

巧構妙築 建優拓新

Design and Construction –
a Quality Built Environment



This year's theme for the Annual Report of the Hong Kong Housing Authority (HA), "Work Together for Quality Public Housing", is especially appropriate when applied to the HA's construction activities. For this we rely on the collaborative efforts of dozens of different parties working together for a high-quality outcome. They include planners, architects, engineers, designers, environmental experts, auditors, administrators, and, of course, contractors of all kinds. Despite their varied expertise and widely differing modes of operation, all the HA's construction stakeholders share a common vision and a set of common values. "Quality" remains the central goal: quality of work, quality of materials, quality of environment, and quality of housing for Hong Kong. In this chapter, we lay out some of the most important ways in which we are achieving quality housing at every level of our construction activities, in

the process helping to build strong, well-designed, lasting homes for those who most need them.

In terms of simple quantity, the HA completed construction of around 13 100 new flats in 2019/20. These included around 10 100 public rental housing (PRH) / Green Form Subsidised Home Ownership Scheme (GSH) flats in seven projects, and around 3 000 other subsidised sale flats (Other SSFs) in three projects. We also completed construction of around 17 600 square metres of gross floor area for retail facilities, and around 660 private car and lorry parking spaces.

At the same time, over the year we developed scheme designs and worked out project budgets for several new and upcoming projects.

PRH/GSH Projects Completed in 2019/20 (in chronological order):

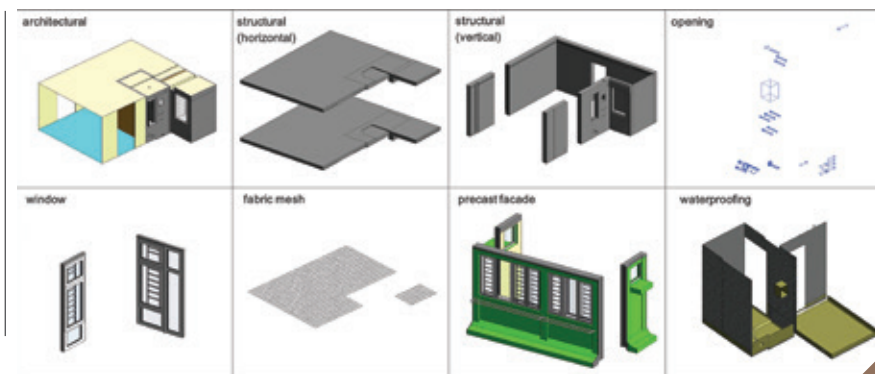
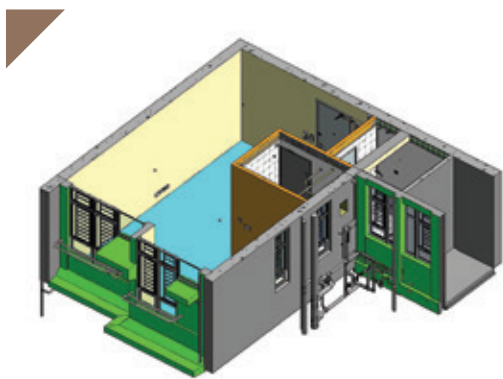
Sau Ming Road	Sau Mau Ping Estate	Sau Yun House
Choi Yuen Road	Po Shek Wu Estate	Shan Wu House, Tsz Jing House, Bik Yuk House
Shek Kip Mei Phase 6	Shek Kip Mei Estate	Mei Hei House, Mei Pak House
Fo Tan	Chun Yeung Estate	Chun Yat House, Chun Yi House, Chun San House, Chun Sze House, Chun Wu House
Fanling Area 49	Fai Ming Estate	Sing Fai House, Tai Fai House
Fung Shing Street	Fu Shan Estate	Fu Fai House
Tung Tau Estate Phase 8	Tung Wui Estate	Wui Chi House

Other SSFs Projects Completed in 2019/20 (in chronological order):

Cheung Sha Wan Wholesale Food Market Site 5 Phase 2	Hoi Lok Court	Hoi Sha House, Hoi Ting House, Hoi Yuk House, Hoi Tung House
Texaco Road	Sheung Man Court	Sheung Man Court
Wo Sheung Tun Street	Choi Wo Court	Choi Wo Court



Shek Kip Mei Phase 6 (two blocks on left)



MFD BIM models break down flats into separate components for easier and more efficient design

Technology in the Service of Design Quality

New technologies are providing us with valuable ways of enhancing the quality of our design processes. Recently, for example, we have been using “reality capture” technology to enhance tree preservation in a project at San Kwai Street. “Reality capture” is the process of obtaining surface characteristics and spatial information of an object, building or site in three dimensions, from which accurate digital representations can be created. For the San Kwai Street project, we used laser scanning technology to capture a set of 3D point clouds of the existing trees on the site. By integrating the 3D point clouds with the Building Information Model (BIM) of the housing development, our architects were able to accurately visualise the proximity and disposition of the existing trees in relation to the proposed buildings. This enabled us to make well-informed decisions about both the building design and appropriate levels of tree pruning.

BIM: Our Design Library

Although BIM technology can be used to produce 3D models, at heart it is essentially an information management strategy. In 2019, we applied BIM technology to our standard Modular Flat Design (MFD) flat units and develop a digital “library” of MFD BIM models. These models cover different stages of the project life cycle from start to finish, including scheme design, detailed design, tender, construction, and General Building Plan submission. The MFD BIM “library” of flat units can be easily modified and readily applied to different public housing projects. Having it available helps to enhance our efficiency in the design

and tender preparation processes, and improves collaboration between project team members throughout the entire workflow.

IT at Work

IT resources are nowadays a very important part of planning and construction works for HA's public housing development. Some of the most valuable IT tools used by our architects and engineers include Building Information Modelling (BIM), the Geographic Information System (GIS), the Housing Construction Management Enterprise System (HOMES), Radio Frequency Identification (RFID), and the Development and Construction Site Mobile System (DCSMS).

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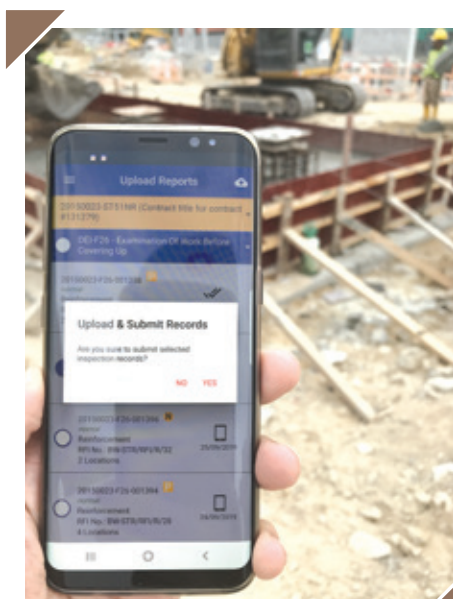
Sheung Man Court in Kwai Tsing

After the mass rollout of DCSMS Phase 1 in 2016, HA site staff were given two applications enabling them to carry out site inspections using mobile technology. With a smart phone and the DCSMS mobile applications (Apps), which include Building Works and Building Services Works Inspection Apps, site staff were able to communicate quickly and directly with contractors, and in a fully traceable way. A Safety Alert App was also introduced to enable HA site staff to report accident/incident to HA top management. These measures have made monitoring the progress of projects easier and more effective. Feedbacks from users suggest that the new system is also enhancing site safety management, quality of work and even contractor productivity.

Subsequent to the roll out of Phase 2 of the DCSMS in 2019, contractors can now use a Request for Inspection App to submit inspection requests once they have completed a construction task, as well as to check the status of their requests. Another Phase 2 feature is a Site Alert App, which enables HA site staff to post site alerts for contractors and communicate with them by instant messaging. Further, the Safety Alert App developed in Phase 1 has been enhanced to enable HA to generate accident statistics report and contractors to submit accident/incident reports and carry out root cause analysis. This has further streamlined our procedures and improved our ability to manage accidents/incidents effectively, generate comprehensive accident statistics and reduce paper records. Other Apps that have been included in Phase 2 are a Site Direction / Site Memo App, used by site staff to issue site directions or memos to contractors, and a Structural Works Inspection App.

We are now proceeding with the development of Phase 3 of the DCSMS, which will consist of Final Flats Inspection Apps and a Foundation Works Inspection App. The Final Flats Inspection Apps are a group of Apps that will support our site staff when they carry out the final flat-to-flat inspection of building and building services works. The Apps will replace the existing HOMES Mobile Site Inspection (HMSI) system, which currently runs on ageing industrial grade Personal Digital Assistants. In July 2019 we began a trial run of the Final Flats Inspection Apps, with roll-out scheduled for mid-2020. Meanwhile, the Foundation Works Inspection App is also under development. This App will support site staff carrying out foundation inspections of the three most frequently used pile types – large diameter bored piles, socketed steel H-piles, and mini-piles. A trial run for this App is scheduled for late 2020, with rollout planned for mid-2021. It will replace the existing Construction Mobile Inspection System (CMIS), which currently runs on ageing Windows tablets.

Since 2016, our staff have benefited from the launch of seven Apps under the DCSMS, namely a Building Works Inspection App, a Building Services Works Inspection App, a Structural Works Inspection App, a Request for Inspection App, a Site Direction / Site Memo App, a Safety Alert App and a Site Alert App. With Phase 3 further expanding the suite of useful Apps, we are ensuring that IT continues to be exploited to the full to enhance the quality of public housing development.



(Left) The DCSMS Apps on mobile devices are streamlining safety management and enhancing quality and productivity at our sites

(Right) Enhanced Precast Technology: Precast plank for semi-precast corridor slab with pre-installed conduits

Exploring the Potential of Modular Integrated Construction

Since 2008, the HA has adopted Modular Flat Design with no-frills finishes and fittings as its development strategy for all public housing developments. The Modular Flat Design involves the use of precast concrete components which are constructed off-site and transported to the building site for final assembly. In her 2017 Policy Address, the Chief Executive announced new initiatives for promotion of Modular Integrated Construction (MiC) in the construction industry. The MiC refers to the manufacture of free-standing volumetric modules which are completed with most of the finishes required for walls, floors and ceilings off-site before they are assembled on site. Although the MiC is similar to the HA's modular system, it involves a higher amount of finishes to be pre-installed to the components as compared with HA's no-frills design.

In line with the Policy Address, the HA has been exploring the viability of applying the MiC in public housing construction for further enhancing our productivity. In parallel, the HA has extended the application of the precast concrete construction technology to areas such as semi-precast corridor slab with pre-installed conduits. We are continuing to explore other opportunities to further increase the site productivity, for example by using volumetric precast lift machine rooms located on the main roofs of housing blocks.



A robot conducting water test at bathroom

Promoting the Use of Robotics Technology for Quality Construction

Nowadays, new construction technologies are developing at a rapid pace, and there are success stories concerning the application of robotics technology to enhance productivity and quality of works in construction sites. We believe that the use of robotics technology at construction sites could also help address challenges being posed by Hong Kong's ageing workforce and the city's labour shortage. Robotics also has the potential to improve site safety and to deliver better quality housing. To encourage wider use of robotics technology by contractors, the HA has incorporated requirements relating to robotics construction in tender assessment of complex building new works contracts since March 2020. Technical scores would be allocated to applications of robotics for tasks such as wall painting and the laying of floor tiles that would enhance productivity, quality, safety and environmental performance. We are also exploring ways of wider application of robotics technology in our construction through R&D collaborations with stakeholders.

Greener Estates for Better Living Quality

Increasingly, we are using scientific studies and technological tools to ensure our estates are green and operate sustainably. From the very start, at the level of designing a new PRH development, we use **Carbon Emission Estimation (CEE)** to estimate the total carbon emissions of the estate – including emissions generated by construction materials, building structures, communal building services installations, energy usage, tree-planting, and demolition – over its expected life of 100 years. With this information, we can adjust the design in ways that reduce carbon emissions and improve the overall sustainability of the development. Once the estate is operational, we also use the **ISO 50001 Energy Management System** to measure and monitor the communal energy consumption of each domestic block. In 2019/20, we applied CEE and energy estimations to seven new projects, using this information to reduce the estimated communal energy consumption for their domestic blocks by about 29% compared with the baseline figure.



The Zero Irrigation System in use at Yau Lai Estate

To promote the use of renewable energy in line with Government policy, since 2011 the HA has been providing a **grid-connected photovoltaic (PV) system** for each domestic block in new PRH developments whenever sufficient space is available and the relevant design criteria can be met. PV systems convert solar energy into electricity, and the HA's PV systems are designed to feed in electricity equivalent to about 1.5% to 2.5% of the demand of the building communal area to the electricity grid. Up to the end of March 2020, PV systems with a total system capacity of 1 010 kW had been installed in 109 domestic blocks in HA estates.

We have also continued to incorporate “passive design” and **micro-climate studies** into our design activities. These tools enable us to understand the specific geographical and climatic features of our building sites and use this knowledge to adjust our designs, for example by using the distribution of daylight better, avoiding “hot spots”, and improving natural ventilation.

Ground Granular Blast Furnace Slag (GGBS) is an environmentally friendly replacement for concrete in some circumstances, and its use has been mandated in our specifications for new building contracts for some time. In addition, 35% of the cement in concrete used for the construction of precast concrete façades and precast staircases is required to be replaced with GGBS. We are currently conducting viability studies which, if successful, will extend this requirement to semi-precast slabs.

Planting is another way of enhancing the greening of our estates. Our policies stipulate that wherever possible, at least 20% of the site area of each new estate should be reserved for greening, rising to 30%

for estates covering more than two hectares. Our target tree-to-flat ratio is one tree for every 15 flats built. One challenge with planting in dense urban sites is to ensure trees and plants receive adequate water. Since 2016, we have been using an in-situ type of Zero Irrigation System to irrigate selected planters in all our PRH and Subsidised Sale Flat (SSF) projects. This system has also proved effective in enhancing our storm water management and reducing the use of potable water for irrigation. We are continuing to look at ways of improving this system by incorporating more sustainable materials. Other greening initiatives have included the development of a prefabricated modular system to make the planting of trees at ground level and on the podiums of estate blocks quicker and easier, and the use of more pre-grown vertical green panels at appropriate projects to create “instant greening” effects.

Green Buildings, Gold Ratings

Every building project completed by the HA that requires a gross floor area (GFA) concession is submitted for assessment under the Hong Kong Green Building Council's green building assessment scheme, the Building Environmental Assessment Method Plus for New Buildings (BEAM Plus NB). This scheme provides us with an objective external assessment of the sustainability features of our new developments throughout their entire life-cycles. As a matter of policy, we aim to achieve at least a Gold rating standard under the scheme. The HA's 2019/20 certification results under BEAM Plus NB (Version 1.2) are as follows:



3D illustration of Subsidised Sale Flats Development at On Muk Street Phase 1

Project & Rating (Provisional Assessment)
Subsidised Sales Flat Development at Ma On Shan Road (Gold)
Public Housing Development at Tai Po Area 9 and Public Housing Development at Chung Nga Road East, Tai Po (Gold)
Subsidised Sale Flat Development at On Muk Street Phase 1, Shek Mun, Sha Tin (Gold)

Universal Design for Safety and Accessibility

All of the HA's new and refurbished estates are designed in accordance with the **Universal Design** approach. This approach refers to design that ensures an environment can be accessed, understood and used to the greatest extent possible by all people regardless of their age or abilities. Universal Design brings particular benefits for the elderly, who make up a significant percentage of our PRH residents. Default design features these days include wheelchair-accessible corridors, flat entrances, and kitchen and bathroom doorways. We also incorporate materials and fittings that are safer and easier to use for the elderly, such as non-slip floor tiles and large-sized switches.

Safety for All Workers

The HA's safety commitments are laid out in detail in our annually updated Site Safety Strategy. This contains detailed requirements for all construction work carried out on our New Works and Maintenance Works sites, and for work carried out by the HA's property services agents, cleansing services contractors and security services contractors. It also includes stringent tolerance to accident, currently not more than nine accidents per 1 000 workers in any year. Although any accident is one too many, we are pleased that the HA's accident rates for 2019 were just 5.2 cases per 1 000 workers for New Works contracts and 5.3 per 1 000 workers for Maintenance Works contracts. By comparison, the average industry accident rate for Hong Kong overall is 29 per 1 000 workers. Furthermore, although 16 industrial fatal accidents were recorded in the Hong Kong construction industry during the year, none of these occurred under HA New Works or Maintenance Works contracts. The HA's site safety website at <https://www.housingauthority.gov.hk/sitesafety> provides further accident statistics relating to the HA's works contracts and the Hong Kong construction industry as a whole.



A worker working under the tower crane



A mist jet gun helps lower the temperature on a site

To maintain such high standards of safety, during the year we enhanced some of our risk management measures and work process controls. In order to better monitor the safety performance of our contractors, we made improvements to our safety auditing systems, including the HA Safety Auditing System and the HA Lift and Escalator Nominated Sub-contracts Safety Auditing System for New Works, and the HA Safety Auditing System (M&I) and HA Lift and Escalator Installation Safety Auditing System for Maintenance and Improvement works. Also strengthened was the Surprise Safety Inspection Programme, which improved our ability to run surprise site safety checks of New Works contracts.

Audits and inspections are important ways by which we monitor and improve safety practices, and we specify a number of these in the HA Safety Auditing System. For example, we run regular audits of New Works and Maintenance Works, together with surprise safety inspections of these works, which are used to improve our safety practices and performance. During the year we introduced new and revised safety specifications for New Works contracts that included new safety innovations recognised in the safety audit, new good site practices to heighten safety awareness and prevent accidents, a safety climate index survey, and a work safe behaviour programme to raise workers' awareness of correct safety procedures. For Maintenance and Improvement Works, enhancements were introduced that included a more comprehensive scaffold assessment as a part of the surprise inspection.

Safety training is another important way of keeping our safety standards high. During the year we ran several safety forums, seminars and workshops for our contractors and works staff. These included our annual Safety Forum in July 2019, run under the slogan "Caring Culture for Safe Work Practice – We Bolster Caring Culture for Safety and Health of Our Workers". Safety information was also made available and regularly updated on the HA Site Safety Website, which included information on accident statistics, Safety & Health Alerts, powerpoints and videos of safety forums and seminars, good site practices and innovative site safety measures, safety handbooks and other publications. An updated edition of the *Site Safety Handbook for Maintenance and Improvement Works* was published and distributed to all units in the Estate Management Division, with the electronic copy uploaded onto the HA Site Safety Website.

With the outbreak of novel coronavirus disease (COVID-19) in January 2020 in Hong Kong, we moved quickly to protect site workers' health. To start with, we alerted our contractors of the importance of stepping up measures to prevent the spread of the disease by strengthening their compliance with requirements imposed by the Government and observing advice issued by the Department of Health's Centre for Health Protection. Specific measures adopted included site monitoring to identify any workers showing symptoms, and anti-disease messages disseminated to workers at special briefing sessions. Workers who were feeling sick were advised to stay at home and seek medical advice. Enhancements were also made to site hygiene arrangements, including enhanced cleaning of toilet and latrine facilities and improved ventilation of rest areas.

Comprehensive Quality Management

The HA holds, or requires its contractors to hold, certifications for various international quality management systems. This is to ensure that our performance is in line with international standards, and can be measured against that of other similar organisations worldwide. Our Development and Construction Division bases some of its work on the European Foundation for Quality Management Excellence Model, while all HA contractors must be ISO 9001, ISO 14001 and OHSAS 18001 certified. In addition, our building (New Works) contractors and

piling contractors must operate a certified ISO 50001 energy management system. In March 2018, new ISO 45001 certification was rolled out that will replace the existing OHSAS 18001 standard in three years' time, while new ISO 50001 certification was introduced in August 2018. We have accordingly alerted relevant contractors of the need for them to acquire ISO 45001 certification and to transit to the 2018 edition of ISO 50001.

The standards to which we are certified and the management systems we adopt in our operations are shown in the following tables:

Certified Standard	Scope	Certified since
Development & Construction Division (DCD)		
ISO 9001: Quality Management	Planning, design, project management and contract administration for the construction of public housing	1993
ISO 14001: Environmental Management	Planning, design, project management, contract administration and materials testing for the construction of public housing	2009
ISO 50001: Energy Management	Planning, design, project management and contract administration for the construction of public housing	2012
ISO 45001: Occupational Health and Safety Management System	Materials testing for the construction of public housing	2020
Estate Management Division (EMD)		
ISO 9001: Quality Management	Planning, design, project management and contract administration for the maintenance and improvement of public housing	1993
ISO 14001: Environmental Management	Planning, design, project management and contract administration for the maintenance and improvement of public housing estates. Provision of property management services (including cleansing, security, landscaping and office administration) in public housing estates	2011
ISO 50001: Energy Management	Planning, design, operation, project management and contract administration for facility management and improvement works of the communal areas of PRH domestic blocks	2013
ISO 45001: Occupational Health and Safety Management System	Planning, design, project management and contract administration for the maintenance and improvement of public housing	2019
Independent Checking Unit (ICU)		
ISO 9001: Quality Management	Building Control for Public Housing	2014
ISO 14001: Environmental Management	Building Control for Public Housing	2014

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Other Quality Schemes/ Standards	Scope	Adopted since	Remarks
DCD			
ISO 26000: Social Responsibility	Planning, design, project management and contract administration for the construction of public housing	2010	Integrated with other management systems of DCD. A non-certifiable standard, but measured through the HKQAA CSR Advocate Index. For the eighth consecutive year since 2012, DCD achieved the full score of 5.0.
ISO 31000: Risk Management	Planning, design, project management and contract administration for the construction of public housing	2010	Integrated with other management systems of DCD.
European Foundation for Quality Management (EFQM) Excellence Model	Planning, design, project management and contract administration for the construction of public housing	2010	Integrated with other management systems in DCD.
EMD			
ISO 19011: Auditing Management System	Internal audit for planning, design, project management and contract administration for the maintenance and improvement of public housing	2012	Integrated with other management systems of EMD. A non-certifiable standard, but verified through HKQAA with Verification Statement obtained in 2013.
ISO 26000: Social Responsibility	Planning, design, project management and contract administration for the maintenance and improvement of public housing	2012	Integrated with other management systems of EMD. A non-certifiable standard, but measured through the HKQAA CSR Advocate Index. For the sixth consecutive year since 2014, EMD achieved the full score of 5.0.
ISO 31000: Risk Management	Planning, design, project management and contract administration for the planned maintenance and improvement of public housing	2012	Integrated with other management systems of EMD. A non-certifiable standard, but verified through HKQAA with Verification Statement obtained in 2013.
HKQAA Sustainable Building Index (SBI) Scheme	Sustainability performance (environmental, social and economic) of domestic blocks in 10 estates containing all major block types	2012	A non-certifiable standard, but verified through the HKQAA SBI Scheme. In 2012, the HA became the first organisation to obtain the HKQAA SBI Verified Mark.



Measuring the verticality of pile steel casing (left) and supervising the construction of driven H-piles to ensure building quality

The social responsibility performances of the HA's Development and Construction Division (DCD) and Estate Management Division (EMD) are both assessed annually under the Corporate Social Responsibility (CSR) Advocate Index of the Hong Kong Quality Assurance Agency (HKQAA). Based on ISO 26000 standards, the index measures the level of maturity of the Divisions' social responsibility undertakings and their contributions in areas of organisational governance, human rights, labour practices, the environment, fair operating practices, consumer issues, and community involvement and development. In 2019, the DCD achieved the full HKQAA CSR Advocate Index score of 5.0 for the eighth consecutive year, and the EMD achieved 5.0 for the sixth consecutive year.

Quality in Core Building Materials

While all the HA's contractors must be ISO 9001 compliant, we also look to guarantee the quality of many of the building materials sourced by these contractors for use in HA construction. Our product certification requirements are one way of doing this, proving an extra layer of quality assurance on the upstream side of the supply chain. The 12 key building materials or products for which we currently require product certification are fire resistant timber doors, panel wall partitions, packed cement for architectural use, tile adhesives, ceramic tiles, repair mortars, aluminium windows, uPVC drainage pipes and fittings, close-coupled water closet suites, mesh reinforcement, LED bulkheads, and multi-layer acrylic paints.

Separately, we also require major plumbing pipes and pipes fittings used in HA construction or maintenance works to carry the Kitemark of the British Standards Institution or to be covered by other product certification schemes accepted by the Water Supplies Department. In addition, we carry out surveillance tests on plumbing materials after delivery. Much plumbing work is sub-contracted by the HA's main contractors. In order to maintain the plumbing quality, these main contractors are contractually required to appoint domestic plumbing sub-contractors from the Plumbing Installation Category of the Development Bureau's List of Approved Suppliers of Materials and Specialist Contractors for Public Works. Further, to avoid concentration risks, we have imposed workload capping limits on the approved plumbing sub-contractors and our Licensed Plumbers. When developing and implementing their building management plans, our building contractors are required to include provisions for the close supervision of plumbing sub-contractors and Licensed Plumbers.

As an extra step to ensure the highest quality of building materials, we require all our new works contractors to develop project-specific materials risk assessment systems for their building materials, including those supplied by their sub-contractors and suppliers. These systems are then incorporated into the contractors' Quality Control Systems and Sub-contractor Management Plans. Contractors are required to appoint third-party Certification Bodies to conduct annual audits of their Quality Control Systems for each HA project they are involved in.



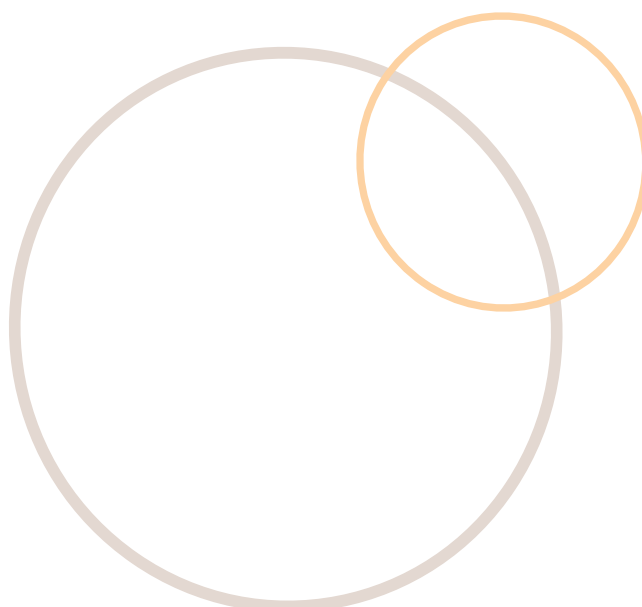
LED bulkhead (left) and aluminium windows are two of the 12 key building products for which we currently require product certification

Independent Third-party Overseeing

The HA draws on the expertise of the [Independent Checking Unit \(ICU\)](#), under the Office of the Permanent Secretary for Transport and Housing (Housing), to provide a range of checks and balances on its work. Building plans and structural plans submitted for the HA's new development projects are all subject to third-party checking by the ICU, as well as plans for Alterations & Additions (A&A) works in our existing buildings (including Minor Works). The ICU exercises administrative building control over the HA's new development works and existing buildings in line with the Buildings Ordinance and the Building Authority (BA)'s policies and guidelines. In addition, under the authority delegated by the BA, the ICU is responsible for statutory building controls in relation to properties with subsidised sale flats sold by the HA, as well as retail and car parking facilities divested to Link or their subsequent private owners. For these buildings, the ICU processes submissions for A&A and Minor Works applications, and offers advisory input on the suitability of using premises for different purposes (in relation to various licensing referrals from other government departments). The ICU is also responsible for overseeing the implementation of the Minor Works Control System, the Mandatory Building Inspection Scheme (MBIS) and the Mandatory Window Inspection Scheme (MWIS), and for enforcing the rules on unauthorised building works and dilapidated buildings.

Since 2016, the HA has been able to submit building and structural plans for both its new development projects and A&A works for existing HA buildings to the ICU by e-submission via the ICU's [Housing Electronic Plan Submission System \(HePlan\)](#), which enables the submission to be processed electronically. The ICU's [Housing Electronic Building Records Online System \(HeBROS\)](#), meanwhile, provides the public with on-line inspection and copying services for HA building records, and enables searches on the submission status of Minor Works, MBIS and MWIS records.

The Lift Inspection Focus Team operates an audit inspection system for lifts and escalators managed by the HA, which helps us improve lift and escalator safety and reduce the risk of accidents.



Procurement Quality

The HA engages various works contractors to build and maintain its estates, and property management service providers to manage its estates and facilities. Embracing the partnering spirit and in line with its corporate vision and mission, the HA is committed to securing competent, reliable and long-term partners through equitable procurement operations in accordance with the following principles:

- (1) Safeguard open and fair competition in the marketplace;
- (2) Partner in a fair, reasonable and ethical manner;
- (3) Provide effective administration which is accountable and transparent;
- (4) Obtain value for money;
- (5) Incorporate risk management on a holistic basis; and
- (6) Maintain continuous improvement.

The HA is a procuring entity governed by the Agreement on Government Procurement (GPA) of the World Trade Organisation, and it adopts selective tendering procedures in procuring most of its core businesses. Other types of tendering arrangements, including open tendering, limited tendering and prequalified tendering, may also be adopted as appropriate. For many years, the HA has maintained lists of qualified works contractors and property management services providers appropriate to the nature of its business, in accordance with the Guide to Registration of Works Contractors and Property Management Services Providers (the “Guide”). Currently, the HA has nine Lists of Works Contractors and three Lists of Property Management Services Providers. For selective tendering, HA normally invites those qualified contractors on the relevant HA Lists to submit tenders for works contracts and property management services contracts, in a fair and non-discriminatory manner. Contractors who are not on the HA Lists can apply for admission, and these applications are processed in accordance with the “Guide”.



The newly completed PRH project – Shek Kip Mei Phase 6

Public Engagement —
The Wah Fu Estate Redevelopment



Dr Liao Poon-huai (left) and Mr Stanley Ying – two Directors spanning over half a century – share the development of public housing over the past 50 years

Public housing is ultimately for the community, so it is logical to take into account opinions of members of the community in any proposed developments to the area they live in. The value of community engagement is well understood by the Hong Kong Housing Authority (HA), and recently we have had the opportunity of rolling out public engagement activities for a major redevelopment project: the Wah Fu Estate Redevelopment.

Wah Fu Estate is one of Hong Kong's oldest public rental housing (PRH) developments, having been officially unveiled back in 1968. Several generations of Hong Kong residents have grown up there, and it remains a much-loved home to many. When the Chief Executive announced the Wah Fu Estate Redevelopment in the 2014 Policy Address, the HA engaged the local community in the redevelopment process as a consistent approach, especially when developing a preliminary clearance plan. The redevelopment project is a complex and large-scale one, and includes the need for reprovisioning

communal facilities and rehousing residents. It was vital that the memories, values, needs and aspirations of the local community would be well considered.

Wah Fu Estate reached its 50th anniversary in 2018, and we celebrated this milestone with an event titled “A Cultural Journey through Half-Century Wah Fu”, held in the estate on 7 April 2019. This historic celebration event was organised in collaboration with 19 co-organisers, including tenants' associations of Wah Fu Estate, local non-profit making organisations, and local schools, etc. A highlight of the opening ceremony was the presence of the first Director of Housing and the chief designer of Wah Fu Estate, Dr Donald Liao Poon-huai, who officiated along with the then Permanent Secretary for Transport and Housing (Housing)/Director of Housing, Mr Stanley Ying, and representatives of the 19 co-organisers and of Southern District Council. Fun activities at the event included a “Wah Fu Today and Yesterday” carnival and a series of cultural performances.



Wah Fu Carnival is well received by the tenants

This wonderful event was the perfect occasion to launch our first community engagement workshop on the redevelopment programme. That workshop brought together around 100 participants to share their views, most of them were residents of Wah Fu Estate and representatives from 12 local groups and the local district councilor. Their discussions were based on a questionnaire and the first issue of Wah Fu redevelopment newsletter “On the Road to Redevelopment”, which was distributed to all Wah Fu Estate stakeholders before the event. Following the valuable exchanges during the workshop, a second newsletter was published in January 2020 to update stakeholders on the workshop findings and the consolidated results of the questionnaire survey.



Wah Fu newsletter “On the Road to Redevelopment” issue nos.1 (left) and 2

One of the goals of the public engagement campaign was to bring together the HA, Wah Fu Estate tenants and other local groups in a joint effort to identify and preserve the most valuable historical and cultural elements of the estate during its future redevelopment. The aim of the first community workshop was to provide the HA with a channel to engage with the local community at a very early stage, in order to arrive at a general consensus for the future redevelopment plan to base on. We are trying to build trust and productive relationships with the local community in the whole process, thus enabling the upcoming redevelopment process to progress smoothly and harmoniously.

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The kick-off ceremony of the project “A Cultural Journey through Half-Century Wah Fu”

Fast-track Housing Development: Hoi Ying Estate, Hoi Lok Court & the Long-span Footbridge



The single-aspect wings facing the West Kowloon Highway

Sitting between the West Kowloon Highway and the Cheung Sha Wan waterfront are two recently completed public housing projects – Hoi Ying Estate and Hoi Lok Court. Occupying a site once reserved as a wholesale food market, the two developments have been designed and built under a fast-track programme spanning just over five years. The feasibility study and the initial design of the project began in 2013, with Hoi Ying Estate and Hoi Lok Court Phase 1 completed in 2018 and Hoi Lok Court Phase 2 in 2019. The two developments are now providing about 3 840 comfortable, quiet and affordable homes for around 11 300 residents. The speed that these two sites were developed is all remarkable given the isolated nature of the site geographically and the severe site constraints, and is a testament to some exceptional design and construction efforts.

The secret to the success of these two developments was holistic and comprehensive planning. From the outset, both Hoi Ying and Hoi Lok were planned, designed and developed as a single community. Both sites were subject to severe noise challenges, primarily due to their proximity to the 16 traffic lanes of the adjacent West Kowloon Highway and Lin Cheung Road, as well as being bounded by the MTR Tung Chung Line

and Airport Express to the north. The area available for building the domestic blocks on the site was relatively small due to the need to maintain a designated non-building area, the existence of an extensive drainage reserve area within the site, and the need to provide a 3 800-sq.m. public open space in the development.

Our designers came up with seven different site-specific blocks for the estates that would maximise the site development potential while also mitigating road traffic noise from the highway and railway noise from the above-ground MTR lines. First, domestic blocks in the development were set as far apart from Route 3 as possible, and single-aspect design was largely adopted on this side of the blocks so that flats faced away from the road. The orientation, design and disposition of each domestic block were then optimised to provide mutual noise-screening without compromising ventilation. Acoustic fins and acoustic windows were also provided for some flats. Added articulation through colour patterns and architectural fins helps enliven the single-aspect “walls” facing the roads. The result is a group of buildings that has a pleasant visual impact, harmonises with the neighbourhood, and offers a surprisingly quiet environment.



The well-designed public open space for relaxation

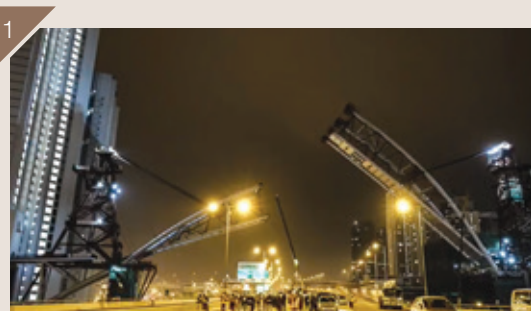
The estates have also been designed to foster a harmonious community life, with many external spaces and amenities provided for relaxation and recreation. Vehicular traffic is limited to the periphery facing the busy roads, enabling a quiet and traffic-free central court and amenity area to be created for residents. The public open space between Hoi Ying and Hoi Lok takes advantage of a ventilation corridor for cooling, and has been designed to act as a social hub for seasonal and festive social events. With the development built on reclaimed land, its landscape elements reflect the changing coastline of Cheung Sha Wan over the years. Another special feature is a viewing deck located in the centre of the public open space that offers panoramic views of the harbour waterfront. Elsewhere, the roof of a semi-basement carpark in Hoi Lok provides a platform for a landscaped garden for residents, with its ventilation shafts cleverly integrated into the roof garden's contours.

Although Hoi Lok is only a 10-minute walk from the MTR Nam Cheong Station, Hoi Ying and Hoi Lok are indeed quite a distance from the busy centre of Cheung Sha Wan. Creating a pedestrian connection between the two estates and the centre of Cheung Sha Wan through Hoi Tat Estate, a public housing development on the other side of the West Kowloon Highway, posed a major design challenge. These two waterfront estates are separated from Hoi Tat Estate by 16 lanes of major roads. The solution was an elevated walkway that would span these laneways in the form of a single long-span footbridge. With a length of about 145 metres, it will be the longest pedestrian footbridge connecting public housing estates in Hong Kong. Its tied arch and warren truss design enables the footbridge to have a wide span without intermediate supports, providing unobstructed sightlines for drivers on the roads below.

Connecting the pre-erected halves of the bridge between Hoi Ying and Hoi Tat Estates took place overnight and required a large section of Lin Cheung Road and the West Kowloon Highway to be completely closed for traffic. Both structural frames were lowered and joined to create the bridge link in the early morning of 29 December 2019, in an operation that involved collaboration with overseas experts and various government departments. Building services and finishing works on the structural frames are currently in progress, with the footbridge due for completion by late 2020. Eventually to be topped with a glass canopy, the footbridge will become an iconic feature of this cluster of public housing estates and a vital component of the vibrant new community on the Cheung Sha Wan waterfront.

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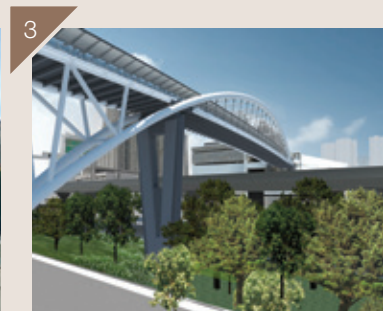
The erection process of the long-span footbridge:



The operation in progress before dawn of 29 December 2019



Finishing works on the footbridge (June 2020)



Footbridge completed