



## Lighting Depth

The Lighting Depth looked at the redesign of four spaces, including the genetics laboratory, the auditorium, the lobby, and the exterior space between the classroom and laboratory buildings. All of the spaces met the design criteria that were determined from the IESNA and ASHRAE 90.1. The spaces all achieved their desired atmospheres. Overall, the spaces came together to provide an academic atmosphere that is productive and easy to navigate. This was illustrated and analyzed through the use of AGI 32 with Isolines and Renderings.

## Electrical Depth

The Electrical Depth accommodated for the redesign of the four lighting spaces. Panelboards and their respective feeders were sized to coordinate with the overall system. A protective device coordination study was also performed. It showed that the protective devices had been properly coordinated with the overall design. An analysis of distributed versus central transformers was also completed. This study looked at the amount of transformers necessary for each system, how much physical space each system would require, and finally the cost of each system. It was concluded that overall, the best design solution would be to have centralized transformers throughout The VCU Life Sciences Building. Finally, the electrical design was completed for a mechanical system that would incorporate cogeneration into The VCU Life Sciences Building.

## Mechanical Breadth

The Mechanical Breadth examined the feasibility of a low-emissions transformer to provide power to the rooftop units while also producing domestic hot water. Currently, the rooftop units receive power from the utility. The motor control centers were redesigned to accommodate a cogeneration system. Finally, the feasibility, initial cost, and energy costs were examined to determine if cogeneration would be economical in The VCU Life Sciences Building. There were significant savings, however, because the need for the process is essentially being created, the system would be extremely inefficient. Therefore, cogeneration was determined to not be economical for The VCU Life Sciences Building.

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## Construction Management Breadth

Finally, The Construction Management Breadth took a new perspective to examining a cogeneration system. The initial labor cost, scheduling issues, and the payback period were examined to determine if any of these would deem the cogeneration system feasible. Because equipment was being added to the system, the initial labor costs increased which increased the overall initial costs. This also served to add a significant amount of time to the schedule. This would cut into existing float time or extend the schedule by almost three weeks. There were significant savings with a very short payback period, however, this again, did not outweigh the fact that the need was created and that the cogeneration system would be inefficient in The VCU Life Sciences Building.