

Bay South, Gardens by the Bay, Singapore

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LIGHTING DESIGN: Lighting Planners Associates ARCHITECT: Grant Associates / Wilkinson Eyre

The first phase of Singapore's Gardens by the Bay, the dramatic leisure destination designed by UK architects Grant Associates and Wilkinson Eyre, features a dynamic lighting scheme by Lighting Planners Associates.

Since its completion on 29 June 2012, over one million people have visited Gardens by the Bay, Singapore's latest outrageous leisure destination. Then, at the beginning of October, thousands of architects from around the world were given an opportunity to visit the site, when the World Architecture Festival (WAF) was held in Asia for the first time at Marina Bay Sands.

At 101 hectares, Gardens by the Bay will eventually be one of the largest gardens of its kind in the world comprising Bay South, Bay East and Bay Central. Grant Associates was responsible for master planning the first and largest of the three planned gardens, Bay South, which stretches over 54 hectares and opened in June 2012. Bay East and Bay Central are yet to be completed.

A remarkable blend of nature, technology, environmental management and imagination, highlights of Bay South include eighteen Supertrees (25-50 metre vertical gardens that light up at night) and two giant Cooled Conservatories, designed by Wilkinson Eyre Architects, housing Mediterranean and Tropical climate plants. The project also includes a rich variety of Horticultural Gardens, designed around the themes 'Plants and People' and 'Plants and Planet'.

The British design team for Bay South also included Atelier Ten (environmental design consultants); Atelier One (structural engineers); Land Design Studio (museum and visitor centre designers); and Thomas Matthews (communication designers). However, for the lighting design the client, National Parks Board of Singapore, looked closer to home with the Singapore office of Kaoru Mende's Lighting Planners Associates (LPA) taking on the demanding job after winning a design competition.

"As it is a new form of outdoor entertainment and leisure, we sought to underline an 'entertainment with organic lighting' concept," comments Mende. "We thought entertaining the public with organic and eco-friendly lighting would be a crucial element of future lighting design. Even today, the excessive consumption of energy in the service of entertainment is no longer considered viable: a more friendly approach is essential from both a consumer and environmental perspective."

With this in mind, LPA came up with four main concepts:

- The scheme should savour lighting that dramatises shadow and eschews excessive lighting;
- It should gently engage visitors with interactive light;
- It should harmonise light with the garden's greenery, water and wind;
- It should create an environment that helps visitors feel the spirit of the living forest.

Such an environment requires sustainable lighting fixtures as well as sensors and control technology capable of subtle changes in colour and intensity. By faithfully applying these criteria to their design, LPA sought to create an environment in which visitors felt the living vitality of the nature around them.

For this reason, fixtures that are fundamentally for nighttime could not interfere with the landscape during the day. The luminaires are concealed and integrated within the architecture and the landscape as much as possible with the light itself being used to emphasise the concept and uniqueness of the landscape design.

Each area has its own characteristics and style and are all connected by common underlying concepts, principles and lighting elements, thus forming a coherent vision on the whole and creating a highly sophisticated and exciting nightscape. As LPA examined the overall lighting image of Gardens by the Bay, the guidelines for the masterplan were analysed individually.

COOLED CONSERVATORIES: FLOWER DOME AND CLOUD FOREST

The Conservatory Complex is an architectural icon, a horticultural attraction and a showcase of sustainable energy technology. Comprising two biomes designed by Wilkinson Eyre Architects that house temperate and tropical plants in specially created conditions, the conservatories glow with a soft light that illuminates the flower fields and the misty mountain in the Flower Dome and Cloud Forest respectively. Soft shades of colour, with varying levels of transparency, are also experienced when visitors enter the huge singular spaces.

The large Flower Dome biome, at 1.2 hectares (approximately 2.2 football fields), is 38m in height. The glass dome is designed to suit the large range of plants from the Mediterranean, South Africa and California. In the Flower Field, the lighting has been used to create thrilling forms of nighttime entertainment and interaction with the visitors.



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The other biome – the smaller but taller Cloud Forest – is 0.8 hectares (approximately 1.5 football fields) and 58m high. The cool moist conservatory simulates the climate of tropical highlands, covered with the plants from Tropical Montane Cloud Forest regions between 1,000 and 3,500 metres above sea level, up to latitudes of 26 degrees north and south of the equator.

A huge 35m waterfall is the centrepiece of the space which is lit from below by Lumenpulse Lumenbeam LBX projectors emphasising the power of the water. From the lower walkway, the field of vision opens up to a mountain which is planted with a mixture of fern and colorful plants. Lighting gently illuminates the fresh green foliage and flowers and, at the same time, creates the natural combination of light and shadow.

Externally, a soft grazing light along the ribs of the conservatory facades highlights the profile of the structures. The light is brighter towards the North side along the Marathon route, and is a gentle wash on the South side to avoid competing with the Main Garden lighting experience.

SUPERTREES

Designed by Grant Associates, the Supertrees are unique vertical gardens ranging from 25 to 50 metres in height (equivalent to nine to sixteen storeys), with emphasis placed on the vertical display of tropical flowering climbers, epiphytes and ferns. In the day, the Supertrees' large canopies provide shade and shelter. At night, the Supertrees come alive with lighting created by LPA.

Six different lighting elements have been blended and programmed to create a story using sound and light. All the lighting fixtures on the eighteen Supertrees are controlled through a centralised intelligent control system that makes it possible to create dynamic lighting scenes.

The vertical planting displays are effectively lit with Griven Graphite 300 250W metal halide projectors located around the base of each tree. The coloured lighting of the membrane (by Martin Cyclo linear fixtures) above the vertical planting is programmed to keep changing slowly and mysteriously and show different colour schemes over the course of a night.

THEMED GARDENS

Together with mass flowering and coloured foliage landscape, the gardens form a spectacle of colour and texture and fragrance within the complex, providing a mesmerising experience for visitors. A variety of lighting techniques are featured to reinforce the landscaping character of each of the ten Themed Gardens and other areas.

Pathways are generally lit with low height bollard lights that are specially designed for the project. The design languages are derived from the landscape elements such as the aerial root structure and characteristic graphical patterns. A curved bollard that is equipped with a 4.8W LED lamp provides lighting for steps. The lantern with the iconic graphic is designed to project shadow patterns onto the path.

The pathway connecting the Themed Gardens to the The World of Plants where the tallest trees are planted to create a forest-like feeling, features spotlights mounted on 10m poles hidden within the trees to project light through the tree branches. These paths do not need fixtures or any ornate lighting effects, just a simple glimpse of what might be moonlight in between overgrown thickets.

THE FUTURE

With Bay East and Bay Central to be completed in the future, Gardens by the Bay will be a 101 hectare showcase of the latest energy efficient lighting in tandem with cutting edge environmental design and sustainable development principles. Of course, this would mean nothing if it was not merged with the innovative design of Lighting Planners Associates. With these elements the end result for phase one of Gardens for the Bay is wonderful, impactful and powerful. We look forward to the next chapter.

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