## CIVL 1112 – Assignment #9

Name:

## Objective

The purpose of this assignment is to utilize the spreadsheet developed in Assignment #8 to maximize the cost-adjusted SWR.

You must submit the cover sheet for the assignment, printouts of your spreadsheet for Part 2, and your Word document for Part 3. Also, submit your spreadsheets for Parts 2 and 3 to Canvas. You must follow the Excel format.

**Part 1**: Please complete the <u>CIVL 1112 Midterm Survey</u> (see your email for a link to UMsurvey). The data collected from this survey are used to assess student progress toward meeting the course objectives (see the course syllabus). The course instructor and the Department of Civil Engineering highly value them. Completing the survey is optional and will not impact your performance evaluation for this homework assignment.

**Part 2**: Adjust the design variables for the RC beam design project and attempt to maximize the costadjusted SWR. Keep track of your designs in a table and sort the resulting design based on cost-adjusted SWR. Assume concrete has an  $f_c = 6,000$  psi. Construct a graph of the cost-adjusted SWR as a function of the tensile reinforcement  $A_s$ .

Please submit your Excel document, following the proper file naming convention, to the drop box in Canvas. In your Excel file, include comments on the results, specifically regarding the reinforced beam's strength, weight, and cost.

**Part 3:** Use the equation editor in Microsoft Word to describe the reinforced concrete tensile model and cost equation used in Project #2. Click <u>here</u> for a typical description of the reinforced concrete and cost models. Submit your Word document, with proper file naming convention, to Canvas.

Part 4. Read the Chapters 15 and 16 in "A Mind for Numbers" by Barbara Oakley.