3b. Problem Set 2

Reading:	You should also review the Athena Eco Calculator User's Guide and "How it Works" document.
Objectives:	Conduct basic building life-cycle assessments, including a sensitivity assessment.

1. Get the tools you need to do Life Cycle Assessments.

We will be using the Athena Eco Calculator Tool.

To get it:

1) Go to **http://calculatelca.com/software/ecocalculator/ecocalculator-for-commercial-assemblies/ttp://calculatelca.com/login-welcome-page/**
2) Create user and login if needed.
3) Agree to the terms and conditions.
4) Select Minneapolis as the location. Select high or low rise. Low rise is fewer than 4 stories.
5) The file opens in Excel.

The results take into account:

- Resource extraction and processing
- Product manufacturing
- On–site construction of assemblies
- All related transportation
- Maintenance and replacement cycles over an assumed building service life
- Structural system demolition and transportation to landfill

Operating effects are not considered.

2. Use the Athena EcoCalculator to evaluate global warming potential and fossil fuel consumption for the construction of the Williams Village North Building.

You need to fill in the yellow squares in the spreadsheet. Much of the information you will need is available from our previous assignments and online. See also the Williams Village Center Program Plan on D2L (pg. 64, 72, 76, 105, 117). If you want, you can get the drawings for Williams Village North from Facilities Management CAD office. They will give them to you if you are a student.

Be sure to clearly document any assumptions you need to make about materials or quantities. Note that all the inputs are surface areas, but the definition depends on what you are looking at. For example for columns and beams, you are inputting the floor area supported by columns and beams. Since Williams Village has a steel beam system, you would choose exterior wall is non load bearing, and then put the total floor area on the line that says WF column/WF beam. (WF = wide flange = steel beam section)

3. **Sensitivity Analysis. For these questions, please revise your analysis, recomputed global warming potential and fossil fuel consumption and comment on your results.**

a. What happens if you change the exterior wall type?
b. What happens if you change the window type?
c. What happens if you change the climate to a different location? (For this you will have to download a different version of the spreadsheet.)

Please submit your Minneapolis spreadsheet electronically. You should also submit a document (hard copy or electronic) describing the results you get for parts 2 and 3.