

## Legislative Council Panel on Housing

### Public Rental Housing Developments at Kai Tak Sites 1A and 1B

#### Purpose

This paper is to brief Members on the Hong Kong Housing Authority (HA)'s public rental housing (PRH) Developments at Kai Tak Sites 1A and 1B. The HA has adopted the theme of "Homes in the Park" and incorporated a series of environment-friendly features for the design and construction of the two projects.

#### Background

2. The HA's PRH Developments at Kai Tak Site 1A (3.47 hectares) and Site 1B (5.7 hectares) are located at the north apron area of the Kai Tak Development<sup>1</sup> near Richland Garden, Choi Hung Estate, Rhythm Garden and the future Kai Tak Station of the Shatin-Central Link.

3. The two estates provide about 13 300 flats for 34 000 residents in 15 domestic blocks, as well as ancillary retail facilities including a wet market, carparking facilities, kindergartens, neighbourhood elderly centre, integrated children and youth centre and recreational facilities. The layouts are shown in **Annex 1**. The first population intake will take place in 2013, and construction works started at the end of 2009. Sites for schools and public parks are also planned within the vicinity of the estates. Construction of supporting infrastructure including new roads and footbridges linking adjoining areas is being taken forward by concerned Government Departments.

#### Homes in the Park

4. To echo the vision of the Kai Tak Development which seeks to practise sustainable development and cultivate a comprehensive network of parks and gardens for everyone to enjoy, the HA has adopted the design theme of "Homes in the Park" for the two estates with the following key features -

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<sup>1</sup> Kai Tak Development is a signature project on the ex-Kai Tak Airport. The vision of the Government is to develop Kai Tak Development into "a Distinguished, Vibrant, Attractive and People-oriented area by the Victoria Harbour" with a good mix of community, housing, business, tourism and infrastructural uses.

- (a) passive building designs,
- (b) green and healthy environment,
- (c) environment-friendly design initiatives, and
- (d) green construction techniques.

### **(A) Passive Building Designs**

5. In refining the estate layout and building design for green and healthy living, we have adopted passive building designs through air ventilation and micro-climate studies, properly consolidated to optimize the planning and design of buildings and outdoor spaces. This will help provide a healthy and quality living environment for tenants through optimal use of the natural environment such as wind environment, ventilation, daylighting and solar radiation as well as energy consumption.

6. For domestic properties, we have positioned the domestic blocks to capture the prevailing south-easterly wind for most of the year to maximize natural ventilation; and we have developed floor plans with simple corridors to ensure good air circulation and ample natural light throughout the buildings, including the semi-private areas of lift lobbies and corridors, as well as the private domain in each domestic flat.

7. For retail facilities in the public domain, we will bring life to the street level by providing retail facilities primarily in the form of street front shops in pedestrian precincts. The arcades on the first floor are designed to be naturally ventilated to provide an open and welcome atmosphere while reducing the use of air-conditioning as far as possible.

### **(B) Green and Healthy Environment**

8. Formed by the surrounding domestic blocks, a central park will be fully integrated with the green spaces in both estates. Residents can gain easy access to the entrance lobbies through a park setting while smaller pockets of open area with seating, planters and trellises at the edge of the blocks together with covered foyers, provide communal places for residents to meet up and chat with each other. To assure a healthy living environment for social inclusion, we will provide barrier-free access to all major facilities of the estate to suit people of all ages and abilities.

9. We will provide ample green coverage for both estates with greening ratios<sup>2</sup> over 30% of the respective site area, including at least 20% at the pedestrian zone. The rest will comprise roof greening and vertical greening. Vertical greening is designed as a feature for the retail facilities at the junction of Eastern Road and Road L3. It serves to reflect a green Kai Tak and welcome all visitors and residents to the Kai Tak Development .

10. A variety of plant species have been chosen to create interesting themed zones with hillocks, a garden feel, and other motifs. Chosen as the estate's theme tree, the bauhinia will be planted together with other varieties of trees, shrubs and flowers to offer shade and an ever-changing seasonal palette of colours.

11. The aviation heritage of Kai Tak will be visible within both estates. Aviation elements such as the Signal Hill and runway axis have been adopted and developed as design features. A specially designed aircraft icon will also be used in landscaping, graphic design and signage. An open air exhibition gallery is planned to showcase some recollections and unique memories of Kai Tak to enhance a sense of belonging amongst the residents.

### **(C) Environment-friendly Design Initiatives**

12. Throughout the estate, we will put in place environment-friendly design features to reduce environmental impact. Major features include -

#### **(a) District Cooling System**

We have adopted the centralized and energy-efficient chilled water supply system implemented by the Electrical and Mechanical Services Department to provide chilled water to the air-conditioning systems of the non-domestic facilities such as retail facilities, kindergarten and estate management offices.

#### **(b) Electric Vehicle Charging Facilities**

We will provide conduit and cable containment to all of the car parking spaces and wiring up to 30% of car parking spaces in the carparks to enable electric vehicle charging, in anticipation of a wider use of electric vehicles in future.

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<sup>2</sup> Interpretation of greening ratio will be based on PNAP APP-152 and applicable to all project sites within the Kai Tak Development according to Planning Department.

**(c) Renewable Energy & Energy Efficient Installations**

We will capture solar power by providing photovoltaic panels on the roofs of domestic blocks to generate electricity for use in the communal facilities. In addition to wide adoption of the energy efficient electronic ballasts and T-5 fluorescent tubes, we will also install light emitting diode (LED) lights at ground floor entrance lobbies as a pilot to further save lighting energy. Furthermore, through the use of a two-level lighting control system, based on lighting-on-demand principle, the lighting level at lift lobbies, corridors and staircases of domestic blocks will be kept at a lower but acceptable level under normal situation but can be raised to a higher level by users when required. We will install smart meters and display panels at ground floor lobbies of the domestic blocks to show the public the average electricity and water consumptions per flat of individual blocks with a view to arousing tenants' energy awareness.

**(d) Lift Regenerative Power**

A lift motor can work as a generator to produce electrical energy if it operates under heavy load down, light load up or braking conditions. By deploying the latest technology in the lift systems for domestic blocks, we can feed regenerated power into the power supply system for use after conditioning by a state-of-the-art regenerative power technology, so as to achieve electricity savings.

**(e) Rainwater Harvesting cum Root Zone Irrigation System**

We have earmarked a portion of the planting area to implement a rainwater harvesting cum root zone irrigation system. The former can help to reduce fresh water consumption by providing filtered rainwater for irrigation while the latter makes use of a mat laid under the soil to store and supply water directly to the plant roots where it is needed most. Evaporation of water can thus be minimized and the amount of irrigation water can be reduced.

**(D) Green Construction Techniques**

13. We are collaborating with contractors and stakeholders in the industry to explore and implement green construction to enhance productivity and efficiency, as well as reducing environmental impact to the neighbourhood -

**(a) Marine Mud Cement-Stabilization Method for Backfilling**

Excavated marine mud has to be treated before transporting to dump site. By treating the marine mud with appropriate proportion of cement and sand, we can re-use it for in-situ backfilling<sup>3</sup> thereby alleviating the pressure on landfill sites as well as reducing traffic and thus reducing pollution.

**(b) Trial Use of Innovative Concrete Mix Design and Quality Management System**

As a trial, we will use a patented advanced concrete mix design and quality management system in the construction of low-rise structures such as the retail facilities and kindergarten. The system optimizes particle packing thereby reducing cement content and in turn reducing carbon dioxide emissions from the concrete production process. This is new to Hong Kong and will mark a breakthrough by bringing in a performance-based approach for concrete production technology.

**(c) Modular Design and Component Prefabrication Techniques**

Besides prefabricated components and precast elements such as fabric reinforcement, semi-precast slab, precast façade and staircase, we also use volumetric precast kitchen and volumetric precast bathroom. Their implementation will reduce wastage and falsework and also improve the quality of the development as a whole.

**(d) Electric Vehicle as Contract Cars**

To support and promote the use of electric vehicles, the contractors have joined up with the power companies to arrange leasing of electrical vehicles for use as contract cars.

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<sup>3</sup> The initiative won the 2011 Environmental Paper Award from the Environmental Division of the Hong Kong Institution of Engineers and the Gold Prize of the General Public Service Award from the Civil Service Outstanding Award Scheme 2011.

**(e) Trial Use of Bio-Diesel Fuel**

Bio-diesel fuel has been adopted for trial use for some of the construction equipment in order to reduce the emission of green house gases. The effectiveness of the trial will be documented for future reference.

**Carbon Emission Estimation**

14. We have developed a Carbon Emission Estimation (CEE) model to gauge the holistic carbon emission of new public housing developments, and we have chosen Kai Tak Site 1A as a benchmarking estate, with the standard New Harmony Block as a benchmark block. The model focuses on the major aspects of construction materials and building operations which have implications for carbon emissions, reduction and absorption during the whole building life from cradle to grave. We have identified six major aspects in the model –

- (a) materials consumed during construction;
- (b) building structure;
- (c) communal building services systems;
- (d) renewable energy;
- (e) planting; and
- (f) demolition.

**Way Forward**

15. We will continue to monitor the implementation of these two green estates, and if successful, extend the application of those pilot green features to other new projects in the pipeline. We will also share the experience with stakeholders in the industry.

16. Members are invited to note the content of this paper.

**Transport and Housing Bureau  
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