AE 481W : SENIOR THESIS

FINAL PROPOSAL

Prepared for

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By

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Executive Summary

The final proposal consists of three technical analyses that it is going to be prepared for the final presentation in spring, 2006. This proposal is written and submitted to analyze current issues of the Benner Pike Shops and generate process of how each analysis is going to take place. Even though the analyses will be performed based on this guideline, it is possible that there could be some modifications through out the process. In such case, it will be reported to the advisor beforehand.

The first analysis is the system comparison between tilt-up concrete panels and cast in place concrete masonry units. Cost and schedule analysis will be performed to compare two different systems. Structural breath analysis is going to be part of this study since the systems take strengths and reinforcing into consideration. A 4D model of tilt-up process will be generated to see how it is erected respect to time.

Reconfiguration of the HVAC units located on the rooftop of the Benner Pike Shops is the second analysis. Also for this examination, cost and schedule analysis will be performed to the original and modified coordination. The crane and rooftop capacity will be checked to see if it is adequate for the modified units to be installed. Mechanical breath analysis will be part of this study.

The last analysis is going to focus on current closing out planning of the project done by the LSF general contractor. Research of the company will be performed to find out why they had come up with the current closing out plan. Communication process of the project will also be studied with e-mail surveys of several PACE members.

Description	Research	Value Engineering	Constructability Review	Schedule Reduction	Total
Tilt-up Concrete Panels		15%	10%	10%	35%
HVAC Units Reconfiguration		10%	10%	15%	35%
Close out Plan/Communication	20%			10%	30%
Total					100%

Technical Analysis #1

Use of Cast in Place Tilt-up instead of Cast in Place CMU

Issues:

The majority portion of the exterior wall in the Benner Pike Shops is created with 12" concrete blocks. Because of the massiveness, the total masonry job for the projects takes up about three months of the total schedule. In addition, there are number of other trades that could not start until the exterior wall has been set up. Tilt-up concrete panels can substitute the existing CMU walls to increase efficiency, and workability while reducing the cost and the schedule. The advantage of tilt-up construction is in the low cost of forms and the placing of concrete and reinforcing.

Goal:

To determine the advantage and disadvantage of substituting the exterior wall system to tilt-up concrete panels from concrete masonry units. Topic will focus on cost and schedule of the system with breaths analysis on its strengths and reinforcement.

Methodology:

- Any requirements of local building codes will be checked to see if there is any limiting factor for tilt-up concrete panels.
- Determine the exact square footage of CMU walls to be replaced. The walls will be broken into pieces of rectangular to be adequate for the tilt-up process.
- Current strengths needed for the building will be calculated in order to decide the amount of reinforcing bars to be placed before the pour.
- Assemblies cost analysis will be performed to compare two systems in their cost. Cost summary table will be generated to ease the comparison.
- 4D model showing erection of the tilt-up panels will be created to show the duration of the total process. The impact of shortened duration will be integrated into the existing schedule to modify the change.

Technical Analysis #2

Reconfiguration of Rooftop HVAC Units

Issues:

The existing HVAC units located on the rooftop of the Benner Pike Shops are randomly distributed with too many in quantity. Some of the stores have more than 5 HVAC units with its capacity ranging from 1000 to 3000 lbs. Having too many HVAC units would draw issues on maintenance, and equipment installation. Since the front of the shops is exposed to outside with its glass show window and doors, separate HVAC systems should be integrated between front and back of each store. The main idea is to have a small HVAC unit in the front and larger units in the back for each store.

Goal:

To determine the cost and time saved by reducing the number of HVAC units for the Benner Pike Shops.

Methodology:

- The capacity for each shop's HVAC system will be calculated to come up with coordination in combining HVAC units for each shop.
- The strength of the rooftop will be confirmed to see if it could hold changed HVAC units which are going to be heavier.
- Modification in ductwork will be performed in order to satisfy the reorganized HVAC units.
- Modified HVAC system will be proposed to professor Ling to check if it is adequate.
- The crane reconfiguration will be performed to confirm the erection of the new units since weights of several units are going to be heavier than the previous units.

Technical Analysis #2 (Con'd)

- The estimate of the modified HVAC system including crane design will be created based on RS Means to be compared with the previous system. Cost comparison table will be generated to give direct comparison of two systems.
- New duration of the process will be calculated to come up with shortened schedule.

Technical Analysis #3

Redesign of Closing Out Planning and Communication Process

Issues:

LSF general contractor for the Benner Pike Shops have replaced their current superintendent of the project to a different one. The issue of replacing is that the new superintendent is not as much familiar as the previous one with the project and it could take some time for the new superintendent to get a grip of the job. Plus, final closing out could be really stressful resulting possible delay in the project. Another issue that could delay the project is lack of communication among the project team. The project was actually delayed one week and a half because the GC did not communicate with the tenants of the shops well. This analysis will focus more on research.

Goal:

To determine if there is any inefficiency in the current close out plan of the project and can it be improved. Communication process among different teams in the project will be examined.

Methodology:

- Examination of LSF general contractor company will take place to find out the purpose of their current closing out plan for the Benner Pike Shops. Following factors will be put into consideration.
    - How the team was selected for the GC?
    - How frequently they held meetings?
    - Who was participated in the meetings other than GC team members (archit ect, subcontractors, client)?
    - Any meetings with leased shop owners
    - Any prequalification issues
    - Motivation among the team members

Technical Analysis #3 (Con'd)

- Advantages and disadvantages will be drawn from the research performed of the GC company.
- E-mail survey regarding the same factor researched for LSF will be performed among the members of the PACE about their usual closing out plan and communication process for projects.
- Alternate solution for closing out plan and communication process will be created which will affect the schedule of the project to decrease.
- Finalized schedule and cost table of all three analyses will be generated, and indirect cost saving will be presented.