



SENIOR THESIS FINAL REPORT

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1.0 EXECUTIVE SUMMARY

Senior Thesis Final Report is designed to discuss the findings and conclusions of the four analyses performed on the Global Vascular Institute. This project includes a 450,000 SF hospital/medical research facility and a 14,735 SF Link connecting the new construction to the existing Buffalo General Hospital. All of the analyses are intended to focus on the critical industry issue of improving efficiency in the construction industry.

ANALYSIS #1: Feasibility and Design Study for Photovoltaic Energy System

Due to the complexities of the function of the Global Vascular Institute, extremely high amounts of energy are needed to keep this building fully functional. The focus of this analysis was to design an appropriate façade photovoltaic system and to perform a feasibility study on that system. This analysis showed that the top 19170SF of the South façade was the best space to be utilized to construct the PV array. A preliminary structural analysis revealed that the photovoltaic system would actually be less of a structural load on the South façade of the building by 6,450lbs. With the use of rebate and incentive programs within New York State, the feasibility study determined that the PV system would recoup initial installation and material costs within 24 years of start-up.

ANALYSIS #2: Elimination of Inefficiency Through the use of Prefabricated Façade Panels

The design of the Global Vascular Institute is quite unique to any other building in the general area of this project. Its façade is designed so that the entire North and South facades are clad with horizontal rows of aluminum metal panels and glass while the East and West facades are all glass panels. The process of installing each of these panels was very time consuming and creates a lot of congestion for the already small site. This analysis showed that by prefabricating the East and West facades, the overall on-site schedule for the façade installation was greatly reduced. The results of this analysis determined that there is a 91 day savings in installation time with the use of prefabrication. The additional cost required to implement prefabrication for the façade is \$357,210 which is about .12% of the entire cost of the project.

ANALYSIS #3: LEED Certification

At the completion of the Global Vascular Institute project, a LEED Certification will not be pursued. This decision was made during the schematic phase because of budgetary reasons. Upon completing a point-by-point analysis, it was determined that the original design Global Vascular Institute would obtain 46 out of 110 LEED points. This is enough for the project to achieve a LEED Certified rating because it is greater than the 40 points required. To become LEED Silver, 50 points are required, for LEED Gold, 60 points are required, and for LEED Platinum, 80 points are required. From the point-by-point analysis, it was determined which was the cheapest way to obtain each rating by mixing and matching the cost of different points from each credit category.