



# 建設發展 以民為本

Building through a  
Community-centred Approach

■ 水泉澳興建中的公共租住房屋（公屋）項目。  
The public rental housing (PRH) project being built at Shui Chuen O.



Part of Hung Fuk Estate was completed during the year.

To build for the community effectively, the needs of individuals, families, and the community as a whole must all be taken into account. The Hong Kong Housing Authority (HA) has adopted a people-centred approach to building for the community, which involves us in careful study and consultation with the people we are tasked to serve.

In 2014/15, we completed construction of around 9 900 PRH flats, in a total of six projects: Shui Chuen O Estate Phase 1 (Ching Chuen House, Long Chuen House, Yan Chuen House, Hei Chuen House and Lok Chuen House), Shui Chuen O Estate Phase 2 (Shing Chuen House and Ho Chuen House), Cheung Lung Wai Estate (Ching Cheung House and King Cheung House), Hung Fuk Estate Phase 1 (Hung Yan House and Hung Hei House), Hung Fuk Estate Phase 3 (Hung Yat House, Hung Yuet House, Hung Cheong House and Hung Shing House), and Mei Tung Estate (Mei Tak House). We also completed 4 800 square metres of retail facilities, and 300 parking spaces for private and commercial vehicles.

### Listening to tenants

We hold community engagement workshops during the early stages of planning and design of our projects, at which we listen closely to views from the community and incorporate them where possible. We also conduct surveys of residents in newly completed estates; these are analysed and considered in our Post Completion Review Workshops. All this tenant feedback is taken into account when we come to design new estates, with our customers' expressed preferences being given weighting alongside other criteria such as safety and comfort, sustainability and environmental friendliness, and efficiency and cost-effectiveness.

We also use tenant feedback to regularly refine our Model Client Brief and Modular Flat Design. One such refinement made to our Modular Flat Design during the year was the addition of a window under the air-conditioning hood, a change that will improve the natural lighting in 2P/3P (2-person / 3-person), 3P/4P and 4P/5P flats. More details about our Modular Flat Design are given in the Feature Story at the end of this chapter.



Members of the HA's Building Committee visited Shui Chuen O Estate in August 2014. Part of the estate was completed during the year.

## Designing for green and healthy living

With the aim of ensuring our young and old residents benefit from a green and healthy living environment, we implement a range of green design and systems in our buildings. Many of the key energy-saving initiatives we have introduced over the past few years are recounted in the feature story on Green Building at the end of this chapter.

Carbon Emission Estimation (CEE) is a tool for estimating the total carbon emissions from public housing estates over their entire expected life. We have been applying CEE at the planning and design stage for all domestic blocks in new public housing developments since 2011. By setting benchmarks for block and estate emissions (currently against New Harmony 1 Option 6 block and Kai Ching Estate respectively), we are able to gauge how effectively the blocks and estates we design are minimising carbon emissions throughout their life cycle. CEE covers a wide range of materials and activities. It includes materials used for major construction activities, building structures, communal building services installations and demolition on the one hand, and the use of renewable energy and tree planting on the other.

At the end of March 2015, we had endorsed CEE of 143 domestic blocks, and estimated that compared with the benchmark figures, they would achieve a reduction in carbon emission of around 796 000 tonnes for their whole life cycle, or a 12% reduction as against the baseline figure.

Other green initiatives include our use of micro-climate studies to help optimise the environmental performance of newly designed buildings. We also adopt the principle of “passive design”, by which we harness the unique characteristics of individual sites to optimise natural ventilation and daylight in our estates. Each of our new domestic blocks is also subject to ISO 50001 energy estimation at the design stage. This enables us to gauge the communal energy consumption associated with the building once it is in operation. Up to the end of March 2015, ISO 50001 energy estimation had been applied to 135 domestic blocks in new public housing developments.

We are continually looking for means of making our construction materials more environmentally friendly. Since 2013, for instance, we have incorporated the use of Ground Granular Blast Furnace Slag (GGBS) into our specifications for new building contracts, and now require that GGBS should replace 35% of the cement in concrete for the construction of pre-cast concrete façades. We are also studying the possibility of using GGBS in other precast concrete elements, such as precast staircases, precast refuse chutes and semi-precast slabs.

Greening is another key area in building sustainable communities. We require overall greening coverage of at least 20% of the total site area and at least 30% for sites of over two hectares, and plant at least one tree for every 15 flats built. This has been supplemented by the introduction of integrated water sensitive urban design features that slow down run-off and enhance the water retention capacity of sloping sites, introduced at our Shui Chuen O and Au Tau projects. The HA has also pioneered the application of the Zero Irrigation Planting System in Tuen Mun Area 18. This pilot system irrigates plants without using potable water. Instead, it makes use of capillary action to deliver storm water stored in underground water retention cells to the plants. In the Choi Yuen Road project, a prefabricated modular system is being developed to enable efficient tree planting on the podium and reduce the construction time.

## Green Building Recognition

The HA is committed to creating and maintaining a sustainable and high-quality built environment. We ensure that all new HA projects are capable of achieving a “Gold” rating under the Hong Kong Green Building Council’s green building assessment scheme, namely the Building Environmental Assessment Method Plus (BEAM Plus), while selected projects are capable of even achieving the highest “Platinum” rating. Apart from BEAM Plus, we also submit some projects for assessment under the China Green Building (Hong Kong) Council’s Design Labelling system (CGBL). The accompanying table summarises our green building certification results for 2014/15.



Members of the HA's Building Committee, Tender Committee and Audit Sub-committee visited Kai Ching Estate and Kai Ching Commercial Centre in February 2015. The estate and the commercial centre achieved a Platinum Rating in the BEAM Version 4/04 Final Assessment.

Project	Scheme	Rating
<b>Development &amp; Construction Division</b>		
Kai Ching Estate	BEAM Version 4/04	Platinum Rating, Final Assessment
Kai Ching Commercial Centre	BEAM Version 4/04	Platinum Rating, Final Assessment
PRH Development in San Po Kong	BEAM Plus Version 1.2 for New Buildings	Platinum Rating, Provisional Assessment
PRH Development at Anderson Road Site A and Site B Phases 1 and 2	BEAM Plus Version 1.2 for New Buildings	Platinum Rating, Provisional Assessment
HOS Development at Pik Tin Street, Sha Tin Area 4D	BEAM Plus Version 1.2 for New Buildings	Gold Rating, Provisional Assessment
HOS Development at Mei Mun Lane, Sha Tin Area 4C	BEAM Plus Version 1.2 for New Buildings	Gold Rating, Provisional Assessment
PRH Development at Tuen Mun Area 54, Site 2, Phase 1 & 2	BEAM Plus Version 1.2 for New Buildings	Gold Rating, Provisional Assessment
HOS Development at Sha Tsui Road	BEAM Plus Version 1.2 for New Buildings	Gold Rating, Provisional Assessment
HOS Development at Ching Hong Road Ching Chun Court	BEAM Plus Version 1.2 for New Buildings	Gold Rating, Provisional Assessment
PRH Development at Ex-Au Tau Departmental Quarters	CGBL	Three-star Rating
PRH Development at Tung Chung Area 56	CGBL	Three-star Rating
PRH Development at San Po Kong	CGBL	Three-star Rating
PRH Development at Anderson Road Sites A and B Phases 1 & 2	CGBL	Three-star Rating
Conversion of Chai Wan Factory Estate to PRH	CGBL	Three-star Rating
<b>Estate Management Division</b>		
Kwai Shing West Estate	BEAM Plus Version 1.2 for Existing Buildings	Platinum Rating, Provisional Assessment

## Caring for workers

The HA's Site Safety Strategy 2014 is a set of stringent safety requirements that we implement at all our new works sites and maintenance works sites. We also require our property service agents, cleansing services contractors and security contractors to operate according to it. Our safety goal of no more than 12 accidents per 1 000 workers was achieved in 2014/15, with accident rates of 6.4 per 1 000 workers for new works contracts and 2.2 per 1 000 workers for maintenance works contracts. This is well below Hong Kong's average industry accident rate of 41.9 per 1 000 workers.

We continued our ongoing process of enhancing specification requirements to assure safety in various areas. Enhancements were made to specification requirements relating to the control of temporary works, the safe loading of vehicles and transport of materials, the safe use of tower cranes, static and mobile cranes, the safe operation of site vehicles and mobile plant, the safe use of platforms for working at height and the restrictions on the use of ladders.

We have refined the operation of the Surprise Safety Inspection Programme (SSIP) in new works contracts in two ways. Firstly, the performance of contractors as observed during surprise inspections now contributes to their scores under the Performance Assessment Scoring System (PASS), which affects the contractors' future tendering opportunities. Secondly, contractors' performance as observed during surprise inspections is now one of the criteria used in assessing the payment amount under the Integrated Pay for Safety, Environment and Hygiene Scheme. These refinements have served to strengthen the safety commitment of contractors and the resources they are putting in to safety, simply through day-to-day routine site inspections.

Our work in existing estates is also totally safety-oriented. This year we established a surprise safety inspection system. We also completed a study on making our Lift PASS and Maintenance Assessment Scoring System (MASS) scores as one of the assessment criteria in future tenders for lift addition works and lift modernisation works, a move which would see contractors' past performance affecting their chances to win new contracts.

To manage information relating to site safety more efficiently and effectively, we have begun to develop the Housing Authority Occupational Injury and Disease Surveillance System. This is a web-based information management system that facilitates easy recording of accidents and incidents by contractors, and also enables statistics to be conveniently generated for analysis.

## Managing for effective delivery of services

Effective quality management is another important part of our building for the community. We have been adopting the European Foundation for Quality Management (EFQM) Excellence Model to help us make continuous improvements across our operations while achieving a number of quality management certifications over the years. Our contractors must be ISO 9001, ISO 14001 and OHSAS 18001 certified and, from January 2014 we have also required our building (new works) contractors and piling contractors to have a certified ISO 50001 energy management system. The standards to which we are certified and the management systems we adopt in our operations are shown in the tables overleaf:

## Certified Standards

Certified Standard	Scope	Certified since
<b>Development &amp; Construction Division</b>		
ISO 9001: Quality Management	Planning, design, project management and contract administration for the construction of public housing	1993
ISO 14001: Environmental Management	Planning, design, project management, contract administration and materials testing for the construction of public housing	2009
ISO 50001: Energy Management	Planning, design, project management and contract administration for the construction of public housing	2012
OHSAS 18001: Occupational Health and Safety Management System (to be developed as ISO 45001 in the near future)	Materials testing for the construction of public housing	2013
<b>Estate Management Division</b>		
ISO 9001: Quality Management	Planning, design, project management and contract administration for the planned maintenance and improvement of public housing	1993
ISO 14001: Environmental Management	Planning, design, project management and contract administration for the planned maintenance and improvement in public housing estates; provision of property management services (including cleansing, security, landscaping and office administration) in public housing estates	2011
ISO 50001: Energy Management	Planning, design, operation, project management and contract administration for facility management and improvement works of the communal areas of public rental housing domestic blocks	2013
OHSAS 18001: Occupational Health and Safety Management System (to be developed as ISO 45001 in the near future)	Planning, design, project management and contract administration for the planned maintenance and improvement of public housing	2014
<b>Independent Checking Unit</b>		
ISO 9001: Quality Management	Building Control for Public Housing	2014
ISO 14001: Environmental Management	Building Control for Public Housing	2014

## Other Quality Schemes and Standards

Scheme / Standard	Scope	Adopted since	Remarks
<b>Development &amp; Construction Division (DCD)</b>			
ISO 26000: Social Responsibility	Planning, design, project management and contract administration for the construction of public housing.	2010	A non-certifiable standard, but measured through HKQAA CSR Advocate Index. For the third consecutive year since 2012, DCD achieved the full score of 5.0.
ISO 31000: Risk Management	Planning, design, project management and contract administration for the construction of public housing.	2010	Integrated with other management systems of DCD.

Scheme / Standard	Scope	Adopted since	Remarks
<b>Development &amp; Construction Division</b>			
European Foundation for Quality Management Excellence Model	Planning, design, project management and contract administration for the construction of public housing.	2010	Integrated with other management systems in DCD.
<b>Estate Management Division (EMD)</b>			
ISO 19011: Auditing Management System	Internal audit for planning, design, project management and contract administration for the planned maintenance and improvement of public housing.	2012	Incorporated in Quality Management System. A non-certifiable standard, but verified through HKQAA with Verification Statement obtained in 2013.
ISO 26000: Social Responsibility	Planning, design, project management and contract administration for the planned maintenance and improvement of public housing.	2012	Incorporated in Quality Management System. A non-certifiable standard, but measured through HKQAA CSR Advocate Index. EMD achieved the full score of 5.0 in 2014.
ISO 31000: Risk Management	Planning, design, project management and contract administration for the planned maintenance and improvement of public housing.	2012	Incorporated in Quality Management System. A non-certifiable standard, but verified through HKQAA with Verification Statement obtained in 2013.
HKQAA Sustainable Building Index (SBI) Scheme	Sustainability performance on environmental, social and economic aspects of domestic blocks in 10 estates with major block types.	2012	A non-certifiable standard, but verified through HKQAA SBI Scheme. HA became the first organisation obtained the HKQAA SBI Verified Mark in 2012.



For the third consecutive year, the HA's Development & Construction Division achieved the full score of 5.00 in the HKQAA CSR Advocate Index annual performance assessment. This year, the Estate Management Division also enrolled for verification under this index and achieved a full score of 5.0. These results show the maturity of our social responsibility practices.

■ This year, the Estate Management Division achieved a full score of 5.0 in the HKQAA CSR Advocate Index performance assessment.

## Quality control

Product certification is one of the methods now used by the HA to implement upstream quality control. It is currently applied to ten building products – fire resistant timber doors, panel wall partitions, packed cement for architectural use, tile adhesives, ceramic tiles, repair mortars, aluminium windows, uPVC drainage pipes and fittings, close-coupled water closet suites, and mesh reinforcement. Multi-layer acrylic paint is the next building material targeted for product certification, along with LED bulkheads.

## Quality through building control

The Independent Checking Unit (ICU) under Office of the Permanent Secretary for Transport and Housing (Housing) provides third-party checking of the building and structural plans submitted for HA's new development projects, as well as processes submissions for alterations and additions in the HA's existing buildings, in a process that parallels the Buildings Department's practices.

ICU obtained ISO 9001 and ISO 14001 certification in May 2014. In December 2014, the Housing Electronic Building Records Online System (HeBROS), which was developed by ICU, was launched to provide on-line inspection and copying services for HA's building records to the public. Meanwhile, the Housing Electronic Plan Submission System (HePlan) is currently being developed by ICU. This IT system will enable the HA to make submissions of HA's new development projects, as well as alterations and additions projects to ICU electronically without the need for hardcopy submission. The system also provides workflow functions for ICU officers to process submissions and manage records electronically. Trial use of HePlan would commence by the end of 2015.

The Lift Inspection Focus Team (LIFT) implements an audit inspection system to enhance safety and reduce the risk of accidents in lifts and escalators managed by the HA.

## Harnessing IT for efficient building design and construction

We use a number of important IT resources to enhance the quality and effectiveness of our design and construction activities. The key ones are Building Information Modelling (BIM), the Geographic Information System (GIS), the Housing Construction Management Enterprise System (HOMES) and Radio Frequency Identification (RFID). We are constantly looking to develop new systems that will enhance our operational efficiency.

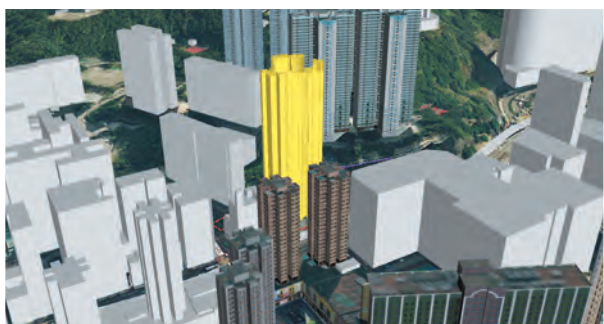
We are currently developing the Development and Construction Site Mobile System (DCSMS), a system that will streamline the management of safety, quality and productivity at our building sites. DCSMS enables site staff to capture inspection data or records and send them to a centralised server via mobile phones. We completed the Pilot Phase of DCSMS during the year and are now proceeding to implement Phase 1, in which we will develop apps for building services works inspection and safety alerts, as well as enhance the apps developed in the Pilot Phase for building works inspection. With the pre-installation of RFID tags, site staff can easily identify flat numbers, machinery, plant, precast components and more, helping streamline their daily inspection work and boosting productivity.

We have been constantly extending the use of BIM in the planning, design and construction of new estates. We have also adopted new, innovative applications that integrate BIM and GIS. Notably this year, we developed the integrated approach of using Civil 3D, ArcGIS and Revit (the CAR Approach) to enhance and streamline our feasibility studies and scheme design work. The CAR approach provides a collaborative and holistic platform that enables us to design, review and evaluate public housing development proposals easily at the feasibility and scheme design stages.



For example, it enables us to build a 3D digital model of the proposed site development platform and the layout of the building blocks by integrating accurate data from various sources. With this integrated 3D digital model, various types of analysis and assessment can be performed with greater efficiency, helping eliminate mismatches of design details overlooked in the conventional 2D approach. This integrated approach also enhances sustainable design for site formation works in a number of ways. For instance, it streamlines traditional paper-based procedures, and enables balanced cut-and-fill in site formation works, reducing abortive design and construction works.

Another highly promising piece of new technology now being used by the HA in estate design and planning is our Unmanned Aerial System (UAS), popularly known as a “drone”. We conducted a pilot study on using UAS in the surveying process for potential housing sites in 2012, and in 2014 the technique was trialled for the planning of a public housing development in Queen’s Hill. UAS captures high-resolution digital images of terrain from above, which can be used to create an extremely precise digital photo map of a potential project site. Such digital maps greatly speed up our site feasibility studies. Furthermore, our project teams have reported that the digital maps are excellent tools for visualising the appearance of designed building blocks within the terrain. Not only do these visualisations enable planners to “see” what the development will look like when set in the landscape, but they can also be used to create highly realistic fly-through animations of the proposed development, a very effective tool during the public consultation process.



## Innovating solutions collaboratively

We collaborate closely with industry stakeholders and draw on a wide range of internal and external expertise to encourage innovative solutions. One example is our use of the Integrated Procurement Approach (IPA), based on a three-envelope tendering system comprising price, technical and innovation submissions. IPA encourages stakeholders to collaborate to deliver innovative design and construction concepts, and is particularly suitable for complex and large-scale housing projects. It turns the tendering process into a learning process, in which tenderers can collaboratively explore new ideas and new options.

IPA and the “three-envelope” tendering system were first successfully implemented in Tak Long Estate (Kai Tak Site 1B). Under IPA, the tenderers submitted a number of innovative green proposals, including the central garden design concept, the improved pedestrian wind environment, and the high greening ratio. The estate was completed in 2013/14 and the survey of residents’ showed a very high customer satisfaction level. A total of 97.3% of households selected the top two satisfaction levels for the Estate as a whole; 98% expressed satisfaction with the adequacy of greenness; and 99% of the residents stated they had never experienced discomfort due to wind in the external areas in summer. Following a review of the procurement method used in this first IPA project, we developed an enhanced version and implemented it for our second IPA project, Anderson Road Site A and Site B Phases 1 & 2. This project is currently under construction, with an expected completion date of 2016/17, and involves reshaping the old quarry skyline.

■ BIM and GIS were used in combination for the feasibility studies and scheme design work relating to the Subsidised Sale Flats Development at Texaco Road.

## Modular Flat Design: A People-centred Approach for Better Living

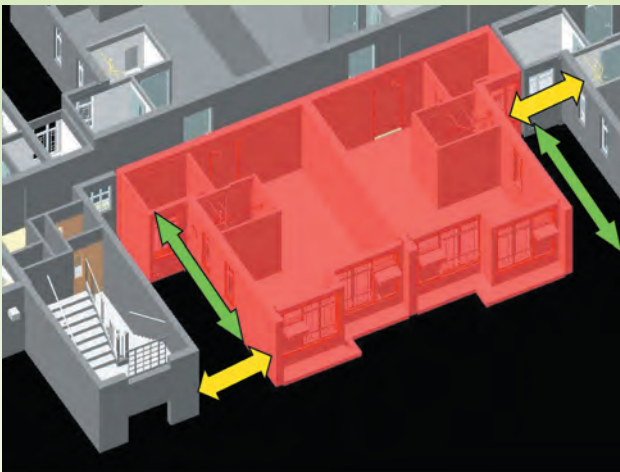
When we design flats, issues such as cost-effectiveness, health and safety, and environmental friendliness are all priorities. Fundamentally, though, our key design approach is “people-centred”, meaning that our priority is to develop designs that are highly liveable, and that enable residents to adapt their flats easily to their own personal needs and uses. In 2008, we introduced a standard Modular Flat Design (MFD) that was based on the twin goals of being “functional and cost-effective”. Since then, we have been constantly expanding and refining our range of Modular Flats by incorporating feedback from Residents Surveys and Post-completion Reviews on newly completed PRH estates, as well as views reflected at Estate Management Advisory Committee meetings. The first PRH estate to adopt MFD was Lower Ngau Tau Kok Estate, which was completed in 2012.



- Under universal design for MFD, the sinktop inside the kitchen of a modular flat can be placed at a convenient height for wheelchair users.

Today, our library of Modular Flats includes a range of four flat types, all with internal floor areas based on the HA's policy of allocating 7m<sup>2</sup> of floor space per person. We consider these flats as having living areas and “service areas” (kitchen and bathroom). The optimum ratio of these two parts, developed based on residents' feedback, is one where the service areas take up no more than 35% of 1-person / 2-person (1P/2P) and 2P/3P flats, or 25% of 3P/4P and 4P/5P flats. All our domestic flats adopt the universal design concept throughout, meaning they are all self-contained and include basic provisions such as a flat entrance with a gateset wide enough for wheelchairs, window grilles, a sink and cooking bench of adjustable height, a wash basin, a sunken shower and a laundry facility. They are thus able to serve the needs of tenants of any physical condition.

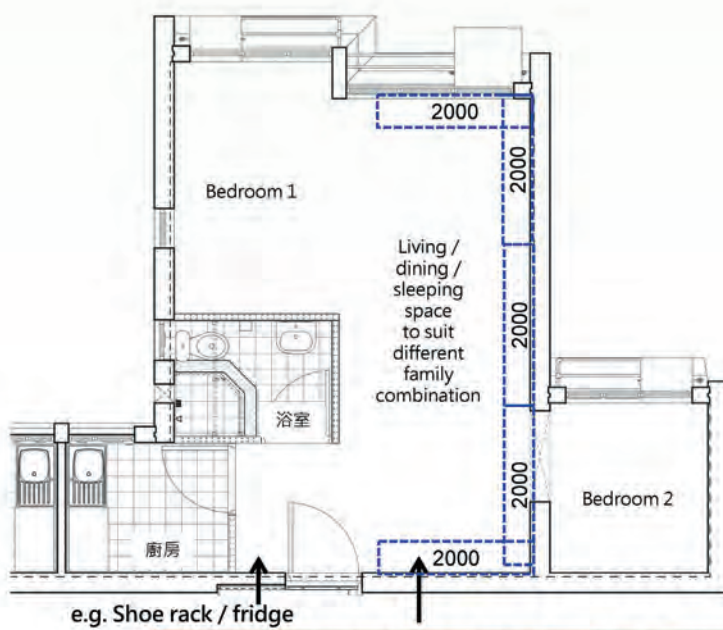
MFD also optimises flat layouts and dimensions. For instance, the width and depth of the re-entrants between flats are kept at a ratio of not less than 1:3, to reduce the chance of any build-up of stagnant air and ensure a healthy living environment.



- The width and depth of the re-entrants are maintained at a ratio of not less than 1:3 to avoid stagnant air build-up.

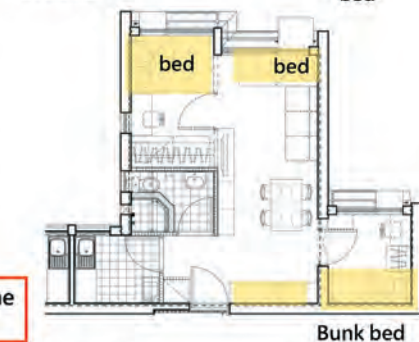
The MFD approach also gives tenants greater flexibility in arranging their furniture and partitioning rooms. In flats for 2 to 3 persons, 3 to 4 persons, or 4 to 5 persons, the 6-metre long wall area offers three potential “zones” for living and dining / working / sleeping space, while the position of the flat entrance door and bathroom door also enables residents to make the most effective use of their internal living space.

As for lighting, the window area in the front façade of the living area is maximised to enhance natural lighting and ventilation. At the same time, our micro-climate studies help us achieve optimal environmental design solutions so that wind flow, natural ventilation and daylight are all enhanced, while maintaining adequate sun-shading. We now also apply an innovative acoustic design to windows and balconies, which minimises noise nuisance while maintaining good natural ventilation.



Adopting a module of 2m to enable flexibility in planning the living, dining, working and sleeping space inside the flat

Note – Some projects may not be able to achieve the 2m module owing to site constraints.



- Furniture layout options for residents in 4P/5P flats.



## Energy-efficient Building Services Systems: Clean and Green

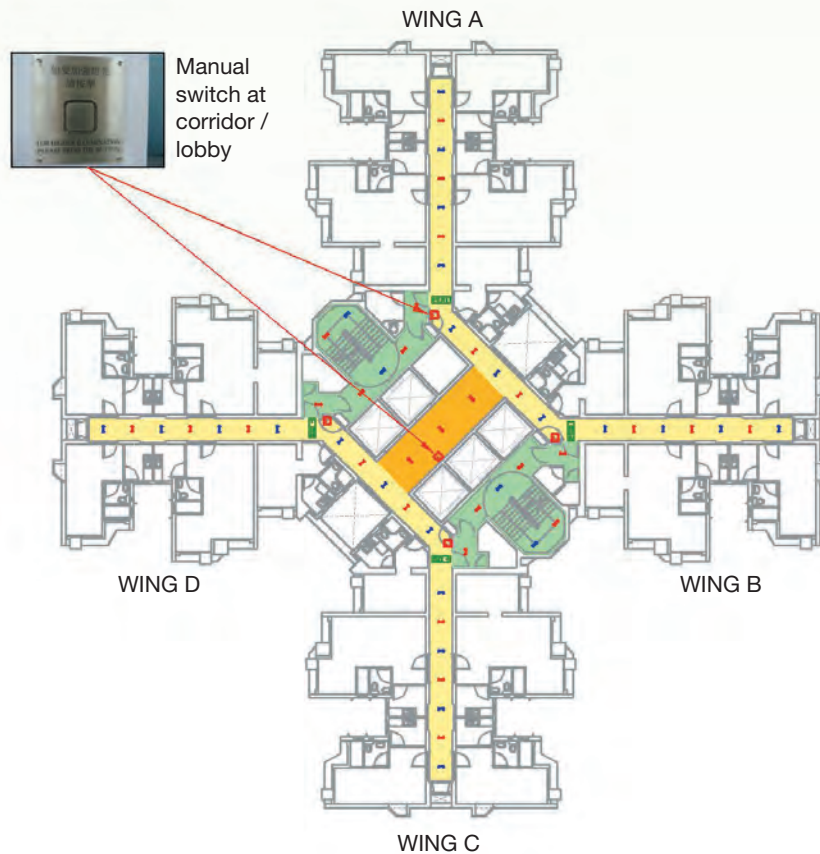
By building green we are building for the communities of the future, who will expect nothing less than sustainability and environmental friendliness in architecture and community living. Here is a brief overview of a few key areas in which the HA is driving sustainable living through energy-saving practices and the use of renewable energy.

### Improved lighting systems

Lighting consumes the most energy of all systems operating in the communal areas of our domestic blocks. Embracing the lighting-on-demand principle,

we have developed a “two-level lighting control system” for lift lobbies, corridors and staircases in the design of all new public housing developments that can save lighting energy by more than 30% on average.

We have completed the trial of LED (light-emitting diode) bulkhead light fittings in a domestic block at Kai Ching Estate, with encouraging results showing that the newly installed light fittings use 40% less energy than conventional ones. We are planning to adopt LED light fittings as standard for lift lobbies, corridors and staircases of domestic blocks in new public housing developments once an adequate supply of quality certified products is available in the market.



Layout of manual switches for the two-level lighting control system.



■ A grid-connected PV system.

## Better lift systems

Lift systems are the second most electricity consuming systems in domestic blocks. Our adoption of “gearless lift drives” and “lift regenerative power” for large lift motors has helped us achieve significant energy savings. The pilot installation in Kai Ching Estate indicates that lift regenerative power systems can generally regenerate up to 20-30% of the energy consumed by the lifts. Further, gearless lift drives coupled with Variable Voltage Variable Frequency power systems can reduce energy consumption by more than 10% over conventional geared lift drive systems.

## Use of Renewable Energy

In recent years, we have been tapping into the power of sunlight by installing grid-connected photovoltaic (PV) systems in the domestic blocks of new PRH estates. With these systems, our target is to provide at least 1.5% of the communal electricity used by each block, with due consideration being given to the availability of un-shaded space and if the systems create possible glare to adjacent buildings. Studies undertaken at Kai Ching Estate, where PV systems have been operating for some time, have recorded an average annual electricity generation of about 1 090 kWh per kW peak capacity, surpassing the estimated amount by more than 5%. We have also tried out some other types of commercially available PV panels, such as poly-crystalline silicon, amorphous silicon and CIGS (Copper Indium Gallium Selenide) thin film PV panels, to explore which provide the most effective solutions for Hong Kong conditions.



## Keeping our Customers Satisfied

To build for a sustainable community, it is essential that our end products genuinely serve the needs of our users and achieve high levels of community satisfaction. This is why feedback about customer satisfaction is built into our entire design, build and management cycle. It helps create a momentum of continuous improvement that makes life better for each succeeding generation.

As part of our integrated feedback and knowledge management system, we have conducted Residents Surveys for all newly completed PRH estates since 2004. Independent service providers conduct these surveys around 14 months after each project has been completed. Their main goal is to gauge residents' satisfaction with the design and provisions of the estates where they live. The survey results are also used to collect opinions on possible design scenarios we would like to explore. To date, eleven annual Residents Surveys have been conducted, covering 76 completed projects and over 170 000 flats. The surveys are organised into three key topics, namely flat design, domestic block design and estate design (external areas). Each of these is further elaborated to cover topics such as building quality, environmental and social features.

In recent years, responses from these surveys have been very encouraging in terms of assuring us that we are doing things right. For instance, our most recent surveys indicated that 90% of households were satisfied with the provisions inside their flats, and nearly 95% were satisfied with both the design and planning of their domestic blocks and the arrangement of the external areas. These results were backed up by verbal comments from tenants, some of which are excerpted below:

The layout is very efficient, better than those in some private residences

I love the open views from the windows

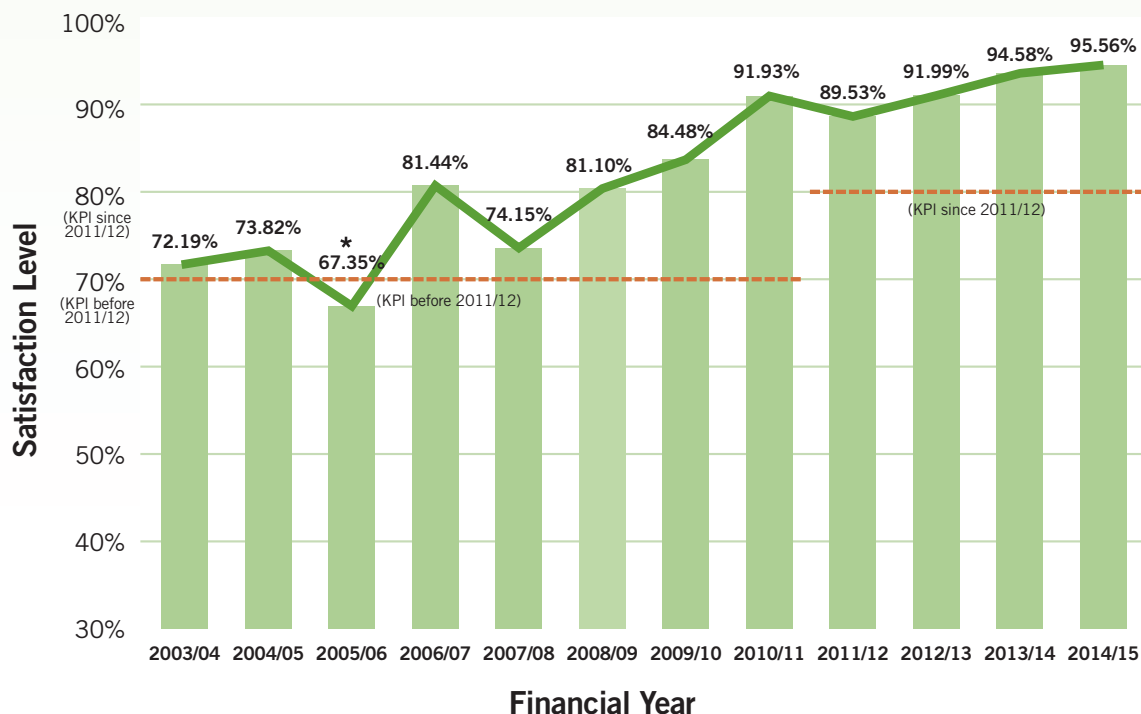
There is plenty of space in the room and lots of sunlight

I'm very satisfied with my new flat

We use the survey results to calculate a Customer Satisfaction Index for the whole financial year, which is calculated as a percentage out of 100. The idea is to set this against our pre-set Key Performance Indicator (KPI) to gauge how well we are doing in terms of keeping our customers happy. The answer appears to be “very well”. Originally, we set our KPI at 70%, but it became clear that this was too low, so in 2011/12 we revised it upwards to 80%. However, our 2014/15 survey (which covered eight PRH estates and 20 898 flats) revealed an average satisfaction rate of 95.56%!

The Customer Satisfaction Indices and survey findings are vital tools for better understanding the needs, expectations and lifestyles of our tenants. In particular, their feedback on issues such as the design and provisions of flats, blocks, and external areas are given great weight when we formulate design policies and improve our Model Client Brief and design guides.

### Customer Satisfaction Indices from 2003/2004 to 2014/2015 Based on Residents Survey Results



\* Note: We have conducted a focus group study on the declining satisfaction level. The study revealed that satisfaction levels were affected not simply by the actual PRH design provisions, but that the external social, economic and environmental factors of the time also had a significant impact on tenants' views and perceptions.

