
SECTION EIGHT | Summary and Conclusions

Just as any one member of a group can ruin a performance, any system in a building can prevent the building from reaching its potential. In analyzing the August Wilson Center for African American Culture, nothing could be more true. The architect's vision of a "conceptually transparent, flexible container" leads to many challenges in the design of the building systems. Speaking specifically towards lighting, this architectural style means that each space must be treated as part of a system, rather than a single room that must meet a defined set of criteria. The redesigned lighting system attempts to maintain the integrity of the architect's vision while meeting the performance standards required of any lighting system. Furthermore, the lighting design attempts to reiterate the architect's vision that "The signature character of the building comes as a result of its content." With varied appearances, the building will reflect its inner-state and become a performance for those around to witness.

The electrical system changes have been designed to facilitate the goals of the lighting design. Specifically a more flexible and simpler control system results from centralization of lighting loads onto dimming panels. A study of voltage systems has revealed that a significant cost savings can be achieved by distributing electricity to mechanical equipment at a higher voltage. A cost study of a photovoltaic array shows that this system does not have any financial incentive, however.

The designed addition of a roof terrace provides a new venue for the center while also helping the lighting design to meet its objectives. This design is certainly feasible, but a more comprehensive design involving the lower levels would be required in order for the design to meet all occupancy related code requirements. If included from the initial design, this space would be of great value to the center with minimal additional costs.

Finally, the acoustical analysis has identified two spaces which may not exhibit ideal acoustical properties. The proposed solution for improving reverberation times in both spaces is both economical and aesthetically pleasing. The noise reduction qualities of the barriers separating these spaces from the lobbies that surround them have also been identified as problematic, but solutions to these problems are far more complex and are not feasible within the current architectural design. As a designer working with an architect, it is ultimately the architect's decision to maintain a visual quality or sacrifice appearance for performance.

Overall, the biggest challenge in analyzing and working with the systems of the August Wilson Center has been the unique character of the architecture. The spaces created are far from standard and certainly strive to embody signature qualities. However, as is often the case, this unyielding visual character makes the engineering of the building systems a complex task. In the redesign that is part of this senior thesis project, I believe this unique challenge has been faced and a successful design has been created.

SECTION NINE | References

The following software was used for calculations and production of rendered images:

AGI-32, Autodesk VIZ 2008, Autodesk AutoCAD 2008, Adobe Photoshop CS3, RetScreen

Information from the following resources was utilized during the research and design process:

The IESNA Lighting Handbook, 9th ed., Illuminating Engineering Society of North America, New York, NY, 2000

ASHRAE Standard 90.1-2004. Atlanta, GA: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 2004

National Electric Code 2005, Quincy, MA: National Fire Protection Association, Inc., 2004

Long M., *Architectural Acoustics*, San Diego, CA: Elsevier, Inc., 2006

Mehta, M et al. *Architectural Acoustics: Principles and Design* Prentice-Hall, Inc. Upper Saddle River, New Jersey, 1999

The Database of State Incentives for Renewable & Efficiency (DSIRE). <http://www.dsireusa.org>

SECTION TEN | Acknowledgements

Thank you to the following individuals and companies that have helped, directly or indirectly, in the production of this senior thesis project:

Dr. Richard Mistrick – Thesis Advisor and Lighting Consultant

Ted Dannerth – Electrical Consultant

Professor Robert Holland – Architecture Consultant, Thesis Advisor

Professor Moses Ling – Acoustics Consultant

Professor Kevin Parfitt – Thesis Advisor

Dr. Kevin Houser – Lighting Consultant

Mike Prioletto, Mike Weniger and Turner Construction Company – sponsors

Steve Iski of Studio i Lighting – project lighting design

Hornfeck Engineering – project electrical engineering

Perkins + Will – project architect

Lutron Technologies, Inc. – schematic design presentation host

Charles Stone – schematic design presentation panelist

Luke Tigue – schematic design presentation panelist

Fellow AE students, specifically the Lighting/Electrical Option

Friends

Family