EXECUTIVE SUMMARY

This Senior Thesis Report is the result of a full year's evaluation through technical analyses created through from knowledge acquired from the Architectural Engineering curriculum and industry experience. The Cinema-Dining Terrace Expansion construction project is the focus of this report. The evaluation of four analyses was implemented with the goal of accelerating the schedule and decreasing costs through logistics modifications, prefabrication, resource recycling, and Building Information Modeling.

Analysis 1: Site Logistics Modifications

The first analysis evaluated altering the site logistics for the projects primary phases. The modifications implemented the use of two tower cranes to accelerate the demolition and steel erection phases. Through these modifications, the schedule was reduced by 41 workdays and the costs were reduced by $1,533,398.00 when including the prefabricated exterior enclosure.

Analysis 2: Exterior Envelope Prefabrication

The second analysis focused on prefabricating the exterior enclosure. Prefabricating the exterior allowed for quicker installation which helped reduce the schedule from 122 workdays to 37 workdays. The offsite prefabrication ensures quality with the controlled fabrication environment but creates increased project costs that totaled in $738,490.00.

Analysis 3: Water Drainage Recycling

The third analysis investigated the implementation of a rainwater recycling system. With the large roof space and the already designed drainage, the addition of a rainwater recycling system saved approximately $15,000/year on water bills. The system has a 7 year payback period and recycles over 2 million gallons of water a year and its installation has minimal effect on the schedule.

Analysis: BIM Utilization

The final analysis evaluates the possible utilization of BIM on this project. The application of BIM for this project has the potential to assist with phasing and coordination. Employing BIM can be very useful on renovation projects due to the complications of coordinating with on active building. It could be used for MEP coordination, Phasing plans, and support for displaying the analyses to the owner.