

Marina Bay Sands and Tall Sustainable Buildings

Tall buildings represent the most advanced technologies and innovative materials in building construction. However, they also bring problems such as high energy consumption, fire accidents, and high operational costs. This paper analyzes briefly how tall buildings can also be sustainable



What is the rated green system building in Singapore?

The goal for this building was to achieve the platinum level of BCA Green Mark, which is the local equivalent of U.S. Green Building Council's LEED certification

The ArtScience Museum

▶ This hand-like structure has three levels of galleries, a level for the lobby and a cafe overlooking the city.

▶ It houses a conference centre at its lowest level.

▶ Touted as the first repository where science meets the arts, the ArtScience Museum will have permanent, local and travelling exhibits.

▶ The museum also has outreach programmes. It will draw on a network that includes The Solomon R. Guggenheim Museum, the Field Museum

of Natural History and The Gallery of Research-Austrian Academy of Sciences.

▶ Its initial programming will be drawn up by a six-member board of architects and designers.

▶ The building's out-stretched palm roof collects rainwater, which feeds a waterfall cascading through the museum into a pool below.

▶ At night, the roof is transformed into an amphitheatre with skylights and tiered seating (left).

The three towers

▶ The towers house the resort's 2,500 hotel rooms, likely to target travellers on different budgets.

▶ To prevent the towers presenting an impenetrable wall when seen from the sea, the hotel is split into three towers with the space in-between serving as "windows".

Links to the downtown botanic gardens, Gardens by the Bay

Entry to the resort from the city. There will be four main entry points:

- A From the city
- B The upcoming helix bridge
- C The MRT station
- D The Gardens by the Bay

What type of building is the Marina Bay Sands?

- ✓ MBS is a three 55-storey hotel towers that are connected at the top by the one hectare SkyPark.
- ✓ Over 2,500 suite hotel rooms are contained within the three distinctive towers which are 200m-tall structures.
- ✓ 340m-long Skypark which is considered the largest cantilevered public observation deck in the world.
- ✓ Grand ballroom seating more than 6,000 diners, 100,000m² of casino, retail, and restaurant space, two theaters with total capacity of 4,000, and two crystal pavilions that appear to float on the sea like icebergs are also important items of the main design.
- ✓ At night the roof of the museum will become an amphitheatre with seating for 3000 people, playing host to a light and water show.



Dome 1

▶ This houses the theatre where Sands' partner, Broadway producer Clear Channel Entertainment, may put up its acts.

▶ Sands has promised three entertainment venues.

Dome 2

▶ This houses the casino and restaurants. The casino has a sweeping roof, no columns at all, and is flanked by galleries.

▶ Locals who do not want to shell out the \$100 entry fee can still peer into the casino when dining at its surrounding restaurants.

Dome 3

▶ This hosts five levels of wired-up convention and exhibition space.

▶ There are two levels of exhibition halls and two floors of meeting rooms. One floor is devoted to meeting rooms, and a column-free ballroom with a city-view.

Floating crystal pavilions

▶ There are four glass pavilions that house two clubs, a cafe and a station for the river taxi.

▶ They look like they are floating on the water, but are linked to the main building by underground links.

The promenade and the events plaza

▶ The promenade facing the bay has both outdoor and air-conditioned areas.

▶ Its events plaza will have a hydraulic platform that can morph from a flat stage to an amphitheatre with tiered steps.

The Strait Times
April 7, 2006

The sky garden

▶ This park 50 storeys up has an observatory, where members of the public can get a panoramic view of the city.

▶ The remaining facilities for hotel guests include restaurants, swimming pools, a jogging track and a spa.



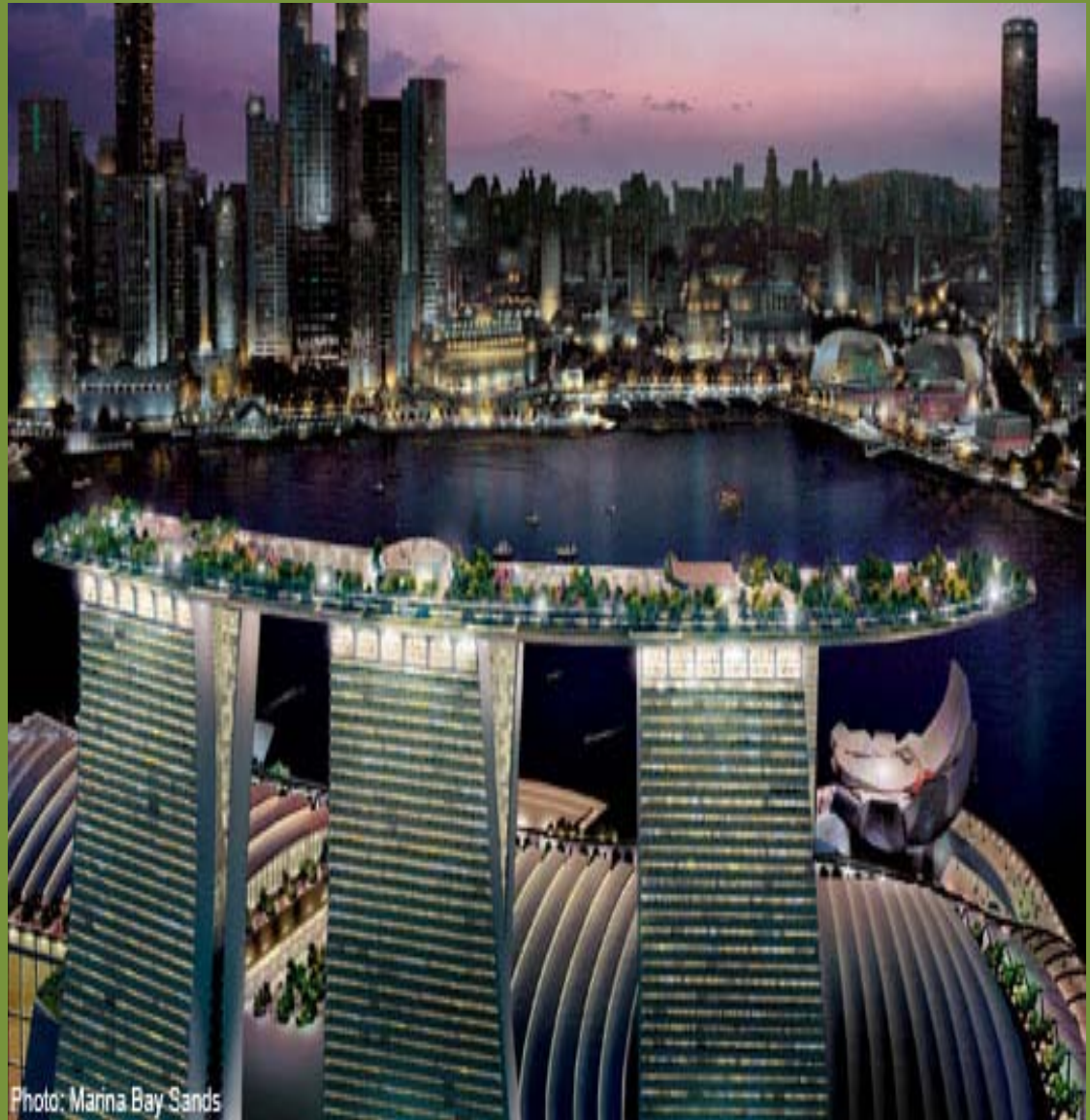
What were the main challenges during construction?

- ✓ **The coastal sites' geology: Marina Bay Sands sits on sand infill, which rests in soft clay marine deposits. This soft clay makes excavations more than a few meters deep very difficult.**
- ✓ **Constructing and lifting the Skypark into place on top of the three towers.**



Why is the Marina Bay Sands a Green Building?

- ✓ **Energy Conservation**
- ✓ **Water Conservation**
- ✓ **Waster Management**
- ✓ **Ensuring Air Quality**
- ✓ **Other Green Features**



Conclusions

The goods and the bads:

- ✓ Marina Bay Sands is the realization of a long-term development vision for Singapore and one of the fastest-growing business hubs in Asia.
- ✓ The main concern for the construction of tall buildings.
- ✓ The landscape network reinforces urban connections with the resort's surroundings and every level of the district has green space that is accessible to the public.
- ✓ Economic growth and employment.
- ✓ Materials used in MBS (embodied energy)
- ✓ There are good commercial and practical reasons for developing these three mega-towers in Singapore; however, it appears that there is a race in the new building development around the world in order to be the “tallest”.
- ✓ More sustainable tall buildings that ensuring durability and longevity, as well as energy savings is the goal of every stakeholder involved in tall building projects

