

To: Professor Riley, January 28th, 2008

Concerning: Liberty Walk at East Gate
Mt. Laurel Township, New Jersey

Thesis Research Topics (Revised)



330 Fellowship Road

A Liberty Property Group Project

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Breadth Topic One - Fire Protection

The first research topic and the one that carries most of the student's interest is on Fire Protection. Through a class on Design of Fire Protection systems, I came across an interesting idea. The professor listed it in a lecture, however knew very little about it, nor could find much about it.

The topic is water cooled steel structures. I soon learned that there was a building in Pittsburgh that had a chamber inside of the web through which water was run to keep the structure cool. In a very heated building like where steel is formed, this can stabilize the structure.

However I did not know about this system when I formulated an idea as to how to accomplish it. In most buildings, a set of water pipes for the sprinkler systems run up the core of the building, and then branch off at each floor to cover the required area. My idea was to keep the same coverage area, but change how the sprinkler lines are distributed to each floor.

The idea is to run the sprinkler lines up the individual steel columns, and branch off at each floor to cover the area immediately around that specific column. This would happen for all interior and wall columns. This will extend the life of the column in a fire. How much it would extend it, is the biggest question.

Any column responds to gaining heat by losing strength. When it hits a certain temperature, it has lost a percentage of its strength. The most important temperature would be that at which all of the safety factors applied to the capacity have been nullified. By calculating the difference in the time to this temperature for both a regular column and a cooled column, the strength of my new system can be verified.

However, the strength does not come without a cost. It is expected that this new system will cost more due to the complexity over the usual simple systems. The cost of the building as well as the extra time a column can gain in a fire will determine the value of the system.

Work Force Research – Crew Composition

Two specific trades have approached the Architectural Engineering department about problems with their work force, and work force development. These two trades are the Electrical and Roofing trades.

My research into their problems will encompass solutions to getting better workers as well as a quantification of the current workforce that exists, in all of its different forms. This part will be the main crux of the research.

I will be collecting two sets of data or plans as well as actual project costs for two sets of each trade. The first set will be of a Union Project. Union projects are often rigidly staffed with skilled workers and apprentices in a pyramid typed structure. The second set will be of a non-union job in a no-prevailing wages environment. This environment is hoped to have a very flat organizational structure. The disparity of the two will help to quantify the value of any workers, as well as the time needed to finish a project. This will yield an answer to which Workforce Composition, if any, is better than the other.

An electrical job is often very complex, so there may be very little difference in the staffing plans and values. However a Roofing Job isn't as complex and may highlight any workforce differences.

Breadth Topic Two – Solar Panel Installation

I have just recently learned that with the coming wave of Solar Powered buildings, there is some contention as to who would be responsible between a roofing contractor and the electrical contractor. Considering that I will be discussing workforce problems with these two trades already, it seemed like a good topic to research.

One of the first things to accomplish will be the picking of solar panels, as well as their placement on the roof. Through this I will develop a Power Purchase Agreement profile, including a plan to take advantage of any coming Pennsylvania or local area subsidies for solar power. In these plans, a construction company will use a subsidy to fund part of the construction of a solar panel array, essentially at no cost to the building owner. Then the builders of the solar panels will sell power to the building owner at rates less than the power company lines, with a lease for transfer of ownership over a period of years.

With the coordination of the two trades, I will also research solutions to keep the installation of the panels as simple as possible, yet strong. A topic will be discussed is any breaches in the building envelope, like how to prevent them or even fix them.

Past this I plan on researching the argument over who gets to install the very profitable and expensive solar panels. Hopefully I will be able to come to some logical conclusion about how to assign them.