4.42J
Design Project 2
Due: December 3, 2008
In class at 11AM

MIT has undertaken a program to improve the energy efficiency of all existing buildings. Although modest gains can be made within existing building parameters, a substantial redesign, although not necessarily financial feasible, might indicate the upper limits to the efficiency. You are asked to pick one building or wing of an existing building on campus. For the same program for the building, in terms of floor area and function, propose a major redesign that would be feasible if the building was replaced. The new building should an outstanding sustainable design that is also financially sound.

In Design Projects 1 and 2 you are asked to select a building and propose and assess innovative building designs, technologies and operating schemes that will yield an outstanding sustainable building. In this phase, phase 2, you will quantitatively assess the behavior of the proposed schemes and refine your designs. You are asked to consider the design of the building envelope, lighting and operations as they influence energy use and comfort within the building. These should include design concepts and operation that will enhance summertime comfort while minimizing the use of conventional air conditioning. You should consider alternate overall designs that will combine good building perform with good esthetics. Second: consider means to reduce the energy used by the building for heating and cooling throughout the year. This may involve innovative schemes for the building façade, building systems and operations. Calculations of the energy use for the year should be made and feasibility estimates of other concepts should also be included. You can use the Web based tool that was demonstrated in class or you can use and an alternate calculation method.

Address your report to readers who have some technical background. The report should include an introduction, discussion of the above items with diagrams, quantitative assessment of the energy efficiency of your design, conclusions and recommendations. Any equations can be hand written and diagrams in clear freehand if you choose.

The grade for this project is equivalent to one-hour quiz.
You are required to discuss your preliminary finding with the instructor and TA (unpaid but highly knowledgeable consultants) at least once before the due date Students will make a brief presentation of the design along with large sketches of the design and results for energy efficiency.
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Your design will be graded in terms of:

Clarity and thoroughness of the report
Creativity of the design
The energy efficiency of your design
Practicality of design
Appropriateness and accuracy of calculations
Impact on the Architectural Form
Punctuality (Late reports will lose substantial credit)

4.42J / 1.044J / 2.66J Fundamentals of Energy in Buildings
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