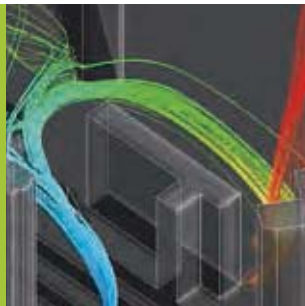


Planning, Design, and Delivery of Quality Public Housing in the New Millennium



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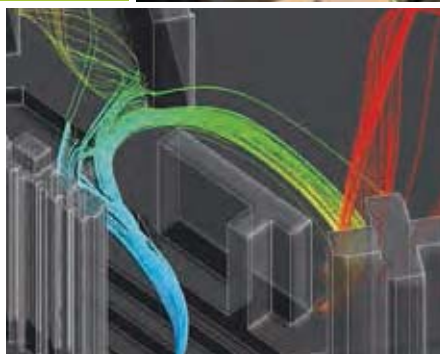


Quality
Management

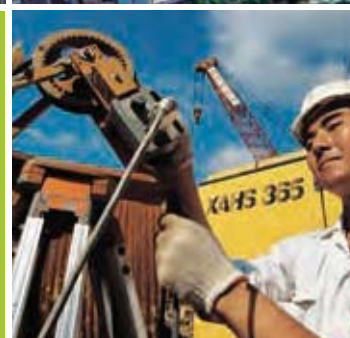


People
Oriented

Environment-
Friendly



Excellence



Vision

To help all families in need gain access to adequate and affordable housing.

Mission

- To provide affordable quality housing, management, maintenance and other housing-related services to meet the needs of our customers in a proactive and caring manner.
- To ensure cost-effective and rational use of public resources in service delivery and allocation of housing assistance in an open and equitable manner.
- To maintain a competent, dedicated and performance-oriented team.

Core Values

Caring

Customer-focused

Creative

Committed

Message from the Chairman of the Hong Kong Housing Authority

The Hong Kong Housing Authority is responsible for producing and managing one of the world's largest public rental housing programmes, helping low-income families gain access to adequate and affordable housing. Our public housing programme has been successful in providing homes for over two million people and it has been considered by many people, both local and international, as one of the solid foundations upon which the prosperity of Hong Kong is built.

The Housing Authority is a statutory body, established in April 1973 under the Housing Ordinance to formulate, administer and oversee policies on public housing, while the Housing Department acts as the executive arm in implementing these policies. The Authority and the Department have been working relentlessly throughout the years, aiming not only to provide a shelter for residents, but also a home and a community that enable every resident to live in harmony with their families and neighbours in the district.

What distinguishes us from other housing developers is not only in the way that we plan the estate, design and build the housing blocks, but also in how we maintain and manage them with constant feedback from users and all stakeholders involved. As a result, we have many case studies to learn from, enabling growing excellence in our planning, design and delivery of sustainable housing for Hong Kong. Structures and fittings that require frequent maintenance provide us with the impetus for change, thereby selecting more durable materials and more maintenance-free design and construction solutions. At the same

time, with the responsive feedback from residents, through our daily interaction and residents' surveys, we understand their needs and aspirations. As a caring organisation, our planning, design and delivery of public housing are thus considered in a holistic manner, with end users' needs, quality of construction and effectiveness of management deeply seated in our minds. As a result, we have been able to improve the built quality of our estates, for needy families in Hong Kong, within an affordable rental structure.

As can be imagined, the volume of construction has been huge – we currently provide homes and accommodation for about one third of the population in Hong Kong. We fully appreciate that any enhancement in design or construction, however small, will be multifold creating both major and long-lasting benefits in society. We must therefore exercise the utmost care in ensuring the cost-effective use of public resources in an open and equitable manner, together with continuous improvement. At the same time, because of this critical mass in construction, we have the leverage to partner our stakeholders in the construction industry to undertake research and development. These activities drive the industry towards safer, healthier, more efficient and sustainable construction operations and systems. With the support of the industry, we have been driving innovations in the use of new materials and systems, knowing that any such improvement will reap a bountiful harvest in delivering cost-effective and quality housing.

Throughout these years, we have been actively engaging our residents and the community-at-large, as well as our stakeholders, to provide valuable feedback on our housing provisions, built quality and construction practices. I would therefore like to express my sincere gratitude to our residents and our stakeholders. I am also indebted to Housing Authority members, for their insightful guidance, their advice and wisdom in establishing and overseeing housing policies, as well as to the management and staff of the Department, for their unfailing support in executing and underpinning the work of the Authority with such dedication. Without these concerted efforts, we would not have been able to produce our highly successful housing programme, a programme that the people of Hong Kong can justly be proud of. The planning, design and delivery of public housing recorded in this book provide vivid evidence of the tremendous contributions made by everyone of us both within the Authority and the Department in the past decade. I hope you will find it enjoyable reading!

Eva Cheng, JP

Chairman
Hong Kong Housing Authority

December 2010

Message from the Director of Housing

JH Payne (1791-1852) said, "Be it ever so humble, there's no place like home." Home is where our heart is, and homes for the needy in Hong Kong are something close to the hearts of all of us in the Housing Authority. Since I took up my appointment as Director of Housing earlier this year, I have felt both the pressure and the pride, in following the long line of my distinguished predecessors, who have steered the Department so ably in providing quality homes for one third of the population in Hong Kong.

In terms of the scale and scope of our activities as well as the range of people that we serve, our task is challenging and complex, but very rewarding. Since 1954, we have built over 700,000 public rental housing flats in 156 estates, providing homes for low-income families who cannot afford private rental accommodation. In the next five years from 2010/11 onwards, we will continue our efforts to provide about 75,000 flats. This production volume means an average annual production of about 15,000 new flats, which coupled with the flats we expect to recover every year, will ensure that

Hong Kong's public housing target, to maintain the average waiting time for eligible applicants at around three years, will be met.

We are committed to providing affordable and sustainable housing development, in line with our Core Values – caring, customer-focused, committed and creative, to shape harmonious communities. We aim to provide quality, modern homes in a safe, healthy and green environment, catering for all ages and abilities, enabling a sense of community and neighbourhood that residents will treasure and be happy to call "home".

Public housing is often viewed from the social or welfare point of view and seldom looked at from the view of their impact as the physical environment. This book provides the stories and thought behind how these homes and communities, lived in by over two million people in Hong Kong, are planned, designed, and delivered. I hope that this book will help our tenants and, indeed, anyone with an interest in Hong Kong's public housing programme appreciate the effort that has been put into every detail of their living environment to make it healthy, pleasant and sustainable.

As you read through the chapters, you will see that the Housing Authority adopts holistic planning, humanistic design, transparent procurement and a cost-effective approach to deliver public housing from overall estate planning down to the detail, such as the installation of small fittings in the drainage systems.

These behind-the-scene efforts by our staff, our partners, suppliers and contractors, have brought about impressive results. I would like to take this opportunity to express my sincere appreciation for their dedication, diligence and professionalism.

The poet Dufu (712-770) in his poem stated his vision to build thousands of houses for the poor to make them happy. "安得廣廈千萬間，大庇天下寒士俱歡顏" This is also the overriding vision in our minds as our ideal is to provide affordable homes for the less privileged in our society.

DW Pescod, JP

Director of Housing

December 2010

Message from the Deputy Director of Housing (Development and Construction)

No one will know everything in this “Millennium textbook”, the first of its kind to capture the wide range of expertise across so many professional disciplines.

It is hard to believe that a decade has passed since the turn of the Millennium. For us at the Housing Authority, it has been a memorable decade which has represented the start of a new era in the planning, design and delivery of public housing in Hong Kong – in our second generation of Quality Reform.

Our first generation quality drive took place around 1990 when we focused on standardisation, quality and safety. It was a time when we mandated prefabrication and precasting for better quality assurance, developed the Performance Assessment Scoring System (PASS) in measuring and benchmarking contractors’ performance, and worked hand-in-hand with building partners to improve site safety.

The second generation Quality Reform was sparked by the piling scams in 1999. We reviewed every process in delivering public housing and launched our Quality Reform, “Quality Housing: Partnering for Change” in 2000, with its 50 Quality Housing Initiatives. We holistically revamped the piling process, reinforced third party checking, invigorated partnering, introduced procurement reform with equitable risk sharing, nurtured quality people, strengthened quality systems, developed quality products and improved productivity. Seeking a paradigm shift in quality planning and design, we took bolder steps to introduce site-specific design and micro-climate studies, increase public engagement, drive research and development and build green estates. In 2006, Quality Reform reached a breakthrough. Triggered by the issue of wages in arrears for three sites, which we had to re-enter due to a defaulting main contractor,

we brought about instrumental changes in our contract conditions introducing strict measures to secure the payment of wages to frontline construction workers.

The advancement of information technology also continued to be a great enabler, with the application of the Housing Construction Management Enterprise System (HOMES), mobile Personal Digital Assistant (PDA) equipment, Building Information Modelling (BIM), and Geographic Information System (GIS), replacing our more traditional systems.

As we begin the new decade in 2010, how will we carry the successes from the past ten years into the future amidst new challenges? This will be our third generation quality drive. Building on our “Quality DNA”, our focus will be on our people, our stakeholders, as well as our quality.

First, committed and caring staff are an invaluable asset. Let me thank all our colleagues – only their hard work and collaboration has made it possible to gather the rich harvest of the past ten years based on our core values – caring, customer-focused, creative and committed. We will therefore be building our rapport with multi-disciplinary staff making sure that we can act together to create synergistic results. We may be cash-tight but we are rich in talent. Our target is to work in unison to serve and excel in delivering public service to respond to challenges and adapt to change.

Second, we seek to partner all our stakeholders in the value chain and build a strong business team to serve our customers. This includes any person or party that is involved in, or is affected by, our development processes. We care for all our stakeholders in the value chain, our staff, our business partners, our frontline workforce, as well as our customers.

Third, we strive for excellence in total quality. Quality means fitness for purpose. Building on our quality ISO 9001 and ISO 14001 fundamentals, we are launching our European Foundation Quality Management (EFQM) total quality system, which covers people, system drivers and results, embracing time, cost and quality. This will help align our objectives in a more focused and holistic manner, while also placing us in a better position to respond to uncertainties, uphold our professionalism and work towards continuous improvement for sustainable development to the best of our abilities.

On reflection, we have overcome difficulties in the past and we continue to resolve problems in the present. In the face of challenge, we look before we leap. We survey the operational environment, set realistic targets and mitigate risk. Our resolute “can-do” spirit has further reinforced our confidence that we will turn difficulties into opportunities and embrace changes for improvement and success, in collaboration with our stakeholders.

Aristotle said, “Quality is not an act; it is a habit.” We must propagate our “Quality DNA” for the benefit of future generations. This publication will therefore serve as a useful reference, documenting our experiences and footsteps in the past decade, while also providing an effective means of communication with our staff and stakeholders as we forge ahead into the future.

Ada YS Fung, JP

Deputy Director of Housing
(Development and Construction)

December 2010

Preface

When people refer to public housing, the perception is usually of mass production, simple structures, minimal services and low budgets. If you hold this view, you will find this book intriguing as it provides a deeper insight into the planning, design and delivery of public housing, which might change some of your conventional assumptions.

From the commencement of Hong Kong's first public rental housing programme after the devastating fire in Shek Kip Mei in 1953, the provision of public housing, from design to operation, is ever evolving. In the early years, the programme had to be quantitative, oriented primarily towards meeting the huge demand for shelter. With advancements in society and the need to keep in pace with the rising public aspirations of the 1980s, a qualitative emphasis heralded the paradigm shift. As the new millennium dawned, sustainable housing became the key to the planning, design and delivery of public housing.

Over the past decade, we have introduced many innovative ideas and pioneered new measures to improve the built quality and sustainability of public housing. These endeavours have made an indelible mark in our history as well as the construction industry-at-large. They provide valuable experience worth recording and sharing amongst ourselves and the industry, so that the lessons learned can spur improvements and success stories can continue. These experiences can provide useful reference that will help future generations map their way forward.

This book is compiled with this aim in mind. It focuses on the planning, design and delivery of public housing in Hong Kong in the new millennium. With our Quality Reform since 2000, the Quality Housing Initiatives identified at that time have progressively been coming into fruition. At the same time, Hong Kong has encountered numerous new challenges in the past decade – the financial tsunami, outbreak of the Severe Acute Respiratory Syndrome (SARS), bird flu pandemic, global warming and climate change. These concerns call for even more innovative approaches for the healthy, sustainable and cost-effective production of public housing. This book seeks to record the Housing Authority's efforts and accomplishments in tackling these problems.

The book is divided into 10 main chapters. The first chapter is an introduction, which is important to help readers understand this book. It starts with a brief description of how the Housing Authority operates in the planning, design, and delivery of public housing to provide readers with an overview of the whole production process. The layout of the book then unfolds, chapter by chapter, documenting our endeavours and achievements in the past decade under the various aspects. While Chapter 2 provides a brief introduction to public housing developments over the years to set the scene for readers, our efforts in the past decade are detailed in the following six chapters. Chapters 3 to 8 document the challenges and

achievements, covering our people-oriented, environment-friendly and quality approach to planning and design. In delivering public housing, we stress the importance of working with our stakeholders together with a transparent procurement system. On site, we focus on sustainable construction practices, and we care for our frontline work force. Keeping up with the latest advancements in technology, we embark on research and development with the industry.

Chapter 9 covers the completed projects, projects in the pipeline as well as project ideas that demonstrate our endeavours in the above direction. They also realise our achievements in providing sustainable and quality homes for residents. Chapter 10 focuses on the way forward, which builds upon our solid foundations in the delivery of quality public housing in Hong Kong. This is followed by a summary of the awards won over the past decade in recognition of all our hard work.

Last but not least, we acknowledge the hard work and commitment from each and every member of staff in the Development and Construction Division as well as our allied disciplines over the past decade. Had it not been for their unfailing efforts and dedication, this "Millennium textbook" and its legendary stories would not be possible. We hope that this book will be a souvenir for your perseverance.

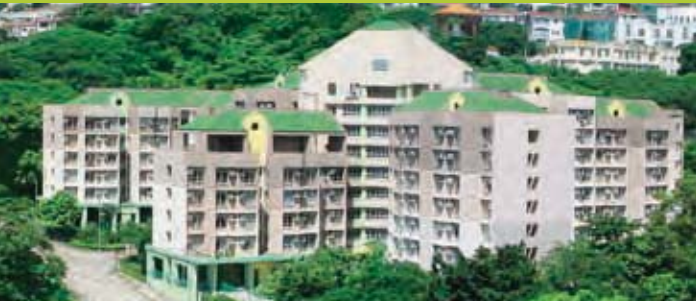
Thank you all!

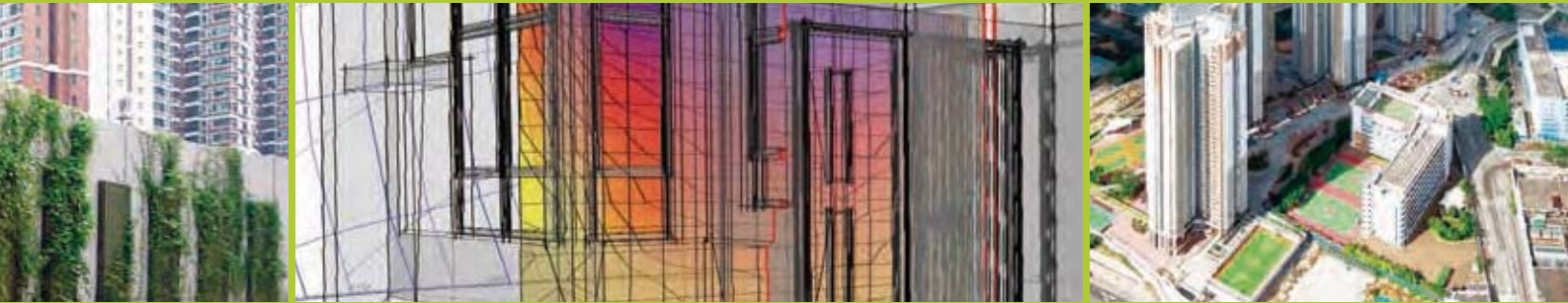
Editor-in-chief

December 2010

1

INTRODUCTION





INTRODUCTION

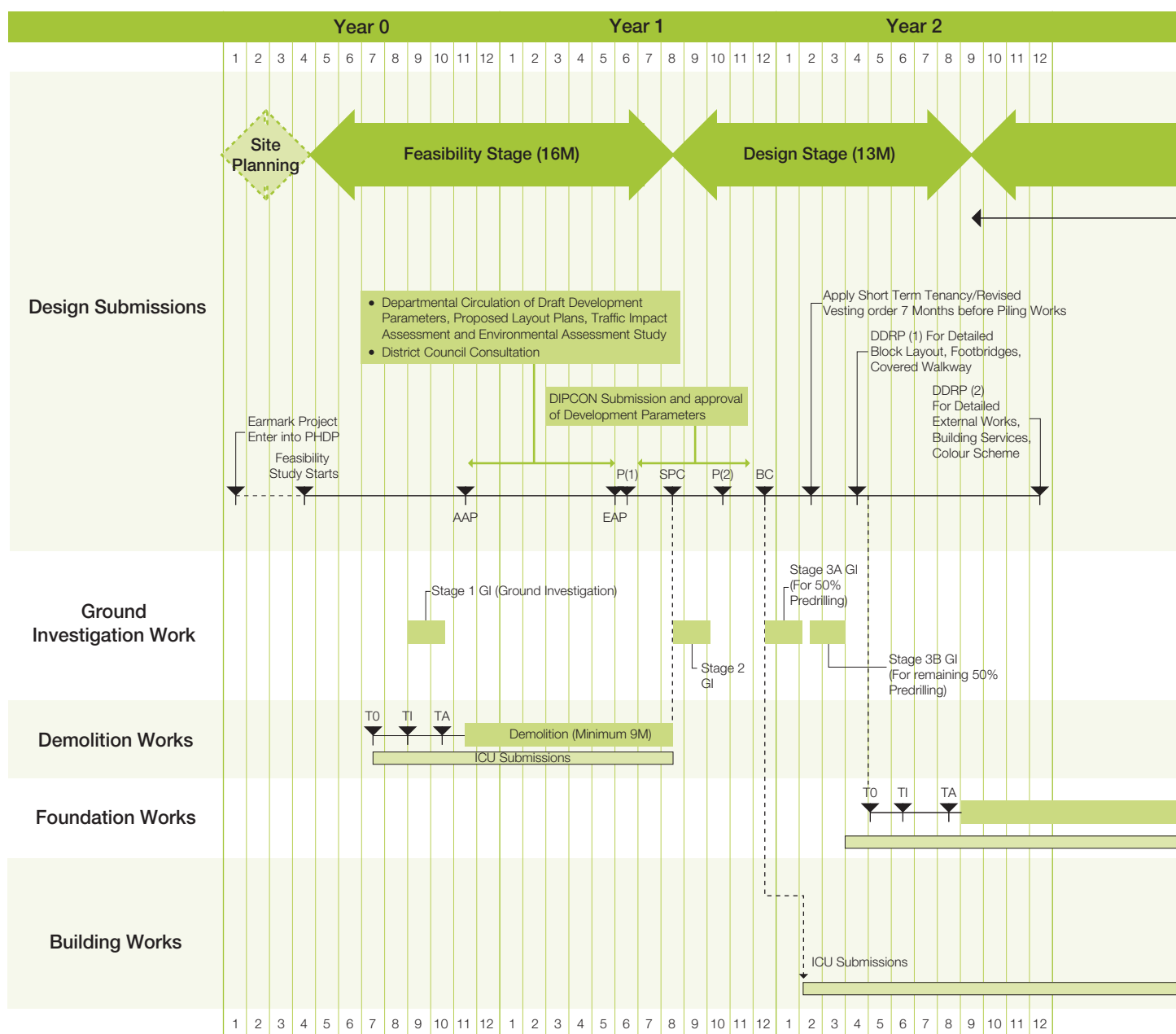
In the past decade, the most used catchwords in the Development and Construction Division, and perhaps throughout the Housing Authority, may possibly have been “quality”, “sustainable”, “partnering”, “caring”, “cost-effective”, “site specific”, “people-centred”, “stakeholders”... Indeed these words appear regularly in our daily work content. They are not just jargon for publicity purposes.

Rather, they are reflective of how we plan, design and deliver our public housing in Hong Kong. It is amazing to see how these catchwords appear and re-appear in different areas in the following chapters on our work in the past decade. Before we plunge into details of our work, let us begin by understanding how the Housing Authority plans, designs and delivers public housing.

Planning, Design and Delivery of Public Housing

It is a long and challenging process to turn a piece of vacant land from scratch into homes for our residents. It takes at least six years, from searching for developable land to delivering livable domestic units for our tenants, with a further two years for the Defects Liability Period and to

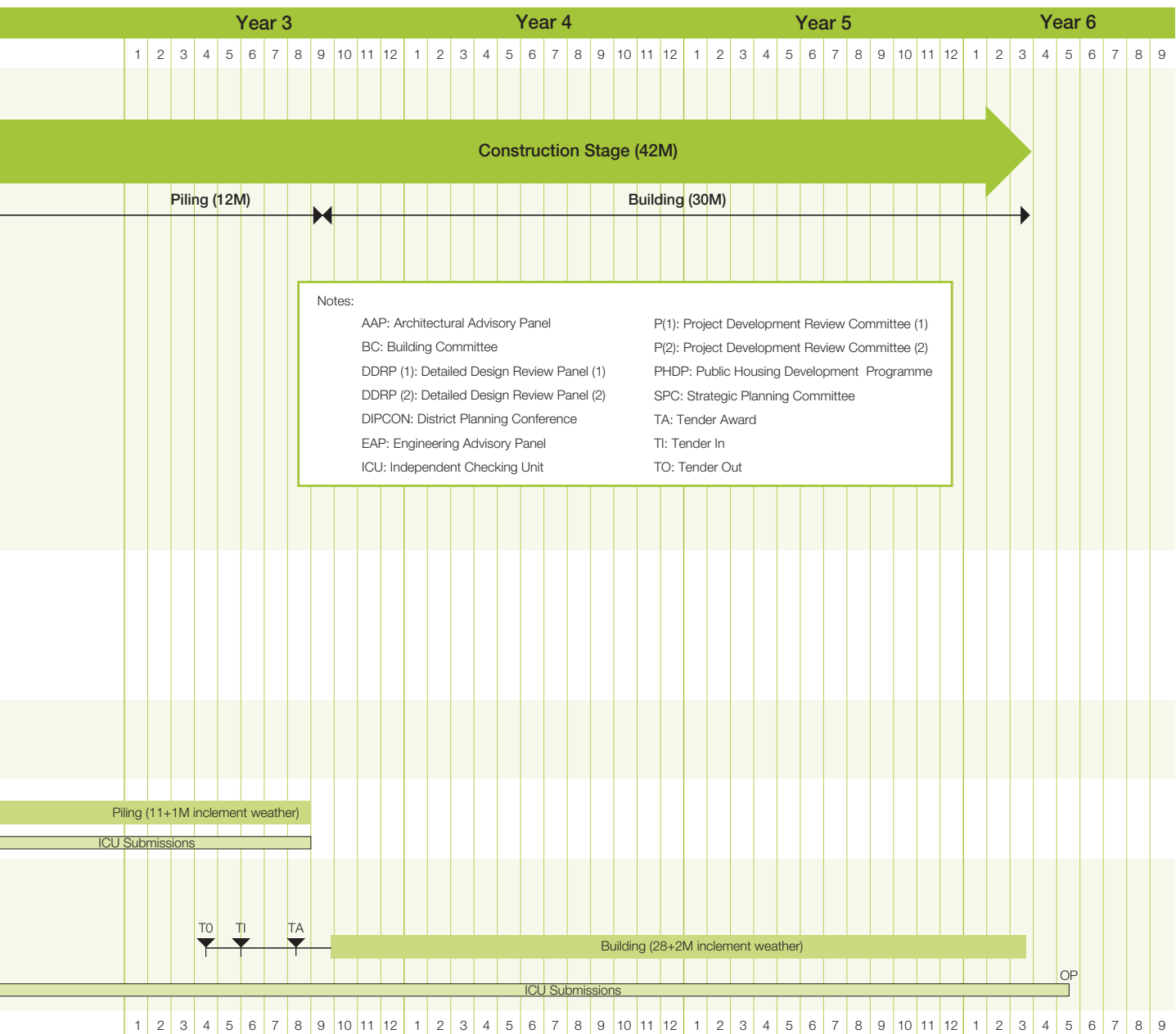
Standard Lead Time Programme for 40-storey Domestic Block



gain project feedback. It means that each site is under the intensive care of the Development and Construction Division of the Housing Department for at least eight or more years! Housing Authority services do not stop here. The estates, after their completion, will be looked after with life-long management and maintenance. This mainly falls under the responsibility of our Estate Management Division.

The relatively prolonged delivery time, when compared to our private sector counterparts, is mainly due to our works at the planning stage, as well as the rigorous in-house control processes for quality, and the construction period for our much larger footprint of about 20 flats per floor, when compared to private sector housing which usually has less than half the number of flats for blocks

of similar height. We care for people throughout the many stages of work in the planning, design and delivery of our public housing. These include: site inception and acceptance, feasibility study and conceptual layout, scheme design and project budget, detailed design and specification, tender, construction, completion and project review.



INTRODUCTION



Site Inception and Acceptance

When a site becomes available for possible public housing development, we immediately carry out a Site Potential Study. We investigate the site potential and identify the constraints to ensure that there is no inherent insurmountable problem for public housing development. Assessments will include development parameters, technical assessments, estate layout, and cost estimates. When we are satisfied that a site has development potential for public housing, we will recommend site acceptance to the Committee for Housing Development, and formally earmark the public housing site under the Public Housing Construction Programme and Public Housing Development Forecast.

Feasibility Study and Conceptual Layout

We then carry out functional and technical feasibility studies to prepare the development parameters and conceptual layout of the development. This will include an architectural feasibility study, planning assessment, civil engineering feasibility study, traffic impact assessment, sewerage/drainage impact assessment, environmental assessment, geotechnical feasibility study, air ventilation assessment and other

technical studies as appropriate. We identify all the site's development constraints and opportunities to establish a set of development parameters for the project. These are then developed into a conceptual layout with a development programme and project estimates to set cost ceilings. For complicated cases, we conduct value management studies and community engagement workshops to determine the optimal development option. The planning brief and development parameters will then be submitted to Planning Department's District Planning Conference and Housing Authority's Strategic Planning Committee for endorsement respectively. Our in-house Project Development Review Committee acts as a "clearing house" for reviewing the development parameters, scheme design and project budget before submission to the Housing Authority.

Scheme Design and Project Budget

We use the approved development parameters to prepare the scheme design proposal, establish the design themes and develop innovative concepts to best utilise the site potential, meet design objectives and fulfill client requirements. A project budget within the approved project

construction cost ceiling will also be prepared. We further submit the scheme design and project budget to the Housing Authority Building Committee for endorsement.

Detailed Design and Specification

Based on the approved scheme design, we collate all planning, construction and client requirements to prepare the detailed design proposal, which include the block and flat layout for statutory submission, construction details, specification, external works design, material selection and colour designs. This detailed design is then submitted to the in-house Detailed Design Review Panel for endorsement. During this period, foundation work including piling and pile caps can be carried out concurrently to shorten the lead time.

Tendering and Contract Award

When the proposals are ready for construction, building tenders are held to find the most suitable contractor, and nominated subcontractors for building services installation. We prepare tender drawings, compile a set of appropriate Special Conditions of Contract from the Standard Library of Special Conditions of Contract, prepare the bills of quantities, and compile Project Specific Specification



on a project basis together with general specifications from the standard Specification Library to formulate the tender document. We divide the whole building process into different contracts, including ground investigation, civil and slope works, demolition, foundation, superstructure and soft landscaping. The majority of contract procurement is in the traditional lump sum design-tender-build type of contract using a two-envelope system which requires tenderers to bid on both the technical and fee proposal. In the past decade, we have tried out alternative procurement methods such as guaranteed maximum price contracts and pioneering Integrated Contracts using a three-envelope system. Tendering usually takes about four weeks for foundation and six weeks for superstructure contracts. We evaluate the tender not only according to the fee proposal, but also on the technical submission, looking at the corporate strength, past performance, current workload and the financial capability. With approval from the Housing Authority Building Committee, the construction contract is then awarded to the tenderer who obtained the highest combined score in their technical and fee proposals.

Construction

Once the contractor is procured, we arrange for Works commencement, and a partnering workshop. A contract team and site supervisory team will be set up. During construction, we administer the contract, inspect, test and examine the Works, approve materials and workmanship, monitor Works progress to ensure that the level of quality, site safety measures, environmental and hygiene management carried out on site, are to our satisfaction. We process variations, assess extension of time and contractual claims if necessary. To ensure the quality performance of our contractor, we carry out regular Performance Assessment Scoring System (PASS) assessments. The scores obtained by the contractor will be influential in subsequent tender opportunities and tender evaluations. We are also very conscious of the cash flow assessment and control of project expenditure. During the contract, we employ a Dispute Resolution Advisor to avoid disputes and help resolve contractual disputes as they arise. We carry out final inspections and pre-handover checks, and when the project is substantially completed, we administer the terms of the contract

on completion of the Works, certify completion and notify statutory bodies on completion of the contract.

Maintenance Period

We have a two-year maintenance period after the substantial completion of the project. During this period, we inspect defects, monitor progress and workmanship of rectification and outstanding works, conduct PASS assessment during the maintenance period, process all claims, variations, and cost of additional works if any, and settle the final account. In order to obtain and disseminate feedback on design improvements from tenants, the contract team and our estate management provide feedback on better design provision to suit tenants and housing management needs. We also conduct Residents' Surveys and Post Construction Review Workshops. Even after the completion of the Maintenance Period, we rectify all latent defects and handle complaints if they arise.

The New Millennium

The above is a brief outline of the stages and procedures of how we plan, design and deliver public housing within the Housing Authority. We have made every



effort, continuously honing our tools to provide quality housing that will satisfy the needs and aspirations of our tenants. In the new millennium, we incorporated two further major ingredients – caring and sustainability, into each and every stage in the provision of public rental housing. While Chapter 2 provides background information on what we have achieved in the past half century in our domestic blocks, community facilities and external landscape design and provisions, our efforts in the new millennium are described in detail from Chapters 3 to 8 in this book. These efforts include: a) people-oriented planning and design, b) environment-friendly design, c) quality management for excellence, d) procurement for excellence, e) green construction, and f) research and development. The developments described in Chapter 9 demonstrate the implementation of all these endeavours as well as their amalgamation into an entire project.

People-oriented Planning and Design (Chapter 3)

a) Committed to Sustainable Planning

We have been providing public housing for more than half a century. To sustain our housing provisions, one of the Housing Authority's most important responsibilities is to identify

and secure public housing sites. This role is becoming more difficult, not only is developable land in Hong Kong very scarce – only about 20% of the overall area of about 1,100 m² is developable, but there also are more and more competing claims for usage of this land. Therefore, we must closely monitor our housing production programme, to ensure that we can meet our production targets and maintain the average waiting time at around three years for general public rental housing applicants. To optimise the use of these valuable land resources, we have adopted site-specific design since the dawn of the new millennium. This initiative helps to address individual site constraints, optimise development potential and maximise the site's natural resources.

To facilitate housing development, we took up the Housing Bureau's function to provide policy support and secure funding for housing-related infrastructure projects since 2002.

While optimising our housing provisions, we fully recognise that changes continue to take place within the community together with the evolving needs of our tenants. We therefore review our planning standards from time to time. In 2005, we developed a standalone Geographic Information system

(GIS), which evolved into a web-based platform in 2009. GIS allows efficient information retrieval and management of landuse data for existing and potential housing sites, which help the comprehensive planning of our estates.

b) Caring for the Community

Where we used to “inform” then “consult” the community in the 1980s and 1990s, we now “engage” the community in the planning, design, delivery and post-completion stages of public housing, to gauge and meet their needs and expectations.

We value the views of our residents, using them to improve our provision of public housing. We thus conduct independent Resident Surveys at all newly completed estates as well as Post Completion Reviews via facilitated workshops, debriefing and experience sharing sessions to gain residents' feedback. We sponsor Community Participation Schemes, such as “Action Seedling” and “Green Delight in Estates”, which involve our stakeholders in neighbourhood events, helping to build a strong community.

c) Focused on Quality Living for Residents

Since 2002, we have adopted universal design concepts in our housing estates, enabling residents of all ages and different physical abilities



to live together harmoniously. We have also developed a first-of-its-kind multi-sensory map to support universal access in our estates.

Learning from the outbreak of the Severe Acute Respiratory Syndrome (SARS) in 2003, we developed a common W-trap drainage system for use in domestic blocks to prevent the possible transmission of pandemic disease through dried up floor traps. We have also improved our refuse handling systems, migrating from the Automatic Refuse Collection system to a more cost-effective refuse compaction system using either a Central Compactor System or a Distributed Compactor System. Facilitating daily life for our tenants in every aspect, we provide uninterrupted water supplies even when water tanks are being cleaned, with the provision of twin water tanks; as well as uninterrupted electricity supplies for lift services during their periodic inspections, testing and certification. Providing further convenience, we offer free Wireless Fidelity (Wi-Fi) services at ground floor entrance lobbies.

All these facilities, which enhance the quality of life for our residents, have now been included in our modular flat design for mass customisation in public rental housing. These new modular flats not only assure quality

and cost-effectiveness, they also help to achieve consistency in core standards.

Environment-friendly Design (Chapter 4)

a) Environment-sensitive Designs

Providing a healthy living environment and reducing energy consumption, we have, since 2004, applied proven scientific technologies to carry out micro-climate studies in the planning and design of all new projects to optimise the use of natural ventilation, daylight, sun-shading and to mitigate against solar heat gain at every site. We have also piloted the use of Arc-screen and special acoustic window designs to reduce exposure to surrounding noise levels.

b) Energy-saving Innovation

We have been a fore-runner in the exploration of energy efficient building services installations. We now apply a two-level lighting system to cater for the needs of the visually-impaired without foregoing the principles of energy saving. We also piloted the use of renewable energy, generated by solar and wind power, aiming not only to promote energy savings but also to drive green awareness among our residents. In our estate shopping centres, we piloted the use of hybrid ventilation, which integrates both

natural ventilation and free cooling into the system to supplement the air-conditioning and save energy.

c) Going Green

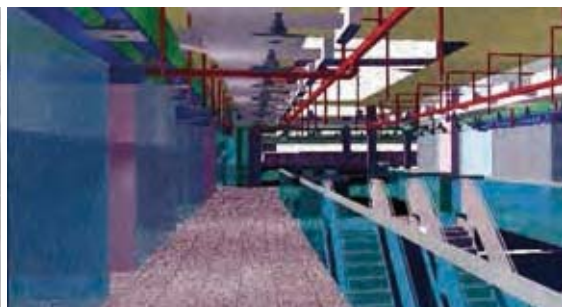
In addition to saving energy, we make every effort to reduce our carbon footprint, increasing the greening ratio of our estates through the use of green roofs, vertical greening and green slopes. To this end, several studies have been carried out on the different greening methods, as well as various plant species to find the most suitable greening techniques.

Quality Management for Excellence (Chapter 5)

The piling scams in 1999 sparked off the quality reforms in 2000 under our “Quality Housing: Partnering for Change” programme with 50 Quality Housing Initiatives. One of these initiatives included the establishment of an Independent Checking Unit, paralleling the practices adopted by the Buildings Department to exercise independent building controls to ensure public health and safety in new projects as well as their compliance with the Buildings Ordinance and relevant Regulations.

In this quest for excellence, we apply international standards for quality management from ISO 9001 and ISO 14001 to the European Foundation

INTRODUCTION



for Quality Management (EFQM), aiming to enhance our total quality management.

We cannot succeed without our building partners in the industry. We seek to build trust, establishing common goals with our partners to deliver quality housing. We believe that equitable risk sharing with our building partners together with reasonable contract conditions is conducive to quality. We also avoid and resolve disputes through the Dispute Resolution Advisor System. Seeking to reduce risk from the very start, we have revamped the piling system. This has strengthened our risk management and developed a comprehensive and user-friendly system to conduct independent checks on structural design in a rational and effective manner.

Procurement for Excellence (Chapter 6)

a) Working with Partners for Quality

Building our partnerships for quality housing, we have a transparent procurement cycle to secure competent and reliable business partners through equitable procurement principles and operations. We maintain permanent

lists of qualified contractors and services providers as our long-term partners through equitable procurement operation incorporating their performance and track record. We also implemented an objective and transparent Performance Assessment Scoring System to measure contractor performance, which will be taken into consideration in future procurement activities.

b) Ensuring Cost-effectiveness

We ensure the cost-effectiveness of our contracts by monitoring the movement of tender prices through the Tender Price Index and Construction Material Prices. Our construction cost yardsticks act as a realistic reference and benchmark for our project budgets, while the inclusion of Contract Price Fluctuations in the contract conditions also help to eliminate uncertainties in the material prices for tenders.

c) Helping Business Partners

Sustaining these partnering activities, we work with our business partners, helping to tide them over difficult or adverse situations if necessary. During the economic downturn in 2008, for example, as a caring developer, we introduced measures to alleviate any financial burdens suffered by

our contractors. We also worked to stamp out wage arrears problems in the construction industry, with the introduction of various improvement measures to rectify the multi-layered sub-contracting system in the industry.

d) Promoting Systemised Chain Management

In our procurement for excellence, it is essential to take the entire supply chain into consideration. As we go green ourselves, we also require our suppliers to obtain ISO 14001. Our Building Materials Database provides a track record of materials used, in addition to also providing a platform for experience sharing. At the same time, we ensure the quality, safety and reliability of our products through upstream control, such as product certification. Though some of our building components are manufactured off-territory, we monitor quality closely with regular factory visits while also carrying out random open inspections and performance assessments. Recently, we started to track our building components using Radio Frequency Identification (RFID) technology to enhance quality control and facilitate data retrieval for improved management and maintenance.



e) Promoting Site Safety, Health and the Environment

We care for our frontline staff. It is their work and efforts that enable the delivery of our products and services. Safety is thus an integral and important part of our activities. We monitor all aspects of environmental pollution on site to promote environment-friendly construction practices. Promoting this safety and green mindset among our contractors, we introduced an incentive-based Integrated Pay for Safety, Environment and Hygiene Scheme in 2003. This initiative encourages safe, environmental and hygienic practices on site.

Green Construction (Chapter 7)

Continuing our green journey in the provision of public housing, we take the environment into consideration every step of the way, from design and planning to construction and management.

a) Temporary Works

We do not miss any opportunity to go green even with our temporary works. Our hoardings are demountable and reusable and we have also introduced vertical green panels to enhance both the site's appearance and improve

the surrounding environment. The use of hard paved construction in the Authority's building and piling works also promotes environment-friendly, hygienic and safer construction practices.

b) Demolition and Foundation Works

During demolition, we recycle and re-use demolition waste as well as household waste, such as furniture and appliances left behind by previous residents. The removal of asbestos-containing materials is handled with due care. In reducing demolition noise and dust, we now use much quieter hydraulic concrete crushers. We have also worked with Parkt-in-place piles and Jack Piling Systems to reduce piling noise during foundation work.

c) Material Recycle and Re-use

Instead of disposing large volumes of marine mud into landfill sites or marine dumping facilities, we convert them into useful backfill or eco-blocks. We also use ground granulated blast furnace slag (GGBS), a by-product of the steel industry, to partially replace cement in our precast concrete construction activities.

d) Prefabrication and Precasting

Driving green construction, we have been using prefabricated and precast building components in our construction activities for over two decades, as these practices reduce wet-trades on site.

With the shift to site-specific design, we also developed standard flat modules with a limited number of façade designs to facilitate mass prefabrication. We have promoted the use of semi-precast slabs to eliminate slab-formwork for slabs, and we have worked to increase the amount of precast concrete used from the conventional volume of 20% to a record 60% in a pilot project.

Research and Development (Chapter 8)

a) Progressive Research and Development (R&D)

R&D is the key to improving our planning, design and delivery of public housing. Both centrally initiated and project driven, these widespread R&D activities are carried out both in-house and in collaboration with academia, industry specialists, business partners and other related stakeholders.



b) Wider Use of Information Technology

We started to use computer drafting in 1985, beginning with the Computer Aided Drafting and Design (CADD) software. In 2006, we moved from two-dimensional drafting to three-dimensional modelling using the Building Information Modelling (BIM) system. Our HOMES system, standing for Housing Construction Management Enterprise System, also came on line in 2005, providing a collaboration and knowledge management platform for our construction projects. We have also extended the system with the HOMES Mobile Site Inspection System (HMSI) to cover our site inspections, while our Remote Site Monitoring System (RSMS) enhances our work efficiencies and site surveillance levels. The Geographic Information System also provides geographic information on our housing projects quickly and easily.

c) Structural Design Optimisation

In addition to the advancements in computation capabilities in recent years, we have also developed successful software to optimise our foundation design. This new

software carries out cost-efficient superstructure analysis and strengthen our structural design.

d) Sustainable Development

In addition to this optimisation of our structural design, we look into numerous other aspects to maximise the sustainability of our housing developments. This includes the development of a Life Cycle Assessment and Life Cycle Costing evaluation methodology. They use computer modelling to appraise and compare building materials and products on a life cycle basis, which include their impact on the environment as well as their cost throughout the life cycle. A Service Life Study looked into our building structures, an important factor in the decision-making and asset management of new construction projects. Conclusions showed that the service life of our residential building structures completed after 1992 is at least 100 years.

e) New Contract Mode

In 2004, we developed the Modified Guaranteed Maximum Price Contracting (MGMP) procurement model, which aims to drive continuous innovation and

buildability improvements throughout the tender and construction stages.

Trying out new contract models, we adopted a single tender arrangement to fast track the urgent delivery of an amenity and community building. Despite its single tender nature, we set up a mechanism to assess the tender in a transparent manner while at the same time, protecting the Housing Authority's best interests. Most creative of all, in 2008, we developed a first-of-its-kind three-envelope system, with its Integrated Procurement Approach, to drive greater innovation as well as more synergistic integration of designers' and contractors' expertise.

Projects (Chapter 9)

Projects completed during the past decade, or currently in the pipeline provide excellent examples of the implementation of the initiatives mentioned above.

a) Completed Projects

These projects are presented chronologically, based on their year of completion. In Kwai Chung Estate, we rejuvenated a hill-town for a community of 40,000 people with homes for residents of all ages, in a green, healthy and convenient living



environment. In Ching Ho Estate, which means “clear river” in Chinese, we built a green estate by the river. Retaining links with the site’s rural past, based on the request of local residents, we transformed a quarry in the Jordan Valley Rock Hills into Choi Ying Estate, using indigenous boulders as green features throughout the estate.

In Upper Ngau Tau Kok Estate, residents were involved in designing their new homes through a series of community engagement exercises. We also made the best use of natural resources with our pioneering micro-climate studies in this estate. Green living was the main theme in the redevelopment of Lam Tin Estate, where residents will enjoy a green life under a blue sky. Promoting quality living, we provided over 25% of the total site as open green spaces and outdoor leisure areas for the use of residents at Sau Mau Ping South Estate. Seeking to build a dynamic and more conducive living environment, we provided more social support services at Tin Ching Estate in Tin Shui Wai. Undulating roofs and vivid colours also provide the estate with a distinctive identity.

b) Projects in the Pipeline

Projects still on the drawing board and projects currently under construction closely follow our latest innovations in the planning, design, and delivery of public housing. Offering more green and recreational spaces to our residents, we are providing communal terraces for every three floors in Kwai Luen Estate. We are also adopting green designs and an environment-friendly strategy in the construction of our vibrant lifestyle shopping centre, the “Domain”, at Yau Tong Estate, Phase 4. In Tung Tau Estate Phase 9, we are creating interesting skylines with varying building heights, while also enhancing pedestrian comfort at the ground level.

With the redevelopment of Shek Kip Mei Estate, we are taking the opportunity to pay homage to Hong Kong’s first housing estate. We are also doing our utmost to preserve memories with the clearance of Lower Ngau Tau Kok, the last estate under our comprehensive redevelopment programme. In the Tung Tau Cottage Area East, we are using Building Information Modelling (BIM) to enhance design efficiencies, while

at Kai Tak Sites 1A and 1B, we are creating a unique garden-cum-city habitat for residents within the Kai Tak City Centre. New homes in So Uk Estate are being built around selected conservation and heritage items, which embrace treasured memories from the past, and in Shui Chuen O, our focus is on creating an urban habitat that will merge with nature in the adjacent country park.

c) Projects Ideas

In the past decade, we have sponsored two design competitions. The first was the Shui Chuen O Design Competition in 2001, the first open design competition, marking our formal adoption of a site-specific design approach. The second was the Mei Ho House Ideas Competition in 2007, when we invited the public to contribute ideas and conceptual proposals for the adaptive re-use of the Housing Authority’s first public housing block.

The Way Forward

After looking back at our history, it is time for reflection in the present. As we move forward into the future, we will continue our success story, holding on to our belief that we can certainly do better!

2

OUR PAST YEARS





- 2.1 Evolution of Domestic Block Design in Public Housing 22
- 2.2 Evolution of Community Facilities and External Works in Public Housing 24

2.1 Evolution of Domestic Block Design in Public Housing



Hong Kong's public housing programme commenced after the tragic Christmas night fire in 1953 in Shek Kip Mei. At the outset, we built the simple, single-room Mark I blocks responding to the emergency needs of family groups.



1940s

1950s

In the 1960s, with the increasing population and the shortage of land, housing remained a problem. The "Mark" series had to go higher to 16 storeys with the introduction of lifts, central corridor access and the provision of a balcony with a toilet and a fresh water supply point for each unit.



1960s

In the 1970s, while we continued to develop the Twin Tower Block and the H-Block using the latest "Mark" series model with self-contained flats including an ensuite bathroom and kitchen, the Home Ownership Scheme (HOS) was launched providing flats for sale. Multi-room design for larger households became the primary approach.



Twin Tower

1970s



Mark II Block



Mark I & II Units

The blocks are "H" or "I" in configuration, six to seven storeys high, with room units built back to back and accessed via a balcony approach, which also served as a cooking area. Latrines and washing areas are shared.



Mark I Block



Mark III Block



Mark V Block



Twin Tower



Kitchen

Bathroom

Living, Dining & Bed Spaces

Balcony

The 1980s saw the single-room concept replaced by multi-rooms in rental units. Making use of internal corridor access and self-contained flats, the Trident I, II, III and IV, and Linear Blocks were developed to adapt to different sites.

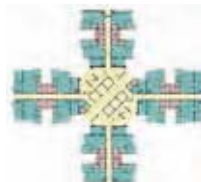


Trident Block



1980s

In the 1990s, with higher aspirations in the quality of public housing and the new construction technologies, the Harmony Block, a new generation in standard block design emerged.



Harmony Block



1990s

The use of standard block design in the past few decades has made it possible for the Housing Authority to provide mass production volumes with high building quality and considerable economies of scale. Since the new millennium, with the slight drop in housing demand and concerns to make the best use of land resources for sustainable housing, standard designs have been replaced by site specific designs.



2000s



New Cruciform Block



The first mechanical construction contracts also emerged around this time. The Standard New Cruciform Block was developed in response to the growth in HOS.



Concord Block

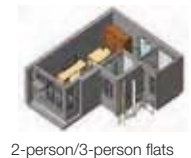


The Harmony Block is based on a modular flat approach for single, two-and three-bedroom units enabling the use of pre-cast concrete construction and prefabricated building components. The use of prefabrication techniques greatly improved quality assurance while speeding up production. At the same time, standard Concord and New Cruciform Blocks were developed for HOS, until the scheme's termination in 2003.

The standard Harmony flat design now serves as a useful design kit for development into different block configurations, to ensure the best use of the natural resources at individual sites.



Site Specific Block



2.2 Evolution of Community Facilities and External Works in Public Housing



Community Facilities

In the first resettlement estate in Shek Kip Mei, community facilities were scarce with only some shops at the ground floor and a number of rooftop primary schools. Thereafter, in the 1960s, public housing estates were built with retail facilities to meet the basic needs of residents. There were ground floor shops as well as free-standing restaurants and markets beside the residential blocks. In the 1970s, with the development of public housing

in new towns, estates had to be self-contained with more community facilities, including commercial, educational and recreational facilities as well as easy connectivity via convenient transportation in and out of the estate. Large commercial centres thus started to take shape. In the 1980s, a more market-oriented approach was adopted in the design, provision and management of these facilities.

Over the past decade, these facilities have improved significantly. Not only are they better planned and designed, but they have also become more diversified.

Many social welfare and community facilities have been provided in new public housing estates based on the projected tenant profile, local demand, and advice from concerned departments. These facilities include community centres; family, youth and elderly service centres; rehabilitation centres for the disabled; etc.

Tenants have access to a large number of recreational facilities within new estates such as children's play areas, badminton and basketball courts, table tennis tables, performance venues, etc.





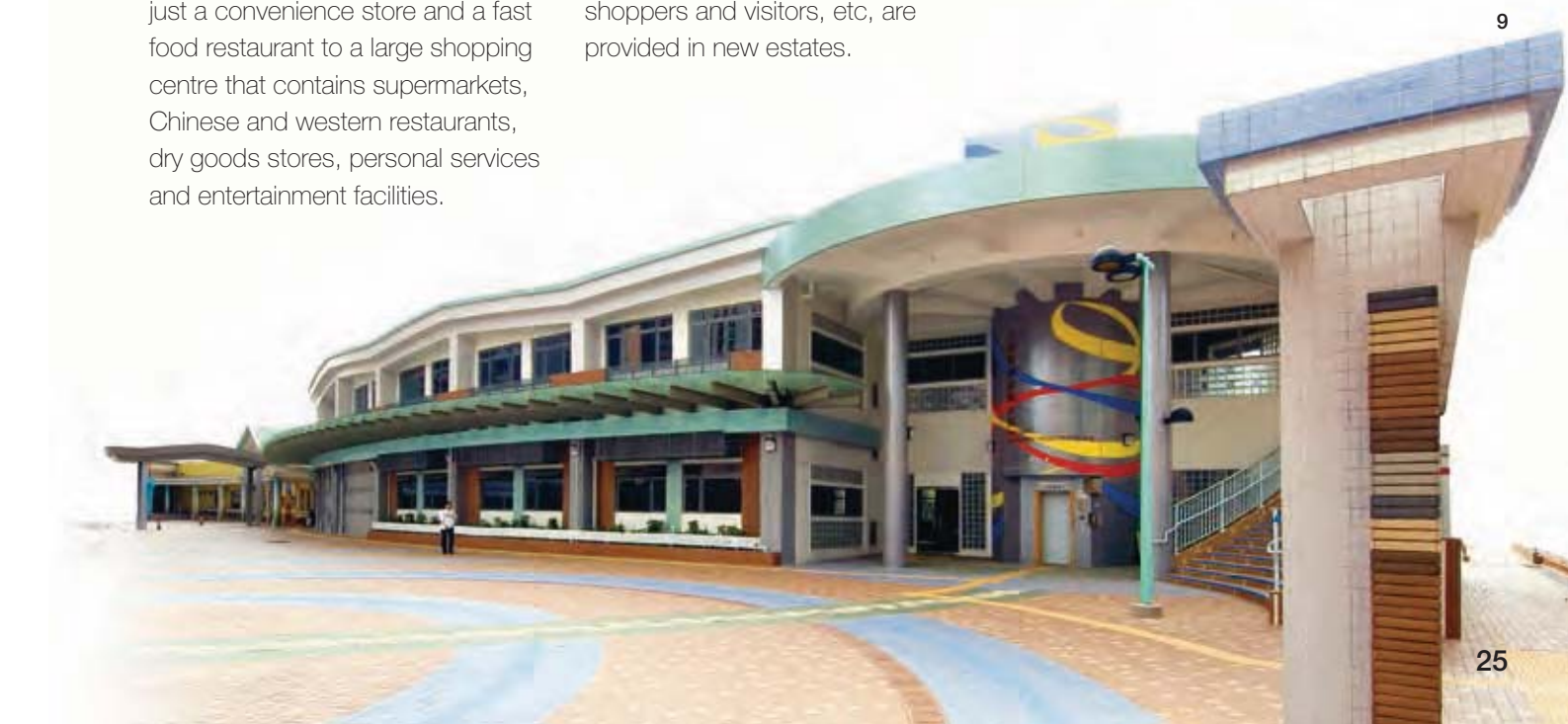
Education facilities are an important component of any new large public housing estate. According to requirements under Hong Kong Planning and Standard Guidelines and on the advice of the Education Bureau, kindergartens, primary and, occasionally, secondary schools are provided in new estates.

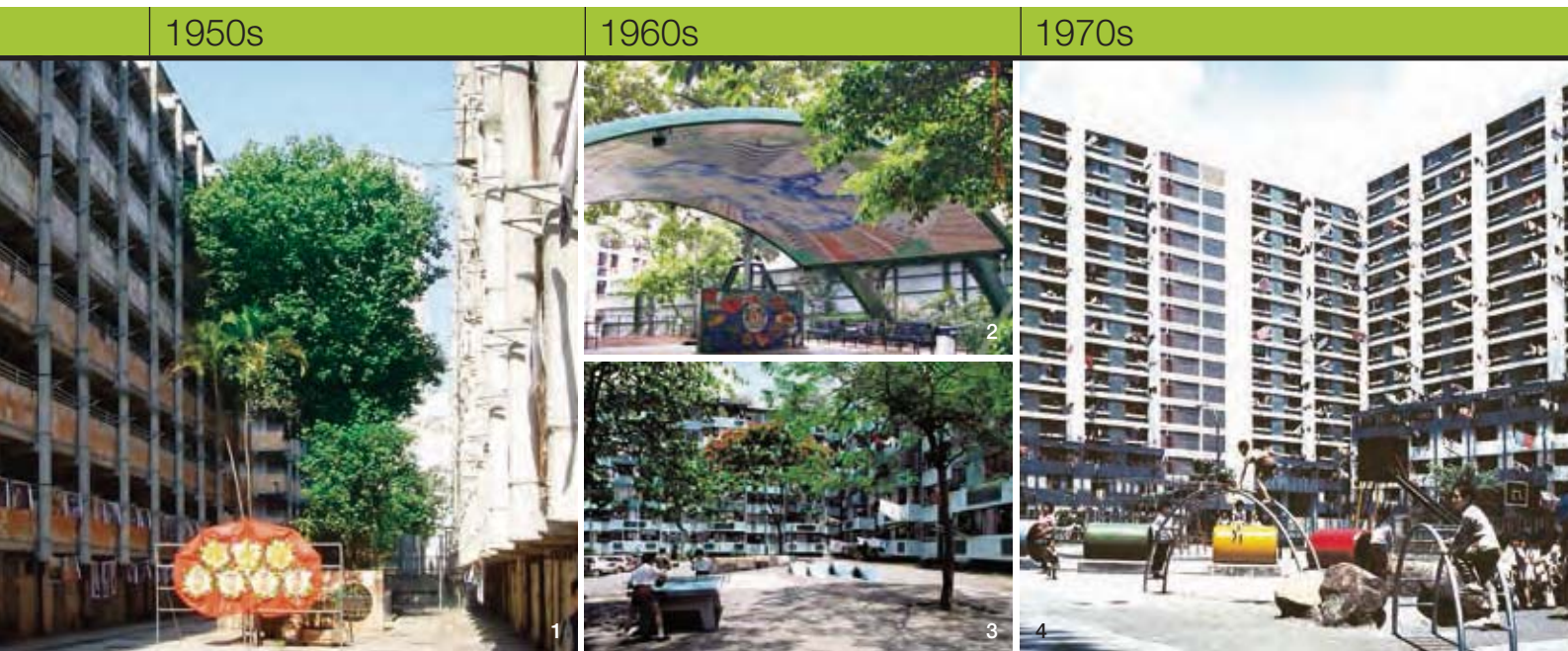
Commercial facilities are provided to meet the basic shopping needs of our tenants. They can range from just a convenience store and a fast food restaurant to a large shopping centre that contains supermarkets, Chinese and western restaurants, dry goods stores, personal services and entertainment facilities.

Many health facilities such as community health centres as well as medical and dental clinics can also be found within our large commercial centres.

Based on findings from the Traffic Impact Assessment and on the advice of the Transport Department, different transportation facilities, including public transport interchanges, minibus and taxi stands, parking for residents, shoppers and visitors, etc, are provided in new estates.

- 1 Cooked food stall at Lok Wah (South) Estate
- 2 The recreational facilities at Tin Ching Estate
- 3 The supermarket at Choi Ying Estate
- 4 The primary school at Tin Heng Estate
- 5 The bus terminus at Tin Heng Estate
- 6 The shopping centre at Hoi Lai Estate
- 7 The social welfare facilities at Choi Ying Estate
- 8 The community health centre at Ho Man Tin Estate
- 9 The community facilities at Tin Ching Estate





External Works

Design in external areas has changed over the past 50 years, going from the mere provision of circulation and garden space in the 1950s to more elaborate parks in the 60s. Estate open spaces became more elegant in the 70s and 80s to attract residents to the new towns in the New Territories. Design became more humanistic and user-friendly in the 1990s and 2000s with community and resident participation. External works evolved from overall garden design, which was very popular in the 1980s, to more community-oriented design involving the preservation of local

heritage and the regeneration of neighbourhoods which would otherwise be lost in many new housing estates.

The use of materials in external areas has evolved over the years. External elements in the 1950s and 60s such as playground equipment, shelters, and outdoor furniture were largely constructed in concrete and wood. Imported proprietary playground equipment and street furniture made in factories became popular in the 70s to 80s, mainly due to raised environmental awareness to reduce wet trade and in-situ construction on site and better quality control. Proprietary products are now routinely used for playground/recreation equipment and street furniture.

In recent years, we have placed an emphasis on new provisions and facilities, apart from also fulfilling Hong Kong Planning and Standard Guidelines. In addition to our usual recreation facilities, such as basketball courts, badminton courts, table tennis facilities, children's play areas and sitting-out areas, which are provided based on the total population of the estate, we also offer gateball courts, foot massage paths, exercise areas for the elderly, etc. Most public housing estates enjoy their own specific design in these external areas – different artwork and stonework, colour schemes and even water features help to enhance a sense of neighbourhood and identity in the different developments.



External works, which traditionally used to provide both active recreation and passive relaxation for residents, has now taken on another socio-ecological role. Soft landscape work, which plays an important role in the design of external areas, is gaining increasing support from residents. We have started to provide community gardens and farms where residents can actively interact with their surroundings.

We make every effort to preserve existing trees, incorporating them into the design of these spaces, using them to form major focal points and recreational areas. Apart from traditional greenery at ground level, we also carry out other forms of greening – the greening of roofs and vertical greening panels, for

example, are increasingly being used in housing estates to improve the surrounding environment. This enhanced greenery reduces the “heat island effect” and provides a pleasant and attractive view for the surrounding domestic blocks.

Recently completed projects such as Lam Tin Phase 7 and Sau Mau Ping Phases 13, 14 and 16 have incorporated renewable energy installations in their external works design such as power generating wind turbines and solar panels on covered walkways. Plant design using plants with ecological value is also gaining popularity. We increased the greening of all new public housing estates to at least 20% in 2010, to enhance the quality of our city and the quality of life for our residents.

- 1 Shek Kip Mei Estate in the 1950s
- 2 So Uk Estate in the early 1960s
- 3 Fuk Loi Estate in the 1960s
- 4 Ho Man Tin Estate in the 1970s
- 5 Choi Ha Estate in the 1980s
- 6 Ka Fuk Estate in the 1990s
- 7 Sau Mau Ping South Estate in the 2000s
- 8 Kai Tak Estate to be completed in 2013

PEOPLE-ORIENTED PLANNING AND DESIGN





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3.1 Committed to Sustainable Planning

3.1.1

Identifying and Securing Public Housing Sites

“We find suitable land for public housing development.”

Obtaining adequate land supplies for public housing is one of the Housing Authority's most important responsibilities. This role is becoming increasingly difficult in view of scarce land resources as well as competing usage claims. Extensive site search exercises are therefore undertaken regularly while close collaboration is maintained with our relevant counterparts. Land for public housing is secured through different means including participation in strategic and regional studies, to identify suitable residential land for public housing developments still in their early planning stage, as well as the rezoning of non-residential sites. Maximising our land resources, we also optimise the development potential of sites already earmarked for public housing.

The challenge of finding a suitable site lies not only in quantity, but also in quality. To ensure that the identified sites are suitable for public housing use, various technical studies relating to traffic, environmental impact, air ventilation, urban design, water supply, drainage and sewerage capacities, etc, are conducted.

To facilitate the timely completion of the various support facilities to tie in with the estate's population intake, such as community halls and bus termini, Housing Authority funds may be used at times, in addition to government funding. We also assume responsibility for their implementation as part of the construction of new public rental housing projects.



1

- 1 Strategic and regional studies
- 2 The community hall at Tin Ching Estate used Housing Authority funds to facilitate its timely completion



2

3.1.2

Monitoring Housing Production

“We closely monitor the housing production programme to meet our target.”

Close monitoring of our public housing programme is vital to ensure steady production and adequate rental stock to meet the Housing Authority's intention to maintain average waiting time at around three years for general public rental housing applicants.

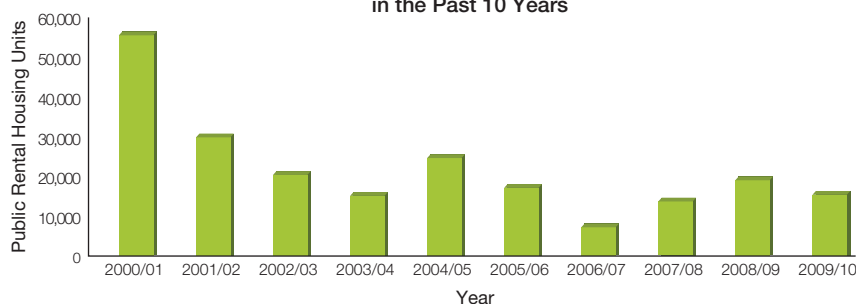
Subject to periodic review, adjustments to the programme will be made as and when necessary.

In the past decade (2000/01 – 2009/10), around 266,000 public housing units (including both rental and sale flats) have been produced. In the five years from 2010/11 – 2014/15, the forecast is about 75,000 new public rental housing flats or around 15,000 units a year.

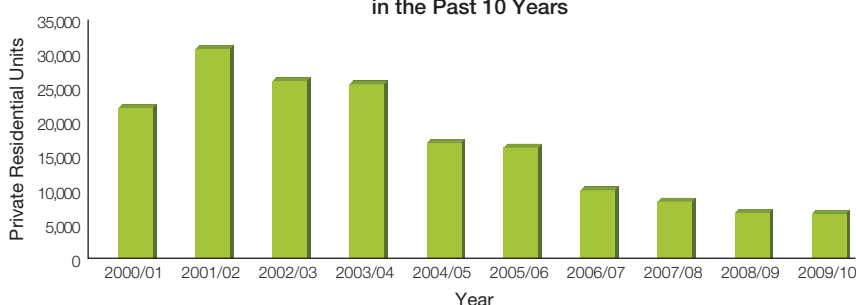
In 2005, our Housing Construction Management Enterprise System (HOMES) was launched. This new system not only enables effective and efficient consolidation and storage of production data, but also strengthens our project monitoring capabilities throughout the full development process spectrum.

Enhancing transparency in the supply of flats in the private residential market, quarterly statistics ranging from the number of flats under construction, number of flats completed and estimated supply of flats in the next few years, have been posted on the Transport and Housing Bureau website (www.thb.gov.hk) since November 2004.

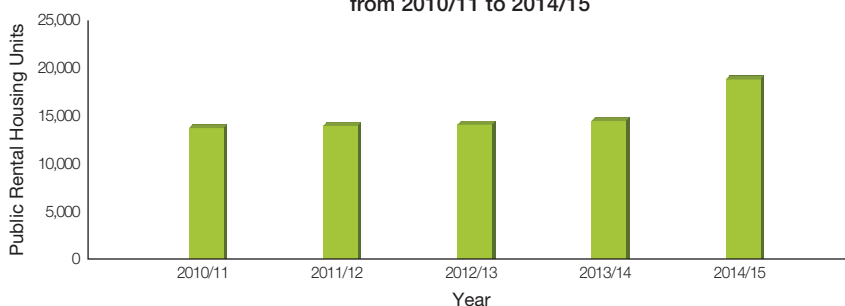
Housing Authority Public Rental Housing Production in the Past 10 Years



Private Residential Units Production in the Past 10 Years



Forecast for Housing Authority Public Rental Housing Production from 2010/11 to 2014/15



3.1.3
Site-Specific Design



“ We optimise the use of valuable land resources through site-specific design. ”

For many years, the Housing Authority’s housing production has been based on a high degree of standardisation and mass production. Advantages include economies of scale, maximisation of land resources, consistent provision standards, mechanised processes and programming expediency, leading to overall efficiencies in construction. With the advantage of standard block design, we have been able to satisfy Hong Kong’s public housing needs within tight development programmes and considerable cost constraints.



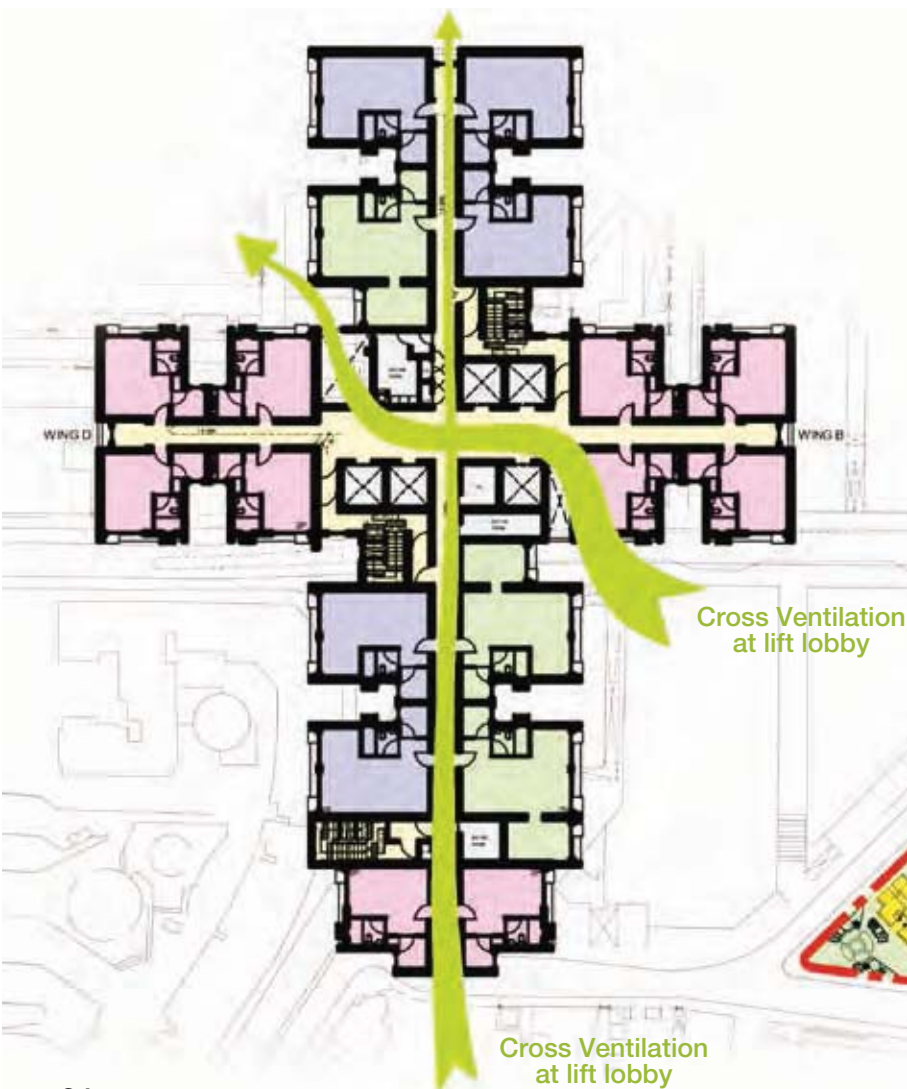
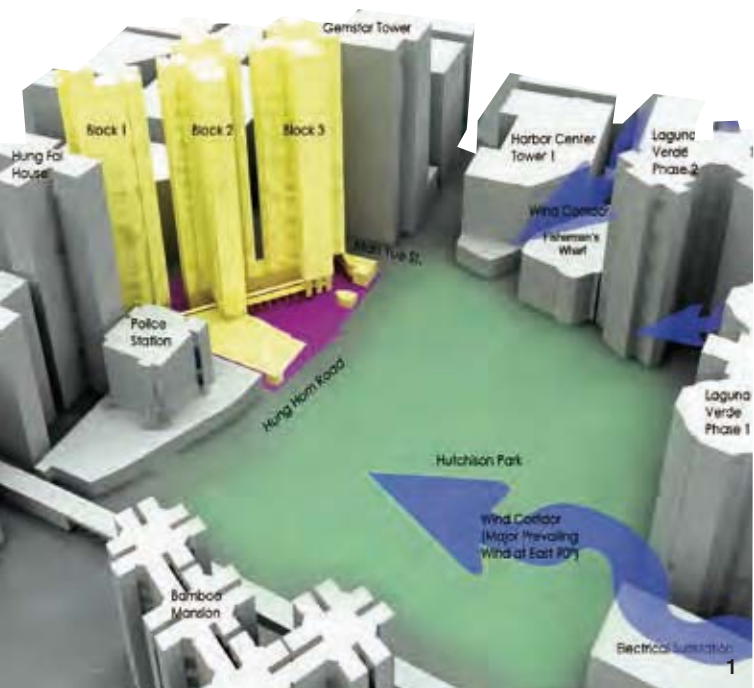
At the turn of this century, Hong Kong moved into a new era with public expectations on the built environment rising to new dimensions. At the Housing Authority, we also took a proactive stand, adopting a site-led and value-driven approach to optimise site potential, enhancing estate identity, improving diversity and lessening the impact of territory-wide standardisation. In August 2000, a site-specific design approach therefore came into play. This new production strategy allows flexibility, enabling the concurrent use of site-specific non-standard designs, and

standard New Harmony Block designs, or a combination of both, to address site constraints and optimise development potential. Examples are the narrow sites in the Ex-Chai Wan Estate and Kwai Luen Road developments.

The migration to site-specific design has instilled a greater sense of community among our residents in view of the improved identity and individuality of the different estates. It also paved the way for environmental impact and micro-climate studies for individual sites, such as in Upper Ngau Tau Kok Phases 2 and 3 and Hung Hom Estate Phases 2 and 3.

- 1 Ex-Chai Wan Estate
- 2 Kwai Luen Road developments
- 3 Redevelopment of Upper Ngau Tau Kok Estate
- 4 A prefabricated bathroom
- 5 Semi-precast slab
- 6 Precast façade
- 7 Mechanised construction

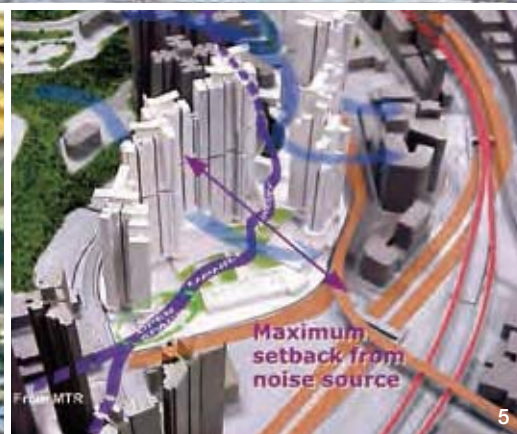
3.1 PEOPLE-ORIENTED PLANNING AND DESIGN | Committed to Sustainable Planning



In our many pilot projects in the past decade, we worked in partnership with design consultants to establish site-specific concepts which have raised overall housing standards.

Over the years, we have made a strong effort to work closely with the Hong Kong Construction Association to address any construction concerns.





With the completion of the last estate using the standard New Harmony 1 Block design in 2009, all public rental housing developments now use a site-specific design approach.

This design approach has been greatly welcomed by leading professional organisations, as it will bring substantive improvements to the built environment. Public consultation has also revealed wide ranging support for this migration to site-specific design.

- 1 Prevailing wind direction studies in Hung Hom Estate Phase 2
- 2 Wind corridor studies
- 3 Site overview analysis
- 4,5 Noise impact assessment
- 6 Hung Hom Estate Phase 2

3.1.4

Provision of Land and Facilities for Sustainable Housing Development

Head 711 of the Capital Works Reserve Fund was established in 1994 to finance housing-related public works projects. Since taking up the project management of Head 711 in 2002 from the then Housing Bureau, we have continued to provide policy support, while implementing housing-related projects to facilitate public rental housing developments.

In recent years, the Housing Authority has sometimes faced objections from the public towards public housing developments. Responding by meeting neighbourhood aspirations for better traffic, transportation and community facilities, we have made extraordinary efforts to address public concerns with the planning

and implementation of Head 711 projects.

The scope of these projects is extremely wide ranging, running from site formation, waterworks, road construction and improvement, to the construction of diverse community facilities.

Recognising the strong demand from local communities for recreational facilities in the district, we took exceptional steps to seek funding from the Legislative Council and fast-tracked a number of open space projects adjoining

public housing sites. The implementation of these facilities help to drive public housing developments, which would otherwise be held up or delayed.

In the redevelopment of Lower Ngau Tau Kok Estate, there was a concurrent need to realign a public road and put footbridge links into place. Making sure that these requirements would not delay the housing development itself, we successfully obtained funding from the Legislative Council and took these projects forward under Head 711.

“ We took up the Bureau’s function to provide policy support and secure funding for housing-related infrastructure projects. ”





With regard to the supply of land, we successfully secured Head 711 funding for the mega Anderson Road site formation project under an extremely tight Legislative Council submission schedule. The project will provide about 20 hectares of space for the development of public housing, district open spaces, schools, etc.

The clearance of four existing temples was essential in the provision of a suitable site for the Anderson Road project which will accommodate a total of about 48,000 people. Taking a proactive stance, we sought to steer policy and held numerous meetings with

the various stakeholders to work out a successful relocation proposal.

Meeting the challenges ahead, we will continue to plan necessary housing-related infrastructure projects in a programmed and structured manner. We aim to continue our strategic role in the co-ordination of concerned departments, to ensure the timely delivery of potential Head 711 projects.

- 1 District open spaces at Choi Wan Road nearing completion
- 2 Road improvement and footbridges enhance the local infrastructure
- 3 Site formation works for the development at Anderson Road
- 4 The relocation of four temples was necessary to form the site platforms for the Anderson Road public housing development

3.1.5
Planning for Changing Needs

“ Making sure we remain in tune with the times, we need to review our planning standards regularly. ”



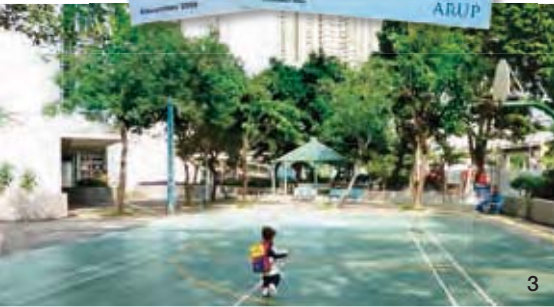
Recognising changes within the community and the evolving needs of our tenants, we have adopted a flexible approach in planning our new estates. In some cases, a multi-purpose space has been set aside so that it can be adapted to meet the particular needs of the community at any given time.

Vacant parking spaces have been converted into useful and high-demand community facilities for the benefit of tenants and local residents as well. In partnership with the Hong Kong Jockey Club, for example, the car park at Ting Heng Estate in Tin Shui Wai has been transformed into a Telebet Centre and Volunteers Training Centre.

While this move requires approval from the Town Planning Board, a number of much needed community facilities have been implemented in recent years. This includes the Amenity and Community Building in Tin Ching Estate in Tin Shui Wai, which was completed in late 2010.

Optimising the use of parking spaces available within public rental estates, we have obtained planning approval to let vacant spaces out to non-residents since 2004.

Where appropriate, we also take a comprehensive view of the area, considering adjacent facilities and developments when planning new public housing developments, to ensure that common facilities can be fully utilised.





5



6

With demand for parking within public housing developments declining over the years, we have experienced high vacancy rates in our parking facilities. A consultancy study was therefore commissioned in 2006 to review overall parking requirements and establish appropriate parking standards.

The study investigated parking requirements for four types of vehicles – private cars, motor cycles, light goods vehicles and bicycles in public rental housing estates based on the two main variables – accessibility to vehicles and the parking choices of tenants.

After examining numerous demand factors, the study recommended a reduction in parking provision for private cars and light goods vehicles

together with the creation of a separate standard for motorcycles. Existing standards for bicycles and retail parking were maintained. As a result, the recommended parking standards for public housing developments in the Hong Kong Planning Standards and Guidelines came into force in June 2009.

In view of the significant reduction in the number of parking spaces to be provided in public housing developments, there will be a notable saving in costs. Around \$106 to \$285 million can be saved annually in the construction budget alone. Less parking spaces will also mean better utilisation of Hong Kong's valuable public housing land resources.

- 1 Telebet Centre and Volunteers Training Centre in Tin Shui Wai converted from vacant parking space
- 2 Study on parking for Public Housing Developments
- 3 Multi-purpose ball court at Kwai Fong Estate
- 4 Planning approval to let vacant parking spaces to non-residents
- 5,6 External and indoor parking facilities at public housing developments, for private cars, motor cycles, light goods vehicles and bicycles.

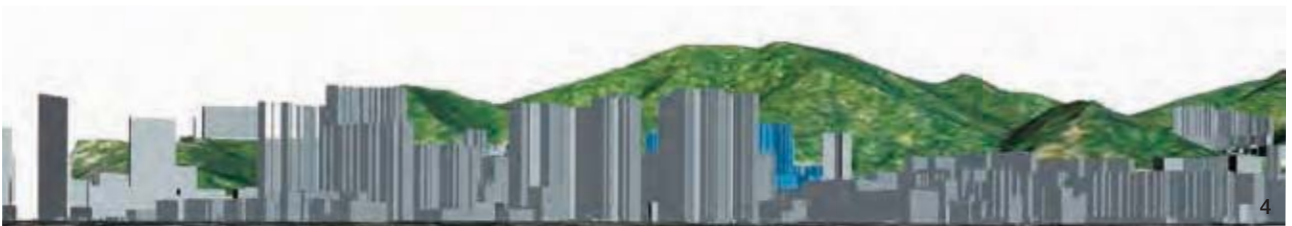


“With the wealth of information on land use and the planning of our estates, we focus on the wider use of information technology to facilitate information retrieval.”

3.1.6 Development of a Web-based Geographic Information System

In 2005, our Planning Section developed a standalone Geographic Information System (GIS) which evolved into a web-based platform in 2009. The new system allows efficient information retrieval and management of land use, planning, and the storing of related data on existing public housing estates and potential housing sites throughout the territory.

This web-based system assists in collecting and integrating geo-spatial information such as territorial and district information, land use plans, aerial photographs, outlines of zoning plans, digital maps, etc. This key information facilitates public consultation, site planning, as well as design and construction work.



The future development of GIS will proceed in three major directions. Firstly, it will expand the database for our internal data sources, providing information on existing trees and slopes within our estates, for example. Secondly, it will explore possible data exchanges with other government departments, such as the Civil Engineering

Department, Lands Department and Planning Department. Lastly, we are exploring the integration of GIS, which is a two-dimensional system, with our three-dimensional Building Information Modelling (BIM) technology. This will result in a comprehensive planning and design process for the development of public housing in the future.

- 1 The front page of our GIS
- 2 A sample screen layout of our GIS
- 3 Enhanced Display Function – Overlap of Base Map with Outline Zoning Plan
- 4 Potential integration of the two-dimensional GIS with the three-dimensional Building Information Modelling (BIM) technology

3.2 Caring for the Community

3.2.1 Community Participation



“From informing to consultation, we now engage the community in the planning and design of our estates.”

Engaging the community is a vital aspect in the delivery of public housing, as it gauges and meets external needs and expectations. Moving from simply “informing” the community in the 1970s to “consultation” in the 80s and 90s, we now “engage the community” to work in partnership with us, making decisions and acting together, in the drawing up of plans and design briefs to meet common objectives, and in providing post-completion feedback and suggestions for long-term maintenance.

Workshops, focus groups and roundtable discussions are held to further this principle of inclusiveness, openness, creativity and transparency.

Community participants include a variety of interest groups, residents, academics, schools, social workers, politicians, and non-government organisations (NGOs).

The “Marble Balls” Saga of Lei Muk Shue Estate (2006)

Decorative marble balls were installed in Lek Muk Shue Estate. However, there were media reports that these marble balls could pose a

potential danger to small children if they attempted to climb them.

This criticism was dispelled with an active communication programme which genuinely sought to rectify any possible problems. A community workshop provided an interactive platform for some 40 stakeholders to present their views, resulting in a general consensus for improvement work to deal with the alleged problem.

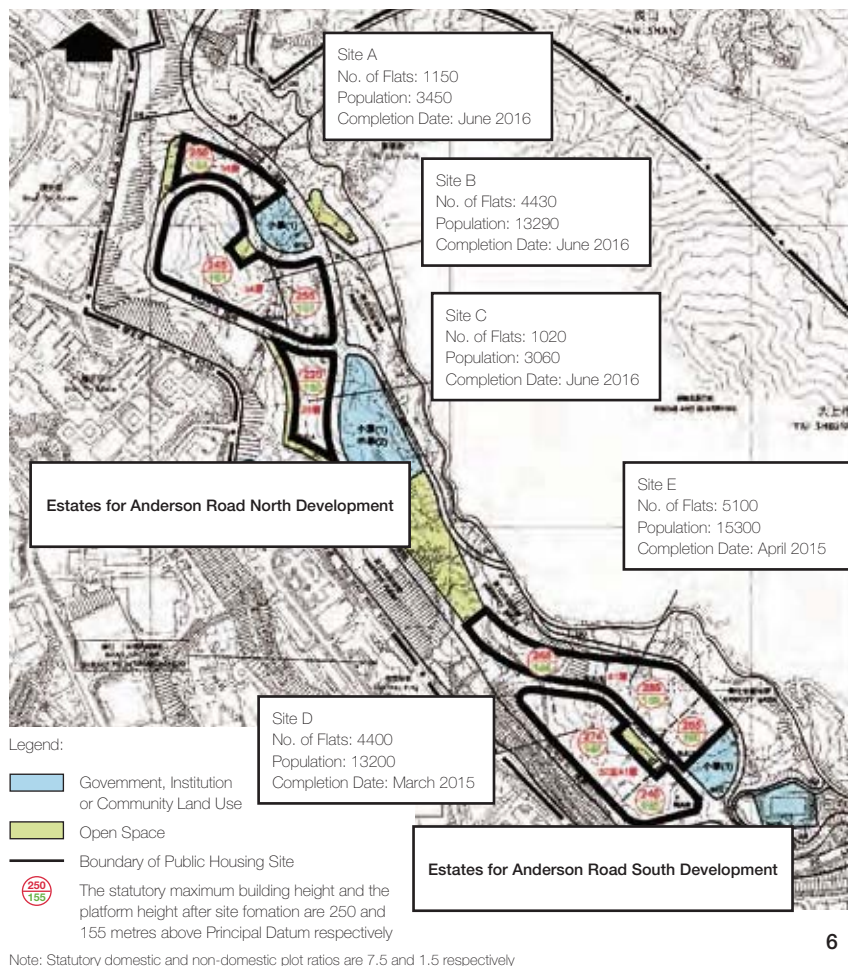




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Preserving the Environment at Ma Hang Headland Park (2006 – 2007)

Two workshops using design games were conducted to collect views from stakeholders and existing residents on the preliminary design of the Ma Hang Headland Park project. Based on the expressed wishes of local residents, this resulted in the building of a leisure and recreational park for people of all ages and groups, including people with a disability.

- 1 The decorative marble balls in Lei Muk Shue Estate
- 2 Community workshops involving all related stakeholders
- 3 Ma Hang Headland Park where the community was involved in its design
- 4 The five-hectare Ma Hang Headland Park, not only provides the local community with recreational facilities and attractive outdoor spaces, it also conserves the environment
- 5 A community workshop was held at the end of 2008 for the Anderson Road Development
- 6 The Anderson Road Development covers over 11 hectares of land comprising more than 10,000 residential units, open spaces, schools, community facilities, shopping centres, public transport services and pedestrian links



Consensus on the Anderson Road Development (2008 – 2009)

At the workshop, about 100 participants actively explored development options, provisions for the estate and community facilities in the district. Taking local aspirations into consideration, a consensus was reached with regard to the scale and scope of these facilities, and development plans were modified accordingly.

Building a Community – A New Look for Yau Tong Estate (2006 – 2007)

In the painting of a wall mural in Yau Tong Estate, we joined hands with the public to build a local identity, foster neighbourhood pride and create a harmonious community.

In the design of the estate's open spaces, a series of workshops and focus groups were held with over 250 participants to evaluate design options and reach a consensus on the preferred layout.

Rediscovering Our Heritage – Memories of Ngau Tau Kok Estate (2002 – 2008)

In the redevelopment of Upper and Lower Ngau Tau Kok Estate, we captured collective memories of the old estates from interviews with some 60 residents. More than 100 tenants donated artifacts such as shop signs and metal gates for display in the redeveloped estates. These exhibits will help to show what life was like in the past, creating a sense of heritage and belonging at the development.

Over 90 participants attended a series of workshops, leading to the proposed use of covered open spaces within the estate. These practical suggestions demonstrate the merit of sharing information, while also generating greater commitment and empowerment within the community.

Open Engagement – Our Ideas Competition for Mei Ho House (2007)

Mei Ho House, one of the first six-storey public housing blocks built in 1954 in Shek Kip Mei, has now become a Grade 1 historical building. It will be conserved and adapted for re-use as a youth hostel. Views were invited from the public on how to rekindle life at Mei Ho House and an ideas competition on its future use was held in 2007.



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This raised considerable public interest with close to 50 entries. We also arranged an “Open House for Mei Ho House” showing flats with old furniture and objects, which brought rich memories to over 3,000 visitors. The building was also included in the “Revitalising Historic Buildings Through Partnership Scheme” launched by the Development Bureau in 2008, which attracted community participation at every level.

Corporate Social Responsibility at Lower Ngau Tau Kok Estate (2009)

Before demolition, our contractor voluntarily took up the cleaning and repairing, as well as safety checks, for over 500 household and stationery items previously used in three primary schools, passing them on to other schools and non-governmental organisations nearby for re-use. The contractor did this as part of its corporate social responsibility programme, helping to preserve the environment while also fostering goodwill and creating closer bonds within the local community.

Hand-in-Hand – “Action Seedling” (2007 – Present)

Together with our building contractors, we distribute seedlings to participants, who nurture them at home, until they have grown sufficiently for transplanting into planters and green areas in new estates. Apart from creating a greener and more pleasant environment, the programme helps generate greater environmental awareness as well as a greater sense of belonging among our residents. At the same time, contractors play an active role in fulfilling their corporate social responsibilities.

- 1 A community event at the end of 2008
- 2 Tenants donated artifacts for display in the redeveloped estates
- 3 The preferred layout with its integrated design for Yau Tong Estate
- 4 A community workshop at the end of 2006
- 5 The Wall Mural Competition at Yau Tong Estate
- 6 A café setting rebuilt for the collective memories of the old estates
- 7,8 Materials salvaged for re-use before demolition of the estate
- 9 This community participation scheme enhances our partnerships with our contractors, public housing tenants and the community-at-large



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3.2.2
Customer Satisfaction Indices



“We treasure the views of our residents. We conduct independent Resident Surveys for all newly completed estates...”

Since 2004 onwards, as part of our integrated feedback and knowledge management system, we employ an independent consultant to conduct Resident Surveys for all newly completed projects, about 10 months after the majority of tenants have moved in.

The primary objective is to gauge residents' satisfaction levels on the design and provisions of the estates in which they live.

Up to the current moment, seven annual term Resident Surveys have been conducted, covering 44 completed projects with over 100,000 flats.

Residents' satisfaction levels on the “estate as a whole” from each Survey is then put together to compile a Customers' Satisfaction Index for that particular financial year.

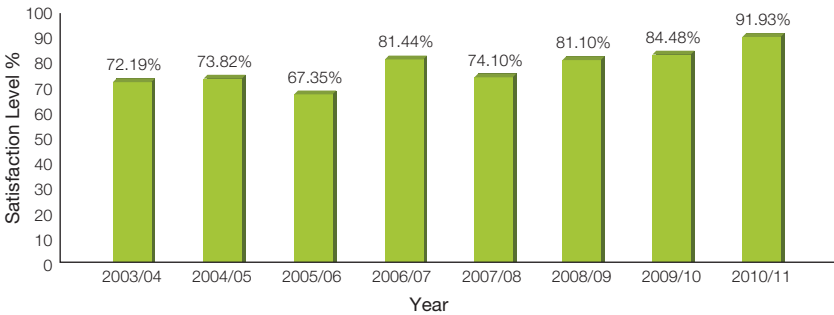
The Customer Satisfaction Indices obtained from these surveys have been high, generally registering above the 70% benchmark. At the same time, recorded dissatisfaction rates have consistently stayed at “extremely low”.

These Customer Satisfaction Indices, together with other survey findings, provide us with a better perception and understanding of users' needs and expectations, not only on the design and provisions

of public rental housing, but also on external work, landscape design, project-specific design provisions, and social lifestyles. These in turn provide useful and objective feedback on the formulation of policies and review of design.

The first edition of our Modular Flat Design 2008 Version, for example, has responded positively to this feedback, modifying the design of laundry racks, the sizes of kitchens and bathrooms, as well as the accessibility to natural lighting and ventilation. Relocating of cooking benches away from openable windows in the second edition of the Modular Flat Design 2010 Revision provides a further example.

Customer Satisfaction Indices from 2003/04 to 2010/11 based on Residents' Survey Results



1 Typical Resident Survey Report
2 Conducting a Resident Survey

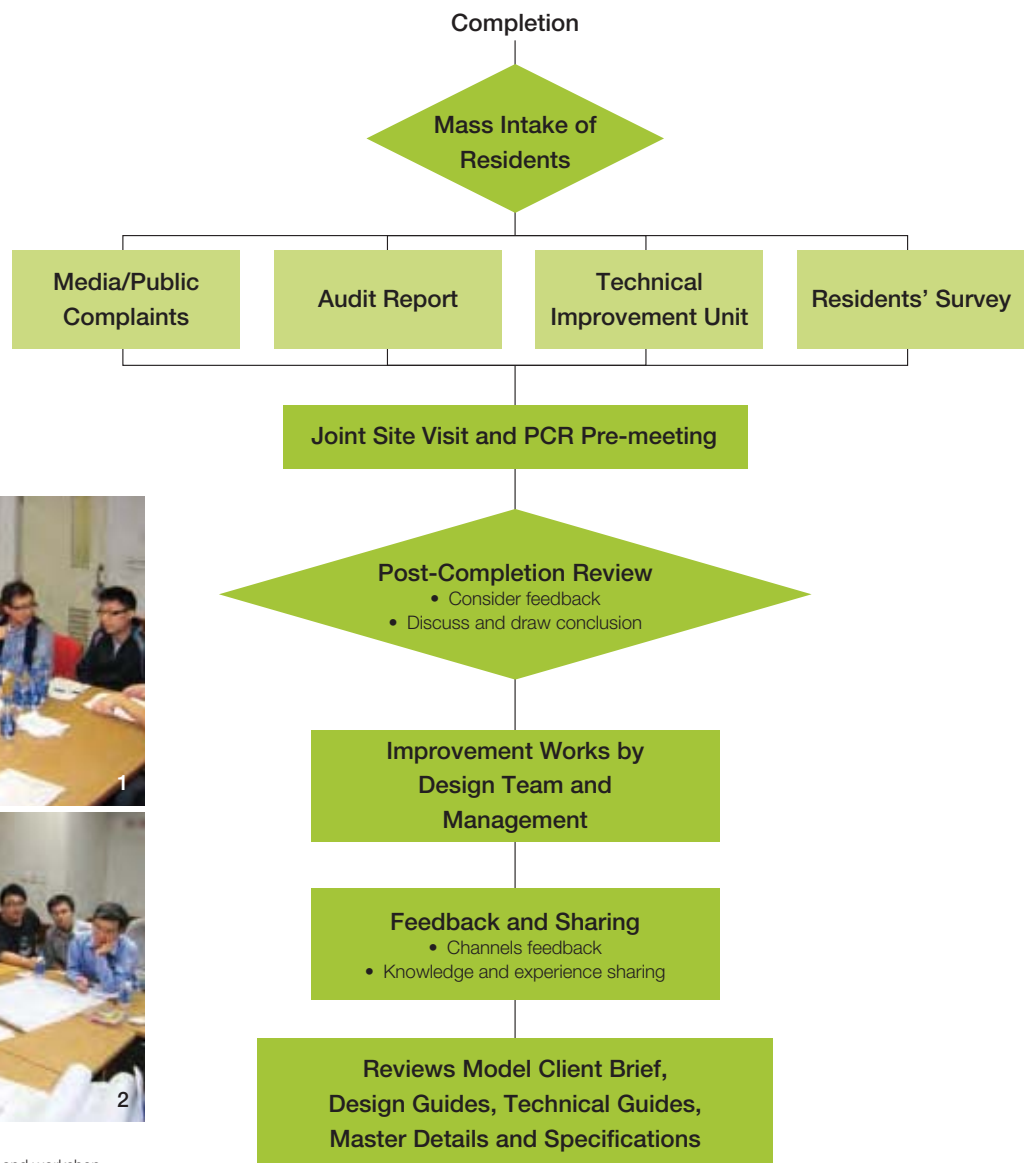
3.2.3 Post-Completion Review

‘...then, we carry out site visits and organise facilitated workshops, debriefing and experience sharing sessions.’

Post-Completion Reviews (PCR) provide an important milestone in the diagnosis of customer experiences and opinions on the design and provision of newly occupied estates. They provide a

structured vehicle which enables project teams to obtain continuous and quality feedback relating to design provisions for review and enhancement. The chart below shows the review process.

Flow Chart for the Post-Completion Review (PCR) Processes



1,2 Post Completion review meeting and workshop

3.2.4
Action Seedling



“ We motivate our contractors to put corporate social responsibility into practice. ”



Under this Community Participation Scheme, our building contractors join hands with Estate Management Advisory Committees, non-government organisations and schools to foster a greater sense of belonging among our residents and the community, while also promoting the benefits of a green lifestyle.

In partnership with our contractors, seedlings are given out to participants, who nurture these plants at home until they are ready

to be transplanted into the planters and gardens of new estates. The first phase of the scheme was launched in 2007, with participants and community members from seven estates looking after thousands of seedlings which were subsequently replanted as part of the estates' external landscapes. While the first phase was completed in early 2009, the second and the third phases involving a further seventeen estates are on-going.



The scheme has successfully established a platform for community participation under a common greening goal amongst ourselves, the public, and the construction industry. The scheme has not only been extremely well received, it has also achieved our objectives to enhance stakeholders' commitment to our housing projects, promote greater environmental awareness and improve the living environment.

- 1 Completion ceremony for the first phase of Action Seedling involving seven projects was held in Un Chau Estate in 2008
- 2 Educational pamphlet and face-to-face discussion were provided to participants on nurturing the seedlings
- 3 Elderly Tenants Participating in the Action Seedling programme
- 4 School children are also participants of the programme
- 5 Seedlings are given out to participants
- 6 Action Seedling launched at Ching Ho Estate with entertainment promoting the benefits of a green lifestyle
- 7 Participants at the completion ceremony for the first phase of Action Seedling



3.2.5 Green Delight in Estates

“We partner green groups to inculcate a greener life style for all our residents.”

In partnership with various green groups, we launched our long-term community environmental programme, “Green Delight in Estates”, in 2005.

The programme aims to raise environmental awareness among public rental housing residents while also instilling a lifestyle culture that will protect and improve the environment.

The programme consists of territory-wide campaigns under an environmental theme, supported by educational and promotional programmes designed by the various green groups for individual estates.

Thirty estates were selected yearly to participate in each phase of the programme. Focusing on special themes, such as waste reduction and recycling, waste separation at source, reducing the use of plastic



bags, building a green infrastructure, tree trails and butterfly gardens, among others, the programme seeks to promote green awareness and green practices. Each of the green groups carried out their own unique educational and promotional programmes in selected estates. Commencing in 2005, the programme rolled out in phases to ultimately cover all our public rental housing estates in five years.

Sustaining a more long-term commitment to the environment among residents, the green groups also recruit and train a volunteer core group of green ambassadors from each participating estate, who will convey the environmental message and guide other residents towards a greener lifestyle.

- 1,2 Green Flower bed competition in 2010
- 3 Planting work in Butterfly Gardens to attract butterflies
- 4 Face-to-face promotions help to educate residents in waste separation
- 5 Tree trails with educational plates
- 6 Game booths spreading the message at a green carnival
- 7 Children and their parents learning through games about green living
- 8 Programme Promoting Separation of waste at source
- 9 Green booth for collection of recyclable items



3.3 Focused on Quality Living for Residents

3.3.1

Universal Design

“We design for residents of all ages and of different abilities to live in harmony with their environment.”

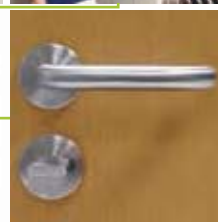
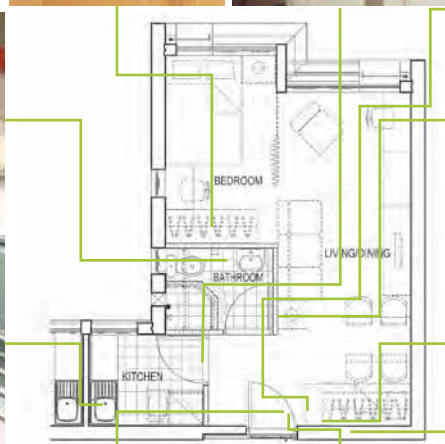
Catering to the needs of different users

- sliding showerhead and soap holder on a vertical rod
- full height vision panels in kitchen doors
- light switches, sockets and the doorbell are placed at an optimum height



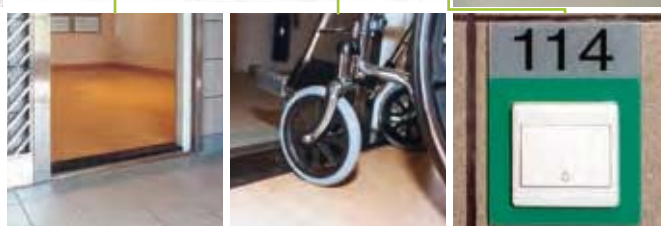
Easy usage

- lever type faucet mixers
- lever type door handles
- large press button light switches and doorbells



To foster a community in which people with different abilities can live in harmony, and to encourage “ageing in place” for the rapidly increasing elderly population, we implemented universal design concepts in our new housing estates from 2002 onwards.

All domestic flats and common areas in our estates are designed to provide barrier free access, and have considered safety and convenience aspects, which enables residents to enjoy greater independence.



Barrier free access

- sufficiently clear door widths
- shallow door thresholds with bevelled edges
- large lettering and contrasting colours for signs



To facilitate the movement of people, including people with physical disabilities, within our estates, barrier free access routes and tactile guide paths connect domestic blocks to major estate facilities such as transportation hubs, commercial centres, welfare and community facilities.

Multi-sensory Maps

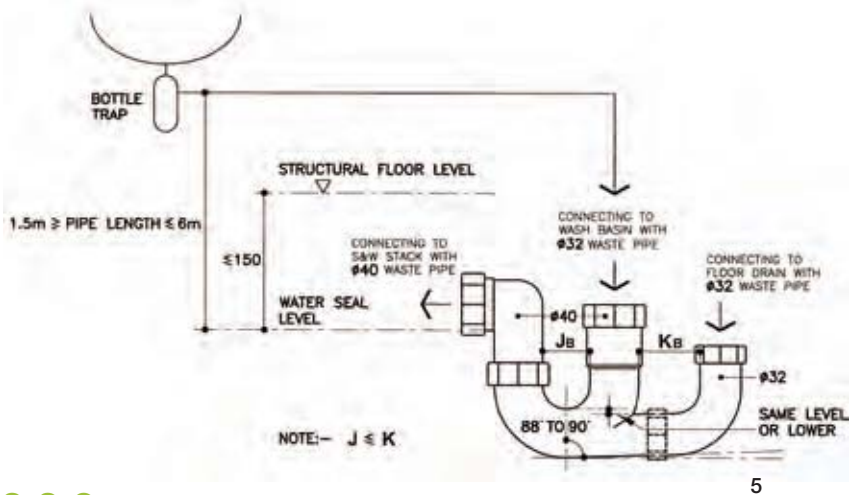
In 2006, we developed a first-of-its-kind multi-sensory map in conjunction with societies for the visually-impaired. This multi-sensory map uses a conventional map layout, which

can be easily read by anyone with normal vision. Highly contrasting colours facilitate usage for people with low vision, while tactile, braille and voice messages serve people with limited or no vision. The elderly and children alike, are also able to find their way around more easily. The map, an integral part of our universal design commitment, thus serves everyone, regardless of their abilities or preferences.



- 1 Barrier free access for wheelchair users
- 2 A multi-sensory map located at the estate's main entrance
- 3 Tactile and braille messages on the multi-sensory map
- 4 The multi-sensory map with highly contrasting colour displays

“ We developed a common W-trap system to prevent the possible transmission of pandemic disease through dried up floor traps. ”



3.3.2 Common W-trap System



The outbreak of SARS (Severe Acute Respiratory Syndrome) in March 2003 raised public concerns over the problem of dried up floor traps in drainage systems. Public health could be jeopardised with the possible transmission of disease into bathrooms and kitchens from contaminated drains.

The Housing Authority collaborated with academia, comprehensively studying the feasibility of adopting common U-traps in the drainage systems of domestic flats, so that waste water from the wash basin could replenish the easily dried up floor drain.

Tests conducted on site to verify both the design hypothesis and performance were satisfactory. However, the proposal was rejected by the Buildings Department due to the excessive pipe length, which exceeded the prescribed maximum length of 750 mm from the trap. There was also the potential for “back foaming” which would cause a nuisance to residents. We therefore extended our collaboration

to study the alternative use of a Common W-trap System in lieu of the Common U-trap.

After a series of reiterative tests successfully verifying the W-trap’s operational stability, we secured approval in principle from Buildings Department to use it in the floor drains of bathrooms and kitchens in public rental housing flats provided that (a) only waste water from basins and showers would be used for replenishment purposes; and (b) the length of untrapped pipework between the W-trap and the floor/ shower drain could be relaxed but would not exceed 750 mm.

A mock-up installation of the drainage details was successfully tried out before full implementation was carried out in all our on-going projects. The first completed project was Yau Lai Estate in 2008.

- 1 Mock-up of the common W-trap system
- 2,3 Reiterative laboratory tests
- 4 Site verification
- 5 Schematic diagram
- 6 W-trap fitting

3.3.3 Twin Tanks

The periodic cleaning of fresh and flush water tanks results in the repetitive interruption of water supplies every three and six months respectively, creating a nuisance for tenants.

In the cleaning process, the residual water in the tanks as well as the water used for cleaning is normally discharged directly onto

the roof slabs before it drains into the building's rainwater pipes.

This increases the risk of "chloride attack" on the roof structure.

Our "Twin Tank" system aims to achieve a non-interrupted flow of water while tanks are being cleaned. To this end, both the rooftop fresh and flush water tanks are being designed as "Twin Tanks", though total water volumes remain unchanged.

The system allows one of the twin tanks to stay in operation when the other is closed for cleaning. The maintainability and durability of the water tanks is enhanced whilst the continuity of the water supply is maintained. The system also conserves water as it reduces the amount of residual water released.

Waterworks Standard Requirement" has been amended accordingly.

Other associated enhancements include a properly designed discharge pipe which ensures the direct flow of residual and cleaning water from the water tanks into the drains, as well as the use of epoxy coated bars and Grade 45 Concrete to increase the structural durability of the water tanks and roof slabs. The first completed project was at Shek Mun Estate in Shatin Area 11.

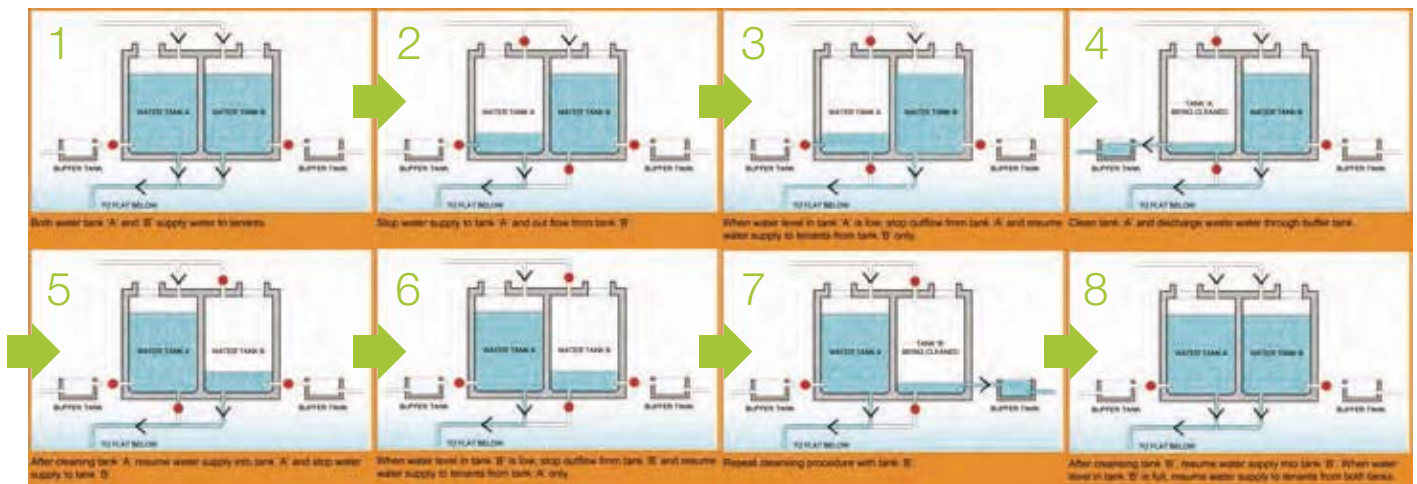


- 1 The Water Supplies Department has accepted this system and the relevant clause in the "Hong Kong

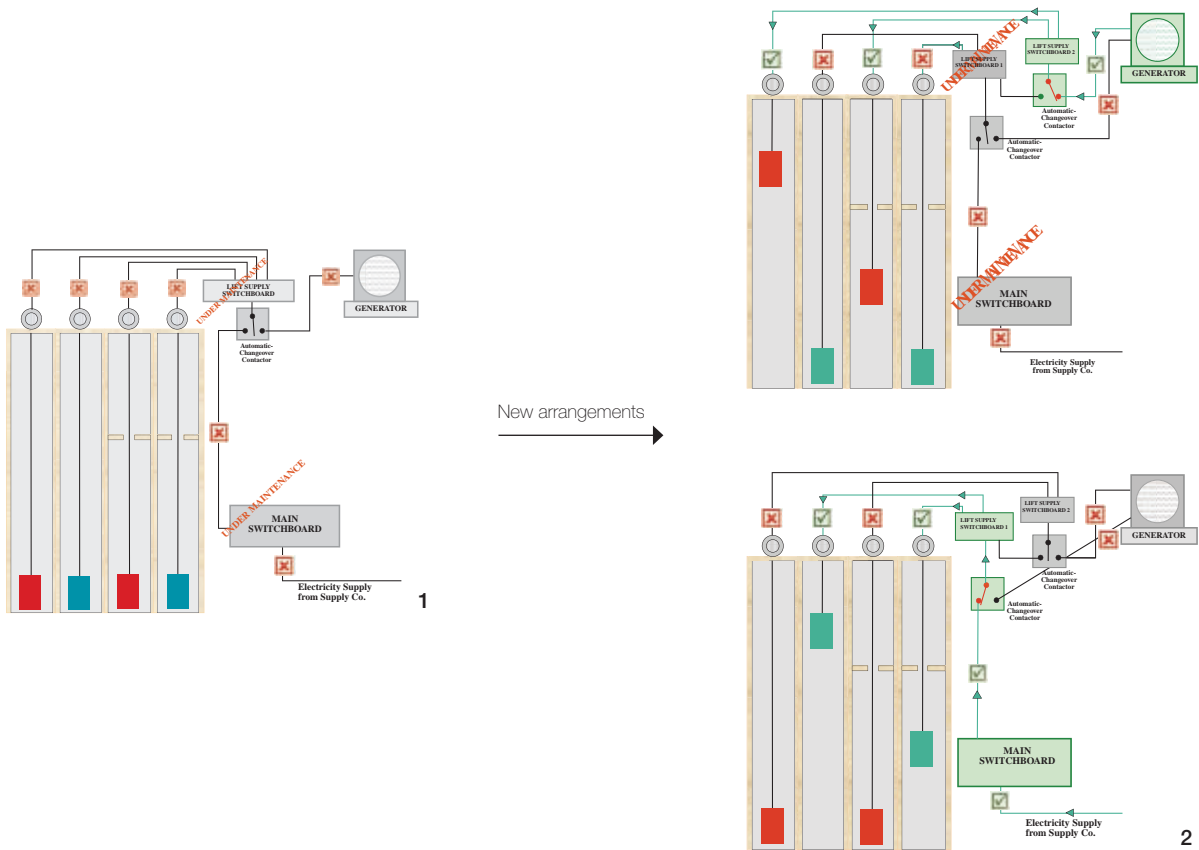
- 1 Temporary suspension of water supply notice
- 2 Water being discharged on to the roof before cleaning
- 3 Graphic presentation of a twin tank water supply system
- 4 The cleaning procedure



“We provide uninterrupted water supply to residents even during cleansing of water tanks by providing twin roof tanks.”



3.3.4 Electrical Supply for Lifts



“ We provide uninterrupted electricity supply for lift services during periodic inspections, testing and certification. ”

- 1 Lifts with single power supply. Lift services are suspended during inspection and testing of electrical installations
- 2 Lifts with dual power supply. Lift services are maintained during maintenance

To ensure the proper operation and function of electrical installations in public rental housing, we conduct periodic inspections, testing and certifying these electrical systems. During this time, electrical supplies to lifts are shut down and lift services are inevitably disrupted, causing inconvenience to tenants. We have therefore reviewed these arrangements, modifying the electrical design in new blocks so that skeleton lift services can be maintained during inspections.

This will provide greater convenience to tenants, and in

particular, the elderly and people with disabilities.

Under the new arrangements, two groups of lifts receive supplies from separate supply switchboards. Each of these supply switchboards is fed from either the general supply or the essential supply through automatic changeover contactors. Inspections and testing can thus be carried out in turn on the two separate supply switchboards, and services are maintained in either one or the other group of lifts.

3.3.5

Free Wi-Fi Services

‘ For tenants’ convenience, we provide free Wi-Fi services at the ground floor entrance lobby. ’

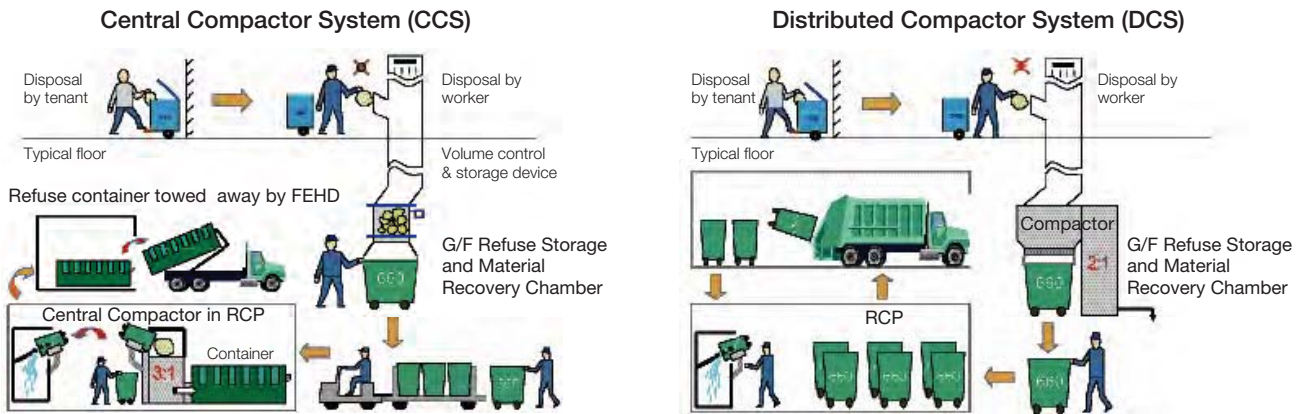
Free Wi-Fi services have been provided in most public rental housing estates, at the entrance lobbies on the ground floor as well as in adjoining open areas, since January 2008.

The service, initially provided in 120 estates, was subsequently extended to cover all 150 public housing developments with about 1,100 hotspots.



- 1 Free Wi-Fi services provided in public rental housing estates
- 2 External areas enjoy free Wi-Fi services

3.3.6 Refuse Handling



“ We have migrated from the Automated Refuse Collection System to a more cost-efficient refuse compaction system. ”

Enhancing health and hygiene in our public rental housing estates, we provide two types of cost-effective refuse handling systems for developments completed since 2005. These two systems, the Central Compactor System (CCS) and the Distributed Compactor System (DCS), have been designed to cater for the refuse handling needs of estates with diverse populations. CCS is used in estates with a daily refuse output of five tons or more. The Food and Environmental Hygiene Department (FEHD) then arranges for a special truck to collect the sealed refuse storage containers. In estates where the population is lower and where the daily refuse output is less than five tons, DCS is used with FEHD collecting the refuse by conventional refuse collection vehicles.

Central Compactor System (CCS)

The system comprises the following major components:

1. a storage chamber with motorised gates connected to the bottom of refuse chutes in

each domestic block correctly controls the volume of refuse loaded into each 660-Litre refuse storage bin before transportation to the refuse collection point,

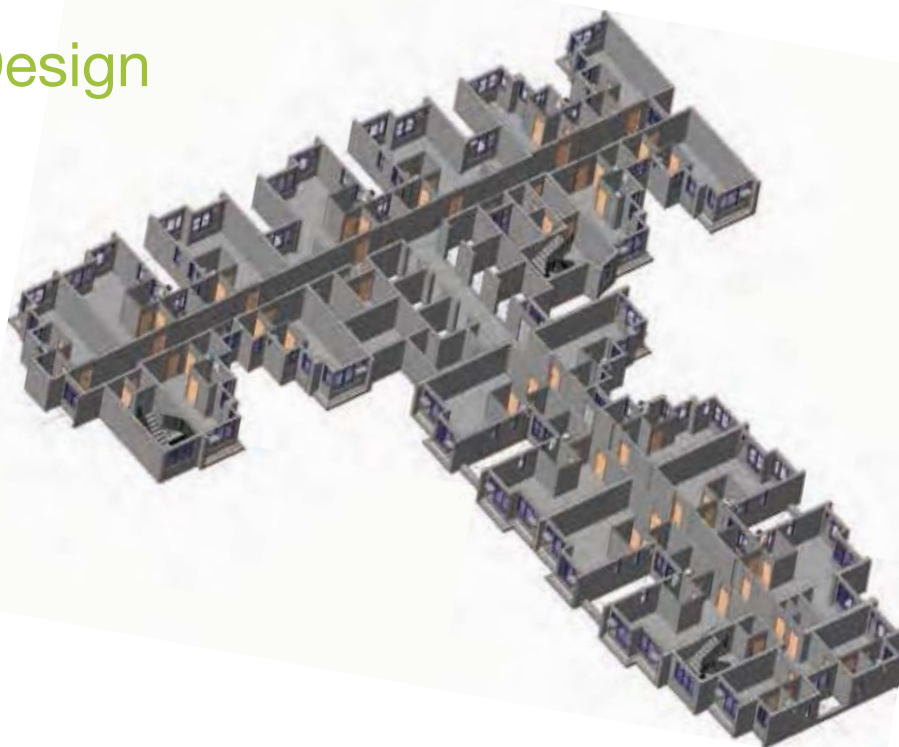
2. a central refuse compactor inside the Refuse Collection Point (RCP) receives and compacts the refuse from the 660-Litre storage bins to one-third its original volume for storage in sealed refuse storage containers, and
3. the sealed refuse storage container, designed for quick loading onto the FEHD collection vehicle, is transported to a refuse transfer station or landfill.

Distributed Compactor System (DCS)

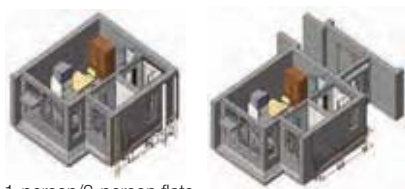
This system consists of a small-scale compactor connected to the bottom of each refuse chute to automatically compact the refuse received to half its original volume and to partially squeeze out any waste liquid before loading the refuse into a 660-Litre bin for subsequent removal to the refuse collection point.

3.3.7 Modular Flat Design

“After implementing site-specific design for a few years with a proliferation of non-standard designs, we rationalised our tool kits by developing modular flat design for mass customisation.”



Small Flat



1-person/2-person flats



2-person/3-person flats

Family Flat



1-bedroom flats



2-bedroom flats

Recently, the Housing Authority developed a new design strategy by adopting a modular flat design for mass customisation in public rental housing. This Modular Flat Design (2008 Version) has been developed to strike a better balance amongst various factors including valuable land resources, buildability, cost effectiveness, user-friendliness as well as taking findings from Resident Surveys. A product of the cumulative experience gained over the years, this modular flat design will help assure quality and cost-effectiveness while at the same time achieving consistency in core standards.

In line with our “functional and cost-effective design” principle, the new Modular Flat Design (2008 Version) library permits wider use of mechanised building processes promulgated under our Quality Housing Initiatives.

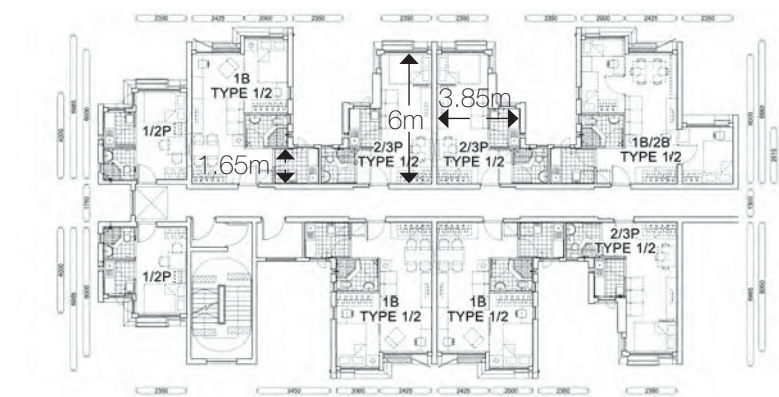
Currently, this library covers a whole spectrum of small modular flats (1-person/2-person flats and 2-person/3-person flats) as well as family modular flats (1-bedroom flats and 2-bedroom flats). Individual projects can choose standard modular flats from this library in the design of buildings to suit individual site situations.

3.3 PEOPLE-ORIENTED PLANNING AND DESIGN | Focused on Quality Living for Residents

Major benefits of Modular Flat Design (2008 Version) include:

- 1. Optimising flat size and service area ratios for better living spaces and higher flat production.
- 2. Standardising dimensions and configurations for healthy living, comfort, flexibility and micro-climate controls in ventilation, lighting and solar heat gains.
- 3. Refining flat layouts and details, reinforcing Universal Design for better accessibility and convenience.

- 1 Standardised dimensions for building assemblies
- 2,3 Side windows for improvements in ventilation
- 4,5 Lowering of windows for better natural lighting
- 6 Universal Design – lowered switches to 1 m high for easy reach and wide enough access for wheelchairs and walking-aids
- 7 Universal Design – recessed support for cooking bench/sink unit for wheelchair access



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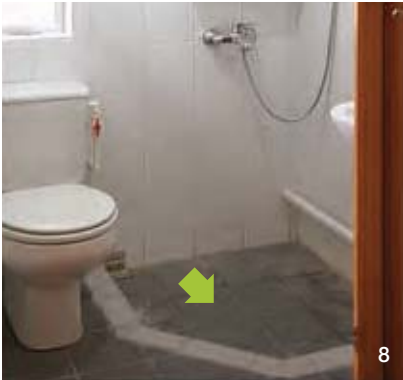
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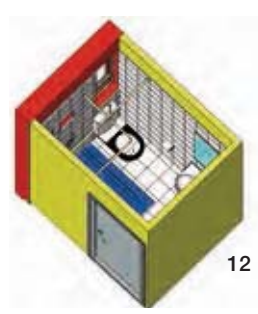
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Pre-fabricated Components



Volumetric Precast Bathrooms



1-person/2-person flats

2-person/3-person flats

1-bedroom and 2-bedroom flats



4. Enhancing plumbing designs, drainage and electrical installations for healthy living and easy maintenance.
5. Standardising the design of structure and fabric components to enhance buildability and achieve better economies of scale.
6. Focusing on the safety, privacy and daily operational requirements of tenants.
7. Optimising site development potential with site-specific design.
8. Assuring quality, cost-effectiveness and consistency.

The first project to adopt the Modular Flat Design (2008 Version) was the Redevelopment of Lower Ngau Tau Kok Estate.

We received strong support from the construction industry who welcomed this standardisation and modularisation, as it ensures better buildability and ease of management for public rental housing construction.

- 8 Sunken shower
- 9 Common W-trap System
- 10 Pre-fabricated panel wall
- 11 Pre-fabricated flat entrance gateset
- 12 Volumetric precast bathroom
- 13 Shower grating to level the shower area for better accessibility by wheelchair users
- 14 Laundry rack installed at front façade