

Legislative Council Panel on Housing

Environment-friendly designs of and green measures implemented in public rental housing estates

Purpose

This paper aims to brief Members on the progress of the implementation of environment-friendly designs and green measures in public rental housing (PRH) estates by the Hong Kong Housing Authority (HA) in 2008/09.

Background

2. In December 2007, we briefed the Legislative Council Panel on Housing on the environment-friendly measures implemented by the HA. At the meeting, Members requested the Administration to submit an annual report on the effectiveness and progress of the environment-friendly measures implemented by the HA in PRH estates. In November 2008, we presented to Members the progress of each of the measures implemented in 2007/08.

Progress

3. In the past year, the HA continued to enhance the building designs and construction technologies of PRH estates, and improve estate management and maintenance so that the quality of living can be upgraded and the impact on the environment be minimised. We encouraged tenants and stakeholders to save energy, reduce waste and promote recycling. Each year, the HA sets out the targets for implementing environment-friendly measures for the following year and monitors the implementation and progress of such measures. All 2008/09 targets have been met. The effectiveness of the measures adopted and the targets for the following year are set out in the Annex.

4. The HA will continue to provide a healthier and better living environment for PRH tenants through various environment-friendly designs and green measures, which in turn contributes to the sustainable development of Hong Kong. It will also set an example for the industry and an encouragement for stakeholders, including contractors and tenants, to jointly protect the environment and improve the quality of life in the community.

Transport and Housing Bureau
October 2009

**Progress Report on Environment-Friendly Designs and
Green Measures of Public Rental Housing Estates
(As at 2008/09)**

Measures	Brief Description	Implementation
I. During the construction of new PRH estates:		
A. Environment-friendly Designs		
A1. 'Micro-Climate' Studies	<ul style="list-style-type: none"> The 'Micro-Climate' studies were carried out since 2004 for all newly-designed estates, where computational fluid dynamics technology is employed to evaluate environmental performance and to enhance design, orientation and disposition of the housing blocks, so as to provide a healthy and quality living environment for tenants through optimal use of the natural environment such as local wind direction, natural ventilation, daylighting and solar radiation. 	'Micro-Climate' studies have been carried out in the planning and design of all newly-designed estates. Annual number of newly-designed estates involved: <ul style="list-style-type: none"> ▶ 2006/07: 9 ▶ 2007/08: 4 ▶ 2008/09: 7
A2. Air Ventilation Assessments (AVA)	<ul style="list-style-type: none"> For major estates planned and designed after July 2006, great care was taken in considering whether the developments would pose any restriction to air flow. The HA would also compare the level of air ventilation of different design options and select the estate disposition with the best environmental effects. 	AVAs have been conducted at the planning and design stages of all major estates. Annual number of newly-designed estates involved: <ul style="list-style-type: none"> ▶ 2006/07: 5 ▶ 2007/08: 2 ▶ 2008/09: 2

Measures	Brief Description	Implementation
B. Green Construction Techniques		
B1. Modular Design and Component Prefabrication Techniques	<ul style="list-style-type: none"> The techniques would enhance buildability, building quality, speed of construction, cost-effectiveness of production of building components and site safety, and reduce the environmental impact of construction sites. 	<ul style="list-style-type: none"> The use of precast concrete components accounts for around 20% of all newly-designed estates.
B2. Hard-paved Construction Method	<ul style="list-style-type: none"> The Hard-paved Construction Method, with the use of precast concrete slabs and other materials to provide hard paving at the sites, has been adopted in all HA construction and piling sites since 2005 to minimise the generation of mud and dust and its impact on the surrounding environment and air quality. 	<ul style="list-style-type: none"> The Hard-paved Construction Method has been adopted in all projects.
B3. Incorporation of Specification Requirements in an Overall Environmental Management Plan in Construction Works Contracts	<ul style="list-style-type: none"> All contractors are required to carry out on-site sorting of construction and demolition materials/waste. 	<p>The specification has been incorporated in all newly-commenced construction works contracts (including building, foundation and demolition). Number of projects involved:</p> <ul style="list-style-type: none"> ▶ 2006/07 : 11 ▶ 2007/08 : 8 ▶ 2008/09 : 8

Measures	Brief Description	Implementation
B4. 'Life Cycle Assessment' and 'Life Cycle Costing' method	<ul style="list-style-type: none"> The HA has, since 2005, developed 'Life Cycle Assessment' and 'Life Cycle Costing' method to assess and determine more accurately and effectively the use of new materials at the design stage. It is aimed at minimising the need for future maintenance and the impact on the environment, and to follow through with the HA's principles of adopting functional and cost-effective design and using easily maintained, durable and environment-friendly materials. 	<ul style="list-style-type: none"> Since 2006, the method has been adopted to assess and determine the use of new materials at the design stage of all new projects. New materials which are more environment-friendly and cost effective from the life cycle perspective have gradually been used in pilot projects since 2006. Examples include sustainable softwood for door core, fibre glass laundry pole and curtain rail. After residents' intake at the pilot estates, the HA will observe the durability of these new materials before deciding whether they should be used extensively.
C. Waste Management		
C1. Refuse Handling System	<ul style="list-style-type: none"> For effective waste handling, the HA has adopted a new refuse handling system for all new developments completed after October 2005 to reduce refuse volume for easy transportation and to prevent odour emission: <ul style="list-style-type: none"> (i) Installing a 'Central Compactor System' inside a central refuse collection point; or (ii) Installing a separate, small scale 'Distributed Compactor System' in each building. 	<ul style="list-style-type: none"> The system has been implemented in all newly-completed estates. Number of newly-completed estates involved: <ul style="list-style-type: none"> 'Central Compactor System': 8 (11 systems in total) (cumulative) 'Distributed Compactor System': 3 (3

Measures	Brief Description	Implementation
C2. Refuse Storage and Material Recovery Rooms	<ul style="list-style-type: none"> In designing PRH estates, the HA provides refuse storage and material recovery rooms on typical domestic floors to allow sufficient space for three recycle refuse bins, so as to promote source separation by facilitating the tenants to separate refuse and store recycled materials. 	<p>systems in total) (cumulative)</p> <p>Space has been reserved for recycle bins in all newly-designed estates. Annual number of newly-designed estates involved:</p> <ul style="list-style-type: none"> ▶ 2006/07: 9 ▶ 2007/08: 4 ▶ 2008/09: 7
C3. Installation of De-odourisers at the Covered Refuse Collection Points	<ul style="list-style-type: none"> Since 2003, the HA has installed new de-odourisers at covered refuse collection points in newly-completed estates, where bio-chemical technology is employed to contain the odour at the time of refuse collection 	<p>De-odourisers have been installed in all newly-completed estates. Annual number of newly-completed estates involved:</p> <ul style="list-style-type: none"> ▶ Before 2006/07: 41 (52 sets in total) (cumulative) ▶ 2007/08: 8 (9 sets in total) ▶ 2008/09: 3 (6 sets in total)
D. Energy Conservation		
D1. Designing new estates according to the Building Energy Codes	<ul style="list-style-type: none"> Since 2002, all new projects of the HA have been designed in accordance with the Building Energy Codes issued by the Electrical and Mechanical Services Department. This is to ensure that the buildings meet the energy efficiency requirements on lighting, electricity, air conditioning, lift and escalator installations. In a typical public housing block with energy efficiency designs, electricity consumption can be reduced by about 6%, achieving a saving of \$40 000 a year. 	<p>Energy efficiency registration certificates to be obtained for all new estates. Number of estates/shopping centres and certificates:</p> <ul style="list-style-type: none"> ▶ 2006/07: 3 (18 certificates in total) ▶ 2007/08: 2 (9 certificates in total) ▶ 2008/09: 8 (82 certificates in total)

Measures	Brief Description	Implementation
D2. Trial use of renewable energy in PRH estates	<ul style="list-style-type: none"> ● The HA uses renewable energy in PRH estates as far as possible. ● HA to install renewable energy lighting in the external areas of new estates. 	<ul style="list-style-type: none"> ● Photovoltaic (PV) System for electricity generation at Lam Tin Estate Phases 7 and 8 has been completed. The HA will monitor the performance of the system for testing. ● Installation of the PV System at East Harbour Crossing Phase 5 for testing is in progress. ● Renewable energy lighting to be installed in the external areas of all new estates. Number of new estates with lighting installed: <ul style="list-style-type: none"> ▶ 2006/07: 1 (nos. of lighting: 2) ▶ 2007/08: 3 (nos. of lighting: 5) ▶ 2008/09: 6 (nos. of lighting: 10)
E. Greening Work		
E1. Estate Greening	<ul style="list-style-type: none"> ● To enhance greening in PRH estates, the HA intends to attain the planting target of at least one tree for every 15 flats in new estates. Trees, shrubs and annual plants will be grown. 	<p>Number of trees, shrubs and annual plants are planted in new and existing estates. The number planted:</p> <ul style="list-style-type: none"> ▶ 2006/07 : 644 100 ▶ 2007/08 : 642 300 ▶ 2008/09 : 793 000

Measures	Brief Description	Implementation
	<ul style="list-style-type: none"> ● The greening programme helps enhance the rooftop landscape, reduce temperature and save energy. ● To grow plants, set up plant nurseries and install vertical green panels on the rooftops and external walls of public facilities such as refuse collection points. 	<ul style="list-style-type: none"> ● In 2008/09, green roofs with a total area of 3 500 square meters were provided for low-rise structures, such as refuse collection points, in six new estates. ● In early 2009, testing of the vertical greening technique was completed at the site of East Harbour Crossing Phase 4, and installation of vertical green panels was carried out in the fourth quarter of the year.
E2. Action Seedling	<ul style="list-style-type: none"> ● The Community Participation Scheme is introduced to engage tenants, contractors and the local communities in greening activities at the construction stage. Seedling plants will be given out by the HA and the building contractors to participants who will nurture the plants at home until they are fit for transplanting into the planters of the new estates. ● The Scheme will be implemented for 14 public housing projects to be completed in 2008/09 and 2009/10. 	<p>Number of PRH estates that have completed the scheme:</p> <ul style="list-style-type: none"> ● 2008/09: 8

Measures	Brief Description	Implementation
F. Other Measures		
F1. Common W-Trap System	<ul style="list-style-type: none"> Subsequent to the outbreak of SARS in 2003, the HA, in a bid to improve the design of drainage systems in new estates, joined hands with the Department of Building and Construction of the City University of Hong Kong in developing this System. By diverting waste water from wash basins and shower areas to floor traps, the System can help prevent the drying up of floor traps of new estates. 	<p>The System has been implemented in all newly-designed estates. Annual number of newly-designed estates involved:</p> <ul style="list-style-type: none"> 2006/07: 9 2007/08: 4 2008/09: 7
F2. Twin Tank System for the supply of fresh/flushing water	<ul style="list-style-type: none"> The HA has successfully adopted the new Twin Tank System since early 2008 in the design of rooftop fresh water tanks and flushing water tanks for new PRH estates. The System, together with orderly cleansing arrangements, provides tenants with continuous supply of fresh/flushing water and reduces the inconvenience caused by water tank cleansing and repairs. 	<p>The System has been implemented in all newly-designed estates. Annual number of newly-designed estates involved:</p> <ul style="list-style-type: none"> 2006/07: 8 2007/08: 4 2008/09: 7
II. Green measures implemented in existing PRH estates:		
A. Domestic Waste Disposal and Recovery		
A1. Domestic Waste Disposal	<ul style="list-style-type: none"> The HA has implemented in phases the Source Separation of Domestic Waste (SSDW) Programme in all PRH estates since 2005. Floor-based waste separation facilities have been provided in PRH blocks and more types of recyclables are covered so as to increase the rate of domestic waste recovery and reduce wastes for disposal. 	<ul style="list-style-type: none"> Number of estates participating in the SSDW Programme : <ul style="list-style-type: none"> 2006: 60 2007: 90 2008: 120

Measures	Brief Description	Implementation
		<ul style="list-style-type: none"> ● Daily rate of domestic waste disposal per capita: <ul style="list-style-type: none"> ▶ 2006/07: 0.735 kg ▶ 2007/08: 0.724 kg ▶ 2008/09: 0.694 kg ● Waste paper collected: <ul style="list-style-type: none"> ▶ 2006/07: 13 025 tonnes ▶ 2007/08: 14 748 tonnes ▶ 2008/09: 14 193 tonnes ● Plastic bottles collected: <ul style="list-style-type: none"> ▶ 2006/07: 503 tonnes ▶ 2007/08: 764 tonnes ▶ 2008/09: 939 tonnes ● Aluminum cans collected: <ul style="list-style-type: none"> ▶ 2006/07: 267 tonnes ▶ 2007/08: 309 tonnes ▶ 2008/09: 495 tonnes
A2. Waste Recovery Activities	<ul style="list-style-type: none"> ● The HA has joined hands with charitable and non-profitable organisations to organise various waste recovery activities such as collection of used clothes, rechargeable battery recycling programme, collection of compact fluorescent 	<ul style="list-style-type: none"> ● Used clothes collected: <ul style="list-style-type: none"> ▶ 2006/07: 561 tonnes ▶ 2007/08: 632 tonnes ▶ 2008/09: 618 tonnes

Measures	Brief Description	Implementation
	lamps and spent fluorescent tubes, computer recycling programme and mooncake tin box recycling campaign, etc.	<ul style="list-style-type: none"> ● Rechargeable batteries collected: <ul style="list-style-type: none"> ▶ 2006: 229 kg ▶ 2007: 200 kg ▶ 2008: 230 kg ● Collection boxes have been placed in estate offices for collecting disposed compact fluorescent lamps and fluorescent tubes. Large-scale recycling campaigns for used computer items recycling campaigns are organised twice a year for estate tenants. Arrangements are made for Environmental Protection Department's (EPD) contractor to collect these items from estates for further processing. ● Participation in the SSDW Competition organised by the EPD. Awards are given to estates that score high in the average total quantity of recyclables collected per household per month in the past year.

Measures	Brief Description	Implementation
		<ul style="list-style-type: none"> ● Participation in the ‘SSDW – Model Family Competition 2008’ jointly organised by the EPD and the community newspaper from October to December 2008. ● Assist Friends of the Earth (HK) and the EPD in organising and publicising the Mooncake Boxes Recycling Programme to collect mooncake tin boxes for recycling purposes during the festival period
B. Energy Conservation		
B1. Lighting Device Energy Saving Scheme	<ul style="list-style-type: none"> ● The HA has launched a trial scheme on lighting device energy conservation in Ho Man Tin Estate. Preliminary results indicate a monthly saving of over 10% in power consumption for the public areas of the housing blocks. 	<ul style="list-style-type: none"> ● Testing was completed in ten pilot estates. As the efficacy was moderate, the original energy-saving devices in Ho Man Tin Estate were replaced with a new model in November 2008, and those in the five domestic blocks in Kwai Chung Estate will also be replaced with a new model. The HA will continue the testing.

Measures	Brief Description	Implementation
	<ul style="list-style-type: none"> • Provided that safety will not be compromised, estate management personnel are encouraged to switch off or delay switching on part of the lighting in the public areas of the estates during designated periods. Tenants can also participate in the energy saving campaign by following at home the energy saving tips provided under the scheme. 	<ul style="list-style-type: none"> • In response to the WWF's 'Earth Hour' held in March 2009, the HA switched off the non-essential external lightings in PRH estates to show its support for energy saving. The HA is considering switching off some of these lightings in the night-time in future.
C. Estate Greening		
C1. Thematic Gardens and Green Roofs	<ul style="list-style-type: none"> • Thematic gardens are built at selected estates to enhance estate landscape. • The greening programme helps enhance the rooftop landscape, reduce temperature and save energy. 	<ul style="list-style-type: none"> • The Butterfly Garden at Hoi Lai Estate and the Red Plants Garden at Tai Wo Hau Estate were completed. • Thematic gardens will be built at Shek Pai Wan Estate and Lung Hang Estate. • The pilot schemes for green roofs at Wo Lok Estate and Fu Shan Estate were completed. Extension of the pilot scheme to other estates is being explored. • Green roofs programme will be carried out at Fuk Loi Estate, Ping Shek Estate and Choi Hung Estate.

Measures	Brief Description	Implementation
C2. Landscaping	<ul style="list-style-type: none"> The existing landscape of selected estates is upgraded by soft landscaping under the Landscape Improvement Programme. 	<ul style="list-style-type: none"> The landscaped areas are : <ul style="list-style-type: none"> ▶ 2006/07 : 110 000 m² ▶ 2007/08 : 116 000 m² ▶ 2008/09 : 110 000 m² Landscaping will be carried out at 18 PRH estates.
C3. Green Delights in Estates	<ul style="list-style-type: none"> The HA continues to organise a community environmental protection programme, ‘Green Delights in Estates’, in conjunction with three green groups, namely the Conservancy Association, Friends of the Earth (HK) and Green Power. Under the programme, each green group designs and implements environmental initiatives for 10 estates every year to promote environmental awareness among the tenants. 	<ul style="list-style-type: none"> Activities organised include ‘Let’s Save Energy’ Campaign, ‘Energy Saving Ambassador Scheme’ and ‘In-depth Educational Activities’, etc. The programme has been extended to 90 estates and will be rolled out in phases to cover all PRH estates in Hong Kong.
D. Other Measures		
D1. Housing Channel	<ul style="list-style-type: none"> The HA continues to make use of the Housing Channel at the ground floor lift lobbies of PRH blocks to disseminate green messages to tenants and encourage them to lead a green life. 	<ul style="list-style-type: none"> The HA continues to use the Channel to publicise the green activities at the estates.