

Legislative Council Panel on Housing

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

Purpose

This paper is 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 2009/10.

Background

2. In December 2007, we briefed the Legislative Council Panel on Housing on environment-friendly measures implemented in PRH by the HA. At the meeting, Members requested the Administration to submit an annual report on the effectiveness and progress of the implementation of environment-friendly measures implemented by the HA in PRH estates. In November 2008 and November 2009, we presented to Members the progress of each of the measures implemented in 2007/08 and 2008/09 respectively.

Progress

3. In the past year, the HA continued to enhance the building designs and construction technologies in PRH estates, and improve estate management and maintenance so that the quality of living can be upgraded and the impact on the environment be minimized. We encouraged tenants and stakeholders to save energy and reduce waste, and we promote recycling. Each year, the HA sets out targets for implementing environment-friendly measures for the following year and monitors the implementation and progress of such measures. All 2009/10 targets have been met. The effectiveness of the measures adopted is 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 contribute to the sustainable development of Hong Kong. It will also continue to be a role model for industry and encourage all stakeholders, including contractors and tenants, to jointly protect the environment and improve the living quality of the community.

Transport and Housing Bureau
November 2010

**Progress Report on Environment-Friendly Designs and
Green Measures of Public Rental Housing Estates
(As at 2009/10)**

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"> 'Micro-Climate' studies have been 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. 	<p>'Micro-Climate' studies have been carried out in the planning and design of 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 ▶ 2009/10: 8
A2. Air Ventilation Assessments (AVA)	<ul style="list-style-type: none"> For major estates planned and designed after July 2006, great care has been taken in considering whether the developments will pose any restriction to air flow. The HA will also compare the level of air ventilation of different design options and select the estate disposition with the best environmental effects. 	<p>AVAs have been conducted at the planning and design stages of all major estates. Annual number of newly-designed estates involved:</p> <ul style="list-style-type: none"> ▶ 2006/07: 5 ▶ 2007/08: 2 ▶ 2008/09: 2 ▶ 2009/10: 3

Measures	Brief Description	Implementation
B. Green Construction Techniques		
B1. Modular Design and Component Prefabrication Techniques	<ul style="list-style-type: none"> The techniques will 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 minimize 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 requirements have 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 ▶ 2009/10 : 15

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' to assess and determine more accurately and effectively the use of new materials at the design stage. It is aimed at minimizing 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. These pilot projects have been completed and occupied by residents. The HA is observing the durability of these new materials before deciding whether they should be used extensively.

Measures	Brief Description	Implementation
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. 	<p>The system has been implemented in all newly-completed estates. Number of newly-completed estates involved:</p> <ul style="list-style-type: none"> ▶ ‘Central Compactor System’: 12 (15 systems in total) (cumulative) ▶ ‘Distributed Compactor System’: 4 (4 systems in total) (cumulative)
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 recycle materials. 	<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 ▶ 2009/10: 5

Measures	Brief Description	Implementation
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) ▶ 2009/10: 5 (5 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 an annual saving of \$40 000. 	<p>Energy efficiency registration certificates have been 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) ▶ 2009/10: 8 (65 certificates in total)

Measures	Brief Description	Implementation
D2. Trial use of renewable energy in PRH estates	<ul style="list-style-type: none"> To use renewable energy in PRH estates as far as possible. 	<ul style="list-style-type: none"> Photovoltaic (PV) System for electricity generation at Lam Tin Estate Phases 7 and 8 has been installed. The HA is monitoring the performance of the system for testing. Installation of the PV System at Yau Lai Estate for testing is in progress. Installation of the PV System at Kai Tak Sites 1A & 1B as pilot is in progress.
	<ul style="list-style-type: none"> To install renewable energy lighting in the external areas of new estates. 	<ul style="list-style-type: none"> Number of new estates with renewable energy lighting installed in the external area: <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) ▶ 2009/10: 9 (nos. of lighting: 20)

Measures	Brief Description	Implementation
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. ● 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. ● To increase the greening ratio of all new estates to at least 20%. 	<ul style="list-style-type: none"> ● Number of trees, shrubs and annual plants planted in new and existing estates: <ul style="list-style-type: none"> ▶ 2006/07 : 644 100 ▶ 2007/08 : 642 300 ▶ 2008/09 : 793 000 ▶ 2009/10 : 892 477 ● In 2009/10, green roofs with a total area of 3 313 square meters were provided for low-rise structures, such as covered walkways and refuse collection points, management offices in ten new estates. ● In 2009, testing and installation of the vertical greening panels were completed at Yau Lai Estate. Four more panels were erected in the first quarter of 2010 at the lift tower. ● In 2009/10, 5 estates achieved a greening ratio of at least 20% and 1 large estate has achieved a greening ratio of 30%.

Measures	Brief Description	Implementation
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 20 public housing projects to be completed in 2008/09, 2009/10 and 2010/11. 	<p>Number of PRH estates that have completed the scheme:</p> <ul style="list-style-type: none"> ▶ 2008/09: 8 ▶ 2009/10: 8
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 ▶ 2009/10: 5

Measures	Brief Description	Implementation
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 ▶ 2009/10: 5
F3. Green Station at G/F lobby	<ul style="list-style-type: none"> The HA has provided each domestic block with adequate wall space for bulletin boards to display environmental messages to tenants. 	<p>Since October 2009, this provision has been adopted by all projects at design stage.</p>

Measures	Brief Description	Implementation
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 ▶ 2009: 153 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 ▶ 2009/10: 0.695 kg

Measures	Brief Description	Implementation
A1. Domestic Waste Disposal (Cont'd)		<ul style="list-style-type: none"> ● Waste paper collected: <ul style="list-style-type: none"> ▶ 2006/07: 13 025 tonnes ▶ 2007/08: 14 748 tonnes ▶ 2008/09: 14 193 tonnes ▶ 2009/10: 17 934 tonnes ● Plastic bottles collected: <ul style="list-style-type: none"> ▶ 2006/07: 503 tonnes ▶ 2007/08: 764 tonnes ▶ 2008/09: 939 tonnes ▶ 2009/10: 1 218 tonnes ● Aluminum cans collected: <ul style="list-style-type: none"> ▶ 2006/07: 267 tonnes ▶ 2007/08: 309 tonnes ▶ 2008/09: 495 tonnes ▶ 2009/10: 520 tonnes

Measures	Brief Description	Implementation
A2. Waste Recovery Activities	<ul style="list-style-type: none"> ● The HA has joined hands with charitable and non-profitable organizations to organize various waste recovery activities such as collection of used clothes, rechargeable battery recycling programme, collection of compact fluorescent lamps and spent fluorescent tubes, waste electrical appliances / computer recycling programme and mooncake tin box recycling campaign, etc. 	<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 ▶ 2009/10: 775 tonnes ● Rechargeable batteries collected: <ul style="list-style-type: none"> ▶ 2006: 229 kg ▶ 2007: 200 kg ▶ 2008: 230 kg ▶ 2009: 257 kg ● Collection boxes have been placed in estate offices for collecting disposed compact fluorescent lamps and fluorescent tubes. Large-scale recycling campaigns for waste electrical appliances / used computer items recycling campaigns are organized twice a year for tenants. Arrangements are made for contractors that are monitored by the Environmental Protection Department (EPD) to collect these items from estates for further processing.

Measures	Brief Description	Implementation
A2. Waste Recovery Activities (Cont'd)		<ul style="list-style-type: none"> ● Participation in the SSDW Competition organized 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. ● The HA assists Friends of the Earth (HK) and the EPD in organizing and publicizing the Mooncake Boxes Recycling Programme to collect mooncake tin boxes for recycling purposes during the festival period.

Measures	Brief Description	Implementation
B. Energy Conservation		
B1. Energy Saving	<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 Friends of Earth's "Dim-it 6.21" Campaign on Summer Solstice held in June 2009 and the WWF's 'Earth Hour' held in March 2010 respectively, 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 midnight 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 Scented Plants Garden at Shek Pai Wan Estate and the Ixora Garden at Lung Hang Estate were completed. Thematic gardens will be built at Choi Hung Estate and Yau Oi Estate. • The pilot schemes for green roofs at Wo Lok Estate, Fu Shan Estate, Fuk Loi Estate and Choi Hung Estate were completed. Extension of the pilot scheme to other estates is being explored.

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 ▶ 2009/10: 90 000m² Landscaping will be carried out at 18 PRH estates.
C3. Green Delights in Estates	<ul style="list-style-type: none"> The HA continues to organize 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 organized include ‘No Plastic Bags’ Campaign, ‘No Plastic Bags Ambassador Scheme’ and ‘In-depth Educational Activities’, etc. The programme has been extended to 120 estates and will be rolled out in phases to cover all PRH estates.
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 publicize the green activities at the estates.