## Summary and Conclusions

Throughout this endeavor, it was a goal to make a holistic study of an entire system. As current and future building professionals it is an enormous advantage that we have a well rounded knowledge of building systems, when exiting from our studies in the Architectural Engineering major. As a Lighting Electrical option within AE, I am trained to evaluate with both aesthetics and engineering in mind; which I think best combines my talents as an Architectural Engineer. It was this passion, for the mutual successes of the building's architecture and functionality, that I based my designs for Gateway Community College.

In all lighted spaces, it was a primary concern to maintain cohesiveness in the transitions between spaces. Since they were all connected (in some way) it was important for my designs to focus on a common attribute to bring them even further together. Bringing attention to the white masonry wall was a focus to connect the architect's concepts of *gateways* and *exterior environments* inside the building to the occupant. Different means of lighting have produced effects that tie the wall from one space, throughout the building; creating reliability and balance on the large architectural form.

Electrical redesigns reinforced the lighting intent by providing a feasible and understandable control system. Electrical redesigns also explored (somewhat) uncommon means of energy efficiency and "sustainability." A study on efficient transformers identifies a simple way to benefit a building's electrical consumption in a relatively short payback period. A PV analysis was able to substitute a system that involved a lot of material and coordination, and simplify it to another means of producing energy. Though this new method did not produce energy as quickly as the as-designed system, it was proven to be the better investment over time; especially when warranty and life-span of the product are taken into account.

The switch to the new PV system also integrated better with other systems I examined. Daylighting, mechanical, and structural arrangements all benefitted from each other through the organization of two new architectural skylights. Moving the original PV layout lessened the roof load, which allowed the member size to decrease. The smaller member size allowed more light to enter into the GCC creating a brighter environment. Coordination of fenestration properties reduced the thermal load (in most cases) through the daylight transition openings. This helped reduce the amount of light to a more comfortable level for the occupant while also facilitating financial savings through daylight harvesting.

Although Gateway Community College was not always easy to understand, or to work with; it was always fun. I treasured the chance to explore the new education facility and expand my current standard for contemporary architecture. I am exceedingly grateful for the opportunity and am very proud of the designs I have accomplished.

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**Programs used:**

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- AutoCAD 2009
- Photopia
- Photoshop
- RetScreen

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