

# Technical Assignment 3

## Problem Identification and Technical Analysis Options

### Taylor Hall – George Mason University



## Current Project Issues

At the Taylor Hall construction project site, there are several areas that have had a noticeable negative impact on the construction process, schedule and budget. Just to recap, Taylor Hall is a 70,000 SF freshman dormitory housing 295 students and is located at George Mason University's main campus in Fairfax, VA. The project is set to cost \$16,000,000 and is to be completed in just 12 months.

As predicted earlier, the Infinity Structural System is beginning to cause issues on the job site. This is mainly due to the late approval of BCOM and GMU staff. Without a design approved, the job cannot move forward with this critical path item. The complexity of the Infinity Structural System and the size of the application have been questioned since the original decision to value engineering them into the project compared to the original concrete structure.

On the same topic of owner approval, there have been several issues with the metal panels near the entrance of the building and how it ties into the curtain wall and the brick veneer. This material has come under architectural fire due to its relatively modern look when compared to neighboring buildings. Other than the delayed approval because of aesthetics, there also seems to be some constructability concerns with how it will be fit into the façade installation schedule since building dry-in can't be extended any further.

Many value engineering ideas were presented to the owner, but due to strict approval boundaries of BCOM, only few were added into the building. With the project being over budget already, and the late approval of designs, the project team is faced with difficult daily decisions to continue working without approved drawings or risk delaying the project. One example of this is the decision to not include a green roof in the construction because it was thought to delay the project.

On top of the above mentioned, the project team and owner have recently lost key personnel involved in the project, making it even more difficult to make executive decisions on these issues.

## Potential Points of Analysis

The following potential points for analysis in the spring 2014 semester will include focus areas in Value Engineering, Schedule Acceleration, Constructability Review, or be a research on a Critical Construction Issue. Potential breadths for research are highlighted below where applicable.

### Green Roof Addition

Since sustainability is a key concern of the owner and a green roof was originally intended to be installed over the miscellaneous use room on the ground floor, I feel it would be appropriate to do an in depth research on the topic. The depth would analyze the cost and schedule implications of the addition of the green roof and data would be collected by interviewing specialty subcontractors from the region as well as experienced project management personnel.

Furthermore, this depth could lead to a potential for a structural breadth investigation to see if the current steel joist roof would be able to support the loads associated with the green roof. This could also include a mechanical breadth to investigate the thermal and moisture protection that would need to be added with the green roof in place to insure there are no leaks.

### Stick Built Structural System

Due to the complexity that the Infinity Structural System has brought with it, it was suggested that a stick built framing system could provide a more efficient and cost effective structural system. The depth would include analyses on cost and schedule implications as well as constructability. Using a stick built structural system was one of the original options considered when value engineering out the

concrete structural design, so it would be interesting to compare the decision to go with the Infinity Structural System with this up and coming method of construction in the DC metropolitan area.

## Prefabricated Brick Veneers

Since the installation of the brick on the exterior of the building is a critical path item and this is a schedule-driven project, it would be logical to find an effective way to accelerate installation. One way of doing this may be through prefabricated or tilt-up panels which incorporate “thin bricks” set in a grout and polymer like panel. The depth could include a cost vs. benefit analysis by incorporating labor and prefabrication costs and its reduction in the critical path schedule. Secondly, constructability can be analyzed since the site is congested and a crane would be needed at this later point in construction.

In terms of breadths, this research could include an envelope analysis looking into the new systems thermal and moisture protection performance compared to the original design. An Architectural breadth could potentially investigate how this new façade system would affect the appearance of the building and it’s tie-ins with other materials such as the metal panels and curtain walls.

## Prevention through Design

For the critical industry issue and research topic, I believe it would be valuable to look into how special design tactics could increase safe construction and future maintenance of the building. Since this is a public project and is under a watchful eye of students on a daily basis, it is increasingly important to maintain a safe project site. Through my research of common site safety and facility maintenance errors, I could develop design change proposals that could increase the overall safety of the project to ensure that Balfour Beatty’s Zero Harm initiative is taken advantage of in its fullest potential.