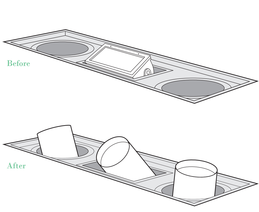
THE OCULUS

World Trade Center – Lighting Upgrade

"Light is to architecture what sound is to music." - Santiago Calatrava

The Oculus opened on March, 2016, and is the centerpiece of the of the World Trade Center Hub. Designed by world renowned architect Santiago Calatrava at a cost of 4+ billion dollars, the complex is a unique blend of rail station, pedestrian hub, and 75,000 square feet of enclosed shopping center space. The original lighting design was created by Fisher Marantz Stone NYC before LED lighting solutions were a viable technology for the complex architectural space.

The key feature in the space are the 83 vertical rib shaped columns on each side that extend 300'+ into the air from the ground level to meet at the apex in the center. Below the ribs are 3 levels of subterranean retail space and pedestrian passageways to the subway trains, path trains, and exits to multiple locations at ground level. The original lighting design utilized a custom 3 lamp recessed CMH fixture from Eliptipar with a 100W PAR38 CMH 7 ½" recessed up light to each vertical column using a 150W T CMH asymmetrical center mounted fixture that provided fill light to the large open space.



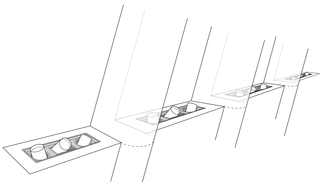
The New York Port Authority was committed to completing a lighting upgrade of 13,000+ existing CFL and CMH fixtures to LED solutions, but they could not find a solution small enough or optically capable of projecting light 300'+ from the ground level shelf to the apex of Oculus with a RGBW LED solution.

FSG, Facility Solutions Group, worked with Clarté Lighting to develop a solution that would fit into the existing fixture's housing. The solution needed to install quickly, fit into the existing housing, and provide the needed center beam candle power (CBCP) to project lighting over 300'+ from the ground level shelf to the apex of Oculus's ceiling.

Due to Clarté Lighting's extensive modular offering of matching retrofit and new construction fixtures, an existing PAR38 scale RGBW retrofit kit and new PAR38 scale fixtures were configured with slight modifications to fit and mount into the existing housing easily and quickly.

No existing lighting controls existed in the space so ETC, a world leader in DMX controls with support offices in NYC, were brought into the design to support the installation of the DMX Paradigm dimming system in order to control the Clarté Lighting 16-bit RDM DMX RGBW PAR38 scale fixtures.

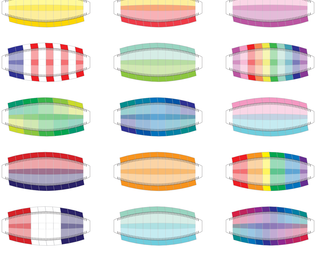
Today a PAR38 scale RGBW spot optic aimed upward grazes the vertical surface from the base of the column to the top of the column at 300' on each side of the ribs. The center 150W T CMH asymmetrical fixture was replaced with a new adjustable PAR38 scale RGBW fixture. Clarté's fixtures were painted a Dunn Edwards color to match the existing fixture housing which is one of the 10,000+ custom colors offered by Clarté for 100% of their fixture offering.



Each color operates at 600 of the maximum possible 1000 milliamp CREE RGBW LED for 28 watts per color (only 60% of the maximum rated LED current). The light operates 24 hours a day and 365 days a year for 8760 hours annually. The existing system utilized 110 watts + 166 watts + 110 watts = 386 watts per fixture. Clarté Lighting PAR38 scale LED utilize 28W + 28W + 28W = 84 watts for a reduction of -78% of the energy used.

At .19¢ a KWH and 8760 operating hours per year, the annual savings per bay of 3 fixtures would be $502.65. Oculus has 50 bays of 3 lamp fixtures per side amounting to a total annual savings of $50,265. The LED fixtures also eliminated the replacement of 300 CMH 10,000 hr. and 15,00 hr. lamps, which would have required bringing in expensive lifts to reach up 3 stories to access the ground level located fixtures creating a total annual savings of $75,000+.

The NY Port Authority's design plan is to have the uplighting in white 90% of the time to highlight Santiago Calatrava's large scale dramatic architecture. To enhance the patron's experience during the holidays, colors that feature the holiday will be projected from the Clarté Lighting RGBW fixtures.



American Manufacturing and Support

Clarté Lighting is headquartered and manufactures in Azusa, CA. ETC is headquartered and manufactures in Madison, WI. FSG is headquartered in Dallas, TX, with the Perth Amboy, NJ, and NYC offices of FSG supporting the installation and management of the new LED lighting upgrade system.

To learn more about the Clarté fixtures used at the Oculus and to see more pictures of the project, click through the links below.

Oculus Portfolio

Side Retrofit Fixtures RET-413-PAR38

Center Fixture SMS1-666-PAR38

Theatrical Performance + Architectural Aesthetics

CLARTÉ LIGHTING crafting unique solutions