**ABSTRACT**

Recently, there has been an increase in the number of energy efficient buildings in the U.S. We want to encourage this green movement by providing people with a simple and systematic approach for green building construction. Our project focuses on creating a guideline for an energy-efficient residence hall. We have looked into energy-efficient and eco-friendly lighting, heating, insulation, and other aspects that integrate into a green building. Our guideline, as a result, will aid colleges in the Worcester community to design and construct green residence halls.

**Integrated Heat Pump**

Studies showed that air-source Integrated Heat Pump (IHP), illustrated in the chart below, will result in 46-67% energy saving. Calculated payback period is 5-10 years.

**Walls**

The walls are made of concrete for its insulation value and structural integrity.

**Stairwell**

Closable vents leading from the floor to the stairwell along with windows in the stairwell leading outside act as a thermal chimney which gets rid of excess heat.

**Radiant Floor Heating**

Radiant heating system is placed directly below flooring material. Solar-heated water runs through thin pipes and heats the room with a 20% to 40% higher efficiency than other heating systems.

**Windows**

- Window ratio of up to 70% to maximize day lighting
- Double-glazed windows that provide efficient insulation
- Special window design that optimizes air flow for cooling purpose

**Lighting**

Fluorescent lighting produces as much light as a normal incandescent light bulb while using 65%-75% less energy.

**Residents**

Results form our survey shows that WPI students are willing to live in green residence halls. Feedback from East Hall residents show that students enjoy their green building living experience.

**Would You Live In A Green Residence Hall If It Costs More?**

- Yes 77%
- No 23%

**East Hall Living Experience**

- Overall good 50%
- Pleasant and satisfying 38%
- Average 8%
- Disappointing 4%