

EXECUTIVE SUMMARY

This is the final report on a construction management study of the Worcester North High School project. It aims to reflect a year's worth of analysis tied with a semester's worth of research. There are four analyses that were conducted for the body of this thesis, detailed below.

Demonstrating proficiency in construction management is the depth analysis on sustainability rating systems—primarily CHPS compared with LEED. This analysis takes a review of the current CHPS and LEED systems to define each one's strengths and weaknesses. Furthermore, surveys were sent out to industry professionals in Massachusetts to glean their opinion of the two methods of certification. Based on this data, it is apparent that CHPS is a better system for school in Massachusetts, but that it lacks the robust education and knowledge base that LEED provides.

Next, an electrical breadth analysis on implementing a grid-tied solar photovoltaic system was conducted. This aimed at providing two design alternatives: one that met the \$250,000 allowance in the project budget and one that fit in the space allotted on the roof by the design engineers. A 38.6 kilowatt system and a 7.59 kilowatt system are designed and compared; both systems provide energy savings over time.

For a structural breadth study, the design and installation of a green roof was examined. Included in the study is a review of available green roof assemblies, costs, and structural implications. A typical bay of the roof structure was analyzed to ensure its suitability for a green roof assembly. According to these calculations, a 23 psf roof landscape will work fine.

Finally, as a lighting/electrical breadth, LED luminaires were considered for use on North High School. Research shows that LEDs are not suitable yet for general illumination but do have a niche in down lighting and accent lighting. As an alternative, an LED recessed downlight was looked at to determine if it could be used on North High School. Initial procurement costs made this option unfeasible, despite significant energy savings over time.