Improving Hammond Thermal Efficiency

Overview
The Fellowship of the Heat was tasked with the problem to find a simple and cost effective way to decrease the heating prices for the building. The Hammond building is expected to undergo a full renovation within the next decade. To start, the team had to first find a main source of heat loss in the building. Then the team came up with several possible solutions and tested those solutions for their effectiveness. After the results were gathered, the team had to run an economic analysis to determine how long each solution would take to return its investment.

Objectives
The objectives for this project were as follows:

- Determine the main source of heat loss inside the Hammond building
- Develop possible solutions to fix areas of heat loss
- Test each solution to determine its effectiveness
- Analyze test results and compare implementation costs
- Propose a final solution

Approach
The Fellowship of the heat used the following approach to meet the required objectives:

- Contacted/met with sponsor to discover their needs
- Generated ideas on how to save money/what to test
- Gathered ideas for prototype of testing box
- Proposed prototype
- Created CAD drawing of prototype
- Created pre-pre-alpha prototype
- Created pre-alpha prototype
- Created alpha prototype
- Conducted tests with prototype
  - Tested window inserts, window film, and insulating paint
- Conducted tests in Hammond building
- Analyzed data
- Presented data

Outcomes
The following conclusions were made after all the tests were concluded:

- Window inserts will bring returns within the next 10 years
- Window film will bring returns within the next 20 years
- Paint additive is not an effective solution
- No tested solution would be effective enough to install prior to full renovations