

Executive Summary

The Duffy School



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With every project there are many problematic areas that can be addressed and analyzed to help the project succeed. The Duffy School Addition and Renovation is like most projects and has several areas that need to be better analyzed. Throughout extensive research performed in the Fall Semester, I found four analyses that focus on problematic features of the Duffy School Addition and Renovation. They are based on areas of value engineering, critical industry issues, constructability review, and schedule and cost reduction. Analysis topics include the feasibility of installing rooftop solar panels, researching the requirements of performing construction on historical buildings, prefabricating the exterior walls on the addition, and implementing BIM on the project.

Analysis 1- Rooftop Solar Panels

This analysis focuses on improving the energy efficiency of the common/shared spaces in the Duffy School. The area of investigation would be to see if solar panels can be placed on the building to help pay for the energy consumed in the common areas. This analysis will investigate the different solar panels available, their ease of installation and maintenance, and the associated costs. The locations of the panels were first selected based on different criteria. The specific panel, inverter, mounting and racking were selected next. The overall cost of the solar panels were calculated and came out to \$69,270.76 and the duration to install the panels was found at around 19 days. With the total cost and installation of the panels being low, adding solar panels to the building is recommended.

Analysis 2- Historical Requirements

This analysis focuses on improving the schedule by hiring an historical consultant for all the historical components of the school. The Duffy School Addition and Renovation needed to follow numerous historical guidelines according to the Duffy Urban Renewal Program and by Florence Township. These guidelines required many pieces of the existing school to be carefully removed and stored, so that they can be reused in the new apartment building. There were many other issues that a historical consulting firm would have been able to help with. Many discussions with an associate from the historical firm helped solve many of the historical problems that are causing schedule delays. With the amount of time saved, I do recommended hiring an historical firm.

Analysis 3- Prefabricated Exterior Wall Panels

This analysis focuses on schedule improvement by pre fabricating the exterior brick veneer. The Duffy School's new addition enclosure consists primarily of brick veneer façade and a small curtain wall. Covering large percentages of the building enclosure, the opportunity of using prefabricated panels or modular façade systems would potentially accelerate the schedule and reduce labor costs. By eliminating the use of traditional methods to enclose the building, the construction site would be less congested, offer higher quality and performance products, and help move quickly on the schedule. Different prefabricated wall systems were researched until the ideal one was selected. The total duration to install the panels was found to be right under

3 days and the total cost was found to be \$72,840 more than traditional stick built. With the large cost added to the project, I do not recommend using prefabricated exterior panels.

Analysis 4- BIM Utilization

This analysis focuses on the use of BIM to improve the project. BIM was not used at all on this project but could have been used to improve the project in several ways. BIM could have been used from the start to turn the original school building drawings into electronic files. Having an electronic model of the building will have been able to show the problems with the as-built. Having an electronic model will also allow for the use of a clash detection software. Both reasons explained above should help to greatly reduce the total amount of RFI's and ASI's. BIM was found to be able to help the Duffy project in three different ways. BIM has many more uses, but for this project I recommend implementing BIM at a small scale.