

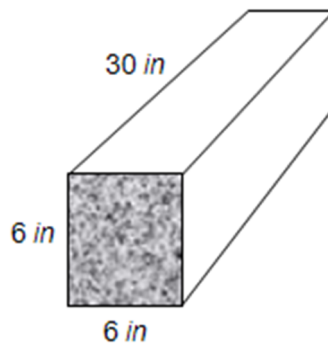
Objective

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 calculations for Part 1.

Part 1

1. Determine the maximum elongation in a 100-ft. steel cable if the maximum strain is 0.003 and the allowable tensile stress is 60,000 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 27,100 lb., 28,500 lb., 27,500 lb., 28,100 lb., and 27,800 lb., respectively?
3. If 2 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 $w/c = 0.40$ (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 1.3 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 1.2 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).