.3 (a) The role is to bracing the beams (A, B, C, D) in lateral direction of its longidinal direction and minimize the latterally unsupported Length to reach higher available nominal Strength of bending.

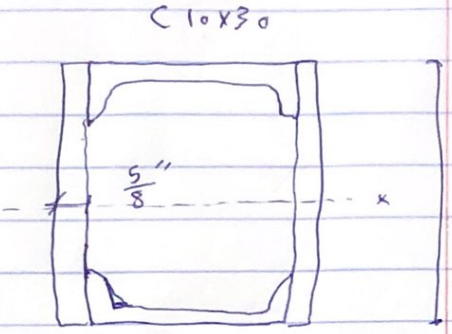
(b) because beams B and C braced in onther side for LTB, no need to bracing it in this side.

Q.4

Same idea

1- bracing the beams in the lateral dir. of its longation
2- Put/use Joists [light beams - I shape to bracing it laterally.
3- use open-wep (actually truss)

Q.5



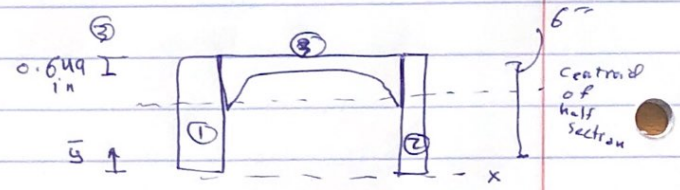
Steel A36

$F_y = 36$ ksi

$F_u = 58$ ksi

$M_p = f_y Z_x$

$Z_x = \frac{A}{2} q$



	A in^2	$\bar{y}$ in	$A\bar{y}$
①	3.75	3	
②	3.75	3	
③	8.81	6 − 0.649	

$\Rightarrow \Sigma A\bar{y} = 69.6$

$\bar{y} = 4.27$ in

$\Rightarrow q = 2\bar{y} = 8.54$ in

③ $I_x = 3.93$ in^4

~~ΣAd^2~~

~~$I_c + A_1 d_1^2 + I_2 + A_2 d_2^2 + I_3 + A_3 d_3^2$~~

$$Z_x = \frac{(16.31)(2)}{(2)}(8.54) = 139.3 \text{ in}^3$$

$\Rightarrow M_p = f_y Z_x = (36)(139.3) = 5014.8$ lb.in