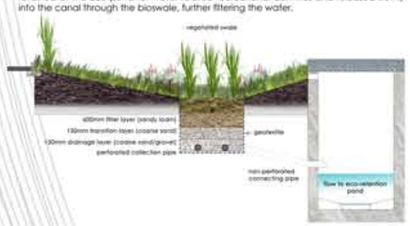
BIO-PRECINCT

Harnessing Green Consciousness – Creating a Comfortable Living Environment

The design adopts a green approach from inception with inputs from green mark managers and technology teams. It focus on passive design solution as the main priority and integrates cost efficient, environmentally-friendly technologies to create a comfortable and healthy living environment.

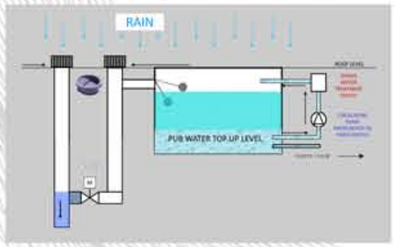
Water

At precinct level, bio filter ponds within the rain forest courtyards filter the collected rain and ground water using oxygenating reeds. This filtered water will be channeled and retained at the Eco pond for water-related recreational activities and released slowly into the canal through the bioswale, further filtering the water.



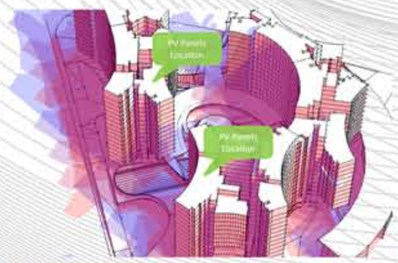
At block level, rain water harvesting system for the irrigation of sky garden landscape reduces potable water consumption. (9 rain water harvesting tanks of 2m3 each to collect approx 7776 m3 of water which is equivalent to $7581.6 saving per year). Automated irrigation sprinkler system with rain sensors aids the ease of maintenance and conserves water.

At unit level, integrated basin/cistern pedestal system and water efficient fittings, such as taps and mixers, flushing cistern, showers, covered under the Water Efficiency Labeling Scheme (WELS) helps recycle water and reduces water wastage.



Energy

Simulation software is used to identify the optimal location to harvest a minimum 4 hour sun light per day from 10 AM to 2 PM. The output of the PV systems is connected in parallel with the utility power grid using a grid-tie system without the need for storage batteries. The power supply drawn from the utility grid will be correspondingly reduced by the amount of power generated by the PV system. (70,080 Kwp/year energy is harvested which is equivalent to $ 13,511.00 saving per year)



Shadow Ranges
- June Solstice
for PV Panels Location (10:00 - 14:00)

Green Features

Green features which are innovative and/or have positive environmental impact are adopted:-

Recycling using dual refuse chutes to separate recyclable from non-recyclable waste and dedicated chute for recycling of dry waste (compost bins).

Proximity and accessibility to transport nodes and amenities like LRT station, commercial and social facilities including provision of bicycle lots and trails.

Minimizing airborne contaminants to promote a healthy indoor environment with the use of low volatile organic compounds (VOC) paint. Adopting environmentally friendly materials and products like bamboo flooring for bedroom floor and green concrete for kerbs.

Energy savings
Innovative use of maintenance free sun pipes to harvest daylighting into carpark decks and motion sensors for lift lobbies and common areas to save energy.

Facade

Green AirWell

"Stilts"

Eco-Pond

Roof Garden

Achieving Green Mark Platinum

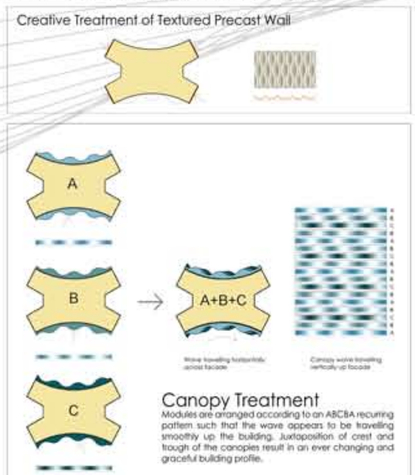
Orientation and layout of block to shade precinct spaces, majority N-S orientation, using screens, balconies, canopies and sill heights to shade interior.

Buildability and Variety

Wave-like treatment of canopies, end wall treatment and façade treatment gives rise to a fluid and sensuous building profile that aptly echoes the surrounding waterway. To achieve both buildability and variation to the façade, the design is limited to 3 standard precast modules.

End Wall Treatment

Creative treatment of textured precast wall surface acts as acoustic treatment, helps heat dissipation and relates to the fluidity of the water with its wave-like texture.

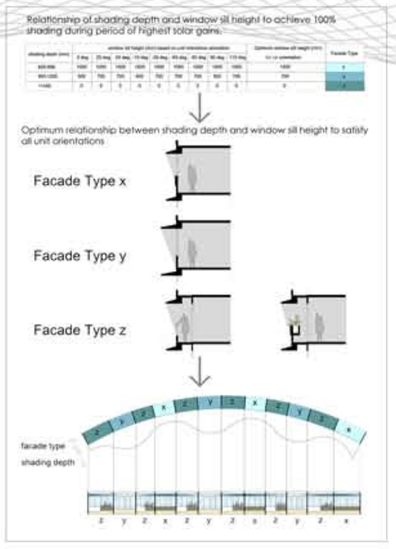


Canopy Treatment

Modules are arranged according to an ABCBA recurring pattern such that the wave appears to be travelling smoothly up the building. Juxtaposition of crest and trough of the canopies result in an ever changing and graceful building profile.

Canopy and Fenestration Relationship

An expressive façade is created through the rhythmic arrangement of 3 standard precast modules differentiated by canopy depth, planter and balcony location.



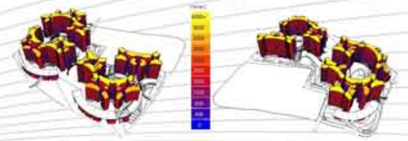
Solar Shading

Majority of the blocks are North-South orientated and are laid out to shade the precinct spaces where activities occur, akin to the shadow alley in the vernacular kampong.

Shadow Ranges - March Equinox, June Solstice, December Solstice

Innovative Solution to address Solar Heat Gain

Simulation software is used to identify facades and areas to further reduce solar heat gain. From this result, shading devices such as canopies, balconies and screens are strategically placed to reduce solar heat gain into the unit. They are also designed to recall the rippling of the water as a design theme. In addition, roof top greening also helps to reduce solar heat gain significantly and improve the living environment with more green and recreational space.



Average Daily Solar Radiation North Facade

Average Daily Solar Radiation South Facade

Wind/Ventilation

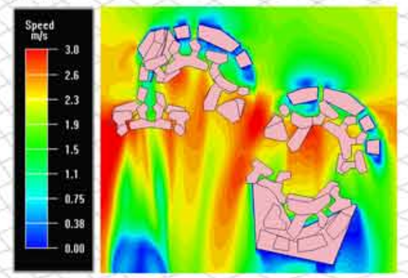
Wind simulation software is used to analyze building design and layout. The final proposal is based on the recommended findings for good natural ventilation.

At the precinct level, the building adopts a breezeway concept. It is generally North-South orientated to optimize prevailing wind conditions to achieve good cross ventilation. High floor to ceiling height at car park decks and big openings at the rain forest courtyard aid good cross ventilation and natural day lighting. Adopting from the kelong typology, the buildings are "lifted" to allow wind to flow through the development and through to the car park and landscape decks.

The blocks are designed with generous openings for good cross ventilation and views.

Within each unit, sufficient openings are provided at the 2 opposite ends to allow for good cross ventilation. For the loft unit, double volume living area allows good day lighting, spaciousness and effective cross ventilation.

Wind



Ventilation

North Prevailing Wind
1.5m high