



拥抱科技 持续建屋

Embracing Technology to Build
a Sustainable Housing Stock



下图为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



发展及建筑处的主要职能

Key Functions of the Development and Construction Division

- 推行和监察房屋建设计划
- 在公营房屋土地供应、发展、规划、设计和建设方面，制定和检讨有关的策略和政策
- 制定、推行和探讨机构采购、安全和环境管理策略
- 就全港／区域／地区规划研究及规划标准与准则提供意见
- 监察房屋资讯系统
- 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

「拥抱创科和环保措施，为居民构建可持续、优质和健康的居住环境」

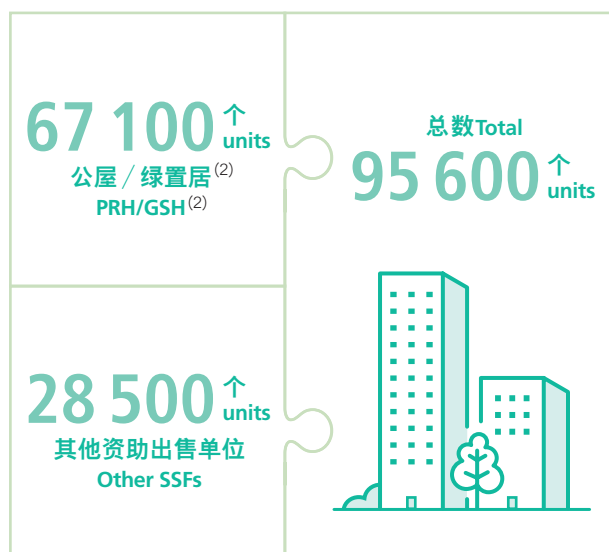
“To embrace innovation, technology and green initiatives to build sustainable, high quality and healthy living environment for our residents”



公共租住房屋（公屋）／绿表置居计划（绿置居）和其他资助出售单位的建屋量⁽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年度的五年期內预计建成单位总数
Estimated production total in five-year period
from 2020/21 to 2024/25



2020/21年度单位落成数目
No. of units completed in 2020/21



注 Notes:

(1) 数字根据2021年3月房委会的房屋建设计划计算，并计至最接近的百位整数。数字会因应计划的改动而有变更。

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) 所列数字是指预计于每个财政年度落成的房委会新单位数目，但不反映可供编配予公屋申请者的公屋单位总数，因为有关数字并未包括从现有屋邨收回的公屋单位，而收回的单位是另一个编配予公屋申请者的主要单位来源。

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(约)
Completed in 2020/21 (approximate)



2020/21年度完成的公屋/绿置居发展项目(按时序排列):

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

永泰道 Wing Tai Road	渔湾邨(渔进楼) Yue Wan Estate (Yue Chun House)
西北九龙填海区6号地盘第一期 Northwest Kowloon Reclamation Site 6 Phase 1	海达邨(海荣楼) Hoi Tat Estate (Hoi Wing House)
彩荣路 Choi Wing Road	彩福邨(彩和楼) Choi Fook Estate (Choi Wo House)
白田第七期 Pak Tin Phase 7	白田邨(康田楼、健田楼) Pak Tin Estate (Hong Tin House, Kin Tin House)
白田第八期 Pak Tin Phase 8	白田邨(咏田楼、心田楼) Pak Tin Estate (Wing Tin House, Sum Tin House)
西北九龙填海区6号地盘第二期 Northwest Kowloon Reclamation Site 6 Phase 2	海达邨(海华楼、海昌楼) Hoi Tat Estate (Hoi Wah House, Hoi Cheong House)



柴湾渔湾邨渔进楼
Yue Chun House, Yue Wan Estate in Chai Wan



深水埗海达邨海荣楼(右)
Hoi Wing House (right), Hoi Tat Estate in Sham Shui Po



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

2020/21年度完成的其他资助出售单位发展项目(按时序排列):
Other SSFs projects completed in 2020/21 (in chronological order):

坳背湾街 Au Pui Wan Street	旭禾苑 Yuk Wo Court
发祥街西 Fat Tseung Street West	凯德苑 Hoi Tak Court
恒健街 Hang Kin Street	锦晖苑 Kam Fai Court
将军澳第65C2区第一期 Tseung Kwan O Area 65C2 Phase 1	雍明苑(润明阁、泽明阁) Yung Ming Court (Yun Ming House, Chak Ming House)
东涌第27区 Tung Chung Area 27	裕泰苑(裕玥阁、裕瑛阁) Yu Tai Court (Yu Yuet House, Yu Ying House)



马鞍山锦晖苑
Kam Fai Court in Ma On Shan



将军澳雍明苑
Yung Ming Court in Tseng Kwan O

在推行房委会的公营房屋计划方面，我们一直在新公营房屋项目的规划和建筑阶段，更广泛采用创新科技，包括数码科技应用技术和别具环保特色的设计。

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.



「建筑信息模拟」技术的最新推行情况

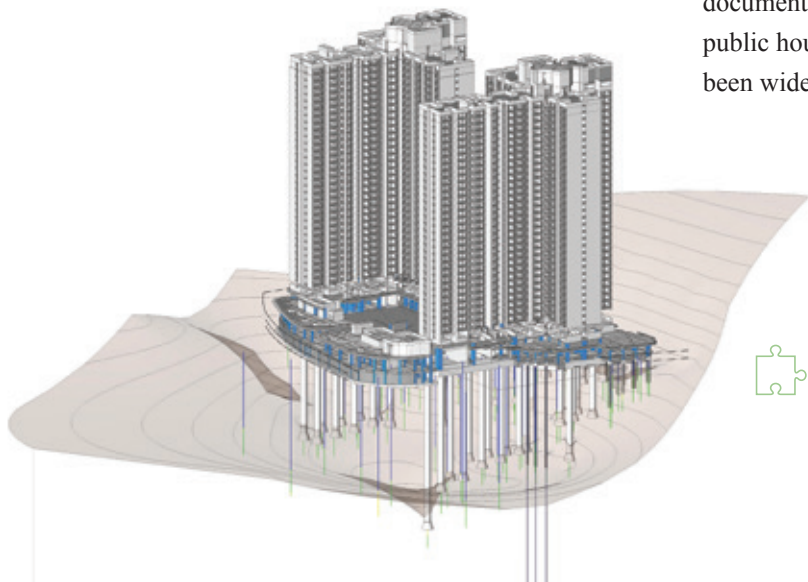
「建筑信息模拟」技术有利汇聚各方，合力以虚拟模式共同设计、建造和营运一座建筑物。这项技术优点甚多，例如：节省成本和资源、提高效率、改善沟通与协调、提供更多机会使用预制组件和进行构件式建筑，以及取得更高质量的成果。长远而言，所采集的空间数据有利我们拓展其他服务，藉以改善房委会的屋邨管理工作。基于上述原因，房委会希望所有新的公营房屋发展项目在设计 and 建筑阶段均采用「建筑信息模拟」技术，并期望于2021年底或之前达到这个目标。

年内我们继续更新房委会的「建筑信息模拟」标准和模型指引，制作新范本，支援不同的工程项目，并扩充房委会的「建筑信息模拟」物件资源库。由2020和2021年起，我们分别要求承建商就性质复杂的建筑工程投标和地基工程投标提交四维短片。「建筑信息模拟」也是房委会「建筑信息模拟驱动的系统化地基设计」的组成部分；这项地基设计是由部门结构工程师自行研发的一站式地基设计方案，尤其有利于把复杂的地下地质状况以立体视像方式呈现；亦可用于制作图则、为法定工程图则建立明细表，以及取得编制标书时所需的工料数据。由2019年起，我们把这项地基设计的应用范围，扩大至房委会所有公营房屋发展项目；而这项设计方案在整个2020/21年度获得广泛采用。

Update on BIM implementation

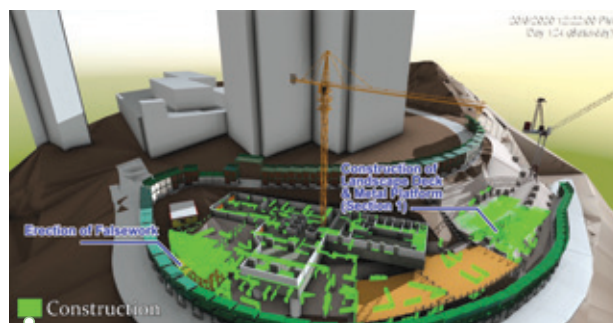
BIM (Building Information Modelling) enables multiple parties to collaboratively design, construct and operate a building virtually. BIM brings benefits such as cost and resource savings, greater efficiency, improved communications and coordination, more opportunities for prefabrication and modular construction, 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.



建筑信息模拟驱动的系统化地基设计
BIM-SAFD

我们除在多个工作范畴中使用「建筑信息模拟」外，也投放资源向各级员工提供相关培训。年内，「建筑信息模拟」的培训预算费用和培训日数均大幅增加。此外，我们已开始制作多出按特定主题介绍「如何」应用「建筑信息模拟」技术的短片，让员工可按自己进度选择观看相关短片。展望未来，我们计划开拓「建筑信息模拟」技术的创新用途，使这项技术与新科技（例如第五代流动网络、「实景捕捉」技术、衍生式设计和场外预制组件）结合使用。



四维施工规划的工程短片画面
Screen capture of a 4D video on construction planning

扩展「发展及建筑工地流动系统」的应用范围

因应流动通讯技术的发展，由2016年起，我们致力研发「发展及建筑工地流动系统」。截至2020年初，我们已根据这个系统推出七个不同的流动应用程序，这不但有助加强驻工地人员与承建商之间的沟通，而且大大提升追踪工地巡查记录的能力。我们继续扩大该系统的应用范围至更多工作范畴。

年内，我们为系统进行第三阶段开发工作取得良好进度。我们推出两个「逐户验收检查应用程序」（一个用于验收建筑工程，另一个用于验收屋宇装备工程），取代之前的「房屋建设管理——工地（建筑）监管流动系统」。两个应用程序均支援驻工地人员为每个住户单位作最后验收检查。其后，我们又推出「地基工程检查应用程序」，让驻工地人员在检查最常用的三种桩柱（即大口径钻孔桩、嵌岩工字钢桩和小直径灌注桩）时，利用流动电话记录验查过程。这个流动应用程序取代现时另一个过时的资讯科技系统，即「建造（地基）监管流动系统」。

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，我们现正准备开发两个新的应用程序，分别是「参考文件应用程序」和「物料测试申请应用程序」。前者可让驻工地人员下载所需文件至流动电话，以便进行日常的督导工作，而后者则有助加强管理工地的物料测试程序。



室内油漆机器人
Internal Painting Robot

推广使用建筑机器人技术

现时世界各地的建筑工地都有使用建筑机器人，以提升建屋质素和生产力，并改善工地安全，成效十分理想。2020年3月，房委会在评审新建筑合约的标书时，加入有关使用建筑机器人技术的新规定。现时标书如有载述使用机器人髹漆墙壁、铺砌地砖和进行类似工作，而有关安排又能提升生产力、建屋质素、安全及环保表现，则该标书会获得技术评分。我们现正继续与相关各持分者联系，探讨如何在公营房屋工程项目中扩大使用建筑机器人技术。

利用无人驾驶飞机检查建筑物

2020年，我们引入崭新科技，试验利用无人驾驶飞机（又称「无人机」）以摄影测量技术检查建筑物的「外壳」。无人机易于操控，且用途广泛。无人机附有拍摄功能，可以有系统地全面描绘和记录建筑物的外貌，并详尽而深入地解构建筑物的外部状况。

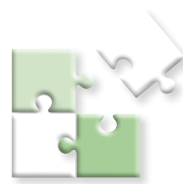
Two new apps are also currently in the pipeline, namely a Reference Document App and a Materials Testing Request App. The former will enable site staff to download essential documents for routine supervision work to their mobile phones, while the latter will enhance the management of materials testing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



我们先后在两个公营房屋先导项目（分别位于马鞍山和柴湾）试用无人机。在每个工地上，先以无人机围绕建筑物飞行，为建筑物外壳拍摄高解像度的数码影像，然后加工处理以制作立体实景模型，再以人工智能协助找出裂纹和其他欠妥之处。试用结果显示，利用无人机可使验楼督察与承建商加强合作，处理修补工程。我们计划日后扩大这种工具的使用范围至其他公营房屋发展项目。

以遥感技术把竣工的工程数码化

过去，有关室内空间的状况主要靠绘制平面图来记录。如要改动室内空间，便须重新绘制这些记录，因而耗用大量资源和时间。鉴于遥感技术日趋成熟，现在记录室内空间状况所需的时间已可大幅减少。2021年初，房委会决定采用附有外置数码摄影机的新式可穿戴测绘装置量度室内三维点云数据。这些装置利用遥感技术制作摄影图像兼提供数码量度数据，因此能够在不需动用很多人手的情况下取得室内环境的完整记录。这项技术对于制作「竣工」记录非常有用，让使用者以非入侵和非接触的方式为新建楼宇的内部进行三维测量。



无人机在检测外墙
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.



坐地式雷射测量技术
Terrestrial laser scanner

发掘可改进建筑工序的机会



「**组装合成**」建筑法是指在预制组件厂房内制作独立组装合成组件(已完成饰面、装置及配件组装的工序),然后运往工地装嵌。「**组装合成**」建筑法有望解决技术劳工人手短缺,以及与工人老化相关的问题。

然而,在香港高密度的公营房屋发展项目中应用「**组装合成**」建筑法有一定难度。为此,我们于2020年完成一项「**组装合成**」建筑法搭建试验,其间建造一座两层高的建筑物,包括八个构件式单位共分割为22个组件。这项试验从多方面测试预制组件和装嵌的工序,并评估在「**组装合成**」建筑法下建造的关键接驳位能否发挥「**建筑效益**」。这项搭建试验所得的结果,在东涌第99区快将展开的「**组装合成**」建筑法先导项目中采纳为改善措施。此外,房委会亦额外选定三个公营房屋发展项目(分别位于观塘德田街、安达臣道石矿场R2-6用地和R2-7用地),采用「**组装合成**」建筑法。展望未来,房委会将积极挑选更多适合采用「**组装合成**」建筑法的项目。

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.



组装合成组件(左)和预制板间墙
MiC modules (left) and precast partition walls

环保屋邨 优质生活

房委会采取多项环保措施，在公营房屋项目推动可持续发展其中一项措施是采用**碳排放量估算方法**，估算建筑物在预计100年整个生命周期内二氧化碳的排放量，当中包括估算经由建筑物料、建筑构筑物、公用屋宇装备装置运作期间和拆卸工程中产生的碳排放量，并以使用可再生能源和植树等方法予以抵销。这做法有助我们改良屋邨的设计，以达到长远可持续发展的目标。

为配合政府推广使用电动车的政策，我们在新建的公营房屋停车场内安装电动车充电设施。现时新建的室内停车场有三成的私家车泊车位配备电动车充电器，而其余七成的私家车泊车位也具备安装电动车充电设施的配套，让我们可以因应需求安装更多电动车充电器。

此外，我们一直积极探讨使用可再生能源，尤其是太阳能。过去十年，在技术可行的情况下，我们都为新的公共租住房屋发展项目安装连接电网的光伏发电系统。截至2021年3月底，我们已为123幢住宅大厦装设光伏发电系统，总发电量为1 100千瓦。

至于其他有利于可持续发展的工具，包括在设计时采用的「顺应自然」设计原则和微气候研究结果，均有助我们对每个建筑工地的地理环境和气候常态有更深入的了解。举例来说，我们利用这些工具进行设计，使建筑物更能善用日照和取得更佳的自然通风效果。此外，在房委会的建筑工程中，我们继续增加矿渣微粉的使用量。我们更在现有的建筑合约中，强制规定用于建造预制外墙和预制楼梯的混凝土，必须以矿渣微粉代替当中35%的水泥含量。我们现已展开研究，探讨可否把矿渣微粉的应用范围扩展至预制硬地面、预制板间墙和预制垃圾槽。



启钻苑连接电网的光伏发电系统
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.

绿色建筑 金级标准

房委会在设计建筑时致力顾及环境，并把其建筑项目（特别是因申请总楼面面积宽免而须进行评估的工程项目）交由香港绿色建筑议会根据绿色建筑环评计划（即绿建环评新建建筑）评级。该计划依据建筑物整个生命周期的可持续发展特点进行评级。我们的目标是使辖下建筑物最少达到「金级」标准。在2020/21年度，我们欣悉根据绿建环评新建建筑（1.2版本），房委会新建项目获得的认证成绩均全部达标。有关成绩载于下表。

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.

建筑项目与评级（暂定评级）— 金级

Project & Rating (Provisional Assessment) – Gold

粉岭皇后山第1号地盘第二期公屋发展计划 PRH Development at Queen's Hill Site 1 Phase 2, Fanling
白田邨公屋重建计划（第七、第八及第十一期）PRH Redevelopment at Pak Tin Estate (Phases 7, 8 & 11)
屯门第29区西公营房屋发展计划 Public Housing Development at Tuen Mun Area 29 West
葵涌丽祖路公屋发展计划 PRH Development at Lai Cho Road, Kwai Chung
粉岭第36区第四期公营房屋发展计划 Public Housing Development at Fanling Area 36 Phase 4
青衣青康路北第一期及第二期公营房屋发展计划 Public Housing Development at Ching Hong Road North, Tsing Yi, Phase 1, Phase 2
安达臣道石矿场RS-1用地公营房屋发展计划 Public Housing Development at Anderson Road Quarry Site RS-1
高山道资助出售房屋发展计划 Subsidised Sale Flats Development at Ko Shan Road
北角渣华道公营房屋发展计划 Public Housing Development at Java Road, North Point

建筑项目与评级（最终评级）

Project & Rating (Final Assessment)

元朗朗善邨 Long Shin Estate, Yuen Long	铂金级 Platinum
观塘安泰邨 On Tai Estate, Kwun Tong	铂金级 Platinum
东涌满东邨 Mun Tung Estate, Tung Chung	金级 Gold
元朗屏欣苑 Ping Yan Court, Yuen Long	金级 Gold
梅窝银蔚苑 Ngan Wai Court, Mui Wo	金级 Gold
梅窝银河苑 Ngan Ho Court, Mui Wo	金级 Gold
深水埗海盈邨 Hoi Ying Estate, Sham Shui Po	金级 Gold
观塘彩兴苑 Choi Hing Court, Kwun Tong	金级 Gold
九龙城启朗苑 Kai Long Court, Kowloon City	金级 Gold

零灌溉系统 — 为可持续发展节约用水

零灌溉系统2013年开始研发，是通过重用雨水灌溉植物的一种先进系统，有助减少房委会的用水量。该系统由三个分支系统组成：雨水收集系统（用以收集和贮存多馀的雨水到种植区下方的贮水箱）、可持续城市排水系统（用以减少雨水溢流至城市排水系统）和底土灌溉系统（此为顺应自然的节能设计，可把贮水箱内的雨水输送至上方生长的植物）。

我们在龙逸邨和洪福邨两个零灌溉系统的试点项目均达至理想效果。零灌溉系统灌溉的植物均生长良好，既无出现积水，也无发出异味。由2016年起，公共屋邨的花槽只要位置和面积合适，便会广泛采用零灌溉系统，以人手保养园艺的需要因而大减。我们的目标是在所有新建公共屋邨广泛应用零灌溉系统。我们会继续进行研究，希望能提升零灌溉系统的设计，并确保尽可能使用最具成本效益的物料和方法。长远而言，房委会会尽量少用食水灌溉植物，并为在本港市区恢复自然水循环出一分力。



东汇邨零灌溉系统花床与周边园境设计融合
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.



油丽邨第七期零灌溉系统花床
ZIS Planter at Yau Lai Estate Phase 7