CIVL 1112 – Assignment #5 Name: _____

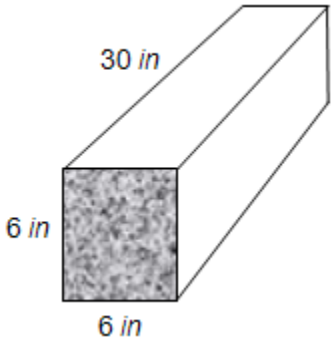
Objective

This assignment's purpose is to prepare you for lab work in Project #2.

You *must* hand in the coversheet for the assignment and your calculation for Part 1.

Part 1

1. Determine the maximum elongation in a 100-ft. steel cable if the maximum strain is 0.0035 and the allowable tensile stress is 50,000 psi. Assume the modulus of elasticity of steel is E = 29,000,000 psi.
2. What is the average failure stress for 5 concrete specimens molded in 3 in. x 6 in. cylinders where the ultimate loads were 29,100 lb., 28,800 lb., 27,500 lb., 28,500 lb., and 28,800 lb., respectively?
3. If 3 cubic yards (yd^3) of concrete are ordered for a project, estimate the weight of cement, fine aggregate, coarse aggregate, and water required for a 1:2:3 mix with a *w/c* = 0.35 (assume concrete weighs 150 lb./$ft.^3$).
4. Determine the amount of cement, fine aggregate, coarse aggregate, and water required to mix and construct *five* beams, each having the dimensions shown in the figure below. Include a "make-sure-you-have-enough" factor of 1.5 in your mix calculations. Assume a *w/c* ratio of 0.4 and a mix design of 1:2:2. The concrete weighs 145 lb./$ft.^3$. All weights should be reported in 0.05 lb. increments (just like in the lab).



5. Rework Problem #4 to determine the amount of cement, fine aggregate, coarse aggregate, and water required to mix and construct *two* beams, each having the dimensions shown in the figure above, and *five* 3 in. x 6 in. cylinders. Include a "make-sure-you-have-enough" factor of 1.5 in your mix calculations. Assume a w/c ratio of 0.45 and a mix design of 1:3:2. The concrete weighs 145 lb./$ft.^3$. All weights should be reported in 0.05 lb. increments (just like in the lab).

Part 2: Read Chapters 3 and 4 in the *Strategies for Creative Problem Solving* by Fogler and LeBlanc.