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EXECUTIVE SUMMARY

In the following proposal you will read about my proposed plans for the analysis that I will conduct based on the systems of the Warrenton Aquatic and Recreation Center as well as the methodology for my proposed research on corporate ethics plans. This report is being constructed with the purpose of showing the reader the different types of systems and ideas that will be analyzed, how they will be analyzed, and the different tools that will be employed to enable accurate data and results. The overall purpose of the analysis of the different building systems is to improve constructability and performance, as well as reduce cost and schedule duration. The following is a brief introduction to each analysis:

Analysis #1- Corporate Ethics Implementation

This analysis will include research to create a training guide that will develop and implement corporate ethics strategies within construction companies.

Analysis #2- Prefabricated Domestic Supply Plumbing

Because the Warrenton Aquatic and Recreation Center contains a large amount of piping, the use of a prefabricated piping system (ProPress) will be analyzed compared to the standard weld pipe that is used for domestic supply. I expect that the prefabricated system will reduce cost, reduce schedule, and increase safety on site.

Analysis #3- Fabric Duct

The area above the competition and leisure pools of the Warrenton Aquatic and Recreation Center is a space that harbors large, exposed metal ductwork. This type of ductwork is bulky and difficult to install as well as costs more money compared to fabric duct systems.

Analysis #4- Structural Column Redesign

The structural system of the building is complex because of multiple systems (load bearing CMU, structural steel, cast in place columns, precast concrete walls, etc...). Normalizing the system in the aquatic portion of the building will improve constructability and reduce schedule time.

ANALYSIS # 1

CORPORATE ETHICS

PROBLEM

Ethics in the construction industry is an issue that is never clear cut. What companies view as ethical differs greatly and can have a significant impact on their competitive advantage. As a result, the industry suffers from a poor image and an uneven playing field. Formulating a training manual to develop and implement ethics into a company would improve the industries image, level the competitive playing field, and increase social responsibility among its employees.

GOAL

The goal of the proposed research is to identify and develop an ethics training guide that would become part of a company's employee training program. With the acquired knowledge from surveying industry members, an analysis and implementation tool would be developed for companies to use. This will provide them with a solution to increase the ethical performance of their respective company.

METHODOLOGY

1. Complete a literature review on corporate ethics focusing on prevailing ideals and codes
2. Interview 3-5 company heads to learn their corporate strategies in relation to ethics
3. Develop and distribute a survey to the respective companies employees that will identify the different companies corporate ethical strengths and weaknesses as well as the success of their implementation
4. Compare the results to formulate successful ethical corporate strategies
5. Research construction ethics awards and identify defining criteria
6. Use the criteria to develop different ethical policies
7. Create a training manual for companies to use that will help instill the companies ethical values into their employees

TOOLS

1. ASCE Code of Ethics

2. CMAA Code of Ethics
3. Corporate Interview Results
4. Internal Company Survey
5. Penn State AE Faculty
6. Strategic Management Materials
7. Microsoft Excel

EXPECTATIONS

The expected outcome of this research is to produce a manual that will help ingrain a company's ethical values into their employees. This tool will be used to improve the industry's image, level the competitive playing field, and increase social responsibility among the company's employees.

ANALYSIS #2

PREFABRICATED DOMESTIC SUPPLY PLUMBING

PROBLEM

The piping system for the Warrenton Aquatic and Recreation Center is considerably larger and more complex than your average building considering the nature of the building. The problem arises from the selection of weld pipe that services the building. Having standard weld pipe in a building is expensive, time consuming, and introduces safety concerns to a jobsite via welding.

GOAL

The goal of this analysis is to conclude whether or not a prefabricated ProPress piping system will save money, time, and reduce safety risks compared to the weld pipe currently being constructed.

METHODOLOGY

1. Determine the sizes and quantities of pipe required for the system
2. Verify accuracy of quantities with project personnel
3. Verify acceptance under local building codes
4. Estimate the cost and duration of the ProPress System
5. Define safety hazards of standard weld pipe systems and ProPress systems

6. Compare cost and duration figures of each as well as their safety hazards

TOOLS

1. Warrenton Aquatic and Recreation Center Construction Documents
2. R.S. Means 2006
3. Penn State Architectural Engineering Faculty
4. Forrester Construction Company
5. ProPress Piping Manual

EXPECTATIONS

The expected outcome of this analysis should indicate that the proposed ProPress system will save money, time, and reduce safety hazards on site. The accuracy of drawings will have to be ensured and more planning will have to be completed upfront to minimize coordination conflicts from the prefabrication, but the system as a whole will increase value to the project and improve the constructability of the system.

BREADTH

ANALYSIS #3

FABRIC DUCT SYSTEM

PROBLEM

The ductwork above the competition and leisure pools of the Warrenton Aquatic and Recreation Center consists of large exposed metal duct. From a cost and schedule perspective, this system is expensive and time consuming to install.

GOAL

The goal of this analysis is to conclude whether or not a fabric duct system will save money and reduce installation time as well as supply the desired air to the space. In addition, by analyzing the duct support structure, determine if the members can be resized to reduce cost.

METHODOLOGY

1. Determine the sizes and quantities current ductwork
2. Verify accuracy of quantities with project personnel
3. Estimate the cost and duration of the metal duct system
4. Design the fabric duct system to maintain space requirements

5. Estimate the cost and duration of the fabric duct system
6. Do a comparative analysis between fabric duct vs. metal duct with regards to chemicals, humidity, temperature, etc.
7. Analyze the support structure for the duct to see if members can be resized
8. Compare cost savings and duration of the respective systems and make the appropriate recommendation

TOOLS

1. Warrenton Aquatic and Recreation Center Construction Documents
2. R.S. Means 2006
3. Penn State Architectural Engineering Faculty
4. Forrester Construction Company

EXPECTATIONS

The expected outcome of this analysis should indicate that the proposed fabric duct system will save money and reduce installation time. Furthermore, the proposed system will at least meet the space requirements from a mechanical standpoint and should reduce structural support members.

BREADTH

ANALYSIS #4

STRUCTURAL COLUMN REDESIGN

PROBLEM

The main structural system in the Warrenton Aquatic and Recreation Center is steel. However, the architect chose to use cast in place concrete for the structural columns in the two aquatic portions of the building. From construction standpoint this increases coordination and congestion problems on site and adds duration to the schedule.

GOAL

The goal of this analysis is to conclude whether or not structural steel columns compared to the cast in place columns are more advantageous for the building. To conclude this I will compare total cost, schedule durations, lead time, column sizes, and constructability.

METHODOLOGY

1. Determine the building loads that the cast in place columns support
2. Design a steel system with the calculated loads
3. Redesign foundation connection and check foundation loading requirements
4. Analyze the systems based on the cost, schedule, and constructability
5. Select the best structural system

TOOLS

1. Warrenton Aquatic and Recreation Center Construction Documents
2. R.S. Means 2006
3. Penn State Architectural Engineering Faculty
4. Forrester Construction Company
5. Microsoft Excel
6. AISC Steel Construction Manual 13th ed.
7. RAM Model

EXPECTATIONS

The expected outcome of this analysis should indicate that the proposed steel column system will save money, reduce installation time, and improves constructability.

WEIGHT MATRIX

Description	Research	Value Engineering	Const. Rev.	Sched. Red.	Total
Ethics Manual	30%				30%
Victaulic Plumbing		10%	5%	5%	20%
Fabric Duct System		10%	10%	5%	25%
Structural Column		10%	10%	5%	30%
Total	30%	30%	25%	15%	100%