



University Sciences Building

Northeastern U.S.

SENIOR THESIS FINAL REPORT

Justin Green – Construction Management

1.0 EXECUTIVE SUMMARY

Senior Thesis Final Proposal is intended to describe what topics will be studied at length during the spring semester. This includes three analyses topics and two breadth studied that apply directly to these main topics. The overall theme for this thesis will focus on the sustainability features of the University Sciences Building, as well as the improvement of energy efficiency and schedule efficiency for the facility.

Analysis #1: Implementation of BIM

Turner has made the implementation of Building Informational Modeling (BIM) mandatory on all of their projects. The Turner team for the University Sciences Building petitioned against using BIM for this facility because the owner was unwilling to pay anything extra to use it. However, BIM is designed to save the construction manager and owner both time and money through upfront coordination and collaboration. This analysis will look at how the implementation of BIM could have helped this project in particular, and what the process would look like. Furthermore, a small portion of a BIM model will be constructed for this facility to gain a better idea of how long it would take to construct a BIM model, along with the upfront costs and resources required to complete the model.

Analysis #2: Solar Photovoltaic System Design

The University Sciences Building is projected to achieve LEED Gold Certification upon the completion of the project. Even though this is a solid level of accreditation, some points were skipped over that might be practical and cost beneficial to implement. This analysis will focus on how to improve the sustainable features of the building through the integration of solar photovoltaic panels, while minimizing the upfront construction costs. It will also take a look at what string sizing, inverter selection, and grid connections are needed to properly collect and store the energy harvested from the sun.

Analysis #3: Implementation of a Rainwater Collection System

The University Sciences Building is very unique that it is one of only a few in the nation to incorporate a living biowall throughout the building. Again, this looks sustainable and is a great improvement in the air quality of the building, but what about other aspects of sustainability? Could rainwater be used to feed the biowall? What other uses and impacts could rainwater collection have on this facility? What impact would waterless urinals have on rainwater collection and storage? All of these questions will be addressed in further detail in the later sections of the report. Water may be cheap now, but this will probably not be the case in the future years to come.