

This proposal serves as an outline for the research and analyses that I plan to conduct in the spring semester. The analyses include:

Architectural/Structural Depth: Eliminate Slope of Curtain Wall

Currently the curtain wall glazing is on an inverted 4 degree slope and runs along a serpentine comprised of multiple radii. There are several sections of glass that are trapezoidal instead of rectangular because of the gradual increase in unit size due to the slope of the wall. Very few are the exact same size and shape, which has caused the glazing to be very expensive. In this analysis, the slope of the glazing will be eliminated and then redesigned to have more uniform glazing unit sizes. A structural analysis will be performed to make sure that the structural integrity of the system is maintained. This is expected to not only lower the cost of the system, but also decrease the time to install the system.

Sustainability Breadth: Application of Photovoltaic Panels
[Energy and the Economy]

Since Arena Stage is not striving to achieve LEED certification, design considerations were not focused around energy saving measures. Theatre complexes usually consume large amounts of energy due to their large open spaces and high ceilings which can result in excessive heating/cooling. Since *Energy and the Economy* is a critical industry issue that was discussed at the PACE Roundtable, the use of solar tracking panels to implement the use of solar/renewable energy is a way to counter Arena Stage's energy consumption. Researching the availability of sunlight, examining the sun path in Washington, DC and the effects of the shade from surrounding buildings will all be necessary. After finding a material provider and installer from the area, the size and number of solar panels will be determined. Energy savings will be calculated to see how it compares to the expected consumption of the building. Although a relatively high upfront cost is expected, by collecting solar radiation from the sun and converting that energy to electricity, the operating costs of the theater complex can be reduced.

Mechanical Breadth: Application of Fabric Duct

Due to the complex renovation of the existing Fichandler and Kreeger theatres, there are many locations throughout the building that do not allow for easy installation of mechanical equipment. Among others, these areas include a large ring duct around the top of the Fichandler exterior wall and several dressing room spaces. The application of fabric duct in such locations would not only be easier to maneuver into these tight spaces, but would provide a similar low air velocity so as to not disrupt the acoustical performance of the mechanical system. The aesthetic quality of fabric duct would also be more appropriate in the dressing rooms where the duct was originally exposed. In order to perform this analysis, a full review of the mechanical system and the sizes of the duct (required cfm) need to be recorded. Extensive research needs to be performed on fabric duct and how it ties into standard sheet metal duct. A cost and schedule analysis would also be produced to compare the original and proposed systems.