

Republic Plaza

Raffles Place, Singapore

Project Type:
Commercial/Industrial

Case No:
C028004

Year:
1998



SUMMARY

A 66-story, 1.1 million-square-foot office tower, developed in the heart of Singapore's central business district. The award-winning skyscraper, built on a 999-year leasehold site, incorporates intelligent building features and has direct links to major roads and public transportation systems. Numerous dining facilities, retail outlets, medical services, and other amenities are available. The development, which contains a net rentable area of 799,161 square feet (74,322 square meters) comprises Plaza I, completed in 1996, and Plaza II, completed in 1997.

FEATURES

- Intelligent infrastructure and space use
 - Fast, double-decker elevator system
 - Fire protection system that screens out false alarms
 - Energy-efficient lighting and power systems
 - Automated car parking
 - Multi-tiered system of safeguards for dependable service
 - Exclusive Tower Club
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SPECIAL FEATURES

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- Automated car parking
- Multi-tiered system of safeguards for dependable service
- Exclusive Tower Club

OWNER/DEVELOPER

City Developments Limited
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Singapore 068877, Singapore
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ARCHITECTS

Kisho Kurokawa Architects & Association
Tokyo

RSP Architects, Planners & Engineers
Singapore

GENERAL DESCRIPTION

Republic Plaza, a 66-story office building (the tallest allowable in Singapore), is a Pacific Rim landmark with the structural style of a quartz crystal. Towering at one of the most prestigious addresses in the heart of the central business district (CBD), it is considered Singapore's premiere office building. The development was financed through shareholder equity and loans from two consortium banks. The mortgage financing arrangement involved shared equity of 10 percent. Total construction cost was approximately \$300 million.

A winner of numerous awards, the project has been ranked one of 21 exemplary world-class skyscrapers by the Institut Français D'Architecture. Selected because of the quality and dynamism of its overall architecture, it was described as a project that "combines intelligent placing, fitness of purpose, technical daring, and architectural beauty."

Developed and owned by City Developments Ltd. (CDL), the 1.1 million-square-foot (102,000-square-meter), 920-foot (280-meter)-high office tower is located at Raffles Place. The project comprises Plaza I, which was completed in 1996, and Plaza II, completed in 1997. Total leasable area is 721,397 square feet (67,090 square meters) in Plaza I and 77,763 square feet (7,232 square meters) in Plaza II.

Republic Plaza, built on a site with a 999-year leasehold, is highly accessible and provides many intelligent building features to enhance the work efficiency of its occupants. Major roads and public transportation systems connect directly to the building entrance and basement; a tunnel links the basement to the main rapid transit station. Extended links to other buildings create access to all parts of Raffles Place, which is home to numerous multinational companies and more than 200 financial and banking institutions.

Republic Plaza, which contains a net leasable area of 799,161 square feet (74,322 square meters) in two buildings, provides numerous dining facilities, retail outlets, medical services, and other amenities for tenants and the office community at large. User-friendly features like interactive directories near entrances provide information on locations and directions.

Situated on the top floors, the exclusive Tower Club provides Singapore's business elite with a place to entertain and enjoy a magnificent view of the city skyline. Club amenities include Chinese and Western dining, private dining and function rooms, a boardroom, and health club services. The club is a joint venture of Club Corporation of America and CDL, with membership by invitation only. The lifetime membership fee is S\$35,000 and includes unique services such as private lockers for members' cigars.

SITE AND DEVELOPMENT PROCESS

Republic Plaza is the flagship of City Developments Ltd., one of the largest listed property companies in Singapore. Hong Leong Group, its parent company, had acquired two plots of land at the present site in the 1980s, but they could not be redeveloped in isolation. Great efforts were made to amalgamate the remaining seven plots over a considerable period in order to develop a major project involving state-of-the-art technology. CDL wanted to play an important role in raising construction standards and in delivering top-quality commercial office space to Singapore.

A total of 42 highly trained and experienced professionals were involved in project management, building design and engineering, and construction management operations. At the peak of its activity, the team managed 1,100 workers of 12 different nationalities. From the outset, the entire project team shared the vision of establishing a dynamic building that provided its users with two strategic features: an intelligent infrastructure and a multitiered system of safeguards for maximum service dependability. Republic Plaza incorporates many intelligent features and advanced technologies to accommodate tenants' operational requirements.

Advanced construction and management techniques made it possible to deliver the project on time and within budget and to use natural resources efficiently, minimizing waste. The use of advanced value engineering resulted in a 40 percent reduction in the amount of steel used, from 14,000 to 8,500 tons, and construction cost per square meter was 15 percent less than that of a comparable building completed earlier.

The 1.1 million-square-foot development required meticulous planning and construction. The building stood on 14 caissons, each five meters in diameter. Detailed value engineering and design revisions allowed the efficiency of the caissons to be raised by more than 35 percent compared with earlier structures built in the same area. A highly sophisticated caisson excavation technique was used that employed 12 remote-controlled excavators.

The greatly congested site and proximity of the underground rail structures made foundation work especially complex. For temporary ground support of the basement excavation, a specially designed ground anchor system had to be adopted as anchors encroached on land beyond the site boundaries. Restrictions on soil movement required on-site monitoring, and underground rail tunnels also were monitored to measure tunnel distortion. In the restricted area near the tunnels, pile casings were installed using the rotary hammer method to minimize vibration. To comply with rail authority requirements, the micropiles were debonded to ensure that no load was transferred to the tunnels.

The superstructure was designed with a reinforced concrete core to which an exterior steel-framed structure was tied.

The core was constructed with two independent jumpforms. The self-climbing jumpforms with integral hydraulic jets worked efficiently on a five-day-per-floor cycle, keeping approximately three floors ahead of the erection of the structure at all times.

About 8,500 tons of three-story-high steel columns were used for the erection of the steel structure. The columns were designed with welded fins for increased shear resistance at the lower building levels, and lasers were employed to ensure that the columns were properly aligned. The results were fed back to the steel suppliers so that deviations could be adjusted in the next section of construction. To accommodate profile changes in the crystal-like structure of the building, special inclined sections had to be fabricated. Steelwork engineering specialists from Japan remained on site for three months to maintain the accuracy of alignment. As a result of precise planning and timing, total erection time was 574 days for the steel and concrete composite structure, two months ahead of schedule.

The extremely complex construction of Republic Plaza's facade involved fabrication and installation of more than 10,000 separate panels. Under a rigorous quality-management system the panels were produced in the factory and delivered to the site in floor-by-floor batches. A global computer network was used to track the manufacturing and delivery process of each component until it was installed.

Because of limited ceiling space, coordination of the installation of advanced mechanical, electrical, communications, and fiber-optic systems required careful effort. Special ductwork was required for the air conditioning. A specially designed and manufactured cage holding all wiring, pipes, and ducts was fabricated on site before it was lifted for floor-by-floor installation, resulting in faster joining.

PLANNING AND DESIGN

Republic Plaza was conceived as a development that would be thoroughly compatible with the market and commercial priorities of the 21st century. The design by architect Kisho Kurokawa was inspired by the structure of a quartz crystal. It dramatizes the tower's verticality with profile changes made with crystal-like cuts. The lower portion of the building is octagonal and aligned with the streets. The upper portion is turned 45 degrees, not only to achieve the crystal effect, but also to capture views of the harbor and the sea. Like a crystal, the tower has a pyramidal top. The building is clad in pink polished granite and features large expanses of tinted glass.

The project design incorporates many intelligent building features. Floor plates range from 9,488 to 14,747 square feet and are column free, providing optimum flexibility for space planning and design. Three-compartment, flush-floor, trunk-line channels and raised access flooring allow for flexibility in cabling for power and telecommunications. Knockout floor panels are provided to facilitate the construction of internal staircases for multifloor tenants and dedicated data risers are provided so that they can easily connect their computer and telephone networks.

Marketing considerations led the developer to install a highly efficient elevator system that includes 15 double-decker passenger elevators divided between two zones. Waiting times at peak hour are 17 seconds. The building offers a flexible air-conditioning system that incorporates efficient zone and temperature controls, variable-air-volume units, a chilled water supply for after-hours use, and a backup chiller. Parabolic mirror-optic light fittings provide energy-efficient lighting.

Two independent power sources along with four standby and two backup generators provide reliable power; tenants need not fear any power outages. Security features include closed-circuit TV monitors, door contact alarms, well-located guard stations, and a smart-card system that controls elevator access to the office floors after hours. Among the other intelligent building features are a fully automated car-parking system, a fire-safety system that screens out false alarms, and a state-of-the-art automated building management system that enhances operational efficiency and tenant safety.

MARKETING AND MANAGEMENT

Preconstruction marketing began in 1991, and an aggressive full-scale marketing program that included media advertising, printed brochures, TV coverage, press releases, and videos for overseas audiences began in 1994. Every stage of development, such as ground breaking or the initiation of another phase of construction, was made into a media event. Mock-up models of the lobby and office suites were built to demonstrate the high quality of the finishes. A dramatic view of surrounding buildings was provided in the walk-through models, which proved to be a good selling feature.

The project is represented by Jones Lang Wootton and is managed by City Project Management Ltd., a subsidiary of CDL. The building was 70 percent preleased prior to completion. One year after completion, the building was 90 percent leased; it currently is 95 percent leased and experiencing a high rate of lease renewals. The completion of the project ahead of schedule gave it a market advantage. With its premium location, outstanding views, overall high-quality design, advanced intelligent building features, and exclusive amenities such as the Tower Club, Republic Plaza commands one of the highest office rental rates in Raffles Place. Management is selective in choosing tenants in order to maintain the building's image.

The basic management philosophy of Republic Plaza is customer oriented and proactive. Meeting tenants' expectations and special needs at every level of service is management's goal.

EXPERIENCE GAINED

- Teamwork, timing, and tenacity are the main elements of a successful project.
- Certain problems are associated with dealing with an international construction and engineering team, and it requires skillful coordination. Delays can occur, especially if the development is the company's first project in the country or region.
- Selection of the contractor is crucial, and the more significant the development the greater the options. Contractors want to be associated with an important building, and they will put forth great effort in order to add a notable project to their portfolio.
- Flexibility and continuous reassessment are essential. Construction of a second tower over the podium after the design had been completed for Republic Plaza increased the gross area by an additional 107,527 square feet (10,000 square meters). Since the foundation already had been completed, more pilings were installed below the building. A core was cut, and the second tower was constructed. The innovative addition made the project significantly more profitable.
- While close proximity to public transportation is ideal, developing the project next to the train station posed unforeseen problems and heavy restrictions on the contractor. In addition, construction was hampered by congestion in the center of the busy CBD.
- Communication with tenants is vital, and special attention should be given to any feedback received from tenants and visitors.
- The 35-member board of governors served as a base for membership in the Tower Club. Having the board introduce their friends and associates to the club was an ideal way to increase membership.

PROJECT DATA	
LAND USE INFORMATION	
Site area: 1.79 acres Net rentable area (NRA): 799,161 square feet NRA per floor: 9,515 to 15,027 square feet Floor/area ratio (FAR): 14.137 Total parking spaces: 508 Parking index: one space per 2,000 square feet of NRA	
Gross Building Area (GBA)	
Use	Square feet
Office	746,541
Retail	37,362
Residential	116,094
Parking	143,809
Theater	56,194
Total	1,100,000
LEASING INFORMATION	
Rent per square foot: \$90 to \$132 annually Length of typical lease: three to six years Typical lease provisions: The premises are leased based on rent, including service charges.	
OFFICE TENANT INFORMATION	
Number of tenants	Square feet
0	0-999
0	1,000 to 1,999
10	2,000 to 4,999
7	5,000 to 9,999
24	10,000 +
Average tenant space: 16,600 square feet Major tenants The Bank of Tokyo-Mitsubishi: 80,000 square feet Bank of America: 75,000 square feet ING Barings: 55,000 square feet Rabobank: 40,000 square feet	
DEVELOPMENT SCHEDULE	
Planning started: 1990 Construction started: December, 1991 Leasing started: 1991 Project completed: Phase I, 1996; Phase II, 1997	

DIRECTIONS

From Changi International Airport: Via the East Coast Parkway (ECP) expressway.

Driving time: Approximately 25 minutes.

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This Development Case Study is intended as a resource for subscribers in improving the quality of future projects. Data contained herein were made available by the project's development team and constitute a report on, not an endorsement of, the project by ULI-the Urban Land Institute.

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Rising 66 stories, crystal-like Republic plaza stands at the heart of Singapore's financial hub.



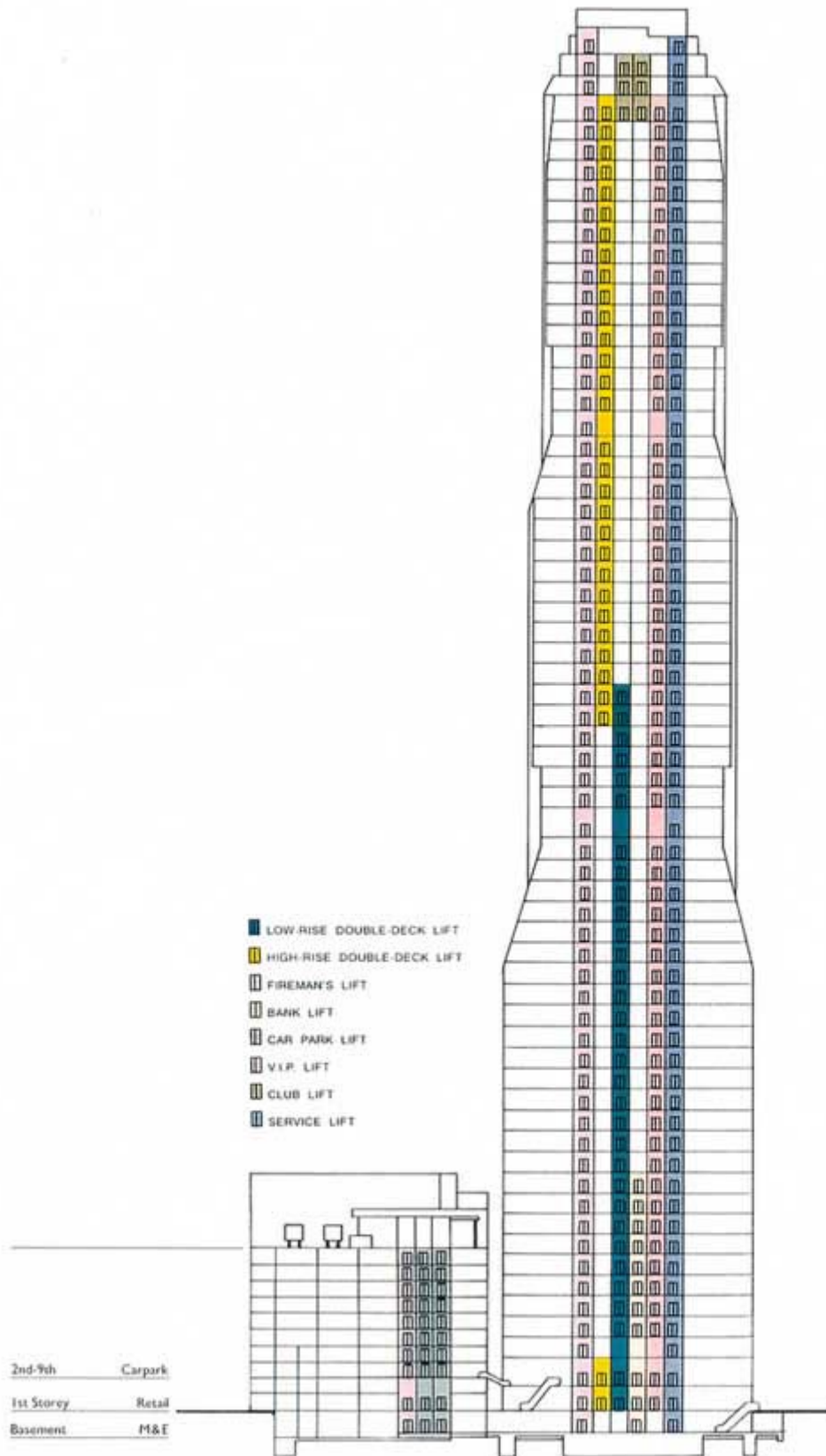
View from Republic plaza as it towers over the Singapore skyline and captures the panorama of harbor and sea.



The lobby of the skyscraper features elegant touches, such as polished granite finishes and a cascading water fountain.



The tower club features private dining, a health club, and other amenities for members



Mechanical rendering of Republic plaza looking north. Fifteen double-decker elevators enhance operational efficiency with the shortest peak-hour waiting time in Singapore.