

The Singapore Flyer – an engineering feat

Set amidst a necklace of attractions, the Singapore Flyer is set to become an iconic landmark in Asia when it is completed in 2008



The Singapore Flyer, a very ambitious project that was announced in 2003 has finally made a headstart after securing the \$240 million financing from German banks Dellebeck Bethmann Maffei (DBM)/ AIN AMRO and Bayerische Hypo- und Vereinsbank AG (HVB Asia).

A groundbreaking ceremony was recently held with the Minister for National Development Mah Bow Tan officiating, an event that also saw leaders from seven religious groups blessing the site.

The Singapore Flyer Groundbreaking ceremony - from left to right, Mr Thomas Bone-Winkel, Director, Dellebeck Bethmann Maffei (DBM); Mr Cheng Hee Kok, Chief Executive Officer, NTUC Club; Mr Lim Nee Chion, Chief Executive and Deputy Chairman, Singapore Tourism Board; Mr Mah Bow Tan, Guest of Honour, Minister for National Development; Mr Peter Purcell, Managing Director, Singapore Flyer Pte Ltd; Mr Ronald Seilheimer, Member of the Divisional Board, Corporates and Markets, HVB Group; and Mr Ken Kobayashi, Senior Vice-President, Division COO Plant Project Division, Mitsubishi Corporation.

Mr Mah recalled a time exactly three years ago when he was first approached with the idea. "I thought to myself then - It's just a very big Ferris Wheel - what's the big deal? Then STB and Peter Purcell convinced me that it's not just a wheel. It is something special and something unique." The location itself was special he added, where the vista will be transformed into a necklace of attractions in the next couple of years.

Mr Peter Purcell, Singapore Flyer Pte Ltd's Managing Director said, "Today's

groundbreaking ceremony marks the birth of an astonishing landmark. The Singapore Flyer will undoubtedly be one of Asia's most distinctive visitor attractions and will be Singapore's own recognisable icon in the minds of tourists, much like Eiffel Tower and the London Eye have come to symbolise France and England."

"And by using a world renowned architectural consortium of Kisho-Kurokawa Architects & Associates of Japan and Singapore's DP Architects, together with other internationally recognised consultants and a Mitsubishi/Takenaka Consortium as our builders, we have set the stage for the Singapore Flyer to become one of Asia's most remarkable architectural and engineering feats," he added.

Engineering challenges

The world class project team includes Arup Singapore/London/Japan/Australia as Project Consultant Engineers. The slim one-dimensional wheel rim of the Singapore Flyer represents an engineering design breakthrough from the conventional deep truss Ferris Wheel configuration. Arup developed this 'third generation' rim design using state-of-the-art technology, which makes the most of the strength and arrangement of the cables to reduce the size and visual appearance of the rim to a one-dimensional truss. From a distance, the truss will seem to disappear in relation to the size of the wheel, giving the Singapore Flyer an exhilarating feel.

The erection of the wheel was also a big challenge. Said Brendan McNiven, Associate Director, Arup-Singapore Pte Ltd "We could not erect the wheel like the London Eye was done where the wheel was



assembled on the river horizontally and then tilted into vertical position once it was complete. There isn't enough space at the Singapore Flyer site to do something similar. So we have to assemble the wheel vertically section by section in pie slice segments, and rotate it to move to the next stage of the wheel as we complete each of the six segments."

The London Eye was also an Arup project.

The piling work for the Singapore Flyer will begin in November. The rim weighs 700 t, the cables weigh 300 t while the support structure and spindle weigh 600 t. In total 1,600 t of steelwork plus the 35 numbers of 7 by 4 m capsules, each weighing 10 t, will be supported off 38 foundation piles 1.5 m in diameter bored more than 40 m into the ground, nine under each of the two 2.3 m diameter main steel columns and five under each of the four support cable stays.

Mr McNiven added, "It has taken a lot of mental muscle to get this project happening. From Arup's technical gurus like Pat Dillard in London doing the rim buckling, to the M&E's development guys like Patrick (MacMahon) and Peter (Purcell) in Singapore doing the funding, it is a great thing to witness and be involved with."

Giant observation wheel

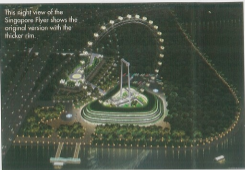
When completed in 2006, the Singapore Flyer will be one of the world's largest man-made moving objects at a height of 178 m, comprising a giant observation wheel 150 m in diameter sitting astride a 20 m high three storey terminal building.

There will be 28 fully air-conditioned capsules, each capable of handling 35 passengers at one time. Passengers will enjoy a 37 minute journey which will include 45 km panoramic views of Singapore, Indonesia and Malaysia. It is expected to attract 2.5 million visitors in the first year with more than half of them from overseas.

The Singapore Flyer will also offer an array of public facilities including a central atrium with a recreated Asian rain forest, an outdoor amphitheatre, an alfresco dining promenade running along the seafront, and high accessibility by train, bus, car and even boat.

The Singapore Flyer promises to transform the visual landscape

This night view of the Singapore Flyer shows the original version with the thicker rim.



of the Marina Bay, which is the future downtown of Singapore and the planned Waterfront City in a garden. In the pipeline are plans for a business and financial centre, an Integrated Resort and recreational and entertainment opportunities along the promenade, waterfront gardens and Marina Barrage. ■

Project Team

Owner	Singapore Flyer Pte Ltd
Landed	Singapore Tourism Board
Project Manager/ Quantity Surveyor	Ridge Hunt Lovett & Bailey
Design Architect	Kisho-Kurkawa Architect & Associates
Project Architect	DP Architects Pte Ltd
Project Consultant Engineer	Arup
Builders	Mitsubishi Corporation and Taishan Corporation of Japan
Interior Design Consultant	CP Design Pte Ltd
Landscape Consultant	Studio Steed Pte Ltd
Lighting Design Consultant	Project Lighting Design