



**578,000 m² of newly
built office building**

Project Overview

Shanghai Tower Shanghai, China

Reaching New Heights in Automated Shading Technology

The Shanghai Tower, soaring to 632 meters in height, is perhaps best known for being the tallest building in China, and the second tallest building in the world but it is so much more than just tall. Its unique spiral shape is built to withstand wind speeds up to 114 miles per hour, and the Gensler-designed structure also integrates dozens of green building features and technologies that earned the Shanghai Tower both a 3-star Green Building Label in China, and LEED Platinum Certification for Core and Shell.

One of those sustainable features is the Lutron Sivoia QS automated roller shade solution controlled by a Quantum total light management with Hyperion solar-adaptive software.

The Challenge

The Tower's beautiful, cylindrical façade employs a double curtain wall design with atria nestled between the walls — an element especially critical to the building's seismic performance in this earthquake prone environment. That same design presented a tremendous engineering challenge for the Lutron roller shades which are designed to deliver a perfect fit and accommodate a variety of shading requirements for the building's diverse corporate tenants.



The Solution

In a building this size, HVAC costs are substantial. The building is engineered to maximize environmental efficiencies. To further reduce HVAC energy, minimize glare, and ensure consistent façade aesthetic, the owner specified intelligent, automated Lutron Sivoia QS roller shades to be pre-installed throughout the tenant floors.

The cylindrical façade presented a unique challenge — there is an approximate 2% angular variation between the 2 adjacent curtain walls, and the roller fabric panel had to fit perfectly within the innermost curtain wall, without gaps or other inconsistencies in design.

Shade Specifications

Sivoia QS roller shades are hinged such that the overall structure of the roller shades can fit seamlessly in concert with the cylindrical building structure. To allow only a very small gap between shade sections, Lutron designed small-angle dragging brackets and mounting brackets on the left and right sides of each shade that feature three-dimensional adjustment. Even after the shades are mounted in place, minor adjustments can be easily made to horizontal, front/back, and left/right positioning to ensure accuracy and consistency of multiple roller shades in any given building section.

Shade system scalability and versatility was a major design consideration. Each floor of the Shanghai Tower is equipped with a Lutron Quantum processor that can support up to 198 automated shades. Currently there are fewer than 70 shades pre-installed on each floor, but as tenants move in or renovate office space to suit their individual needs, shades can be added and programmed according to customer specifications. Installation requires just one pair of communication and power cables from an adjacent shade drive, a bit of simple commissioning, and shades are ready for use.

The 24V Lutron Electronic Drive Unit (EDU) delivers ultra-quiet operation so as not to distract office colleagues by shade adjustments, intelligently tracks shades within a 3mm tolerance for an aesthetically beautiful installation and can be easily programmed for individual control or control within a defined shade group. Shade fabric is an environmentally fabric with a 5% openness factor to ensure a very comfortable working environment.

Wireless control

The shades feature customized scheduling using Lutron Hyperion solar adaptive shading software. The software is configured to deliver the ideal shade position according to astronomical equations that calculate the position of the sun and work with individual wireless window sensors to respond to real-time outdoor conditions such as clouds, shadows, and reflections.

The intelligent shading solution is able to respond to the changing city scape as well, evaluating natural light conditions that may change over time due to building development and adjusting shade position accordingly. Both processors and wireless sensors feature a low-energy-consumption design to extend battery life and provide years of worry-free performance.



Quantum processor at equipment room on each floor



Wireless daylight sensor mounted on the inner layer of the dual curtain walls



Shades controlled by a wall-mounted Pico remote

Perfect alignment of multiple shades that seamlessly fit the cylindrical facade

In addition to automated control, wireless Pico remotes can be easily paired with any given shade or group of shades to provide individual user control for unique tasks or personal preference. The flexible control protocol enables building managers to add extra control locations at any time (wall-mounted, table-top, or hand-held remotes) with no new wiring or time-consuming programming.

Results

The Shanghai Tower is an intelligent, sustainable, green building and a marvel of advanced architectural vision. The beautiful building has turned a new page on skyscraper design in Asia and the entire world. Lutron is honored to provide a shading solution that is perfectly aligned with the design and performance demands of this forward-thinking building, and perfectly suited to meet the changing needs of current and future Shanghai Tower tenants.

Electrical Representative

Tongji Design Institute, Shanghai

Lighting Consultants

BPI

Architect

Gensler



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World Headquarters 1.610.282.3800

24/7 Customer Support 1.844.588.7661