LegCo Panel on Housing

Environmentally Friendly Designs and Green Measures of Public Rental Housing Estates

Purpose

This paper briefs Members on the environmentally friendly building designs and construction technologies of public rental housing (PRH) estates, as well as the green measures implemented therein.

Background

2. In 2004, the Housing Authority (HA) adopted a comprehensive strategy on sustainable development to enhance environmental protection and to provide a healthy and comfortable living environment for tenants.

Environmental-Friendly Building Designs and Technologies

3. In the past years, the HA has incorporated a number of environmentally friendly elements in the planning, design and construction of PRH:

A. 'Micro-Climate' Studies

The HA is committed to promoting the use of new environmentally friendly building designs. Since 2001, the HA has incorporated micro-climate studies in planning and designing PRH, which employ the latest technologies including computational fluid dynamics simulations, wind tunnel test and daylight simulated tools, with due regard to the built environment of the neighborhood. The environment so designed will enable residents to enjoy natural day light and ventilation. From 2004 onwards, the studies have been applied to all new public housing developments. At present, over 25 projects have adopted the studies in their planning and design.

B. Air Ventilation Assessments

In the implementation of major development projects, the HA will take great care in studying whether the developments would pose restriction to air flow. The HA has been conducting Air Ventilation Assessment for all projects designed after July 2006 and comparing the level of air ventilation of each design option. Currently, five projects have been selected for conducting the above assessment.

C. Common W-Trap System in Drainage Facilities

Subsequent to the outbreak of SARS in 2003, the Housing Department (HD) carried out a study in collaboration with the Department of Building and Construction of the City University of Hong Kong to explore ways to improve the design of PRH drainage systems. The study developed a 'common W-trap system' which, by diverting waste water from wash basins and shower areas to floor traps, prevents the floor traps from drying up and therefore helps seal off exhaust gas and bacteria from other storeys and prevent the spread of germs. The HD has installed this system in all new public housing projects.

D. Domestic Waste Management

For effective waste handling, the HA has adopted two refuse handling systems, i.e. 'Central Compactor System' and 'Distributed Compactor System' for all the new developments completed after October 2005. The former refers to a central compactor inside a central refuse collection point and the latter refers to a small scale individual compactor in each building to reduce refuse volume. Moreover, the HA has installed a volume control device in each domestic block to prevent refuse spillage and odour leakage during the refuse handling process.

E. Refuse Storage and Collection Design to Promote Sorting at Source

Since 1998, in designing PRH estates, the HA has provided Refuse Storage and Material Recovery Rooms on typical domestic floors to accommodate three recycle refuse bins. In some cases, an additional lobby outside the refuse room would be provided for accommodating recycle refuse bins so that tenants can dump refuse without entering the refuse room. Besides, in a Refuse Collection Point which serves several domestic blocks, the HA would set aside an area of not less than $10m^2$ as Material Recovery Point for sorting and storage of recyclables.

F. Installation of De-odourizers at Refuse Collection Points

Employing bio-chemical technology, the new de-odourizers installed by the HA at the covered refuse collection points in some of the estates help contain the odours at the time of refuse collection. The HD has now installed 57 sets of de-odourizers in various estates.

G. Energy Saving Designs

All new housing projects of the HA are designed according to the Building Energy Codes issued by the Electrical and Mechanical Services Department to ensure that the buildings meet the energy efficiency requirements on lighting, electricity, air conditioning, lift and escalator installations. Since 2004, 11 housing projects have been awarded 61 energy efficiency registration certificates for compliance with the Building Energy Codes. In a typical public housing block with energy efficiency designs, electricity consumption can be reduced by about 6%, amounting to a saving of $40,000 a year.

H. The Use of Renewable Energy

The HA uses renewable energy in public housing estates as far as possible in order to reduce the use of fossil fuel. The HD will install a solar photovoltaic system in Lam Tin Estate Phases 7 and 8

and the East Harbour Crossing Phase 5 project on a trial basis. The HD is also experimenting with the installation of solar-powered lamp posts in new estates. The first trial at Ching Ho Estate, Fanling was completed last year. The HD will install these lamp posts in the landscaped areas of some projects completed in 2008. In addition, the HD is evaluating the effectiveness and long term performance of solar-wind combined powered lighting installation after its trial at Shek Kip Mei Estate.

I. Green Construction Techniques and Waste Management

To conserve resources and reduce construction wastes, the HA widely adopts modular design and component prefabrication techniques for the sake of promoting green construction practices. These designs and techniques include the use of precast concrete facades, precast staircases and semi-precast slabs, the installation of panel walls in lieu of traditional blockwork, as well as the extensive use of large panel metal formwork and metal hoardings to reduce the use of timber. Besides, HA's contracts have incorporated specification requirements on environmental management plan stipulating that contractors should manage construction and demolition materials/waste efficiently by on-site sorting of such materials/waste, etc.

J. 'Life Cycle Assessment' and 'Life Cycle Costing'

In 2005, the HD completed a research study on the "Life Cycle Assessment" and "Life Cycle Costing" of building materials and components used in blocks of New Harmony 1, and established an in-house database that enables the HA to develop a technically and economically viable procurement strategy for more environmentally friendly materials. The study also helped identify a number of alternative building materials conducive to design enhancement, e.g. the use of fibre glass instead of stainless steel and the use of softwood instead of hardwood.

K. More Environmentally friendly Facade

Since 2005, the Housing Authority Research Fund has sponsored the research into more environmentally friendly facade design features through computational simulation. The new design features, which will help conserve energy, include extended overhang, reduced window glazing and more use of tinted glass. It is expected that the design would be adopted in several housing developments to be completed in 2008 to 2009.

L. Increased Greening in PRH Estates

Since 2004, the HA has increased the scope of greening in all housing developments, including planting and providing amenity planting strips in open carparks, slopes, external walls and rooftops of small/single-storey structures, walls, columns and associated structures of covered walkways, emergency vehicular access and along pavements of estate roads. Every year, the HA carries out major landscape improvement works in 18 estates, including the 'Anti-mosquito Planting Strip' at Sun Chui Estate and the 'Fruit Garden' at Tai Hing Estate.

Moreover, the HD is working with contractors in a pilot scheme for using prefabricated 'vertical green panels' for growing plants on roofs or facades of building. It aims to extend the scope of greening so as to create an attractive landscape and reduce the heat island effect. The HD is conducting further ecological study for this novel system, which includes different watering methods, species selection, optimum soil thickness and fertility persistence of the system.

Green Measures implemented in PRH Estates

4. The HD is also actively promoting the following greening and environmental protection initiatives in existing PRH estates:

A. Green Delight in Estates

Since 2005, the HA has launched a long-term community environmental protection programme called "Green Delights in Estates" to promote environmental awareness among PRH tenants through a series of educational and community activities. The programme is organized in conjunction with three local green groups (the Conservancy Association, Friends of the Earth (HK) and Green Power) which each designs and implements environmental initiatives for 10 estates every year, such as “Territory-wide Clean-up Day”, “Territory-wide Recycling Day”, “Green Estate Ambassadors” and “In-depth Educational Activities”. The programme will be rolled out in phases to eventually cover all PRH estates in Hong Kong.

B. Action Seedling

The Community Participation Scheme is introduced by the HA to engage tenants, contractors and the local communities in the planning, design and construction stages of public housing projects. 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 programme is first implemented for 14 public housing projects to be completed in 2008 and 2009.

C. Domestic Waste Disposal

(i) **Source Separation of Domestic Waste Programme**

The HD has implemented the Source Separation of Domestic Waste Programme in all PRH estates since 2005. To increase the rate of domestic waste recovery, floor-based facilities are provided where residents can conveniently dump their recyclable waste for separation and recovery. 30 additional PRH estates will be included into the Programme each year. It is expected that the Programme will be extended to all PRH estates by 2012. As at the end of 2007, a total of 90 PRH estates have joined the Programme.

(ii) **Waste Recovery Activities**

In recent years, the HA has joined hands with charitable and non-profitable organizations to hold various waste recovery activities. For example, in 2005/06 and 2006/07, the HA organized, in conjunction with charitable organizations, activities to collect more than 1 000 tonnes of used clothes. The HA also helped the Friends of the Earth (HK) in organizing the Mooncake Tin Box Recycling Campaign to collect mooncake tin boxes for recycling purposes.

The HA has been participating in many recycling programmes in recent years including :

– Rechargeable Battery Recycling Programme: Collection boxes are placed in all estates to collect used rechargeable batteries. Batteries collected are then sent to the Environmental Protection Department (EPD) on a monthly basis for recycling. In 2006, about 229 kg of batteries were collected by the HD;

– Collection of Spent Fluorescent Tubes Scheme: Spent fluorescent tubes are collected and sent to EPD's contractor at regular intervals;

– Computer Recycling Programme : Tenants are encouraged to give away their used computer items to estate offices for subsequent collection by designated recyclers at regular intervals;

– Participation in the annual waste recycling competition organized by the EPD. Awards are given to estates that score high in the quantity of recyclables collected per household per month. In 2006/07, 15 PRH estates under the HA won the Basic Awards in the competition.

D. Energy Conservation

In early 2007, the HA launched a trial scheme on energy conservation in Homantin Estate, including the use of energy saving lighting devices. Preliminary results indicate a saving of about 11% in power consumption for the public areas of the housing blocks. The scheme has now been extended to the domestic blocks of ten other estates to allow the energy saving measures to be further tested and assessed.

E. Housing Channel

The HA has also made use of the Housing Channel broadcast at the G/F lift lobbies of PRH blocks to disseminate green messages to tenants and encourage them to lead a green life.

Conclusion

5. HA's environmentally friendly building designs and green measures implemented in PRH estates not only help create a green environment and promote a healthy way of living, but also heighten the sense of belonging among the tenants towards the estate and the community. The HA will continue to implement various education and publicity programmes to raise the environmental awareness among staff members, tenants and contractors.

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