



*Redifer Commons
 The Pennsylvania State University
 University Park, Pennsylvania*

Executive Summary:

In this proposal you will find information on value engineering, constructability review, schedule reduction / acceleration and a research study which I will be investigating in Spring 2004. The research will be based on the Redifer Commons Renovation/Addition. To achieve this I will perform a series of analysis on three different ideas.

The first analysis will be of the heating methods of the general eating space. I will look into the use of radiant floor heat instead of forced air. This will include the constructability issues as well as the long-term energy savings. The second analysis will focus schedule and phasing of the project it will also include material selection and its impacts. The final analysis will be based on research on the impact of 100% contract drawings. This will include the schedule as well as the overall cost of the projects studied.

My investigation will be weighted as follows:

Proposal Weight Matrix				
	Value Engineering Analysis	Constructability Review	Schedule Reduction / Acceleration Proposal	Research or Developing Methods Study
Analysis 1:	10	10		10
Analysis 2:		5	20	5
Analysis 3:	10	10	10	10
Total	17	28	30	25
Total				100

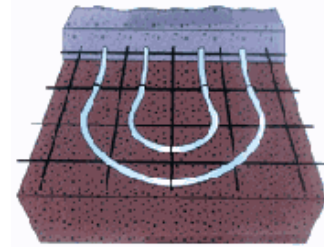


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Analysis 1: Radiant Floor Heat vs. Forced Air Heat

This analysis would consider the proposal for a radiant floor heating system instead of force air at the common dining space.

The dining commons is open to above which creates a large space that would consume unnecessary energy. This is research and study will focus on both the first cost analysis as well as a long term cast analysis. I will be talking to many heating professionals to get a general consensus as well as comparing product data and efficiency of the appropriate sized systems. Radiant floor heating is a relatively new to the construction industry. One concern that may arise from this study is how some of the upper offices will retain their heat. This will be looked into once a heat flow analysis is performed to determine the temperature at the hallways and offices as well as the cost analysis. To achieve maximum efficiency the entire addition may be redesigned. I would expect to find that the short-term cost might be greater because of additional equipment to be purchased. This may change over time. An area of concern is that the heating and cooling loads may not be great enough to merit much savings in the dining areas. To compensate this I may look at the entire addition.



Value Engineering

- Short Term Cost Analysis
- Long Term Cost Analysis

Constructability

- Determine the construction issues associated with both options listing the pros and cons of both.

Research

- Determine and study the heating capacities of radiant floor heat and the extent of heat rise.



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Analysis 2: Schedule Acceleration and Material Selection

The Redifer Commons Addition was very fast paced at times and slow at others project. I will be looking at accelerating this project in three different aspects phasing, structural duration and time frame, and resource sharing with Eastview Terrace Housing Project. Scheduling and phasing were developed very quickly to begin construction. I would like to spend a little more time and review the phasing that was implemented and determine if I can think of a few better solutions such as reworking some of the phasing. In looking at the phasing I will analyze Penn State's needs and what would suit construction flow and productivity the best. I will also look to accelerate the structural system so that the new addition may be ready for turnover during the break in semesters. This would give Penn State more time to move their food service equipment over to the new area. Currently this may occur over Spring Break or after the end of the Spring semester. If the move is pushed back till after the Spring semester construction will be tight in order to finish in time for the start of the new school year. Other materials based research will be performed to study what are long lead-time items that would slow down the fast paced schedule that I will propose. Steel will be one of the materials that I will look at. There was a large delay that occurred in waiting to the steel to be fabricated. I will analyze this and what could be done to minimize the delay or eliminate it. Finally there is a great utilization of manpower between Eastview Terrace and Redifer Commons. I will analyze the impacts of the sharing on both projects and determine possible problems as well as benefits.

Constructability

- Analysis Materials Used Impact on the Schedule

Schedule Reduction and Acceleration

- Phasing Analysis
- Increased Structural System Schedule

Research

- Analyze Penn State's Needs



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Analysis 3: Impact of Incomplete Contract Documents

The analysis will be more in depth because it will also be the focus of my additional 1 credit AE 497 research. A research of the impact of incomplete contract documents on previous projects will be conducted. This will include how it impacts the schedule, the overall cost of the project and the overall quality of the project. The schedule is directly affected by any decisions that are not complete in time because it may delay construction and possible even the critical path of construction. The overall price will be affected by not fully understanding the architect's intent, which will result in change orders. Also bulletins issued as the drawings become more complete are additions to the overall price. By not having the drawings complete quality is sometimes sacrificed because the best solution is no longer an option once work is already in place without being a big cost to the owner. I would like to analyze how the contractor minimizes the risk and problems of having incomplete drawings. I will talk to a number of superintendents, project managers and project executive to see that measures they take. I will either have and interview or ask them to complete a survey to achieve my information. These are a list of things I would like to present in my thesis after looking at a number of projects.

Value Engineering

- Analysis of the pros and cons of value engineering without complete contract documents.

Constructability

- Analysis of the constructability problems encountered.

Schedule Reduction and Acceleration

- Study on the effects on the schedule.

Research

- Research a database of projects to determine the net effect.