Executive Summary

Towson West Village Commons is a newly constructed dining and residential building at Towson University. The facility houses various spaces that are made for the students to enjoy. The building thrives on its goal to lead Towson in a new direction and make living on campus fun. Through various building technologies, the building will reach LEED Silver certification at minimum and will offer a standard for the future expansion of Towson University.

This report is a final submission report for the AE Senior Thesis Studio. The main topic of this report covers the lighting redesign of 5 key spaces throughout the building; the Lobby and Grand Stair, the HRL Suite, the Roof Terrace, the Multi-purpose room, and most importantly the student lounge. The lighting redesign was based around the concepts of the buildings integration of natural materials and natural spaces and the desire to offer a facility that students will want to occupy throughout their collegiate career at Towson. Throughout the day and night, the lighting environment will look to mirror the outside conditions giving new meaning to the indoor environment.

In addition to the lighting redesign, electrical design work has also been conducted to reflect the changes in lighting. Additional electrical design work was conducted to analyze the current distribution system for arc fault evaluations, short circuit analysis and load flow study. Along with this electrical analysis, a hand calculation of short circuit current and protection coordination was also conducted. Another depth explores the possible integration of a DC based power distribution into the building to meet 9am to 5pm office loads. To compliment this analysis, a structural breadth is presented to see if the photovoltaic system needed to power the DC system can be mounted within the confines of the existing roof.

For the Integrated Master's Program, a depth studies the impact of automatic shading and other glazing options for the study lounge. The study lounge has the potential to be continually lit by pure daylight throughout the day. Glare levels were determined and set as the goal to reduce the possibility of glare from daylight. In addition, dimming sensors are analyzed for their impact on potential energy savings. To coincide with this analysis, a Radiant Times Series Model was developed for the space under the various daylight models run.