

## EXECUTIVE SUMMARY

The Reva and David Logan Center for the Arts is located in Chicago, IL. As a campus building of the University of Chicago, it is a multidisciplinary arts center for the students, faculties, and staffs. This art center building consists of performance hall, gallery rooms, craft studios, painting rooms, theaters, classrooms, and many other spaces for housing playwrights and painters, musicians, and filmmakers, dancers and sculptors. With many sustainable and energy efficient designs such as solar panels on the roof, saw-tooth skylights, and ground and water source heat pumps, the building received LEED Gold certification. However, the lighting, electrical, acoustical, and mechanical systems are conducted for the possibility to reflect the better sustainability goals such as energy saving, and cost.

The lighting depth was conducted on the four spaces as Performance hall, Performance penthouse, Main lobby, and Courtyard. All spaces were analyzed for their existing lighting system with space purpose, and interior finishes. And then, all the design criteria for each space were developed with IES Lighting Handbook, 10th edition and ASHRAE Standard 90.1. The new lighting design of the Performance hall was developed with three concepts that are inspired from the type of performance. Those concepts are called as Modernism, Sophisticated, and Classical, and the color of lights, mounting types and the light distribution were considered to deliver those concepts. The new lighting design of the Performance penthouse was considered with flexibility for supporting many activities and collaborating daylight in the space. By giving different lighting zones with control system, the flexible lighting was supported. The design concept of Main lobby was inspired from the idea of Midwest Park which is a significant landmark of the University of Chicago. Two long horizontal lines were applied into the ceiling, and cove lighting was used to provide powerful atmosphere into the space. The lighting design of Courtyard was considered with light trespass because the space is surrounded by buildings.

The electrical depth was studied on the high-efficiency transformer and the size of generator. The all existing dry-type transformers in the building are designed as NEMA TP-1, K-rated transformer for the energy efficiency. To provide better energy saving, NEMA Premium efficiency transformer from EATON is applied. This transformer provided 30 percent less losses than similar-sized NEMA TP-1 models while lowering energy consumption. The generator size was reduced by subtracting a load of the switchboard *LL-EM-LL* that is served by extra emergency service from the power utilities.

The acoustical breadth was conducted on the reverberation time for the performance hall to determine how the space dose functions acoustically well. The mechanical breadth was conducted on the glazing type of the corridor located on the first floor to determine the solar heat gain and cooling load. And two different proposed glazing types were compared with existing one for the costs how much it is required for the cooling load.