



擁抱科技 持續建屋

Embracing Technology to Build
a Sustainable Housing Stock



下圖為深水埗白田邨第七及八期
The picture below shows Pak Tin Estate
Phases 7 and 8 in Sham Shui Po



發展及建築處的主要職能

Key Functions of the Development and Construction Division

- 推行和監察房屋建設計劃
- 在公營房屋土地供應、發展、規劃、設計和建設方面，制定和檢討有關的策略和政策
- 制定、推行和探討機構採購、安全和環境管理策略
- 就全港／區域／地區規劃研究及規劃標準與準則提供意見
- 監察房屋資訊系統
- Implementing and monitoring the Housing Construction Programme
- Formulating and reviewing strategies and policies with regard to public housing land supply, and the development, planning, design and construction of public housing
- Formulating, implementing and reviewing corporate procurement, safety and environmental management strategies
- Contributing to territorial / district / local planning studies and planning standards and guidelines
- Monitoring the Housing Information System

「擁抱創科和環保措施，為居民構建可持續、優質和健康的居住環境」

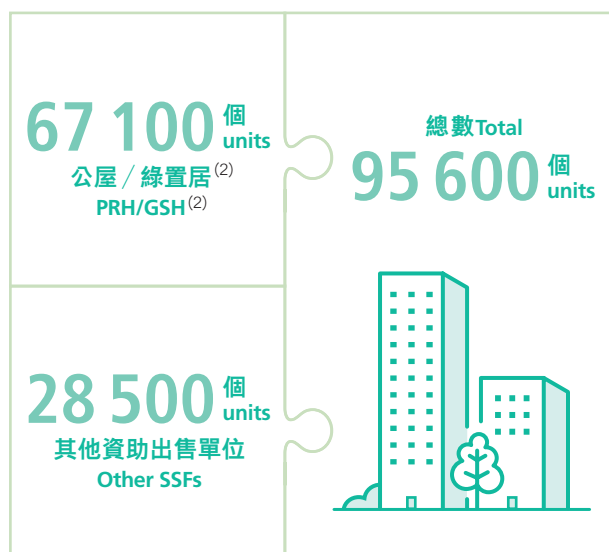
“To embrace innovation, technology and green initiatives to build sustainable, high quality and healthy living environment for our residents”



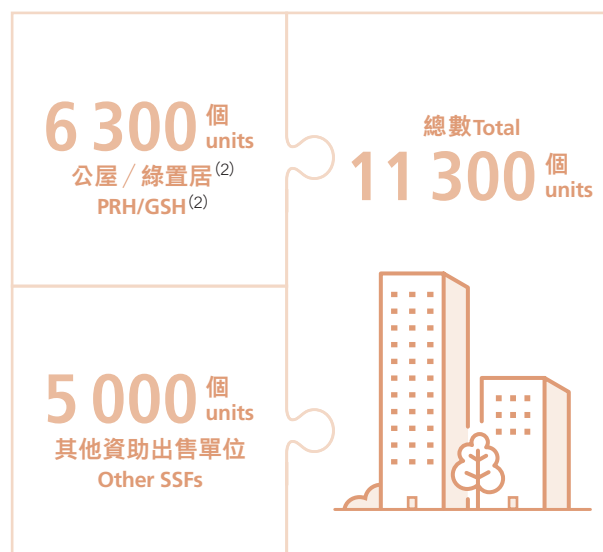
公共租住房屋（公屋）／綠表置居計劃（綠置居）和其他資助出售單位的建屋量⁽¹⁾

Production of Public Rental Housing / Green Form Subsidised Home Ownership Scheme (PRH/GSH) and other Subsidised Sale Flats (SSFs)⁽¹⁾

2020/21至2024/25年度的五年期內預計建成單位總數
Estimated production total in five-year period
from 2020/21 to 2024/25



2020/21年度單位落成數目
No. of units completed in 2020/21



註 Notes:

(1) 數字根據2021年3月房委會的房屋建設計劃計算，並計至最接近的百位整數。數字會因應計劃的改動而有變更。

Figures are based on the HA's Housing Construction Programme as at March 2021, and are rounded to the nearest hundred. Figures are subject to changes in the programme.

(2) 所列數字是指預計於每個財政年度落成的房委會新單位數目，但不反映可供編配予公屋申請者的公屋單位總數，因為有關數字並未包括從現有屋邨收回的公屋單位，而收回的單位是另一個編配予公屋申請者的主要單位來源。

Figures refer to the estimated number of new units to be completed by the HA in each financial year. These numbers do not reflect the total number of PRH units that can be allocated to PRH applicants because they do not include PRH units recovered from existing estates, which is the other major source of units for allocation to PRH applicants.

2020/21年度(約)
Completed in 2020/21 (approximate)



2020/21年度完成的公屋／綠置居發展項目(按時序排列)：

PRH/GSH projects completed in 2020/21 (in chronological order):

永泰道 Wing Tai Road	漁灣邨(漁進樓) Yue Wan Estate (Yue Chun House)
西北九龍填海區6號地盤第一期 Northwest Kowloon Reclamation Site 6 Phase 1	海達邨(海榮樓) Hoi Tat Estate (Hoi Wing House)
彩榮路 Choi Wing Road	彩福邨(彩和樓) Choi Fook Estate (Choi Wo House)
白田第七期 Pak Tin Phase 7	白田邨(康田樓、健田樓) Pak Tin Estate (Hong Tin House, Kin Tin House)
白田第八期 Pak Tin Phase 8	白田邨(詠田樓、心田樓) Pak Tin Estate (Wing Tin House, Sum Tin House)
西北九龍填海區6號地盤第二期 Northwest Kowloon Reclamation Site 6 Phase 2	海達邨(海華樓、海昌樓) Hoi Tat Estate (Hoi Wah House, Hoi Cheong House)



柴灣漁灣邨漁進樓
Yue Chun House, Yue Wan Estate in Chai Wan



深水埗海達邨海榮樓(右)
Hoi Wing House (right), Hoi Tat Estate in Sham Shui Po



觀塘彩福邨彩和樓(左)
Choi Wo House (left), Choi Fook Estate in Kwun Tong

2020/21年度完成的其他資助出售單位發展項目(按時序排列)：
Other SSFs projects completed in 2020/21 (in chronological order):

坳背灣街 Au Pui Wan Street	旭禾苑 Yuk Wo Court
發祥街西 Fat Tseung Street West	凱德苑 Hoi Tak Court
恆健街 Hang Kin Street	錦暉苑 Kam Fai Court
將軍澳第65C2區第一期 Tseung Kwan O Area 65C2 Phase 1	雍明苑(潤明閣、澤明閣) Yung Ming Court (Yun Ming House, Chak Ming House)
東涌第27區 Tung Chung Area 27	裕泰苑(裕玥閣、裕瑛閣) Yu Tai Court (Yu Yuet House, Yu Ying House)



馬鞍山錦暉苑
Kam Fai Court in Ma On Shan



將軍澳雍明苑
Yung Ming Court in Tseng Kwan O

在推行房委會的公營房屋計劃方面，我們一直在新公營房屋項目的規劃和建築階段，更廣泛採用創新科技，包括數碼科技應用技術和別具環保特色的設計。

In implementing our public housing programme, we have been making wider use of innovation and technology in planning and construction of new public housing projects, including digital technology applications and greening features.



「建築信息模擬」技術的最新推行情況

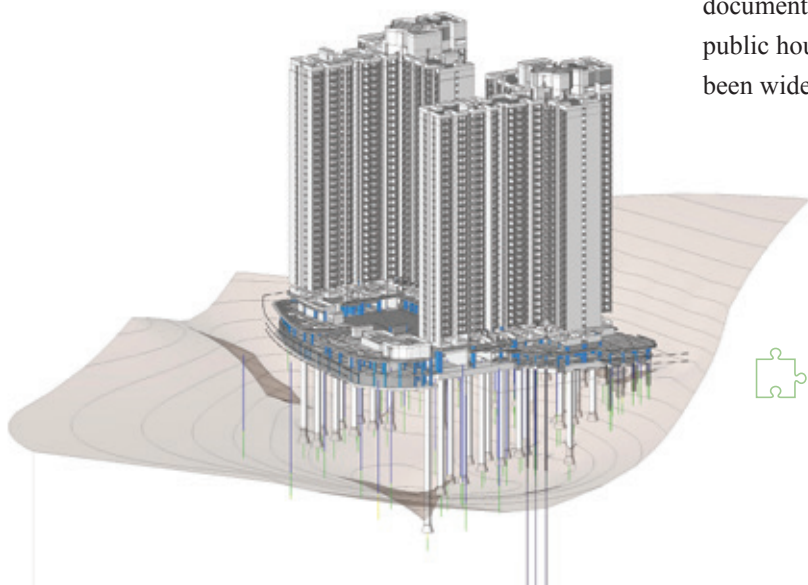
「建築信息模擬」技術有利匯聚各方，合力以虛擬模式共同設計、建造和營運一座建築物。這項技術優點甚多，例如：節省成本和資源、提高效率、改善溝通與協調、提供更多機會使用預製組件和進行構件式建築，以及取得更高質量的成果。長遠而言，所採集的空間數據有利我們拓展其他服務，藉以改善房委會的屋邨管理工作。基於上述原因，房委會希望所有新的公營房屋發展項目在設計和建築階段均採用「建築信息模擬」技術，並期望於2021年底或之前達到這個目標。

年內我們繼續更新房委會的「建築信息模擬」標準和模型指引，製作新範本，支援不同的工程項目，並擴充房委會的「建築信息模擬」物件資源庫。由2020和2021年起，我們分別要求承建商就性質複雜的建築工程投標和地基工程投標提交四維短片。「**建築信息模擬**」也是房委會「建築信息模擬驅動的系統化地基設計」的組成部分；這項地基設計是由部門結構工程師自行研發的一站式地基設計方案，尤其有利於把複雜的地下地質狀況以立體視像方式呈現；亦可用於製作圖則、為法定工程圖則建立明細表，以及取得編製標書時所需的工料數據。由2019年起，我們把這項地基設計的應用範圍，擴大至房委會所有公營房屋發展項目；而這項設計方案在整個2020/21年度獲得廣泛採用。

Update on BIM implementation

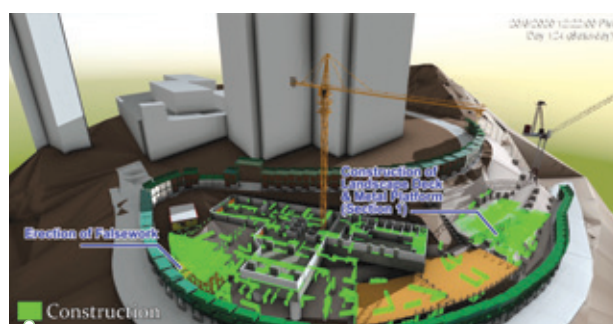
BIM (Building Information Modelling) enables multiple parties to collaboratively design, construct and operate a building virtually. BIM brings benefits such as cost and resource savings, greater efficiency, improved communications and coordination, more opportunities for prefabrication and modular construction, and higher quality results. The spatial data it supplies also allows the development of further services to enhance the HA's estate management work in the long term. With these benefits in mind, the HA aims to implement BIM in the design and construction stages of all new public housing development projects, and expects to have achieved this by the end of 2021.

This year, we continued to update our BIM standards and modelling guidelines, produce new templates in support of different project implementations, and expand our BIM object libraries. From 2020 and 2021, we are requiring contractors to submit four-dimensional (4D) videos as part of complex building tenders and foundation tenders. **BIM** is also an integral part of our BIM-enabled Systematic Approach to Foundation Design (BIM-SAFD), a one-stop foundation design solution devised by our in-house Structural Engineers. BIM-SAFD is especially helpful for facilitating the 3D visualisation of complex underground geological conditions, and can also be used for producing plans, creating schedules for statutory submissions, and measuring quantities for tender documentation. BIM-SAFD was extended to all our public housing development projects from 2019, and has been widely employed throughout 2020/21.



建築信息模擬驅動的系統化地基設計
BIM-SAFD

我們除在多個工作範疇中使用「建築信息模擬」外，也投放資源向各級員工提供相關培訓。年內，「建築信息模擬」的培訓預算費用和培訓日數均大幅增加。此外，我們已開始製作多齣按特定主題介紹「如何」應用「建築信息模擬」技術的短片，讓員工可按自己進度選擇觀看相關短片。展望將來，我們計劃開拓「建築信息模擬」技術的創新用途，使這項技術與新科技（例如第五代流動網絡、「實景捕捉」技術、衍生式設計和場外預製組件）結合使用。



四維施工規劃的工程短片畫面
Screen capture of a 4D video on construction planning

擴展「發展及建築工地流動系統」的應用範圍

因應流動通訊技術的發展，由2016年起，我們致力研發「發展及建築工地流動系統」。截至2020年初，我們已根據這個系統推出七個不同的流動應用程式，這不但有助加強駐工地人員與承建商之間的溝通，而且大大提升追蹤工地巡查記錄的能力。我們繼續擴大該系統的應用範圍至更多工作範疇。

年內，我們為系統進行第三階段開發工作取得良好進度。我們推出兩個「逐戶驗收檢查應用程式」（一個用於驗收建築工程，另一個用於驗收屋宇裝備工程），取代之前的「房屋建設管理 — 工地（建築）監管流動系統」。兩個應用程式均支援駐工地人員為每個住戶單位作最後驗收檢查。其後，我們又推出「地基工程檢查應用程式」，讓駐工地人員在檢查最常用的三種樁柱（即大口徑鑽孔樁、嵌岩工字鋼樁和小直徑灌注樁）時，利用流動電話記錄驗查過程。這個流動應用程式取代現時另一個過時的資訊科技系統，即「建造（地基）監管流動系統」。

Alongside using BIM in a number of areas of our work, we have devoted resources for BIM training for staff of all levels. In the year, our BIM training budget and the number of days set aside for training both increased significantly. We have also begun to produce a number of “how-to” videos on selected BIM topics which staff can access conveniently and use to learn at their own pace. Looking ahead, we plan to explore innovative BIM applications that can be integrated with new technologies, such as the 5th generation mobile network (5G), reality capture, generative design and off-site prefabrication.




Extending the Development and Construction Site Mobile System

We have been developing the Development and Construction Site Mobile System (DCSMS) since 2016, taking advantage of the advent of mobile technology. Up to early 2020, seven different mobile apps had been launched under this system. These have not only made communication between our site staff and contractors more effective, but have significantly improved the traceability of our site inspection records. Since then, we have continued to expand the system to cover more work areas.

This year, we made good progress on the Phase 3 development of the DCSMS. Two Final Flat Inspection Apps (one for building works and another for building services works) were rolled out to replace the previous HOMES Mobile Site Inspection system. These apps support the work of site staff in carrying out final flat-to-flat inspections. This was followed by the launch of a Foundation Works Inspection App, which enables site staff to use a mobile phone to record inspections of the three most commonly-used pile types – large diameter bored piles, socketed steel H-piles and mini-piles. The mobile app replaced another ageing IT system, the Construction Mobile Inspection System.

此外，我們現正準備開發兩個新的應用程式，分別是「參考文件應用程式」和「物料測試申請應用程式」。前者可讓駐工地人員下載所需文件至流動電話，以便進行日常的督導工作，而後者則有助加強管理工地的物料測試程序。



 室內油漆機器人
Internal Painting Robot

推廣使用建築機器人技術

現時世界各處的建築工地都有使用建築機器人，以提升建屋質素和生產力，並改善工地安全，成效十分理想。2020年3月，房委會在評審新建築合約的標書時，加入有關使用建築機器人技術的新規定。現時標書如有載述使用機器人髹漆牆壁、鋪砌地磚和進行類似工作，而有關安排又能提升生產力、建屋質素、安全及環保表現，則該標書會獲得技術評分。我們現正繼續與相關各持分者聯繫，探討如何在公營房屋工程項目中擴大使用建築機器人技術。

利用無人駕駛飛機檢查建築物

2020年，我們引入嶄新科技，試驗利用無人駕駛飛機（又稱「無人機」）以攝影測量技術檢查建築物的「外殼」。無人機易於操控，且用途廣泛。無人機附有拍攝功能，可以有系統地全面描繪和記錄建築物的外貌，並詳盡而深入地解構建築物的外部狀況。

Two new apps are also currently in the pipeline, namely a Reference Document App and a Materials Testing Request App. The former will enable site staff to download essential documents for routine supervision work to their mobile phones, while the latter will enhance the management of materials testing activities on site.

Promoting construction robotics

Construction robots are being used successfully on construction sites around the world to enhance building quality and productivity, and to improve site safety. In March 2020, the HA introduced new requirements relating to construction robotics in its tender assessment of new building contracts. Tenders that include the use of robotics for wall painting, laying of floor tiles and similar activities are now allocated technical scores if they enhance productivity, quality, safety and environmental performance. Meanwhile, we are continuing to engage with various stakeholders to explore ways of extending the use of construction robotics in public housing.

Using Unmanned Aerial Vehicles (UAVs) to inspect buildings

In 2020, we tested some exciting new technology, photogrammetry, for inspecting the “envelope” of our buildings via Unmanned Aerial Vehicles, or UAVs. UAVs are highly manoeuvrable and versatile airborne drones. Equipped with cameras, they can be used to systematically map and record the entire exterior surface of a building, creating a detailed and in-depth picture of a building’s exterior health.



我們先後在兩個公營房屋先導項目（分別位於馬鞍山和柴灣）試用無人機。在每個工地上，先以無人機圍繞建築物飛行，為建築物外殼拍攝高解像度的數碼影像，然後加工處理以製作立體實景模型，再以人工智能協助找出裂紋和其他欠妥之處。試用結果顯示，利用無人機可使驗樓督察與承建商加強合作，處理修補工程。我們計劃日後擴大這種工具的使用範圍至其他公營房屋發展項目。

以遙感技術把竣工的工程數碼化

過去，有關室內空間的狀況主要靠繪製平面圖來記錄。如要改動室內空間，便須重新繪製這些記錄，因而耗用大量資源和時間。鑑於遙感技術日趨成熟，現在記錄室內空間狀況所需的時間已可大幅減少。2021年初，房委會決定採用附有外置數碼攝影機的新式可穿戴測繪裝置量度室內三維點雲數據。這些裝置利用遙感技術製作攝影圖像兼提供數碼量度數據，因此能夠在不需動用很多人手的情況下取得室內環境的完整記錄。這項技術對於製作「竣工」記錄非常有用，讓使用者以非入侵和非接觸的方式為新建樓宇的內部進行三維測量。



無人機在檢測外牆
UVA inspects external walls of a block

The trials were conducted at two pilot public housing projects, in Ma On Shan and Chai Wan. At each site, UAVs flew around the buildings taking high-resolution digital images of the building envelope. These images were then processed to produce a 3D photo-realistic model that could be used to locate and identify cracks and other defects with the support of Artificial Intelligence. The trials showed that UAVs can significantly enhance the level of collaboration between building inspectors and contractors in managing defects rectification works. We plan to extend the tool to other public housing development projects in the future.

Digitalising As-Constructed Works with Remote Sensing Technology

In the past, records of indoor spaces were predominantly in the form of two dimensional drawings. Any changes made to these indoor spaces meant that the records needed to be redrawn, which was both resource-intensive and time-consuming. Advances in remote sensing technology mean that the time required for indoor spatial recording can now be significantly reduced. In early 2021, the HA use new wearable laser scanning devices with external digital cameras to take indoor 3D point cloud measurements. These devices use remote sensing technology to produce a photographic image together with digital measurement data, thus providing a complete record of the indoor environment with minimal human effort. The technology is extremely useful in producing “as-constructed” records, enabling users to make 3D surveys of newly built interiors in a non-invasive and contact-free manner.



坐地式雷射測量技術
Terrestrial laser scanner

發掘可改進建築工序的機會



「組裝合成」建築法是指在預製組件廠房內製作獨立組裝合成組件（已完成飾面、裝置及配件組裝的工序），然後運往工地裝嵌。「組裝合成」建築法有望解決技術勞工人手短缺，以及與工人老化相關的問題。

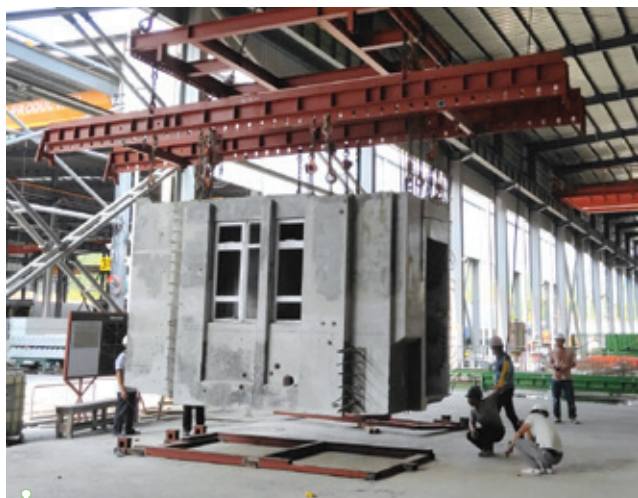
然而，在香港高密度的公營房屋發展項目中應用「組裝合成」建築法有一定難度。為此，我們於2020年完成一項「組裝合成」建築法搭建試驗，其間建造一座兩層高的建築物，包括八個構件式單位共分割為22個組件。這項試驗從多方面測試預製組件和裝嵌的工序，並評估在「組裝合成」建築法下建造的關鍵接駁位能否發揮「建築效益」。這項搭建試驗所得的結果，在東涌第99區快將展開的「組裝合成」建築法先導項目中採納為改善措施。此外，房委會亦額外選定三個公營房屋發展項目（分別位於觀塘德田街、安達臣道石礦場R2-6用地和R2-7用地），採用「組裝合成」建築法。展望將來，房委會將積極挑選更多適合採用「組裝合成」建築法的項目。

Exploring opportunities to enhance construction processes



Modular Integrated Construction (MiC) refers to the manufacture of free-standing integrated modules (completed with finishes, fixtures and fittings) in a prefabrication factory, which are then transported to the site for installation. MiC can potentially address shortages of skilled labour and problems associated with an ageing workforce.

On the other hand, Hong Kong's high density public housing developments do impose challenges for the application of MiC. We therefore completed a MiC mock-up project in 2020, which involved building a two-storey structure with eight modular-flat units, subdivided into 22 modules. The mock-up tested various aspects of the prefabrication and installation processes, and assessed the “buildability” of critical MiC connections. The findings from the mock-up will be incorporated as enhancement measures into the upcoming MiC pilot project in Tung Chung Area 99. In addition, the HA has selected three other public housing development projects for adoption of MiC at Tak Tin Street in Kwun Tong and Anderson Road Quarry Sites R2-6 and R2-7. Looking ahead, the HA will actively identify other projects suitable for adopting MiC.



組裝合成組件（左）和預製板間牆

MiC modules (left) and precast partition walls

環保屋邨 優質生活

房委會採取多項環保措施，在公營房屋項目推動可持續發展其中一項措施是採用**碳排放量估算方法**，估算建築物在預計100年整個生命週期內二氧化碳的排放量，當中包括估算經由建築物料、建築構築物、公用屋宇裝備裝置運作期間和拆卸工程中產生的碳排放量，並以使用可再生能源和植樹等方法予以抵銷。這做法有助我們改良屋邨的設計，以達到長遠持續發展的目標。

為配合政府推廣使用電動車的 policy，我們在新建的公營房屋停車場內安裝電動車充電設施。現時新建的室內停車場有三成的私家車泊車位配備電動車充電器，而其餘七成的私家車泊車位也具備安裝電動車充電設施的配套，讓我們可以因應需求安裝更多電動車充電器。

此外，我們一直積極探討使用可再生能源，尤其是太陽能。過去十年，在技術可行的情況下，我們都為新的公共租住房屋發展項目安裝連接電網的光伏發電系統。截至2021年3月底，我們已為123幢住宅大廈裝設光伏發電系統，總發電量為1 100千瓦。

至於其他有利於可持續發展的工具，包括在設計時採用的「順應自然」設計原則和微氣候研究結果，均有助我們對每個建築工地的地理環境和氣候常態有更深入的了解。舉例來說，我們利用這些工具進行設計，使建築物更能善用日照和取得更佳的自然通風效果。此外，在房委會的建築工程中，我們繼續增加礦渣微粉的使用量。我們更在現有的建築合約中，強制規定用於建造預製外牆和預製樓梯的混凝土，必須以礦渣微粉代替當中35%的水泥含量。我們現已展開研究，探討可否把礦渣微粉的應用範圍擴展至預製硬地面、預製板間牆和預製垃圾槽。



啟鑽苑連接電網的光伏發電系統

Grid-connected PV system at Kai Chuen Court

Greener estates for better living quality

The HA undertakes a wide range of green initiatives in support of sustainable development in public housing developments. One of them is **Carbon Emission Estimation (CEE)**, a method for estimating the carbon dioxide emissions from buildings throughout the expected 100 years of their life cycle. CEE includes an estimate of carbon emissions generated by construction materials, building structures, the operation of communal building services installations and demolition activities, off-set by actions such as the use of renewable energy and tree-planting. This enables us to improve the long-term sustainability of our estate designs.

In line with the Government's promotion of the wider use of electric vehicles (EVs), we have been installing EV charging facilities in new public housing car parks. Currently, 30% of the private car parking spaces in new indoor car parks are equipped with EV chargers, while the remaining 70% are also provided with EV charging-enabling facilities, thereby allowing more EV chargers to be installed as demand grows.

We have also been actively exploring the use of renewable energy, especially the use of solar energy. For the last 10 years, we have been installing grid-connected photovoltaic (PV) systems in new public rental housing developments where technically feasible. Up to the end of March 2021, we had installed PV systems with a total system capacity of 1 100 kW in 123 domestic blocks.

Other ongoing sustainability tools include the use of passive design and micro-climate studies in our design work. We use these tools to better understand the geography and the climate norms of each individual building site. They enable us, for example, to design our buildings so that they respond better to sunlight and benefit more from natural ventilation. We have also continued to increase the amount of Ground Granular Blast Furnace Slag (GGBS) used in our construction. We have mandated that 35% of the cement used for constructing precast façades and staircases be replaced with GGBS in our current building contracts, and have embarked on a study to ascertain the viability of extending the use of the GGBS to precast hard paving, partition walls and refuse chutes.

綠色建築 金級標準

房委會在設計建築時致力顧及環境，並把其建築項目（特別是因申請總樓面面積寬免而須進行評估的工程項目）交由香港綠色建築議會根據綠色建築環評計劃（即綠建環評新建建築）評級。該計劃依據建築物整個生命周期的可持續發展特點進行評級。我們的目標是使轄下建築物最少達到「金級」標準。在2020/21年度，我們欣悉根據綠建環評新建建築（1.2版本），房委會新建項目獲得的認證成績均全部達標。有關成績載於下表。

Green Buildings, Gold Ratings

To demonstrate the HA's efforts in delivering environmentally responsive design, we submit our building projects for assessment under the Hong Kong Green Building Council's green building assessment scheme, namely the Building Environmental Assessment Method Plus for New Buildings (BEAM Plus NB), in particular for projects where this assessment is required to obtain gross floor area (GFA) concessions. The scheme rates buildings based on sustainability features across their entire lifecycle. We aim to achieve Gold ratings for our buildings as a minimum, and are pleased that all our certification results under BEAM Plus NB (Version 1.2) for 2020/21 met this standard, as shown in the table.

建築項目與評級（暫定評級）— 金級

Project & Rating (Provisional Assessment) – Gold

粉嶺皇后山第1號地盤第二期公屋發展計劃 PRH Development at Queen's Hill Site 1 Phase 2, Fanling
白田邨公屋重建計劃（第七、第八及第十一期）PRH Redevelopment at Pak Tin Estate (Phases 7, 8 & 11)
屯門第29區西公營房屋發展計劃 Public Housing Development at Tuen Mun Area 29 West
葵涌麗祖路公屋發展計劃 PRH Development at Lai Cho Road, Kwai Chung
粉嶺第36區第四期公營房屋發展計劃 Public Housing Development at Fanling Area 36 Phase 4
青衣青康路北第一期及第二期公營房屋發展計劃 Public Housing Development at Ching Hong Road North, Tsing Yi, Phase 1, Phase 2
安達臣道石礦場RS-1用地公營房屋發展計劃 Public Housing Development at Anderson Road Quarry Site RS-1
高山道資助出售房屋發展計劃 Subsidised Sale Flats Development at Ko Shan Road
北角渣華道公營房屋發展計劃 Public Housing Development at Java Road, North Point

建築項目與評級（最終評級）

Project & Rating (Final Assessment)

元朗朗善邨 Long Shin Estate, Yuen Long	鉑金級 Platinum
觀塘安泰邨 On Tai Estate, Kwun Tong	鉑金級 Platinum
東涌滿東邨 Mun Tung Estate, Tung Chung	金級 Gold
元朗屏欣苑 Ping Yan Court, Yuen Long	金級 Gold
梅窩銀蔚苑 Ngan Wai Court, Mui Wo	金級 Gold
梅窩銀河苑 Ngan Ho Court, Mui Wo	金級 Gold
深水埗海盈邨 Hoi Ying Estate, Sham Shui Po	金級 Gold
觀塘彩興苑 Choi Hing Court, Kwun Tong	金級 Gold
九龍城啟朗苑 Kai Long Court, Kowloon City	金級 Gold

零灌溉系統 — 為可持續發展節約用水

零灌溉系統2013年開始研發，是通過重用雨水灌溉植物的一種先進系統，有助減少房委會的用水量。該系統由三個分支系統組成：雨水收集系統（用以收集和貯存多餘的雨水到種植區下方的貯水箱）、可持續城市排水系統（用以減少雨水溢流至城市排水系統）和底土灌溉系統（此為順應自然的節能設計，可把貯水箱內的雨水輸送至上方生長的植物）。

我們在龍逸邨和洪福邨兩個零灌溉系統的試點項目均達至理想效果。零灌溉系統灌溉的植物均生長良好，既無出現積水，也無發出異味。由2016年起，公共屋邨的花槽只要位置和面積合適，便會廣泛採用零灌溉系統，以人手保養園藝的需要因而大減。我們的目標是在所有新建公共屋邨廣泛應用零灌溉系統。我們會繼續進行研究，希望能提升零灌溉系統的設計，並確保盡可能使用最具成本效益的物料和方法。長遠而言，房委會會盡量少用食水灌溉植物，並為在本港市區恢復自然水循環出一分力。



東匯邨零灌溉系統花床與週邊園境設計融合
ZIS blends in with surrounding landscape design
at Tung Wui Estate

Zero Irrigation System – Sustainability through Water Conservation

Developed since 2013, **the Zero Irrigation System (ZIS)** is a pioneering system that reduces the HA's water consumption by reusing rainwater for irrigation. It works by combining three sub-systems: a Rainwater Harvesting System that collects and stores excess rainwater in retention boxes under the planting areas; a Sustainable Urban Drainage System that reduces storm water runoff entering the urban sewer system; and a Sub-soil Irrigation System, a passive design system that takes the water in the retention boxes and delivers it to the vegetation growing above.

Satisfactory performances were recorded in two pilot projects at Lung Yat Estate and Hung Fuk Estate. In both projects, plants irrigated by ZIS remained in good condition, waterlogging did not occur, and no unpleasant odours were noted. ZIS has been widely used in planters of appropriate location and size in public housing estates since 2016, and the amount of manual horticultural maintenance has also been substantially reduced. Our goal is to widely adopt ZIS in all our new public housing estates and to continue carrying out research to optimise the ZIS design and to ensure that we use the most cost-effective materials and methods possible. In the long term, the HA aims to minimise the use of potable water for irrigation, and to contribute to restoring the natural hydrologic cycle in urban areas of Hong Kong.



油麗邨第七期零灌溉系統花床
ZIS Planter at Yau Lai Estate Phase 7