

Customer Success Story: Chhatrapati Shivaji International Airport

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Eaton helps enhance energy efficiency, optical performance and aesthetics for Mumbai Airport

Location:

Mumbai, India

Segment:

Construction

Challenge:

Supply an energy-efficient lighting solution for aesthetic and functional illumination

Solution:

Eaton's Cooper Lighting io™ LED luminaires

Results:

Provided uniform, aesthetically-pleasing and targeted illumination for the perforated wall display and lowered energy consumption contributing to LEED Gold certification

"Our new terminal will not only be a high-traffic destination for travelers, but also a unique architectural design area packed full of high-performing, energy-efficient products, like the Eaton io™ LED fixtures."

Saurabh Singh, Assistant Vice President—Contracts, GVK—Mumbai International Airport Pvt. Ltd.

Background

The Chhatrapati Shivaji International Airport in Mumbai, India recently opened the new T2 terminal, which will see more than 40 million visitors annually. The terminal sets a new precedent for functionality and aesthetics with decorated carpets, an art museum and bold architectural details.

As part of the innovative terminal design, a 4.8-kilometer (km) wall was decorated with perforated stainless steel panels, which required backlighting for an artistic silhouette and powerful visual that is reflective and consistent with the airport's overall design.

Challenge

To achieve the desired visual effect, designers needed a solution that could uniformly illuminate the 6-meter high by 4.8 km long wall. Additionally, to solidify the airport's commitment to sustainability, the design team was seeking a lighting solution that would contribute to Leadership in Energy and Environmental Design (LEED) Certification for the terminal—the solution needed high energy-efficiency to conform to power density restrictions and to reduce operating costs through reliable performance and reduced energy consumption.

Additional requirements included remote accessibility to easily address maintenance issues and adherence to strict regional testing standards for robust protection against dust, insects, moisture and water. Further, to optimize energy consumption, the lighting fixtures needed to provide flexible adjustability for precise illumination.

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Solution

Following extensive light system modeling, the Chhatrapati Shivaji design team identified Eaton's Cooper Lighting io light-emitting diode (LED) line series 2.0 as the only solution capable of uniformly lighting the wall from floor to ceiling while providing ideal energy efficiency.

Designed specifically for wall grazing applications, the io LED luminaire's patented optical assembly delivers a powerful 5-degree projection of light. Its award-winning blend of energy efficiency and optical performance excellence, as well as the fixture's adjustability for precise aiming helps highlight the unique architectural elements of the new terminal.

Optimal illumination was achieved through the luminaire's superior 5-degree optical design that produces maximum upward projection without waste due to engineered efficacy. The fixtures also deliver a specified quantity of low angle illumination to ensure vertical uniformity across the entire length of the wall. A result no other light fixture could deliver.

Further, the io LED solution incorporated a framed lens to eliminate light spillage, as well as a remote drive location to easily address maintenance issues. The Eaton team also worked with the airport to meet strict testing standards, including an IP66 rating to extend equipment life by protecting against environmental conditions, insects and dust accumulation.

Results

Compared to competing solutions, Eaton's Cooper Lighting io LED solution was the only luminaire capable of sufficiently lighting both the lower and upper portion of the perforated wall – contributing to aesthetically pleasing, three-dimensional lighting.

"Our new terminal will not only be a high-traffic destination for travelers, but also a unique architectural design area packed full of high-performing, energy-efficient products, like the Eaton io LED fixtures," said Saurabh Singh, assistant vice president-contracts at GVK-Mumbai International Airport Pvt. Ltd.

Additionally, because reduced power consumption and energy savings is a main component of LEED certification scoring, the io LED luminaires allowed the airport to underline its commitment to sustainability by contributing to the certification.

The lighting solution also added to the airport's LEED certification credentials by aiding in the 'Thermal Comfort Design' category by reducing heat waste and required electrical loads. Further, by utilizing the modern LED design that mitigates the use of environmentally harmful gasses and materials commonly found in fluorescent lighting, the airport was also able to add 'Innovation in Design' credits to contribute to its LEED Gold ranking.



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