

PARKROYAL on Pickering

In recognition of its environment-friendly design, the development received a BCA Green Mark Platinum Award, under the New Non-Residential Buildings category, at BCA AWARDS 2012.



PARKROYAL on Pickering is located at the key gateway to the Central Business District and Raffles Place financial hub.

Developed by UOL Group's subsidiary, Pan Pacific Hotels Group Limited, PARKROYAL on Pickering is being designed by internationally acclaimed architectural firm WOHA. The flagship PARKROYAL hotel will boast a hotel-in-a-garden concept that focuses on integrating environmental principles and elements throughout the property.

Located at the key gateway to the Central Business District and Raffles Place financial hub, the hotel features lush greenery spanning a total of 15,000 m² of impressive sky gardens, reflecting pools, waterfalls, planter terraces and green walls.

Amongst its other green features are rainwater and natural light harvesting, an energy-efficient air-conditioning system, automatic sensors to regulate energy and water usage as well as carbon monoxide levels, along with solar cells to power landscape lighting. With these features, PARKROYAL on Pickering will effectively



The hotel features lush greenery.

reduce surrounding temperatures (through the greenery), enhance air quality and reduce greenhouse gases, when it opens in December 2013.

Building envelope

High performance glass used for the building envelope allows for clear views and abundant daylighting while cutting out solar radiation. Vertical greenery shields the west-facing walls, keeping them cool and preventing the walls from radiating the heat into the guest-rooms. The ETTV (Envelope Thermal Transfer Value) of the building has been reduced from the code requirements by more than 20%, to be less than 40 W/m², through design features and selection of materials used for the building envelope.

Energy-saving features

The design of the central air-conditioning system has been optimised to maximise energy efficiency. The centralised chiller system is shared by the office tower and hotel to provide efficient cooling for office units even outside normal office hours. The central chiller system has been designed to use high efficiency chillers and variable speed pumps as well as high efficiency cooling towers which can vary their capacity to match the changing cooling load, thus enabling the system efficiency to be better than 0.63 kW/RT.

The hot water system for the hotel is designed to use air-to-water heat pumps with a COP (Coefficient of Performance) better than 4.0. The use of heat pumps is expected to result in at least a 60% reduction in energy use for hot water generation when compared to the conventional heating systems. Furthermore, the cold air produced as a by-product of the heat pumps is to be recycled and used for space cooling.

Demand-based controls are incorporated for ventilation

systems to minimise energy use. CO (carbon monoxide) and CO₂ (carbon dioxide) sensors are used for controlling car park fans and ventilation for air-conditioned spaces, respectively.

Extensive use of LED lamps and T5 type fluorescent lamps has enabled designers to achieve at least a 20% reduction of lighting power density as compared to the Singapore Code. Furthermore, the building is designed to maximise harvesting of natural light for areas like hotel corridors and lobbies.

The total energy savings for the development is estimated to be more than 3 million kWh/year. Based on simulation of the energy performance, the development will be 30% more energy-efficient when compared to a conventional design.

Water efficiency

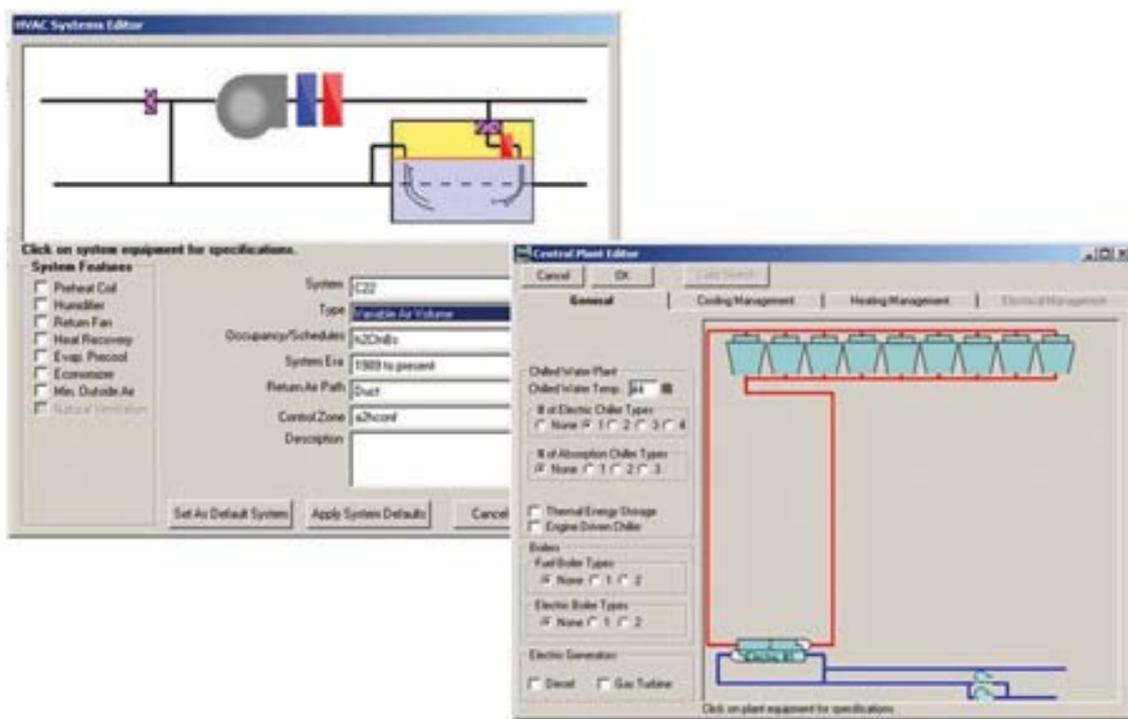
Efficient water fittings are used throughout the building. In addition, a comprehensive leak detection and water usage monitoring system is used so that leaks can be instantly identified and rectified.

Rainwater harvesting and NEWater use have been incorporated to reduce the use of potable water for applications such as irrigation and cooling tower make-up. Furthermore, drip irrigation used for the landscape, coupled with irrigation controls with rain sensors is expected to significantly reduce the use of potable water.

The total annual savings from the water conservation measures is expected to be 6,900 m³ of water.

Greenery

A variety of plant of species ranging from shade trees, tall palms, flowering plants, leafy shrubs and overhanging creepers come together to create a lush tropical setting that is attractive not



Modelling and simulation for the air-conditioning system design. Image by LJ Energy.



The extensive landscaping and greenery are not focused in one area but spread throughout the development.

only to the occupants of the building but also to insects and birds, extending the green areas from Hong Lim Park and encouraging bio-diversity in the city.

The development, with a Green Plot Ratio of 12, is designed as an 'office and hotel in a garden' concept. The extensive landscaping and greenery are not focused in one area but spread throughout the development and well integrated in terms of design and use. Planters and water features at the ground storey provide a garden setting for public plazas, thoroughfares and hotel public areas. Leafy shrubs and overhanging creepers are spread throughout the podium carpark, providing coverage to hard surfaces while allowing air through into the interior. Large and lofty skygardens at four-storey intervals bring greenery to the hotel rooms and offices.

The gardens and greenery allow an alternative approach to be taken in terms of environmental relief without compromising the amenity of end users. This strategy allows over 50% of guest-room corridors, 100% of office tower lobbies and 100% of office tower common washrooms to become attractive garden spaces, with fresh air, shaded by tropical trees and flanked by water features instead of being 24-hour energy-guzzling air-conditioned spaces. As a further point of innovation, these extensive landscape areas are designed to be self-sustaining and rely minimally on precious resources. Rainwater collected from upper floors will be used to irrigate planters on the lower

floors by gravity, whilst non-potable NEWater will be used for water features. Solar cell arrays totalling 60 kWp on the roof, which will produce approximately 1% of the total energy use, will power lamps and softscape lighting, making these substantial landscapes Singapore's first Zero Energy Skygardens.

All images by WOHA, unless otherwise stated.

PROJECT CREDITS

Developer
Hotel Plaza Property (Singapore) Pte. Ltd

Architect
WOHA Architects Pte Ltd

M&E Consultant
BECA Carter Hollings & Ferner (SEA) Pte Ltd

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