

# Final Proposal

Construction Project Management  
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**Shane Flynn**  
Construction Management  
Dr. Magent

**700 6<sup>th</sup> Street**  
Washington, DC

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# 1. Executive Summary

## **Analysis 1:** Precast vs. Handset Stone

Handset stone is very expensive and time consuming. The first 4 floors of 700 6<sup>th</sup> street use handset stone, the rest of the building uses precast with stone casted into place. Handset stone is much slower and more expensive than precast. A potential solution would be to eliminate all the handset stone and replace it with precast.

## **Analysis 2:** Glass Bridge Improvements

My research would consist of changing the material of the bridge to something stronger and less likely to break or researching a material to cover the glass and make it stronger. This material would have to have the same structural strength and would also have to look similar. This research topic would also be a structural breadth because this new material has to support the necessary loads.

## **Analysis 3:** Alternative Stone for Lobby

The stone used in the Lobby was very expensive and came from Italy. There is a lot of money tied up in this lobby. I propose to change the floor and wall stone. Getting the stone from China could be a viable option because the stone could be 40% cheaper.

## **Analysis 4:** It's Never Too Late to Go Green

700 6<sup>th</sup> Street was contracted to be built as a LEED Silver rated building. 75% of the way through the project the owner decided to go for LEED Platinum. A possible research topic would be to find out why the owner decided to go for LEED Platinum 75% way through construction. What were his motives? Another research topic would be to find out how the construction team was able to get a LEED Platinum so late in the project.

## **Weight Matrix**

The matrix in figure 6.1 shows how my efforts will be distributed among each analysis topic. There are main categories that I will be focusing on. They include research, value engineering, constructability review and schedule reduction. The chart demonstrates how heavily each analysis topic focuses among each of the categories.

## **Breadths**

Glass Bridge Improvements-Structural Breadth and Precast vs. Limestone-Architectural Breadth

## 2. Analysis 1: Precast vs. Handset Stone

### Problem Statement/Potential Solutions:

Handset stone is very expensive and time consuming. The first 4 floors of 700 6<sup>th</sup> street use handset stone, the rest of the building uses precast with stone casted into place. Handset stone is much slower and more expensive than precast. A potential solution would be to eliminate all the handset stone and replace it with precast with handset stone casted into place. With the elimination of hand set stone also eliminates the flashing which will save time and money. Another problem with the façade is it is very expensive. Limestone was used heavily on the building façade. A potential solution to save more money is to eliminate all Limestone above the 6<sup>th</sup> floor. The limestone would be replaced with precast that looks like limestone. The limestone is only used for aesthetics and at floors 6 and above the difference should not be seen with the naked eye. This research could lead into an architectural breadth which would entail if there is a noticeable difference between limestone and precast at that height. If the difference between limestone and precast is not noticeable a further analysis would be to eliminate all limestone and replace it with precast.

### Research Methods:

I will first research how much time and money can be saved eliminating handset stone and then I will further the analysis by eliminating limestone above the 6<sup>th</sup> floor. I will conduct this analysis by interviewing a precast subcontractor, masonry contractor, and the project manager. I will use construction data to estimate the savings in time and money. In order to research if there is a noticeable difference between precast and limestone a 3D model with renderings can be made. Or a mock up of the façade can be made with the Limestone and precast side by side. There is also a section of the building that has the precast and limestone side by side on the first floor. I could take pictures of that section from different distances to see if there is a noticeable difference. From these pictures I can find out what distance/floor would be best to start precast at.

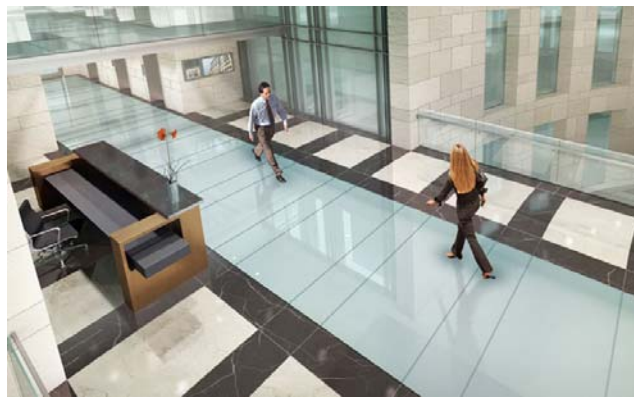
### Expected Outcomes:

The expected outcomes should show a reduction in schedule and cost.

### 3. Analysis 2: Glass Bridge Improvements

Problem Statement/Potential Solutions:

In the main lobby there is a glass bridge and glass floors. The problem with having a glass floor is it is very delicate. A week after the glass floor was installed a screw driver was dropped on the glass causing it to spider crack all the way through the glass. The screw driver was dropped from a distance of 4 feet, which should show you how delicate the glass is. Each glass panel is approximately 10 feet x 4 feet. These panels are 20,000 dollars each and are only produced by 2 manufacturers. The lead time for these panels is months and is not easy to replace. These panels need extra protection so they are not damaged during everyday use or they could be replaced with another material. Refer to picture-3.1.



Picture-3.1

My research would consist of changing the material of the bridge to something stronger and less likely to break or researching a material to cover the glass and make it stronger. This material would have to have the same structural strength and would also have to look similar. This research topic would also be a structural breadth because this new material has to support the necessary loads. A cost comparison between the original glass bridge and the new system would be done.

Research methods:

I would contact the installer of the glass and ask him what material he would have used instead. Structural calculations would have to be done to make sure that new materials would have the same strength as the glass.

Expected Outcomes:

Through my research I will find a cost effective way to protect the glass or another material that will better suit the purpose.

## 4. Analysis 3: Alternative Stone for Lobby



Picture-4.1

### Problem Statement/Potential Solutions:

The stone used in the Lobby was very expensive and came from Italy. There is a lot of money tied up in this lobby. I propose to change the floor and wall stone. Getting the stone from China could be a viable option because the stone could be 40% cheaper. The aesthetic difference between Italian stone and stone from China is minimal. I will research different materials and make a cost comparison between them. The floor is marble which poses a problem because marble is a very fragile material and the salt

from peoples shoes can eat away at it. A more durable stone will be researched for this high traffic area. The stone material may differ but the look of the lobby will not change. The new materials will be almost identical to what is in there now.

Research methods:

I will contact the masonry contractor and ask what alternative materials could have been used to reduce cost. I will research the alternative methods by contacting quarries and getting quotes for the different materials. To show that the alternative materials will have the same look I will obtain samples to make visual comparisons. I could possibly make a 3D model of the lobby with the different materials to show that there isn't a difference in appearance. Instead of a 3-D model I think a more effective way to make an aesthetic comparison is I could also get samples stone that is there and samples of stone would be used to replace the existing.

Expected Outcomes:

I expect to show a significant reduction in cost for the lobby by using different materials that do not change the appearance of the lobby.



## 5. Analysis 4: It's Never Too Late to Go Green

### Problem Statement/Potential Solutions:

700 6<sup>th</sup> Street was contracted to be built as a LEED Silver rated building. 75% of the way through the project the owner decided to go for LEED Platinum. A possible research topic would be to find out why the owner decided to go for LEED Platinum 75% way through construction. What were his motives? Another research topic would be to find out how the construction team was able to get a LEED Platinum so late in the project.

### Research methods:

A possible research method would to consult the owner and the construction team on why LEED Platinum was chosen 75% of the way through the project. I will have to consult the construction team on how they delivered LEED Platinum so late in the project.

### Expected Outcomes:

I know at the end of my research that I will find out the owners reasons for going for LEED Platinum and I will also know how the construction team dealt with the obstacle of going from LEED Silver to LEED Platinum.

## 6. Conclusion

Through the analysis described in the previous section, I hope to provide a thorough construction management study on the 700 6<sup>th</sup> Street project. This proposal summarizes the topics I will research during my Spring 2010 semester. This project is an opportunity to apply everything I have learned over the last five years as well as expand my knowledge in areas that will be useful in the construction industry.

### I. Weight Matrix

The matrix in figure 6.1 shows how my efforts will be distributed among each analysis topic. There are main categories that I will be focusing on. They include research, value engineering, constructability review and schedule reduction. The chart demonstrates how heavily each analysis topic focuses among each of the categories.

| Description                                      | Research | Value Eng. | Const. Rev. | Sched. Red. | Total |
|--|----------|------------|-------------|-------------|-------|
| Precast vs. Handset Stone                        | 5%       | 5%         | 5%          | 15%         | 30%   |
| Glass Bridge Improvements                        | 15%      | 5%         | 5%          | 0%          | 25%   |
| Alternative Stone for Lobby                      | 15%      | 5%         | 5%          | 0%          | 25%   |
| Decision to go for LEED Half Way Through Project | 20%      | 0%         | 0%          | 0%          | 20%   |
| <b>Total</b>                                     | 55%      | 15%        | 15%         | 15%         | 100%  |

Figure 6.1-Weight Matrix Diagram

## 7. Appendix

- I. **Breadth Studies**
- II. **Thesis Research Timeline**

### **Appendix I-Breadth Studies**

While completing the construction management analysis for 700 6<sup>th</sup> Street, I plan to investigate other area specialties of the Architectural engineering program. The breadth studies I have selected are briefly explained below.

#### **Glass Bridge Improvements-Structural Breadth**

The structural breadth will consist of changing the material of the bridge to something stronger and less likely to break or researching a material to cover the glass and make it stronger. This material would have to have the same structural strength and would also have to look similar. This new material has to support the necessary loads as well. A cost comparison between the original glass bridge and the new system would be done.

#### **Precast vs. Limestone-Architectural Breadth**

This architectural breadth will consist of a comparison of precast vs. limestone. All the limestone above the 6<sup>th</sup> floor will be replaced with precast that looks like limestone. The limestone is only used for aesthetics and at floors 6 and above the difference should not be seen with the naked eye. This research will lead into an architectural breadth which would entail if there is a noticeable difference between limestone and precast at that height. This analysis will also consist of a cost analysis because precast the precast is much cheaper. There will not a schedule reduction because the mounting method does not change.

### Appendix II-Thesis Research Timeline

|   | January 25  | February 10 | February 24 | March 18    |
|---|-------------|-------------|-------------|-------------|
| Task 1. Research Precast vs. Handset Stone  | In Progress | Complete    | Complete    | Complete    |
| Task 2. Precast vs. Handset Stone CM Analysis   |             | In Progress | Complete    | Complete    |
| Task 3. Research Glass Bridge Improvements  |             | In Progress | Complete    | Complete    |
| Task 4. Glass Bridge CM Analysis  | In Progress | Complete    | Complete    | Complete    |
| Task 5. Research Alternatives for Lobby   |             | In Progress | Complete    | Complete    |
| Task 6. Stone Alternatives CM Analysis  |             |             | In Progress | Complete    |
| Task 7. Research Why Owner decided to go for a LEED Platinum Rating Half way through construction |             | In Progress | Complete    | Complete    |
| Task 8. LEED Building Analysis  |             |             | In Progress | Complete    |
| Task 9. Revisions For All   |             |             |             | In Progress |
| Task 10. Presentation Preparation   |             |             |             | In Progress |

Figure 7.1-Thesis Research Timeline