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加建隔音屏障工程下的應對氣候變化措施
Climate Change Initiatives under Retrofitting of Noise Barrier Projects

寶寧路的隔音屏障和隔音罩
Noise barriers and enclosures on Po Ning Road

背景
Background

為減低現有道路對鄰近居民的噪音影響，我們已在交通噪音水平超過 70 分貝 (A) 的現有道路上，在切實可行的情況下實施直接的噪音緩解措施，包括加建隔音屏障和隔音罩，以及使用低噪音鋪路物料重鋪路面。

寶琳北路及寶寧路加建隔音屏障工程包括在西貢將軍澳村、寶林邨、厚德邨和景明苑附近建造總長約 1.4 公里的隔音屏障和隔音罩，以及鋪設低噪音鋪路物料。相關工程已於二零二五年年中大致完成。工程完成後，交通噪音水平會降低約 1 至 21 分貝 (A)，讓附近社區約 1,600 個住宅受惠。

此外，我們在工程中採用了光伏系統和 S690 高強度鋼材，這些新措施樹立了可持續基建發展的先例，有助累積經驗並推動其在未來被更廣泛應用，以應對氣候變化和提升環境可持續性。

To mitigate traffic noise impact on nearby residents, we have implemented direct noise reduction measures, where feasible, on existing roads with noise levels exceeding 70 dB(A). These measures include retrofitting noise barriers and enclosures, as well as resurfacing pavements with low-noise road surfacing materials.

The retrofitting projects along Po Lam Road North and Po Ning Road involved constructing approximately 1.4 km of noise barriers and enclosures, and laying of low-noise road surfacing materials near Tseung Kwan O Village, Po Lam Estate, Hau Tak Estate, and King Ming Court in Sai Kung. The works were substantially completed in mid-2025, benefiting around 1,600 dwellings with noise reductions of 1 to 21 dB(A).

Additionally, these projects introduced new initiatives such as photovoltaic (PV) systems and high-strength steel (Grade S690), setting a precedent for sustainable infrastructure development. These initiatives aim to combat climate change while enhancing environmental sustainability.

加建隔音屏障工程下的應對氣候變化措施
Climate Change Initiatives under Retrofitting of Noise Barrier Projects

在隔音屏障和隔音罩上的光伏系統
PV Systems on Noise Barriers and Enclosures

作為我們對可持續發展承諾的一部分，我們在選定的隔音屏障和隔音罩上安裝光伏系統，以推廣可再生能源並支持政府的綠色能源目標。光伏板安裝在結構頂部上以提高光能吸收效率並將陽光轉化為電能。我們已在三個選定的隔音屏障和隔音罩上安裝光伏系統，以推廣城市基礎設施中可再生能源的實際應用，並提升公眾對可再生能源技術的認知。其所產生的潔淨電力將於日間為鄰近行人隧道供電，藉此降低對電網的依賴，助力香港實現減碳目標。

As part of our commitment to sustainable development, we have installed PV systems on selected noise barriers and enclosures to promote renewable energy and support the Government's Green Energy Target. These high-efficiency PV panels convert sunlight into electricity, with their rooftop positioning optimized for maximum light absorption. Currently implemented at three strategic locations, these systems serve dual purposes: they demonstrate practical renewable energy applications in urban infrastructure while raising public awareness about sustainable technologies. The generated clean electricity directly powers nearby pedestrian subways during daylight hours, reducing grid dependence and contributing to Hong Kong's decarbonization efforts.

在隔音罩安裝光伏系統
Installation of PV systems on noise enclosure

加建隔音屏障工程下的應對氣候變化措施
Climate Change Initiatives under Retrofitting of Noise Barrier Projects

S690 高強度鋼材的先導使用
Pilot Use of Grade S690 High-Strength Steel

我們在一段懸臂式隔音屏障結構中試用 S690 高強度鋼材。這種先進鋼材具有顯著的可持續發展優勢，可減少材料用量，同時維持結構強度，從而降低從生產、運輸、安裝到啟用整個生命週期的碳排放。工程團隊成功在環境效益與結構要求之間取得平衡，確保隔音屏障符合所有安全標準，同時保持美觀，並與周邊環境和諧融合，展示了創新材料如何在確保性能及視覺融合的同時，減少基礎設施的碳足跡。

We have implemented the pilot use of S690 high-strength steel in a cantilevered noise barrier structure. This advanced material offers significant sustainability benefits, requiring less material while maintaining structural strength, resulting in reduced carbon emissions throughout the entire lifecycle from production and transportation to installation and commissioning. Our project team has successfully balanced environmental advantages with structural requirements, ensuring the barrier meets all safety standards while preserving aesthetic quality and blending harmoniously with its surroundings. This pilot demonstrates how innovative materials can reduce infrastructure's carbon footprint without compromising performance or visual integration.

加建隔音屏障工程的可持續效益
Sustainable Benefits of Noise Barrier Retrofitting Projects

加建隔音屏障工程為社區帶來全面的環境效益。工程能大幅降低附近住宅的交通噪音水平，在提升居民生活質素的同時，亦展示了可持續的基礎設施解決方案。光伏系統產生的可再生能源，直接支持香港的綠色能源目標，並推進我們的碳中和進程。此外，創新採用 S690 高強度鋼材有效降低了從材料生產到施工及後續階段的整個工程生命週期的碳排放。工程展示了我們通過實踐具多重效益的解決方案以應對氣候變化的承諾，同時亦成功在環保和基建發展之間取得平衡，為社區帶來立竿見影的效益之餘，亦創造長遠的可持續發展成果。

These noise barrier retrofitting projects deliver comprehensive environmental benefits to local communities. By significantly reducing traffic noise levels for nearby residential areas, they improve quality of life while demonstrating sustainable infrastructure solutions. The PV systems generate clean and renewable energy that directly supports Hong Kong's Green Energy Target and advances our carbon neutrality goals. Furthermore, the innovative use of S690 high-strength steel has reduced embodied carbon throughout the project lifecycle - from material production to construction and beyond. Together, these initiatives showcase our commitment to addressing climate change through practical and multi-benefit solutions. The projects successfully balance environmental responsibility with infrastructure excellence, delivering both immediate community benefits and long-term sustainability gains.

在懸臂式隔音屏障應用 S690 高強度鋼材
Application of S690 high-strength steel on cantilevered noise barrier

中九龍繞道（油麻地段隧道）的綠色建築設計
Green Building Design of Central Kowloon Bypass (Yau Ma Tei Section Tunnel)

中九龍繞道（油麻地段）的總平面圖
General layout plan of Central Kowloon Bypass (Yau Ma Tei Section)

引言
Introduction

中九龍繞道（油麻地段）全長 4.7 公里，是連接東、西九龍的幹道，其中包括一段長 3.9 公里，名為中九龍繞道（油麻地段隧道）的新隧道。中九龍繞道（油麻地段）提供了一條三線雙程分隔車道的替代道路，讓車輛可繞過中九龍區擠塞的地面道路網。通車後，在繁忙時間來往油麻地與九龍灣之間的車程預計將由 30 分鐘縮短至大約 5 分鐘。

The Central Kowloon Bypass (Yau Ma Tei Section) (CKB (YMTS)) is a 4.7 km-long trunk road connecting east and west Kowloon. Comprising a 3.9 km-long new tunnel named the Central Kowloon Bypass (Yau Ma Tei Section Tunnel) (CKB (YMTST)), it offers an alternative dual three-lane carriageway to bypass the congested at-grade road network in the central Kowloon area. Upon commissioning, the journey time between Yau Ma Tei and Kowloon Bay during peak hours is expected to reduce from 30 minutes to about 5 minutes.

中九龍繞道（油麻地段隧道）的綠色建築設計
Green Building Design of Central Kowloon Bypass (Yau Ma Tei Section Tunnel)

中九龍繞道（油麻地段）工程不僅包括道路，還涵蓋四座隧道大樓。其中，啟德行政大樓作為整條中九龍繞道（油麻地段隧道）的中央樞紐，其設計貫徹全生命週期環境影響最小化的理念。該行政大樓不僅負責隧道營運管理，更作為香港綠色建築標準的典範。

The project encompasses not only the roadway but also four tunnel buildings. In particular, the Kai Tak Administration Building serves as the central hub of the entire CKB (YMTST). Designed to minimize environmental impact throughout its lifecycle, the CKB (YMTST) features an Administration Building that not only manages tunnel operations but also serves as an exemplary model of Hong Kong's green building standards.

啟德行政大樓
Kai Tak Administration Building

可持續的設計與建築
Sustainable Design and Construction

啟德行政大樓通過採用可再生能源（例如光伏發電系統和太陽能熱水系統）、天然照明和灌溉綠蔭的雨水灌溉系統，顯著降低了電力消耗和用水量，並實現了可量化的減碳，體現了可持續創新。

在能源表現之外，大樓的高性能鋁質面板亦結合了環保功能與美學特徵。其質感和顏色經過精心挑選，以符合日光反射率要求並緩解城市熱島效應，而穿孔的遮陽設計則提升了用戶的舒適度，同時減少了製冷需求。每個細節都反映了我們為開創具環保意識的城市發展而作出的努力。

在建造過程中，我們採用了預製技術，並在可行情況下盡量使用可持續的森林產品、回收物料和當地物料、綠色產品以及不含消耗臭氧層物質的物料。為進一步減少碳足跡，工程廣泛採用場外預製技術和含煤灰的混凝土進行施工。

The Kai Tak Administration Building embodies sustainable innovation by adopting renewable energy solutions such as PV systems and solar hot water systems, along with natural lighting and a rainwater irrigation system for greenery. It significantly reduces both electricity and water consumption while striving for measurable carbon reduction.

Beyond energy performance, the building's high-performance aluminium cladding seamlessly combines aesthetic features with environmental functions. Its texture and colour are carefully chosen to meet daylight reflectance requirements and mitigate urban heat island effects, while the perforated sun-shading design enhances occupant comfort and reduces cooling demand. Every detail reflects the project's commitment to pioneering eco-conscious urban development.

During construction, prefabrication technology was adopted alongside the use of sustainable forest products, recycled and regional materials, green products, and ozone-depleting-substance-free materials as far as practicable. To further reduce the carbon footprint, the project widely adopted off-site prefabrication and pulverised fuel ash (PFA) concrete for construction.

中九龍繞道（油麻地段隧道）的綠色建築設計
Green Building Design of Central Kowloon Bypass (Yau Ma Tei Section Tunnel)

實時監察隧道內的空氣質素
Real-time Monitoring of Air Quality within Tunnel

通過交通管制及監察系統和中央控制及監察系統，啟德行政大樓的控制室整合了實時交通數據，讓我們可持續監察交通狀況，並迅速實施營運措施，以確保道路安全。中央控制及監察系統亦通過持續測量和記錄車輛排放物來監察空氣質素。系統配備人機界面，可遙距操作隧道通風系統組件，包括氣流感應器、隧道通風風扇和空氣淨化系統。這種一體化的控制確保了運作效率，並確保空氣質素符合規定。

The Kai Tak Administration Building's control room integrates real-time traffic data through the Traffic Control and Surveillance System and Central Control and Monitoring System (CCMS), enabling continuous monitoring of traffic conditions and rapid implementation of operational actions for road safety. The CCMS also monitors air quality through continuous measurement and logging of vehicular emissions. Featuring a human-machine interface, it allows remote operation of the tunnel ventilation system components, including airflow sensors, tunnel ventilation fans and the air purification system. This integrated control ensures both operational efficiency and compliance with air quality requirements.

綠建環評認證框架
BEAM Plus Certification Framework

綠建環評是香港最被廣泛使用的的綠色建築評估工具，由香港綠色建築議會制定，以評估和推廣可持續的建築作業模式。啟德行政大樓符合「新建建築」評估下的七個關鍵範疇，即：(1) 綜合設計與建造管理、(2) 可持續地塊發展、(3) 用材及廢物管理、(4) 能源使用、(5) 用水、(6) 健康與安舒和 (7) 創新。

BEAM Plus is Hong Kong's premier green building assessment tool developed by the Hong Kong Green Building Council to evaluate and promote sustainable building practices. The Kai Tak Administration Building satisfies all seven key areas under the "New Buildings" assessment, namely: (1) Integrated Design and Construction Management, (2) Sustainable Sites, (3) Materials and Waste, (4) Energy Use, (5) Water Use, (6) Health and Wellbeing and (7) Innovations and Additions.

1 綜合設計與建造管理
Integrated Design and Construction Management

工程運用生命周期成本法，篩選出在 50 年運營期內最具可持續性的照明及暖通空調系統。該等系統具備實時性能監察和持續數據記錄功能，既能即時調整運行效率，亦可透過評估歷史趨勢分析長期表現。

The project uses life cycle costing to select the most sustainable lighting and Heating, Ventilation, and Air Conditioning (HVAC) systems over a 50-year operation period. These systems incorporate real-time performance monitoring with continuous data logging, enabling both efficiency adjustments in real time and long-term performance analysis through historical trend evaluation.

2 可持續地塊發展
Sustainable Site

作為緩解城市熱島效應策略的一部分，超過 30% 的用地面積被劃為綠化空間。在設計初期，建築佈局已進行周詳規劃，確保啟德行政大樓與周邊建築物之間保持適當的間距，以改善通風效果，並減輕行人層面的熱島效應。上述策略結合噪音控制措施（包括避震裝置和低噪音的暖通空調機組），提升了大樓可持續性的表現。

As part of an urban heat island mitigation strategy, over 30% of the site area is designated as a green space. Building deposition was carefully planned during the early design stage to ensure optimal separation distances between the Kai Tak Administration Building and adjacent structures, improving the air ventilation and mitigating the heat island effects at pedestrian level. Combined with noise control measures including vibration isolation and low-decibel HVAC units, these strategies enhance the sustainability performance of the building.

中九龍繞道（油麻地段隧道）的綠色建築設計
Green Building Design of Central Kowloon Bypass (Yau Ma Tei Section Tunnel)

3 用材及廢物管理
Materials and Waste

工程團隊以選用環保材料作為核心設計原則，積極採用再生混凝土、認證木材及低碳產品，以最大限度降低對環境的影響。通過在混凝土拌合料中以煤灰取代25% 的水泥，我們顯著減少了水泥用量及其碳足跡。預製鋁質面板系統具備 50% 穿孔率，在提升安裝效率的同時，進一步減少了材料用量。

The project embraces eco-friendly material selection as a core design principle, utilizing recycled-content concrete, certified timber, and low-carbon products to minimize environmental impact. By replacing 25% of cement with PFA in concrete mixes, we significantly reduce both cement consumption and its carbon footprint. The prefabricated aluminum cladding system, featuring 50% perforation, further decreases material usage while enhancing installation efficiency.

4 能源使用
Energy Use

大樓整合了可再生能源系統，在大樓頂部安裝 51 塊光伏發電板和太陽能熱水系統，每年合共可產生超過 20 兆瓦小時的能源，相當於五個香港家庭一年的用電量。通過將因應日光自動控制照明的功能結合發光二極管（LED）照明，能源效率得以進一步提升。中央數碼能源管理系統可實時監察表現和因應變化作出適應性調整，在確保高效運作的同時，維持以合理方式善用能源。

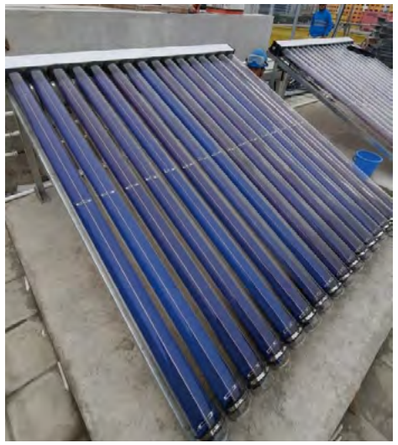
The building integrates renewable energy systems, including 51 PV panels and a solar thermal water heating system on its rooftop. These systems collectively generate over 20 MWh of energy annually - equivalent to the electricity consumption of five Hong Kong households. Energy efficiency is enhanced through LED lighting with automated daylight-responsive controls, while a centralized digital energy management system enables real-time monitoring and adaptive optimization, ensuring efficient operation with optimal energy use.

5 用水
Water Use

工程採用雨水回收系統，收集屋頂徑流並儲存於專用水缸內，為灌溉提供水源。此舉可減少 96% 的灌溉用水量，相當於三個香港家庭一年的用水量。另外，低流量供水裝置減少了 30% 的飲用水需求，智能漏損檢測傳感器則提供實時系統監測，從而防止水資源浪費，確保可持續的用水管理。

The project implements a rainwater recycling system that collects roof runoff for storage in a dedicated tank, supplying water for irrigation. This could reduce water consumption by 96%, which is equivalent to the annual water use of three Hong Kong households. Additionally, low-flow plumbing fixtures decrease potable water demand by 30%, while smart leak detection sensors provide real-time system monitoring to prevent water loss, ensuring sustainable water management.

啟德行政大樓的光伏發電板
PV panels at Administration Building



太陽能熱水系統
Solar thermal water heating system

中九龍繞道（油麻地段隧道）的綠色建築設計
Green Building Design of Central Kowloon Bypass (Yau Ma Tei Section Tunnel)

啟德行政大樓頂部的園景
Landscape rooftop at Administration Building

6 健康與安舒
Health and Wellbeing

為保障隧道營運人員的健康舒適，啟德行政大樓的室內空氣質素已通過認證，達到卓越級別。智能通風系統通過實時監測二氧化碳濃度並動態調節風量，將通風效果維持在高於標準要求 30% 的水平。此外，暖通空調系統配備了消聲器，為員工提供更舒適的工作環境。

For the wellbeing of the tunnel operation crew, the Indoor Air Quality (IAQ) of Administration Building is certified to achieve an excellent class rating. The smart ventilation system utilizes real-time CO_2 sensors to monitor and dynamically adjust airflow rates, maintaining ventilation 30% above the required standards. Furthermore, the HVAC system incorporates acoustic silencers to provide a more pleasant working environment.

通過最佳的日光滲透度、策略性的綠化景觀和有機形狀的家具，親自然的設計提升了人員的健康舒適度。園景屋頂平台作為休憩恢復空間和視覺景觀，讓大約 130 名隧道營運人員得以享受直接眺望鄰近啟德體育園的景觀。

Biophilic design enhances wellbeing by the optimized daylight penetration, strategic greenery views and organic-shaped furniture. Approximately 130 tunnel operations staff benefit from direct visual connections to the adjacent Kai Tak Sports Park Main Stadium via the landscaped rooftop terrace, which serves as both a restorative break space and a visual amenity.

7 創新
Innovations and Additions

通過採用建築信息模擬，我們完善了啟德行政大樓的設計和建造，以減少設計衝突、錯誤和浪費。數碼化工地管理減少了文書工作，從而進一步減少了 900 公斤二氧化碳排放。我們亦將獲獎的智能電力負載管理系統整合至工程的電動汽車充電站以動態分配電力，從而最有效使用能源和支持可持續運輸。

啟德行政大樓在二零二三年八月進行的「綠建環評新建建築 2.0 版」的暫定評估中，取得鉑金級的評級，是對可持續建築設計和營運的最高級別的肯定。

By adopting Building Information Modeling (BIM), the design and construction of the Kai Tak Administration Building were optimized to reduce clashes, errors and waste. The digital site management further reduces 900 kg of CO_2 emissions by reducing paperwork. The project also integrates an award-winning smart load management system for its EV charging stations, dynamically distributing power to optimize energy use and support sustainable transport.

In the provisional assessment for 'BEAM Plus New Buildings Version 2.0' conducted in August 2023, the Kai Tak Administration Building attains the highest level of recognition for sustainable building design and operation at Platinum Rating.

總結
Conclusion

中九龍繞道（油麻地段隧道）工程的成功，展示了大樓建造如何能在工程卓越與環境管理之間取得平衡。工程項目積極推動節能建築、系統及設備的應用，在減少對外部環境污染的同時，亦提升室內環境品質。透過前瞻規劃與創新設計，基建項目既能達致工程卓越，亦能兼顧環境與社會利益，從而平衡發展與保育的需求，助力香港邁向更可持續的未來。

The CKB (YMTST) project successfully demonstrates how building construction can harmonize engineering excellence with environmental stewardship. It fosters energy-efficient buildings, systems and equipment to minimize pollution to the external environment and improve the quality of indoor environment at the same time. With forward planning and innovative design, infrastructure projects can achieve engineering excellence while safeguarding environmental and social interests. This balances the needs for development and conservation, allowing Hong Kong to progress towards a more sustainable future.

洪水橋站的可持續設計及施工方法
Sustainable Design and Construction Method of Hung Shui Kiu Station

引言
Introduction

洪水橋站是《鐵路發展策略 2014》中建議推展的七個鐵路方案之一。新車站位於現有屯馬線的天水圍站和兆康站之間，將服務未來的洪水橋 / 厦村新發展區，配合《北部都會區發展策略》下可持續的人口增長和就業機會。此外，車站位於港深西部鐵路（洪水橋至前海）的起點附近，因此獲定位為關鍵的交匯樞紐，以提升香港和深圳之間的跨境連接，讓該區能夠把握大灣區發展帶來的機遇。洪水橋站的主要建造工程於二零二四年年底展開，預計於二零三零年完成。

Hung Shui Kiu (HSK) Station is one of the seven railway schemes proposed to be taken forward in the Railway Development Strategy 2014. Located on the existing Tuen Ma Line between Tin Shui Wai Station and Siu Hong Station, this new station will serve the future Hung Shui Kiu/Ha Tsuen New Development Area (NDA), supporting sustainable population growth and employment opportunities under the Northern Metropolis Development Strategy. Additionally, the station is situated near the starting point of the Hong Kong-Shenzhen Western Rail Link (Hung Shui Kiu-Qianhai), positioning it as a key interchange hub to enhance cross-boundary connectivity between Hong Kong and Shenzhen. This will enable the region to capitalize on opportunities arising from the Greater Bay Area development. The main construction works for HSK Station began in late 2024, with completion targeted for 2030.

洪水橋站的概念圖
Photomontage of Hung Shui Kiu Station

洪水橋站的可持續設計及施工方法
Sustainable Design and Construction Method of Hung Shui Kiu Station

洪水橋站的可持續設計
Sustainable Design of Hung Shui Kiu Station

新的洪水橋站在被動式環境策略與能源利用方面均融入創新、可持續性和高效能的理念。車站採用可持續原則設計，在降低能源消耗的同時，實現最佳的運作效率。車站整合的設施包括自然通風、太陽隔熱和利用日照，以提升環境表現。

The new HSK Station embeds innovation, sustainability and high performance in both passive environmental strategies and energy harnessing capability. Designed with sustainable principles, the station reduces energy consumption while optimizing operational efficiency. Its integrated features include natural ventilation, solar control, and daylight harvesting to enhance environmental performance.

1 自然通風
Natural Ventilation

車站在前廳區域（包括大堂和月台）採用自然通風，無需使用空調。為達致最佳的氣流和最舒適的溫度，車站的設計整合多項優化設施，包括自動月台閘門、網狀外牆和具能源效益的大風量低轉速風扇，而這些設施已在多個國家的鐵路車站採用，並已證實為有效的方案。大風量低轉速風扇具備先進的翼型風扇葉片設計，能夠在增加最多氣流的同時，將能源消耗降至最低。配合網狀外牆系統，這些設計共同大幅提升了前廳區域的自然通風性能與乘客舒適度。

The station employs natural ventilation for Front-of-House (FoH) areas including concourses and platforms, eliminating the need for air conditioning. The design incorporates multiple features to optimize airflow and thermal comfort: Automatic Platform Gates (APG), mesh façades, and energy-efficient High-Volume Low-Speed (HVLS) fans - a proven solution used in international railway stations. These HVLS fans, featuring advanced aerofoil blade designs, maximize airflow while minimizing power consumption. Combined with the mesh façade system, they significantly enhance natural ventilation performance and passenger comfort throughout the FoH areas.

位於大堂範圍的大風量低轉速風扇
High-Volume Low-Speed fans in concourse area

設有遮雨簷篷系統的網狀外牆系統
Mesh façade system with rain canopy system

洪水橋站的可持續設計及施工方法
Sustainable Design and Construction Method of Hung Shui Kiu Station

2 太陽隔熱和日照
Solar Control and Daylight

基於車站東西面坐向的佈局，乘客在早上和下午時段將受到低角度太陽直射和眩光影響。為解決此問題，車站特別設計了高效能的網狀遮板和遮雨簷篷系統，既能實現最有效遮擋陽光的同時，仍能允許自然光進入。此外，車站通過安裝在後勤範圍頂部的光伏發電板，引入了可持續的能源生產方式。這些光伏發電板向南傾斜，以最大程度暴露於日照，有助抵消車站消耗的能源和減少碳排放。

Given the station's east-west orientation, passengers will experience direct low-angle solar radiation and glare during both morning and afternoon periods. To address this, a high-performance mesh screen and rain canopy system has been specifically designed to provide optimal solar shading while allowing diffused natural daylight. Furthermore, the station incorporates sustainable energy generation through PV panels installed on Back-of-House (BoH) roofs. These south-tilted panels maximize solar exposure, helping offset station energy consumption and reduce carbon emissions.

3 綠化
Greenery

為減少車站周邊積聚的熱力和緩解城市熱島效應，車站設計融合了多樣的綠化方案，包括站外的園景區、網狀外牆上的垂直綠化和補償植樹計劃。垂直綠化系統不但豐富了車站的視覺效果，而且提升了空氣質素和美觀價值。通過整合這些綠化設施，車站成為周邊城市景觀中更具可持續與適應力的一部分，同時為乘客和附近社區締造更健康的環境。

To reduce heat accumulation around the station and mitigate the urban heat island effect, the design incorporates diverse greenery solutions including external landscaping areas, vertical greening on mesh façades, and compensatory tree plantings. The vertical greening system not only enriches the station's visual appearance but also enhances air quality and aesthetic value. By integrating these green features, the station becomes a more sustainable and resilient component of the surrounding urban landscape while fostering a healthier environment for both commuters and neighboring communities.

位於後勤範圍頂部的光伏發電板
PV panels on the top of Back-of-House

洪水橋站的可持續設計及施工方法
Sustainable Design and Construction Method of Hung Shui Kiu Station

4 洪水橋站的可持續建造方法
Sustainable Construction Method of Hung Shui Kiu Station

為盡量減少施工期間對現有鐵路運作造成的影響，工程團隊積極研發創新施工方法，在現有高架橋的兩側組裝已預先安裝自動月台閘門的超大型組件。此方法運用多項先進技術，包括裝配式設計、組裝合成建築法和機電裝備合成法。通過採用這些場外生產和現場組裝的施工方法，工程成功節省大量能源，並顯著減少建築廢料。

To minimize impact on existing railway operations during construction, the project team has proactively developed innovative methods involving the fabrication of mega size modules with APG preinstalled on both sides of the existing viaduct. This approach utilizes advanced technologies including Design for Manufacture and Assembly (DfMA), Modular Integrated Construction (MiC), and Multi-trade Integrated Mechanical, Electrical and Plumbing (MiMEP). By implementing these off-site manufacturing and on-site assembly practices, the project achieves significant energy savings and construction waste reduction.

採用裝配式設計、組裝合成建築法和機電裝備合成法的可持續建造方法
Sustainable construction method with adoption of DfMA, MiC and MiMEP

整合了車站結構、自動月台閘門系統和月台層板的超大型組件在製成後將滑移至最終位置。隨後，我們會重新配置現有安裝在側面的高架電纜系統，並隨後進行機電測試和啟用。此方法在加快工程進度的同時，也大幅減少了對環境的影響，特別是降低了對附近居民的空氣與噪音污染。這項成果充分體現了我們在推動可持續發展、提升建造質量與安全標準方面的堅定承諾。

The completed mega modules incorporating station structures, APG systems, and platform slabs will be skidded into final position, followed by relocation of the existing side mounted Overhead Line system and subsequent E&M testing and commissioning. This methodology not only accelerates construction timelines but also substantially reduces environmental impacts, particularly air and noise pollution for nearby residents. The solution demonstrates a commitment to sustainable development while enhancing construction quality and safety standards.

以組裝合成建築法建造連接香港眼科醫院的有蓋行人道
Adoption of Modular Integrated Construction for Walkway Cover Project near Hong Kong Eye Hospital

位於亞皆老街鄰近香港眼科醫院的有蓋行人道
Walkway cover on Argyle Street near Hong Kong Eye Hospital

有蓋行人道計劃
Walkway Covers in Hong Kong

香港的有蓋行人道網絡作為基礎建設的一環，每日為行人遮光擋雨，提升步行的舒適度。

如以傳統方式建造上蓋結構，會涉及大量現場工序，包括安裝模板、澆築混凝土、焊接和切割工作。這些施工通常會對公眾造成較長時間的滋擾，產生大量建造廢物，以及對路旁環境造成影響。

我們採用了組裝合成建築法建造連接香港眼科醫院的 60 米長有蓋行人道。有別於傳統建造方式，大部分有蓋行人道的組件（包括鋼架結構、上蓋、照明和排水系統）移師到環境受控的預製工場進行生產和組裝，然後運送至工地現場快速安裝。這種創新的建造方法為有蓋行人道計劃帶來顯著的環境效益。

Hong Kong's network of covers on public footpath serves as vital infrastructure, providing daily shelter for pedestrians from intense sunlight and heavy rain.

The conventional construction methods for these cover structures involve extensive on-site activities such as formwork installation, concreting, welding, and cutting operations. These activities typically cause prolonged disruption to public, generate substantial construction waste, and create environmental impacts along roadside.

The recently completed 60 m walkway cover on Argyle Street outside Hong Kong Eye Hospital adopted Modular Integrated Construction (MiC) method. This involved off-site manufacturing of volumetric walkway cover modules including metal frames, cladding, lighting, and drainage systems, in a controlled factory environment, followed by rapid on-site assembly. The MiC approach delivered significant environmental benefits for the Hong Kong Eye Hospital walkway cover project.

以組裝合成建築法建造連接香港眼科醫院的有蓋行人道
Adoption of Modular Integrated Construction for Walkway Cover Project near Hong Kong Eye Hospital

採用組裝合成建築法建造有蓋行人道的環境效益
Environmental Benefits of MiC for Walkway Covers

1 減少建造廢料
Reduction in Construction and Demolition (C&D) Waste

預製工場可精確控制製造過程，提高物料的利用效率，減少浪費物料的情況。位於廣東江門的預製工場有統一標準的程序和嚴謹的品質控制，亦可大幅減少錯誤、避免損壞和重新施工。組裝合成建築法因而減少建造廢料的數量。

Factory-controlled manufacturing minimized material over-ordering and offcuts through precise fabrication. Standardized processes and quality control in the fabrication yard in Jiangmen, Guangdong also significantly reduced errors, damage and rework. The MiC approach resulted in minimal C&D waste.

2 減少空氣污染
Reduction in Air Pollution

在工地現場進行的上蓋結構建造工序僅限於在夜間組裝六個介乎 1.5 至 12 米長的「7」字形預製組件。通過將大部分製造過程轉移至設有先進過濾系統的預製工場，我們大幅減少了直接排放至鬧市的塵埃、煙霧和揮發性有機化合物。

On-site superstructure construction was limited to lifting and connection of six pre-fabricated '7'-shaped modules ranging from 1.5 to 12 m in length during nighttime. By relocating most fabrication to a regulated facility with advanced filtration systems, dust, fumes, and volatile organic compound emissions released directly into the busy pedestrian corridor in the urban area were drastically reduced.

3 減少噪音污染
Reduction in Noise Pollution

切割、研磨、錘打金屬和操作機械會產生大量噪音。工程鄰近易受噪音影響的住宅區，減少噪音滋擾變得尤其重要。由於所有高音量的製造工序在場外的密封式工場內進行，在工地現場進行的組裝工序只涉及較寧靜的起重機吊運操作，而整個安裝組件的工序在四晚內完成，大大減少其產生的噪音。

Cutting, grinding, hammering, and machinery operations generate significant noise. Given the project's proximity to noise-sensitive receptors, minimizing prolonged construction noise was especially important. All noisy fabrication activities were conducted off-site within enclosed warehouse facilities. On-site work involved only quieter crane operations, with the entire modular installation completed in just four nights.

4 減少隱含碳的碳足跡
Lower Embodied Carbon Footprint

此外，組裝合成建築法多方面為減少隱含碳作出貢獻，包括通過精確的設計和製造過程減少物料浪費，充分利用物料。組裝合成建築法亦可減少工地現場的能源消耗，同時減少運送物料的次數，從而將運輸造成的碳排放減至最低。組裝合成建築法能減少公共基礎建設工程的碳足跡，直接幫助香港實現二零五零年前達至碳中和的目標。

Furthermore, MiC contributed to lower embodied carbon through multiple pathways: reduced material waste through precise manufacturing, optimized material usage via precision design and fabrication, decreased on-site energy consumption, and minimized transportation emissions resulting from fewer material deliveries. This directly supported Hong Kong's commitment to achieving carbon neutrality before 2050 by lowering the carbon footprint of public infrastructure projects.

「7」字形預製組件
"7"-shaped pre-fabricated modules

在工地現場安裝預製組件
Installation of prefabricated modules on-site

總結
Conclusion

在連接香港眼科醫院的有蓋行人道項目中採用組裝合成建築法，達致多方面的環境效益。透過將大部分現場施工工序轉移至工廠預製，組裝合成建築法大幅減少建造廢料、空氣污染、噪音污染和隱含碳的排放。

The adoption of MiC for building the walkway cover near Hong Kong Eye Hospital has achieved multifaceted environmental benefits. By transferring many construction activities to the factory yard, MiC dramatically reduced on-site waste, air pollution, noise pollution, and embodied carbon emissions.

紅磡海底隧道收費廣場含石棉物料的篷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

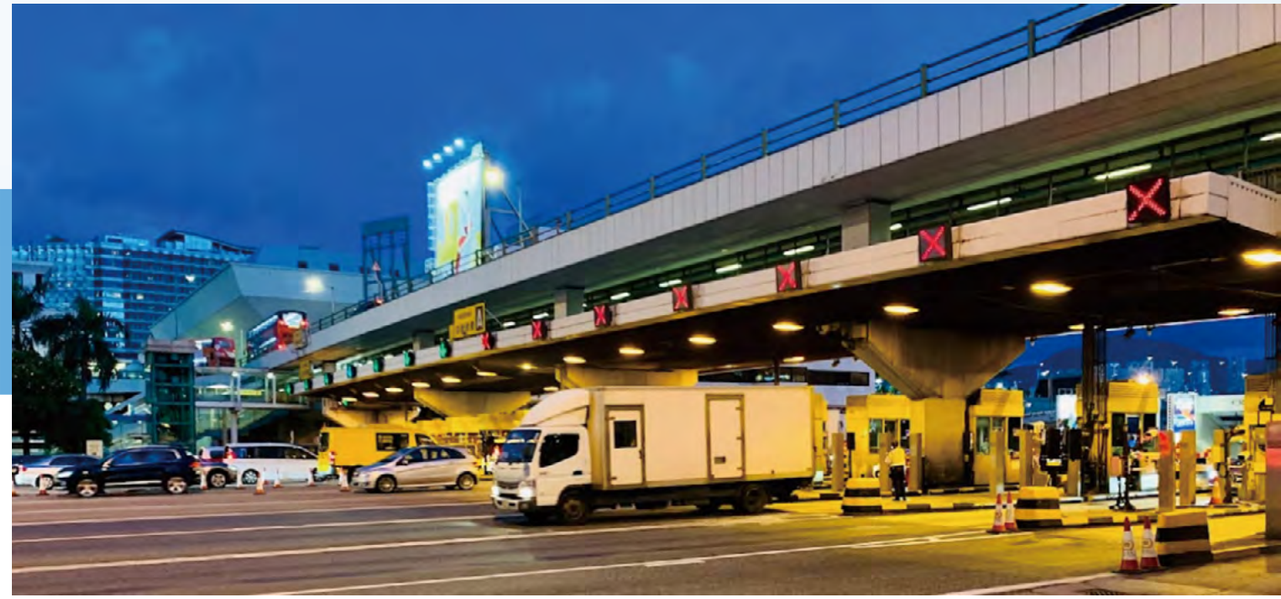
引言
Introduction

二零二二年施政報告中提及，在政府收費隧道推行不停車繳費系統的措施。我們需要拆卸和修改紅磡海底隧道收費廣場的道路設施（包括收費亭、收費島和地面構築物等），當中包括移除含石棉物料的收費亭篷篷。

這個含石棉物料的篷篷拆卸工程位於香港其中一條最繁忙的交通走廊，因此，拆卸工程極為複雜而且高風險。工程進行期間嚴格遵循環境保護和公眾安全等相關規例要求。在周詳的環境管理規劃和嚴謹的措施執行下，不僅成功將工程對交通造成的影響減至最少，也保障所有持份者的健康和安全。

In line with the Policy Address 2022 initiative, implementation of free-flow tolling system at government-tolled tunnels was rolled out. Demolition and modification of highway facilities, including toll booths, toll islands, and above-ground structures, could be carried out at the Cross-Harbour Tunnel (CHT) toll plaza. This included the removal of the toll canopy, which contained asbestos-containing materials (ACMs).

The demolition of the ACMs contained canopy, located in one of Hong Kong's busiest traffic corridors, posed significant complexity and high risks. The project was executed with strict adherence to environmental protection, public safety, and regulatory compliance. Through meticulous environmental management planning and disciplined execution, the project minimized traffic disruptions while safeguarding the health and safety of all stakeholders.



紅磡海底隧道收費廣場
Cross-Harbour Tunnel Toll Plaza

含石棉物料的篷篷位置
Location of the ACMs contained canopy

紅磡海底隧道收費廣場含石棉物料的簷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

環境和公眾衞生風險
Environmental and Public Health Risks

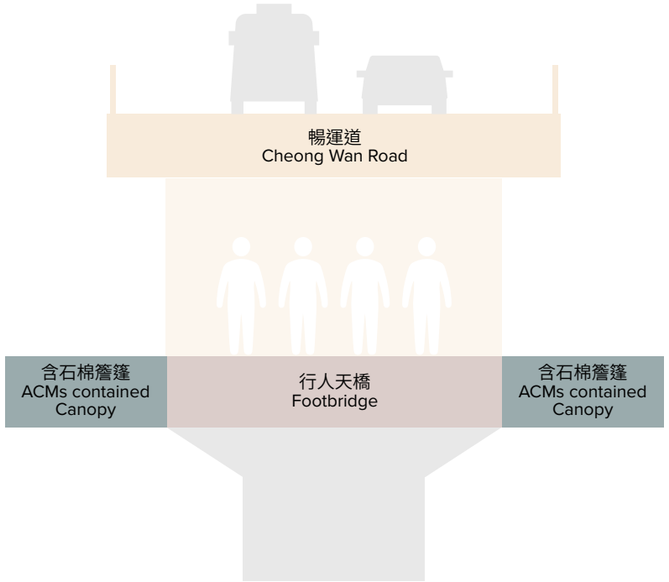
此次拆卸的簷篷建於一九七三年，橫跨 14 條繳費車道並與位於暢運道下方的行人天橋連接。此簷篷被確認含有石棉物料，除了較常見的溫石棉以外，更包含有高風險的石棉物料—透閃石棉。透閃石棉屬於鬆脆易碎的纖維，對環境和公眾衞生構成重大風險。吸入這些石棉纖維已證實對健康造成嚴重影響，包括引發石棉沉着病和間皮瘤等疾病。

有鑒於石棉物料的毒性，以及收費亭簷篷位於極度繁忙的交通樞紐，我們採用一套穩健、多層次的環境管理方案，方案核心包括嚴密的空氣質素監控、採用密閉間施工方法和安全的廢物處理。

Constructed in 1973, the canopy which spanned across 14 toll lanes and connected to a pedestrian footbridge beneath Cheong Wan Road, was confirmed to contain asbestos materials, including Chrysotile, a commonly encountered type, and Tremolite, a highly hazardous forms of asbestos. The presence of such friable material poses significant environmental and public health risks. Inhalation of these fibres is known to cause severe impact on health, including asbestosis and mesothelioma.

Given the material's toxicity and the canopy's location above a high-traffic area, a robust, multi-layered environmental management approach was adopted. This strategy prioritized strict air quality control, containment measures, and safe waste handling.

紅磡海底隧道收費廣場含石棉物料的簷篷（拆卸前）
The ACMs contained canopy at CHT Toll Plaza before demolition



紅磡海底隧道收費廣場橫斷面
Cross Section of the CHT Toll Plaza

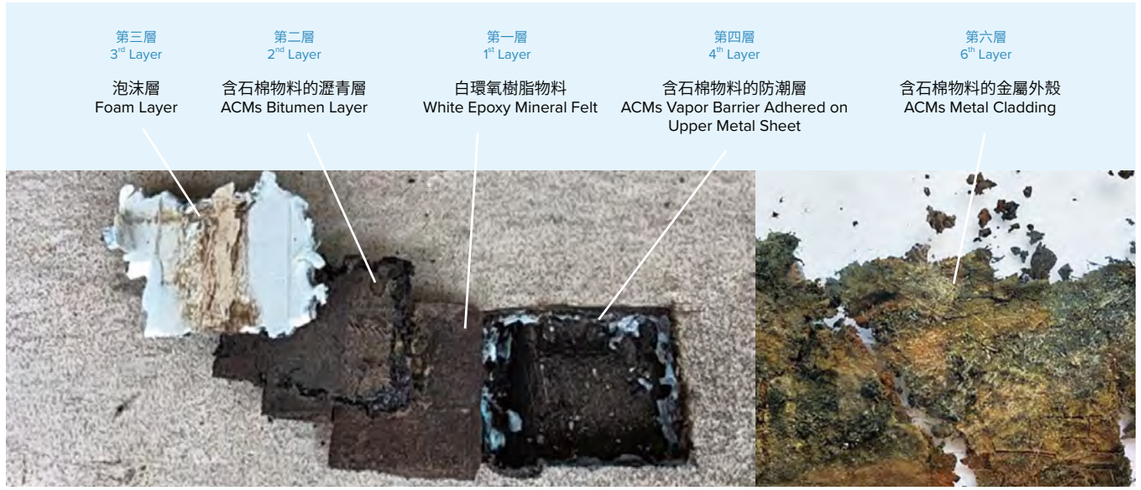
紅磡海底隧道收費廣場含石棉物料的籌篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

主要的環境管理措施
Key Environmental Management Measures

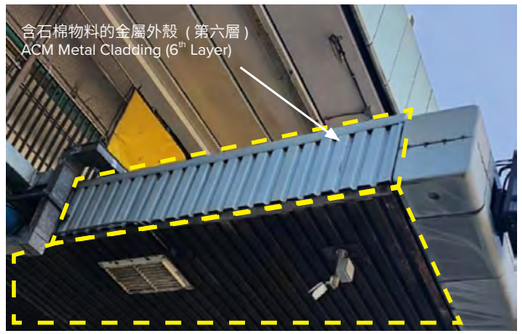
1 全面的石棉調查和空氣監測
Comprehensive Asbestos Investigation and Air Monitoring

深入的石棉調查（包括實地勘查、批量取樣和實驗室分析）經由環境保護署核准的註冊石棉顧問進行，以評估受石棉影響的人口特徵和釋出石棉纖維的潛在風險，從而幫助識別合適的石棉消減方案。

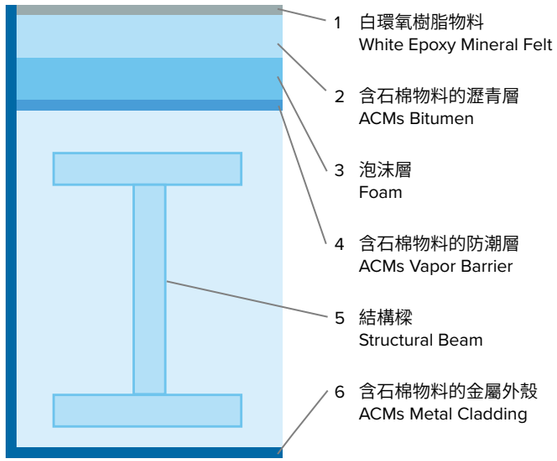
An in-depth asbestos investigation, including asbestos survey, bulk sampling, and laboratory analysis, was carried out by a registered asbestos consultant approved by the Environmental Protection Department (EPD) to assess the demographic of the exposed population and the potential for release of asbestos fibres. Such assessments help identify appropriate abatement methods.



從籌篷抽取的大型樣本
Bulk samples taken from the canopy



籌篷物料切面示意圖
Illustration of the synthesis of the canopy



根據環境保護署核准的石棉消減計劃，我們嚴格實施完善的空氣監測系統，策略性地設置實時空氣質素監測站，配置於施工人員身上、施工範圍內外，以及周邊未受污染的公眾出入通道處（包括隧道收費廣場和暢運道下方行人天橋）。透過持續監測石棉纖維濃度，確保工程期間的空氣質素符合環境保護署的容許限值。整個工程期間，我們持續收集背景空氣樣本和拆卸期間的空氣樣本，以確保施工環境對工人和市民均屬安全。

A robust air monitoring system, as specified in the EPD's approved Asbestos Abatement Plan, was implemented. Real-time air quality monitoring stations were strategically positioned on workers, within work areas and at nearby uncontaminated public access points including the toll plaza and footbridge beneath Cheong Wan Road. Asbestos fibre concentrations were measured to ensure compliance with EPD permissible limits. Background and clearance samples were collected to verify environmental safety for both workers and the public throughout the project.

紅磡海底隧道收費廣場含石棉物料的篷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

2 全密封式負氣壓作業空間
Full Containment and Negative Pressure Enclosure

由於篷篷鄰近行人流量高、位於暢運道下方的行人天橋和含高風險的石棉物料，我們採用移除石棉的最高防護級別—全密封式負氣壓作業空間移除含有石棉的物料。該系統整合了強化板材、鋼製棚架和密封技術，以保障公眾健康。每個全密封式作業空間建造完成後，我們均進行煙霧測試，以驗證作業空間的密封性。

整個全密封式作業空間的結構配備 HEPA 過濾器的負氣壓氣流機組，以防止石棉纖維泄漏。拆卸工程受嚴格管控，透過精密的通風量計算，確保施工區內維持負氣壓，從而保障附近的公眾地方的空氣質量。

Given the canopy's close proximity to the high pedestrian flow footbridge beneath Cheong Wan Road and the presence of highly hazardous asbestos, a full negative pressure enclosure (the highest protection level for asbestos removal) was implemented for ACMs removal. The system incorporated reinforced sheeting, steel scaffolding, and airtight sealing to safeguard public's health. After each containment construction phase, smoke tests were conducted to verify the enclosure's airtightness.

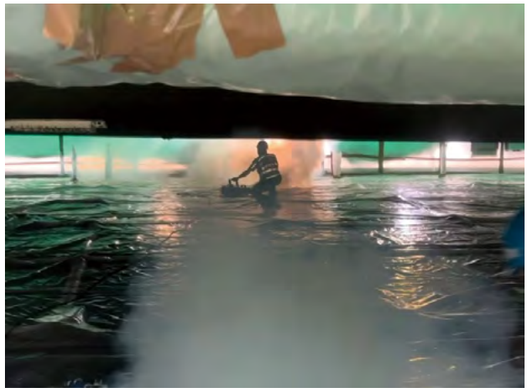
The entire containment structure was equipped with negative pressure airflow units featuring High-Efficiency Particulate Air (HEPA) filters to prevent the escape of asbestos fibres. Stringent air ventilation calculations ensured maintenance of negative pressure within the containment, protecting adjacent public areas while enabling controlled demolition.

為移除含石棉物料篷篷而設立的全密封式作業空間
Full containment for ACMs contained canopy removal

密封區內部
Inside the containment

負氣壓系統
Negative pressure system

工人穿上全套呼吸防護設備
Worker in full PPE



煙霧測試驗證作業空間的密封性
Smoke test for air-tightness

紅磡海底隧道收費廣場含石棉物料的篷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

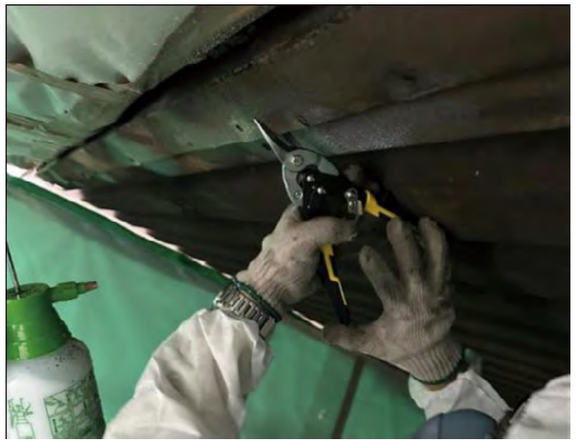
3 抑制塵埃和除污
Dust Suppression and Decontamination

在移除含石棉物料時，我們採用濕抹法清潔技術和嚴格禁止使用機動工具，以抑制塵埃。所有含石棉物料會預先以水或特定的水溶性溶液 (聚醋酸乙烯酯膠液) 潤濕，並以配有 HEPA 過濾器的吸塵設備進行清理，以抑制石棉纖維釋放。所有拆卸的物料會以經核准的石棉廢物袋密封，再作運輸和棄置。

施工區域設有三進除污室，除污室由骯髒衣物更換室、淋浴室和清潔衣物更換室組成，作為作業間的唯一出入口，讓工人進出前後完成除污步驟。所有工程產生的廢水，均通過設有沉澱池和過濾功能的封閉式排水系統收集並過濾，從而防止任何受污染的水排放到公眾環境。

Wet removal techniques and a strict prohibition of powered tools were implemented to suppress dust generation during ACMs removal. All ACMs were pre-wetted using water or water-based Polyvinyl Acetate spray and vacuumed with HEPA filtered equipment to suppress fibre release. All dismantled materials were sealed in approved asbestos waste bags for secure transportation and disposal.

A 3-chamber airlock decontamination hygiene unit, which consisted of a dirty room, shower room and clean room, served as the single entrance or exit to the working zone for workers' decontamination. All wastewater generated from works was collected and filtered through a closed-loop drainage system equipped with sedimentation tanks and filtration units, preventing any contaminated water from being discharged into the environment.



以手動工具配合噴霧移除金屬殼
Trimming of metal cladding by hand tools with water spray

三進除污室
3-chamber decontamination unit

4 處理和棄置廢物
Waste Handling and Disposal

根據《石棉管制的工作守則》和《廢物處置 (化學廢物)(一般) 規例》的規定，所有石棉廢物均已妥善密封，並將其存放在指定區域，由註冊石棉廢物承辦商收集，並運送石棉廢物至經核准的堆填區處置。項目建立了完整的文檔監管鏈系統，以追蹤石棉廢物的流向和最終棄置安排。

All asbestos waste was properly sealed and stored in the designated area for collection by registered asbestos waste contractors, who transported it to an approved landfill in compliance with both the Code of Practice on Asbestos Control and the Waste Disposal (Chemical Waste) (General) Regulation. A full chain-of-custody documentation system was maintained to track the movement and final disposal of all hazardous materials.

石棉廢物存放於指定的臨時存放區
Asbestos wastes inside temporary storage

石棉廢物袋 (核准尺寸為 1 米 × 0.7 米、承載能力為兩公斤)
Waste bags with approved size of 1m x 0.7m and loading capacity of 2kg

紅磡海底隧道收費廣場含石棉物料的篷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

挑戰與限制
Challenges and Constraints

1 車流量和人流量帶來的獨特挑戰
Unique Challenges due to Vehicular and Pedestrian Traffic

紅磡海底隧道作為香港的主要運輸幹線，負載持續繁重的車流量。總長約 62 米的篷篷橫跨正在運作的隧道廣場收費亭，在施工期間須與環境保護署和運輸署進行協調，具有獨特的挑戰性。由於工地位處於交通樞紐，移除含石棉物料時需遵守經核准的石棉消減計劃和相關法規的嚴謹要求。所有工序均在嚴格控制的框架內進行，配備臨時交通改道措施，以盡量減少對公眾的影響。

篷篷拆卸工程分三個嚴格控制的階段進行，涉及建造專用的全密封式作業空間、實施所有上述的環境保護措施和在工程進行期間持續監測空氣。

The CHT serves as a major transportation artery in Hong Kong, handling constantly heavy vehicular traffic. The canopy spanned active toll booths, presenting unique coordination challenges with both EPD and the Transport Department during project execution. Given the site's critical location, ACMs removal was conducted under stringent requirements governed by approved abatement plans and relevant regulations. All works were performed within tightly controlled time windows, with temporary traffic diversions implemented to minimize disruption.

The canopy removal works were executed in three tightly controlled stages, each involving construction of dedicated full containment structures, implementation of all the aforementioned environmental protection measures and continuous air monitoring throughout operations.

2 應急準備
Emergency Preparedness

考慮到含石棉物料的危險性及工地鄰近公眾範圍，我們預先制定了全面的應變計劃，以應對各種潛在事故與惡劣天氣，例如在三號強風信號生效時暫停工程，和在八號烈風或暴風信號生效時拆除全密封區。工程由二零二四年四月開展至同年十月竣工，橫跨整個雨季，為確保工程可按時完工，團隊克服了自然環境的挑戰。考慮到拆除和重建全密封區對工程的竣工會造成重大影響，團隊均要靈活應變，動態調整施工方案，以應對不同的天氣狀況，確保工程按時完工。在二零二四年九月，團隊在超強颱風「摩羯」來襲前動員額外人手、延長工作時間和調動額外設備以加快進度，使第二階段工程得以在二零二四年九月三日 (三號熱帶氣旋警告信號發出前) 完成。

In view of the hazardous nature of ACMs and the close public proximity, comprehensive contingency plans were developed for various incidents, including inclement weather. For example, works halted under Tropical Cyclone Warning Signal No. 3 and containment dismantling under Signal No. 8. The works took place from April to October 2024 during Hong Kong's wet season. In order to ensure the project could be delivered timely, the operation was competed with the nature. The dismantling and reconstruction of the containment had a significant impact on the works completion. Our team stayed resilient with different weather conditions and employed different adaptive work plans to ensure timely project completion. Before the arrival of Super Typhoon Yagi in September 2024, our team mobilised extra manpower, extended work shifts, and allocated additional equipment to expedite progress such that the second stage of works was completed on 3 September 2024 (before Typhoon Signal No. 3 was hoisted).

紅磡海底隧道收費廣場含石棉物料的篷篷拆卸工程
Demolition of Asbestos-Containing Canopy at Cross-Harbour Tunnel Toll Plaza

3 持份者參與和公共傳訊
Engagement with Stakeholders and Public Communication

鑑於工程地點廣受市民關注和工程對社會的重要性，我們十分重視與公眾和持份者之間的互動，以及透明的溝通，我們主動清晰展示了說明工程性質的告示和標誌，以釋除公眾疑慮。我們沿行人天橋加設了額外屏障和空氣監測點，確保空氣中的石棉粒子不會飄到行人區域，同時也增設額外的照明和通風，以提升行人的舒適度。

Given the project's high visibility and importance, proactive and transparent communication with the public and stakeholders was prioritized. Clear notices and signage detailing the nature of the works were displayed to ease the public's concerns. Additional physical barriers and air monitoring points were installed along the footbridge to ensure no airborne asbestos particles could reach pedestrian areas. Additional lighting and ventilation were also provided to enhance the pedestrian comfort.

工程前
Before

工程後
After

暢運道下方行人天橋的額外屏障
Additional barriers at footbridge beneath Cheong Wan Road

暢運道下方行人天橋提供額外照明和通風
Provision of lighting and ventilation at footbridge beneath Cheong Wan Road

總結
Conclusion

成功拆卸位於紅磡海底隧道收費廣場含石棉物料的篷篷，奠下了在人煙稠密的市區環境進行高風險的基礎建設工程的基準。儘管面對有害物料、車水馬龍的交通狀況和鄰近公眾區域所帶來的挑戰，我們仍順利地在沒有發生任何意外、沒有造成環境污染和沒有收到公眾投訴情況下完成工程。

此項成就充分展現出周詳的環境管理、充分的持份者參與，以及對健康、安全和環境管理的堅定承諾，對相關石棉的拆卸工程至關重要。

The successful demolition of the asbestos-containing canopy at the CHT Toll Plaza serves as a benchmark for high-risk infrastructure works in dense urban environments. Despite challenges posed by hazardous materials, heavy traffic conditions, and close proximity to the public, the project was completed without incident, environmental contamination, or public complaints.

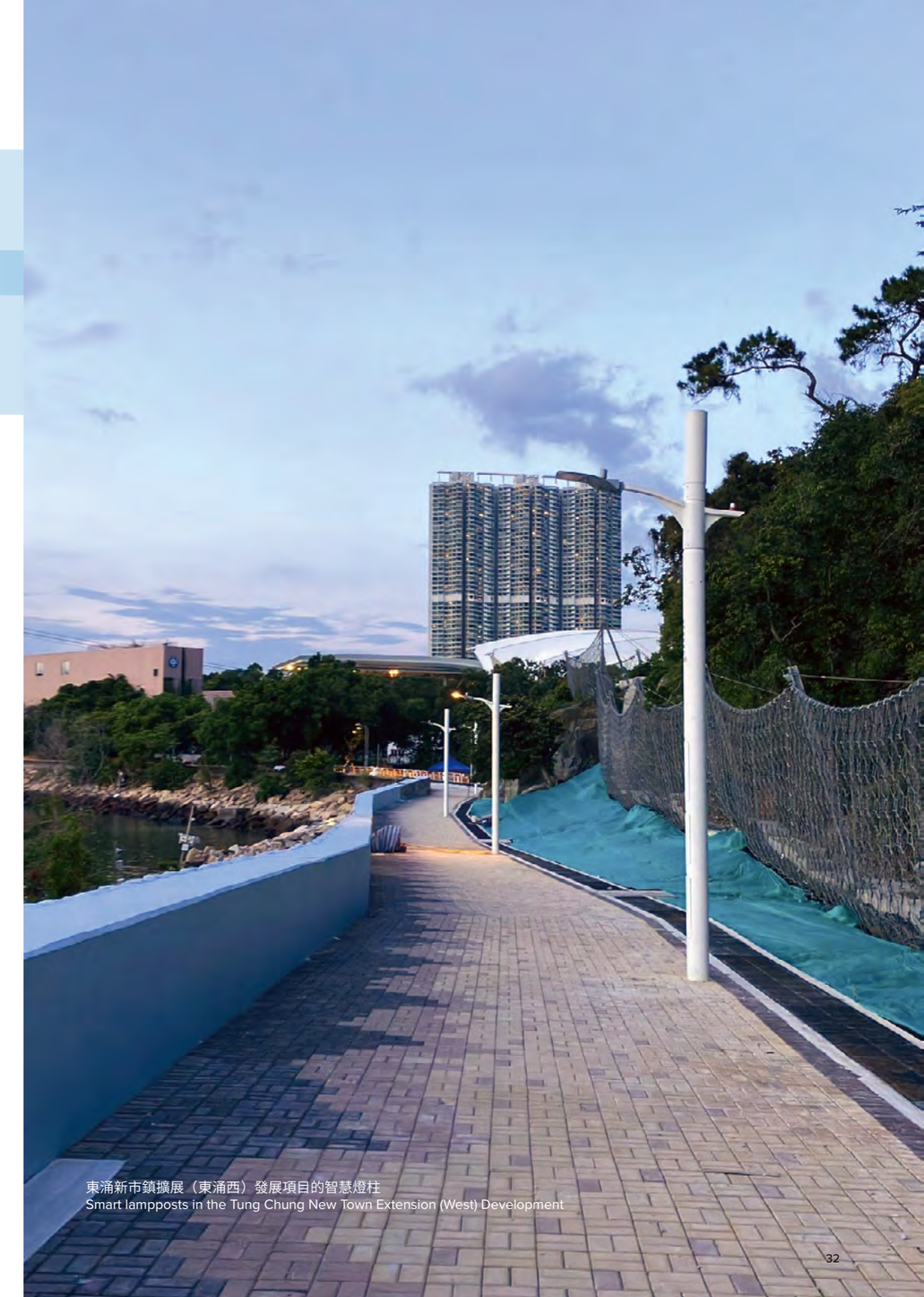
This achievement highlights the critical importance of meticulous environmental management, strong stakeholder engagement, and an unwavering commitment to health, safety, and environmental stewardship in asbestos-related demolition projects.

多功能智慧燈柱的應用
Application on Multi-functional Smart Lampposts

背景
Background

隨着在二零一九年開展的多功能智慧燈柱試驗計劃順利推行，二零二二年十二月公布的《香港創新科技發展藍圖》肯定了進一步推動香港發展為智慧城市的方針。就此，政府計劃在新發展區（包括東涌、落馬洲河套地區、新田、古洞、粉嶺北和洪水橋）安裝智慧燈柱。雖然大部分新發展區仍在規劃中和處於早期建造階段，但路政署和數字政策辦公室持續為項目倡議者就新發展區內智慧燈柱的發展提供技術支援。其中，我們參與了在東涌新市鎮擴展 (東涌西) 發展項目中安裝智慧燈柱的工作。

Following the successful implementation of the Multi-functional Smart Lampposts Pilot Scheme launched in 2019, the Hong Kong Innovation and Technology Development Blueprint published in December 2022 affirmed the direction to further promote the smart city development in Hong Kong. To this end, the Government has planned to install smart lampposts in New Development Areas (NDAs) including Tung Chung, Lok Ma Chau Loop, San Tin, Kwu Tung, Fanling North and Hung Shui Kiu. While most NDAs are still under planning and in the early construction stage, the Highways Department and the Digital Policy Office have been continuously providing technical support to the project proponents on the development of smart lampposts in the NDAs. Among others, we are involved in the installation of smart lampposts in the Tung Chung New Town Extension (West) Development.



東涌新市鎮擴展（東涌西）發展項目的智慧燈柱
Smart lampposts in the Tung Chung New Town Extension (West) Development

多功能智慧燈柱的應用
Application on Multi-functional Smart Lampposts

設有 LED 照明設備的智慧燈柱
Smart lampposts with LED luminaries

多功能智慧燈柱
Multi-functional Smart Lampposts

智慧燈柱上安裝了節能的發光二極管（LED）照明設備，以提升公共照明系統的能源效益。每個 LED 照明設備均配置獨立的控制器，可通過無線網絡和智能路燈管理系統進行通訊。受惠於智能路燈管理系統，當檢測到異常運作參數時，系統會立即將故障警報發送給維修人員，以便進行故障調查及維修。

為加強在地區層面的環境監察，我們與環境保護署和香港天文台合作，在智慧燈柱上安裝感應器。安裝於這些燈柱上的空氣質素感應器可實時追蹤主要污染物和微細懸浮粒子的濃度，例如一氧化氮（NO）、二氧化氮（NO_2）和 PM 2.5。此外，氣象感應器收集氣溫、相對濕度、風速和風向的數據。通過分析空氣質素和氣象數據，我們可以評估和監察香港的區域環境變化，有助更深入了解城市活動以及環境和城市景觀的變化所帶來的影響。

多功能智慧燈柱的實施建立了一個標準化的基礎建設平台，可支援多種智能裝置和應用，並通過整合科技提升城市管理功能和公共服務。智慧燈柱收集的城市數據會通過開放數據平台（data.gov.hk）免費取得，這些數據將有助於公眾和業界開發創新應用程式以及進行研究。

Energy-saving light emitting diode (LED) luminaires are installed on smart lampposts to enhance the energy efficiency of the public lighting system. Each LED luminaire is equipped with an individual control node enabling communication with the Smart Lighting Management System (SLMS) via a wireless network benefiting from the SLMS, when abnormal operating parameters are detected, the system will instantly send fault alerts to the maintenance staff, facilitating fault investigation and rectification.

To enhance district level environmental monitoring, we have collaborated with the Environmental Protection Department and the Hong Kong Observatory to deploy sensors on smart lampposts. Air quality sensors installed on these lampposts enable real-time tracking of the concentrations of key pollutants and fine suspended particulates such as nitrogen monoxide (NO), nitrogen dioxide (NO_2) and PM 2.5. Additionally, meteorological sensors collect data on temperature, relative humidity, wind speed, and wind direction. By analyzing the air quality and meteorological data, we can assess and monitor regional environmental changes in Hong Kong. This facilitates a deeper understanding of the impacts of urban activities as well as environmental and cityscape changes.

The implementation of multi-functional smart lampposts has established a standardized infrastructure platform capable of supporting various smart devices and applications. This platform enhances city management functions and public services through integrated technology. City data collected by smart lampposts is made freely available via the open data portal (data.gov.hk). The data will be useful in facilitating the public and the industry in developing innovative applications as well as for research purposes.

新田公路桉樹的中長期可持續管理
Sustainable Medium and Long-Term Management of Eucalyptus Trees

二零一九年新田公路旁茂密的桉樹
Dense stand of Eucalyptus trees along San Tin Highway in 2019

引言
Introduction

路政署自二零一九年推行「桉樹計劃」，以處理分佈於新田公路兩旁約 7,000 棵種植密度較大的桉樹所構成的潛在風險。這些桉樹因樹身較高且種植密度較大，尤其在颱風季節期間存在潛在的倒塌風險。此計劃旨在通過系統化和以風險為本的樹木管理，提升公眾安全、維護基礎設施和優化路旁環境。

為落實此計劃，路政署委託香港高等教育科技學院對新田公路沿線的桉樹進行健康及生態狀況評估。該研究於二零一九至二零二一年期間進行，並提出了可行的短期、中期和長期管理策略。

Since 2019, the Highways Department (HyD) has been implementing the "Eucalyptus Programme" to address the risks posed by approximately 7,000 densely growing Eucalyptus trees along the San Tin Highway. Due to their considerable height and density, these trees present a potential collapse hazard, particularly during typhoon season. The programme aims to enhance public safety, protect infrastructure, and improve the roadside environment through systematic and risk-based tree management.

To support this initiative, HyD commissioned the Technological and Higher Education Institute of Hong Kong (THEi) to assess the health and ecological conditions of the Eucalyptus trees along the San Tin Highway. The study, conducted between 2019 and 2021, provided practical management strategies for the short, medium, and long-term.

新田公路桉樹的中長期可持續管理
Sustainable Medium and Long-Term Management of Eucalyptus Trees

研究項目和初期管理
Research Project and Initial Management

試驗以抓取和切割機械移除樹木
Trials of removal by gripping & cutting machinery

短期至中期管理策略
Short to Medium-Term Actions

在短期至中期的管理工作上，路政署會移除位於斜坡上和道路邊緣的高風險樹木。此外，亦會修剪約 60% 位於斜坡和所有路旁的樹木，以提升其穩定性和安全性。在颱風季節來臨前，路政署亦會採取一系列額外措施，包括修剪及清除枯木，以及清除傾斜或體積過大的樹木，並把枯死的樹木移除，旨在降低樹木倒塌的風險，保障道路使用者的安全。

In the short to medium-term, management efforts focused on reducing immediate risks. Hazardous trees were removed, particularly on slopes and roadside verges, where their failure could endanger road users. Approximately 60% of slope trees and all verge trees were thinned to improve stability and safety. Ahead of typhoon seasons, additional measures were taken, including pruning, deadwood removal, and the clearance of leaning or oversized trees.

先導樹木管理
Trial Implementations

路政署在石湖圍路附近的兩幅斜坡開展了先導樹木管理措施，其工作包括把當中一幅斜坡上的桉樹全數移除，而另一幅斜坡的樹木密度則降低 60%。為提升斜坡穩定性和生物多樣性，兩幅斜坡上均會重新種植本土植物品種。此外，路政署亦試驗了新的移除方法，包括運用抓取和切割機械，以提升工人的安全和工作效率。我們在二零二四年間進行了三次試驗，證明該方法可行。同時，路政署亦引進了包裹樹頭和管理園林廢物的方法，以控制重新生長及確保樹木管理的可持續性。

Pilot works were carried out on two slopes near Shek Wu Wai Road. One slope was fully cleared of Eucalyptus, while tree density on the other was reduced by 60%. Both sites were replanted with native species, a measure which enhanced slope stability and biodiversity. New removal methods that used gripping and cutting machinery improved worker safety and efficiency. Three trials were conducted in 2024 and proved feasible. Stump wrapping and systematic yard waste management were also introduced to control regrowth and ensure sustainable operations.

第一次試驗（二零二四年五月十四日）
1st trial (14 May 2024)

第二次試驗（二零二四年八月二日）
2nd trial (2 August 2024)

第三次試驗（二零二四年八月八日）
3rd trial (8 August 2024)

新田公路桉樹的中長期可持續管理
Sustainable Medium and Long-Term Management of Eucalyptus Trees

定期管理
Regular Management

定期巡查和護養對樹木管理和維持斜坡上的樹木安全至關重要。在桉樹全數移除的斜坡上，我們會持續監控樹木的再萌芽及清除水橫枝。此外，我們亦會定期進行區域性及個別樹木風險評估及樹群檢查工作，對低風險和中風險區域進行每兩年一次的巡查，對高風險區域則在颱風季前進行每年一次的巡查。準備工作包括修剪過度生長的樹冠、移除枯死的樹枝和處理嚴重傾斜或高度達 12 米以上的樹木，並特別留意道路邊緣和斜坡邊界的樹木。

Regular inspections and maintenance are essential to control regrowth and sustain safe conditions. Stump removal and resprouting control were applied, particularly in areas subject to 100% thinning. Area- and tree-based assessments are conducted regularly, with biennial inspections for low and medium-risk areas and annual inspections for high-risk areas before the typhoon season. Preparations include pruning overgrown crowns, removing dead branches, and addressing trees that are severely leaning or taller than 12 m, with particular attention paid to verges and slope boundaries.

中期管理
Medium-Term Management

中期措施將重點放在提升斜坡和道路邊緣的穩定性。路政署疏伐了約 60% 斜坡上的樹木，並以高度達 12 米以上、樹幹直徑較大、樹冠較闊或結構健康較差的樹木為優先考慮。此外，我們亦會移除嚴重傾斜的樹木，並擬在斜坡邊緣設立二至五米闊的安全緩衝區，按風險水平決定優先次序，先行疏伐 100% 位於道路邊緣的樹木，然後拓展至低風險的地點。

Medium-term measures focus on slope and verge stability. On slopes, about 60% of trees were thinned, with priority given to those over 12 m tall, with large trunk diameters, wide crowns, or poor structural health. Severely leaning trees were also removed, and a clear safety buffer of 2-5 m was established along slope edges. On verges, 100% thinning was carried out, prioritised by risk level before extending to lower-priority sites.

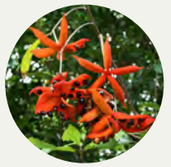
長期管理
Long-Term Management

長期管理計劃涉及分階段疏伐斜坡上的樹木，目標是在中等及低優先級區域實現 60% 的疏伐率。透過持續監察體積過大和有潛在風險的樹木，擬定移除的優先次序。我們亦會沿斜坡邊緣維持二至五米闊的安全緩衝區，並定期檢討優先次序管理系統和更新系統數據。

Long-term management involves phased thinning of slope trees, targeting a 60% reduction across medium and low-priority areas. Continuous monitoring of oversized or hazardous trees ensures that removal priorities remain relevant. A permanent safety buffer zone of 2-5 m is maintained along slope boundaries, and the Priority Management System is regularly reviewed and updated with new data.

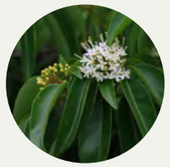
使用的植物品種 Used Plant Species

樹木 Trees



假蘋婆
Sterculia lanceolata

小果鐵冬青
Ilex rotunda Thunb. var. microcarpa



梭羅樹
Reevesia thyrsoidea

華潤楠
Machilus chinensis

灌木 Shrubs

棕竹
Rhapis excelsa

美麗胡枝子
Lespedeza formosa

長紅木
Syzygium rubrum

鵝掌柴
Schefflera heptaphylla

在沿石湖圍路的斜坡試行先導樹木管理措施
Trial Implementation of Long-Term Tree Management Measures at Slopes along Shek Wu Wai Road

斜坡編號 2SE-A/F13 的原有狀況
Original condition of slope No. 2SE/A/F13

試行後
After implementation

新田公路桉樹的中長期可持續管理
Sustainable Medium and Long-Term Management of Eucalyptus Trees

實施經驗
Implementation Experience

1
重新種植
Replanting

路政署在進行樹木疏伐和移除樹木後，會在斜坡上重新種植更多種類的本土品種。此舉不但有助恢復斜坡的穩定性，亦提升了生物多樣性和路旁景觀的視覺效果。

Following thinning and removal, slopes were replanted with a wider range of native species. This not only restored slope stability but also improved biodiversity and the visual quality of the roadside landscape.

2
移除樹木後的處理
Post-Removal Treatment

路政署在進行樹木切除工作時，會將樹頭切除至貼近地面，並包裹樹頭以避免長出水橫枝。我們會清理現場廢物，並運送至集中點，然後分類處理園林廢物，按照不同類別進行適當的棄置或回收。

Stumps were cut low to the ground and wrapped to prevent resprouting. Yard waste was cleared, transported to depots, and sorted for proper disposal or recycling.

3
試驗機械
Machinery Trials

針對抓取與切割機械的試驗，證實了機械化伐樹的優勢。相較於傳統作業，這些方法降低了對攀樹人員的依賴，更提升了作業的安全性與效率。

Trials of gripping and cutting machinery confirmed the benefits of mechanised tree removal. These methods reduced the reliance on climbers, improved safety, and delivered greater efficiency compared with traditional practices.

長期策略
Long-Term Strategy

1
持續監察和疏伐
Ongoing Monitoring and Thinning

路政署每年進行樹木風險評估及管理，並按照既定安排，每年進行最少兩次的例行樹木檢查，以及每季加強在高風險區域的檢查，持續定期監測樹木狀況。高風險樹木的準則，會定期檢討，以確保其切合實際。

Regular monitoring continues through annual Tree Risk Assessment and Management (TRAM), bi-annual Routine Horticultural Inspections (RHI), and quarterly stepped-up checks in higher-risk areas. Hazardous tree criteria are reviewed periodically to ensure their relevance.

2
重新種植和生物多樣性
Replanting and Biodiversity

移除樹木後，路政署會檢討並優先選用適應路旁環境能力較強的品種作重新種植。這些品種不僅能強化生物多樣性，更能確保生態系統的長期韌性。

Post-operation reviews guide the selection of replacement species, focusing on those that perform well under roadside conditions. This adaptive approach strengthens biodiversity and ensures long-term ecological resilience.

總結
Conclusion

截至二零二五年，「桉樹計劃」已有系統地記錄並管理約 4,000 棵分布於 85 處斜坡及路旁帶的桉樹。短期和中期工程大幅減少即時風險，而長期策略則為打造更安全、更多元化的路旁環境奠定基礎。

「桉樹計劃」以系統化的結構和以科學為本的樹木管理策略，有效降低風險、提升斜坡穩定性和促進生物多樣性。計劃以分階段形式進行，平衡了安全需求和環境可持續性，對香港路旁樹木的管理提供了有效的參考。

By 2025, around 4,000 Eucalyptus trees across 85 slopes and verges have been systematically recorded and managed under the programme. Short and medium-term works have significantly reduced immediate risks, while long-term strategies are laying the foundation for a safer and more diverse roadside environment.

The Eucalyptus Programme demonstrates how structured, science-based tree management can reduce hazards, enhance slope stability, and enrich biodiversity. Its phased approach balances safety with environmental sustainability, providing a model for responsible roadside tree management in Hong Kong.

二零二五年香港花卉展覽
Hong Kong Flower Show 2025

二零二五年香港花卉展覽頒獎典禮
Prize presentation ceremony of the Hong Kong Flower Show 2025

夜間的光影效果
The lighting effect at night

展區的鳥瞰風光
Bird-eye view of the display booth

香港花卉展覽（花展）是康樂及文化事務署（康文署）一年一度舉辦的園藝盛事。今屆香港花卉展覽以秋英為主題花，並以「綻放英姿」為主題。路政署每年都積極參與這個活動，並一貫呈獻視覺上令人驚艷且身臨其境的展覽。

二零二五年香港花卉展覽於二零二五年三月十四日至二十三日在維多利亞公園舉行。今年，路政署展區以「連繫生活•編織夢想」為主題，並榮獲大會頒發「最佳展品（園林景點）大獎 - 展品組（本地）」。

HyD actively participated in the Hong Kong Flower Show 2025, a prestigious annual horticulture event organized by the Leisure and Cultural Services Department (LCSD). This year's show featured *Cosmos* as the theme flower, under the overarching theme "Ablaze with Glory".

The Hong Kong Flower Show 2025 took place from 14 to 23 March 2025 at Victoria Park. This year, our theme was "Connecting Life · Weaving Dreams", and we are proud to report that our display booth was honoured with the Grand Award for Outstanding Exhibit (Landscape Display) under the category of Displays Section (Local).

二零二五香港花卉展覽
Hong Kong Flower Show 2025

連繫生活 • 編織夢想
"Connecting Life · Weaving Dreams"

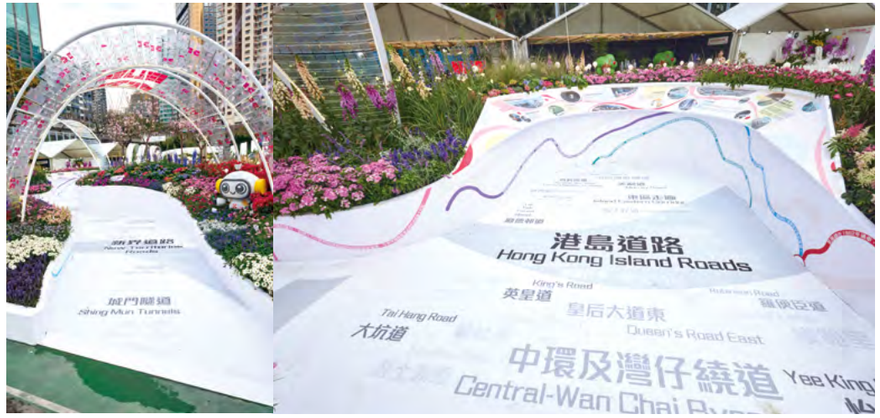
道路與橋樑連繫生活，編織夢想，也承載着我們多姿多彩的生活點滴。路政署在二零二五年花展中以富有創意的方式將道路與橋樑的元素，融合象徵活力的主題花秋英，呈現「連繫生活 • 編織夢想」的設計主題。展區透過立體拱門和蜿蜒的園林佈局，讓參觀者沉浸於充滿變化的景觀。展區的地面、牆身及入口分別以生動的藝術字擺設、圖案設計和互動展品展示與路政署工作相關的趣味知識，讓參觀者在探索和體驗流動花園景觀的同時，亦可加深對路政署在道路和鐵路建設方面工作上的了解。

Roads and bridges connect lives, weave dreams, and carry the vibrant moments of our daily journeys. At the 2025 Hong Kong Flower Show, we creatively blended road and bridge elements with the theme flower "*Cosmos*", a symbol of vitality, to bring the concept of "Connecting Life · Weaving Dreams" to life. The exhibit featured three-dimensional arches and a meandering garden layout, immersing visitors in a dynamic landscape. Through vivid artwork, graphic patterns, and interactive displays, the floor, walls, and entrance showcased fascinating facts about the work of our Department. This engaging design allowed visitors to explore a flowing garden experience while gaining deeper insight into the Department's role in shaping Hong Kong's roads and railways.

由路政署標誌編織而成的立體拱門
Three-dimensional arches with graphic patterns of HyD's Logo

具備圖案設計和互動展品的立體拱門
Three-dimensional arches with graphic patterns and interactive displays

位於展區入口的藝術字擺設「打卡」點
Photo spot at the entrance of the display booth



展示與路政署工作相關趣味知識的圖案設計
Graphic patterns showcasing fascinating facts about the work of our Department

二零二五香港花卉展覽
Hong Kong Flower Show 2025

植物設計
Planting Design

植物設計以今年的主題花秋英，並巧妙搭配毛地黃、飛燕草、石竹等多種色彩鮮豔的花卉，利用超過 50 種植物，營造出生動且七彩繽紛的園林景觀。設計靈感源自大自然的美學，透過多樣植物群落的層疊排列，模擬自然植物社群，打造出兼具視覺美感與生態平衡的園林景觀。

This year's planting design showcased the theme flower *Cosmos spp.* (秋英) alongside vibrant blooms such as Foxgloves (毛地黃), Delphinium (飛燕草), and Rainbow Pink (石竹). Featuring over 50 plant species, the display created a lively and colourful floral display. Embracing a naturalistic approach, the design mimicked wild plant communities through layered groupings, blending aesthetic charm with ecological sustainability.

源自大自然美學的植物設計營造出生動且七彩繽紛的園林景觀
Naturalistic approach of planting design creating a lively and colourful floral display

配上燈光效果的夜間園林景觀
Lively and colourful floral display at night

二零二五香港花卉展覽
Hong Kong Flower Show 2025

盛開的櫻花
Bloom of cherry blossoms

麥桿菊
Bracteantha bracteata

狼尾草
Pennisetum alopecuroides

秋英
Cosmos spp.

二零二五香港花卉展覽
Hong Kong Flower Show 2025

花展開幕當天恰逢櫻花盛開，成為展區一大亮點，吸引大量市民駐足欣賞。為增進與參觀者的互動，路政署吉祥物「Roady」亦親臨現場，成功營造歡樂的節日氣氛。參觀者在沉浸於流動花園景觀的同時，也加深了對路政署在道路和鐵路建設方面工作的認識與了解。

A highlight was the serendipitous bloom of cherry blossoms on the show's opening day, attracting crowds of admirers. To further engage visitors, HyD's mascot, "Roady", made appearances, enhancing the festive atmosphere. Guests enjoyed an immersive journey through the flowing garden landscape while learning about the Department's contributions to Hong Kong's roads and railways.

生動且七彩繽紛的園林景觀
Lively and colourful floral display

路政署吉祥物「Roady」
HyD's mascot, "Roady"

二零二五香港花卉展覽
Hong Kong Flower Show 2025

升級再造的相思木長椅
The upcycled Acacia wood bench

循環再用與升級再造木材
Wood Recycling and Upcycling

升級再造的相思木長椅是展覽區的重要亮點。這些長椅取材自路政署「斜坡植林優化計劃（分階段更替老化的台灣相思）」所收集的木材。此項目將老化移除的相思木升級再造為兼具實用與美觀的長椅，不僅推動可持續發展，也提升了遊客體驗。

在花展期間，這些升級再造的相思木長椅成為展區最受歡迎的設施之一。遊客對其極為喜愛，常常在長椅前拍照打卡。長椅的獨特設計及其背後蘊含的獨特故事，令人印象深刻。

升級再造的相思木長椅完美體現可持續發展理念，同時優化了參觀者的整體體驗。它們在花展期間收獲的熱烈迴響，清晰反映了此項目的成功，並彰顯了可持續發展措施在公共空間中的積極影響。

The upcycled Acacia wood benches serve as a significant highlight of the exhibition area. These benches were crafted from wood logs collected through our "Enhancement Programme of Vegetated Slopes of HyD (Phased Replacement of Senescent Acacia)," which removes aging Acacia trees. By transforming these materials into functional and aesthetically pleasing benches, the project not only promotes sustainability but also enhances the visitor experience.

During the Flower Show, these upcycled benches became one of the most popular features in the exhibition area. Visitors consistently showed great appreciation for them, frequently using the benches as favorite photo spots. Their unique design and the meaningful story behind their creation significantly contributed to their popularity, making them a memorable part of the event.

The upcycled Acacia wood benches stood out as a remarkable exhibition feature, perfectly embodying principles of sustainable development while elevating the overall visitor experience. Their enthusiastic reception during the Flower Show clearly demonstrates the initiative's success and underscores the positive impact of sustainable practices in public spaces.

二零二五香港花卉展覽
Hong Kong Flower Show 2025

展品在展覽完結後延續使命
New Life of the Display Materials after the Show

在二零二五香港花卉展覽圓滿結束後，路政署實施多項可持續措施，延續植物生命、促進社區綠化，並減少廢物產生。主要措施包括植物分發、樹木移植及「Roady」雕塑遷移。

Following the successful conclusion of the Hong Kong Flower Show 2025, we implemented sustainable initiatives to extend the life of plants, promote community greening, and minimize waste. Key efforts included plant distribution, tree transplantation, and the relocation of "Roady" sculptures.

分發植物
Plant Distribution

二零二五年環保回收日
Green Recycling Day 2025

環保回收日 2025
Green Recycling Day 2025

路政署透過與康樂及文化事務署合作，參與其舉辦的「環保回收日 2025」，將花展中的一部分植物分發給公眾。這項計劃不僅鼓勵社區綠化，更讓植物生命在展覽結束後得以延續。

In partnership with LCSD, we participated in the Green Recycling Day 2025, distributing a portion of the Flower Show's plants to the public. This initiative encouraged community greening and allowed plants to thrive beyond the event.

植物捐贈活動－促進永續發展，同時促進社區參與城市綠化
Flowering Giving Event - promoting sustainability while fostering community engagement in urban greening

送贈盆栽活動
Flowering Giving Event

路政署亦參與了由土木工程拓展署西拓展處舉辦的「下一站。花展（新界西）」送贈盆栽活動，將更多花展中的植物贈予當地居民。此活動不僅促進了可持續發展，也增強了社區對當區綠化的參與，讓花卉可以繼續綻放。

We also joined the "Flowering Giving Event", organized by the West Development Office of the Civil Engineering and Development Department, where additional plants were gifted to local residents. This effort promoted sustainability while fostering community engagement in urban greening.

二零二五香港花卉展覽
Hong Kong Flower Show 2025

樹木移植至路政署負責維護的斜坡
Tree transplantation to slopes maintained by HyD

移植樹木
Tree Transplantation

我們從展覽中挑選了部分花展中的樹木（包括櫻花和珍珠相思），移植至路政署負責維護的斜坡。這些樹木現已成為我們道路景觀中不可或缺的一部分，有助提升該地區的景觀美感和生態價值。

Selected trees from the exhibition, including *Prunus spp.* (櫻) and *Acacia podalyriifolia* (珍珠相思), were transplanted to the slopes maintained by HyD. These trees have now become an integral part of the roadside landscape, enhancing the aesthetic appeal and ecological value of the area.

遷移「Roady」雕塑
Relocation of "Roady" Sculptures

廣受歡迎的「Roady」吉祥物雕塑在花展後被遷移至路政署不同辦事處，繼續作為路政署的宣傳大使。

The beloved "Roady" mascot sculptures, a highlight of the Flower Show, were relocated to various HyD offices. These sculptures continue to serve as symbols of HyD.

搬遷「Roady」雕塑至路政署辦公室
Relocation of "Roady" sculptures to HyD's offices

總結
Conclusion

透過上述措施，我們不僅延展了花展的足印，更將短暫的展品轉化為對香港綠化與可持續發展的長遠貢獻。

Through these initiatives, we have maximized the Flower Show's legacy, turning temporary displays into lasting contributions to greening and sustainability in Hong Kong.

辦公室環保管理措施
Green Office Management

節省資源：食水、紙張和廢物循環再造
Resources Saving: Water, Paper & Waste Recycling

為配合政府節約天然資源的倡議，我們致力在進行各項日常工作時實踐「環保辦公室」概念。除了前章中提及的節約能源措施外，我們一直主動推行多項環保政策和措施，以推廣可持續性和提高同事的環保意識。

To align with the Government's initiative to conserve natural resources, we are dedicated to fully embracing the green office concept across various facets of our daily operations. Apart from the energy-saving efforts previously discussed, we are actively implementing a range of green policies and measures aimed at promoting sustainability and enhancing our staff's environmental awareness.

節省用水
Water Saving

何文田政府合署內 100% 的廁所均安裝了省水裝置
100% of toilets in HMTGO were installed with water saving devices

為了盡量節約用水，我們採用兩段式省水馬桶、自動低流量水龍頭及傳感式尿斗。這些元件可有效控制出水時間長短，並使水流量保持在低水平。何文田政府合署內所有廁所均安裝了省水裝置。

To enhance water conservation, we have adopted dual-flush toilets, automatic low-flow faucets, and sensor-operated urinals. These equipment efficiently regulate the duration of water flow and maintain it at a minimal level. All of the toilets in Ho Man Tin Government Offices were installed with water saving devices.

節省用紙
Paper Saving

在二零二四至二五年度，本署用紙量為 17,362 令，其中 100% 為再造紙。
In 2024/25, we consumed 17,362 reams of paper and 100% of which were recycled paper.

為了配合綠色辦公室政策，我們會繼續執行下列節約用紙措施：
To align with the green office initiative, we would continue with the following measures on paper saving:

影印 / 列印
Photocopying/Printing

只在必要情況下影印 / 列印文件，並且應使用紙張兩面
Photocopy/print documents only when it is unavoidable and both sides of paper should be used

處理傳真機及傳真文件
Handling of Fax Machines and Faxes

對外發送傳真文件不使用引頁
Exclude leader page for outgoing fax documents

使用紙張
Use of Paper

鼓勵同事使用再造紙和重用辦公室的紙張文具
Encourage the use of recycled paper and reuse of paper office items

派送 / 傳閱文件
Delivery/Circulation of Documents

除發送機密檔外不使用信封
Send unclassified documents without envelopes

使用電子方式
Use of Electronic Means

在切實可行的情況下使用電郵溝通，以及採用電子範本的信頭、備忘錄和表格，以免因較正內容位置而重複列印
Use e-mails for communication as far as practicable and adopt electronic templates of letterheads, memoranda and forms to avoid pre-printing for adjustment

妥善回收
Proper Recycling

在影印機旁設置單面紙張回收箱（黃色箱）和廢紙回收箱（綠色箱）
Put up a single-sided paper collection box (yellow box) and a waste paper recycling box (green box) near photocopiers

辦公室環保管理措施
Green Office Management

有關節約用紙的新措施
New Measure on Paper Saving:

為了提升保存和管理政府檔案的效率，政府於二零一九年十月發表施政報告附篇時公布，將於二零二五年年底全面推展電子檔案保管系統。為此，我們正分階段在各辦公室推展電子檔案保管系統，亦鼓勵員工更廣泛使用電郵或其他電子方式進行公務通訊，藉以促進數碼工作間的文化，盡量發揮電子檔案保管系統的價值，同時亦可盡量減少檔案管理所需的人力資源。

To enhance efficiency in preserving and managing government records, the Government announced in the Policy Address Supplement published in October 2019 the full implementation of Electronic Recordkeeping System (ERKS) by end-2025. To this end, the ERKS are being rolled out in different offices by phases. Staff are encouraged to adopt a wider use of emails or other electronic means in business communication, in order to foster a digital workplace culture that maximizes the value of ERKS and minimises manual efforts in records management.

廢物循環再造
Waste Recycling

在二零二四至二五年度，我們收集了 **34,943 公斤廢紙**和 **857 個電腦打印機碳粉盒及墨盒**作循環再造。
In 2024/25, **34,943 kg of waste paper** and **857 printer toners** and ink cartridges were collected for recycling.

我們珍惜可循環再造的廢物，並會繼續採取下列措施推廣循環再造 :
To treasure waste with recycling value, we would continue taking the following measures to promote waste recycling:

可循環再造的廢物分開放入回收箱，以便清潔承辦商或本地回收商收集
Place separated recyclables into recycling bins for collection by cleansing contractors or local recyclers

設置回收箱，收集其他可循環再造的廢物 (例如可充電電池)，以作回收
Put up recycling boxes to collect other recyclables such as rechargeable batteries for recycling

辦公室環保管理措施
Green Office Management

因應空氣質素水準而採取的特別措施
Special Measures to Cope With Poor Air Quality

為提高員工對空氣質素的關注，當空氣質素健康指數的健康風險級別達至或預期會升至「甚高」或「嚴重」水平時，我們會向所有員工發出提示，並夾附一套供前線員工及其主管參考使用的預防措施；其中包括為從事戶外工作 (尤其是粗重體力勞動工作) 的工人而作出的風險評估，以及為盡量減少他們在戶外 (特別是交通繁忙的地方) 的體力消耗和逗留時間而應作出的規劃。

To raise staff awareness about air quality, we notify our colleagues when the Air Quality Health Index reaches or is expected to reach the "very high" or "serious" health risk categories. Along with these notifications, we provide a set of precautionary measures for front-line staff and their supervisors for their reference. These measures include conducting risk assessments for outdoor work, particularly for those engaged in heavy manual work, and planning to minimize outdoor physical exertion and reduce time spent outdoors, especially in high-traffic areas.

「室內空氣質素檢定計劃」證書
Indoor Air Quality Certification

環保署於二零零三年推出「室內空氣質素檢定計劃」，以推廣並表彰良好的室內空氣質素管理工作。

截至二零二四至二五年度，何文田政府合署連續 21 年獲頒「良好」級別室內空氣質素檢定證書。在二零二四至二五年度，北角政府合署及工業貿易大樓則達至「卓越」級別要求，而長沙灣政府合署及南豐商業中心的辦公室則獲頒「良好」級別證書。我們會繼續努力，在辦公室保持良好的室內空氣質素，以保障大樓使用者的健康和提升員工的生產力。

In 2003, EPD launched the Indoor Air Quality (IAQ) Certification Scheme to promote and commend good IAQ management practice.

By 2024/25, Ho Man Tin Government Offices have received the Good Class IAQ Certificate for 21 consecutive years. In the year, both the North Point Government Offices and the Trade and Industry Tower achieved Excellent Class IAQ, while the Cheung Sha Wan Government Offices and our offices in Nan Fung Commercial Centre obtained Good Class IAQ. We will continue our commitment to maintaining high indoor air quality to protect the health of building occupants and enhance staff productivity.

我們辦公室的「室內空氣質素檢定證書」
IAQ Certificates of our offices

辦公室環保管理措施
Green Office Management

環保建議
Green Advice

我們透過下列不同途徑，提供環保意見，以加強員工的環保意識：

We have adopted various measures to enhance environmental awareness of staff through the provision of green advice:

以電子郵件及內聯網，定期傳閱與環保有關的部門指引

re-circulate environmentally related departmental guidelines regularly through e-mail and the intranet

張貼海報，提倡善用資源及辦公室環保內務管理措施

display posters to promote economic use of resources and green housekeeping measures

在進行環境審核時，檢討和評估各辦公室遵守環保內務管理指引的情況

review and assess compliance with the green housekeeping guidelines during the environmental audit

透過員工建議書計劃等平台，邀請員工對辦公室的環保管理提出建議

invite staff to put forward suggestions on green management such as through the Staff Suggestions Scheme

透過回收舊利是封和月餅罐 / 糖果空盒等活動，把環保辦公室的概念延伸至日常生活

extend the green office concepts to daily life through activities such as recycling of used red packets and empty moon cakes/candy cans

以電子郵件 (而非複印本) 傳閱寄出的信件 / 便箋副本

circulate flimsies of outgoing letters/memo through e-mail instead of hardcopy

以環保採購方式採購一般貨品與服務
Green Procurement of General Goods and Services

我們一直在採購過程中納入環境保護為考慮因素，並盡可能在採購一般貨品與服務時採用由環境保護署制訂的環保規格，藉此為可持續發展出一分力。在二零二四年，我們採購符合相關環保規格的貨品與服務之採購總額約為 1,100 萬港元，主要的環保採購產品類別為墨盒 / 碳粉盒、電腦設備、數碼相機，以及服裝和紡織品。我們會繼續選用比一般產品更環保的貨品與服務，從而促進可持續發展。

To contribute to sustainable development, we have all along taken into account environmental considerations in our procurement process. We adhere to the green specifications for products and services established by the Environmental Protection Department (EPD) as far as practicable. In 2024, our total values of purchase with EPD's green specifications adopted was about HK$ 1.1 million. The major categories of green products purchased were inks/toner cartridges, computer equipment, and clothing and textile products. We will continue the use of goods and services that minimize adverse environmental impacts, thereby promoting sustainability.

辦公室環保管理措施
Green Office Management

環境審核及碳審計
Environmental Audit and Carbon Audit

周年環境審核
Annual Environmental Audit

為了在內務管理中持續推動環保措施，我們每年會為本署轄下 25 個設於不同地點的辦事處進行環境審核。進行周年環境審核的目的如下：
We conduct annual environmental audits in all 25 offices located in different premises with a view to maintaining the impetus of green measures in housekeeping. The objectives of conducting annual environmental audits are:

- 評估各辦公室遵守環保內務管理指引的情況
  to assess compliance with the green housekeeping guidelines
- 查找未有遵守指引的情況和建議補救方法
  to identify non-compliance and recommend remedial actions
- 推廣良好的環保管理措施
  to promote good environmental management
- 提高人員在環保管理、職業安全及健康措施方面的意識
  to increase staff awareness of green management and occupational safety and health initiatives

審核結果顯示本署各辦公室持續遵守環保內務管理指引，我們亦會爭取機會在各辦公室分享環保管理的最佳做法。
Audit results showed that our offices continued to comply with the green housekeeping guidelines. We have also taken the opportunity to share among the offices the green management best practices.

碳審計
Carbon Audit

何文田政府合署大廈管理處於二零二四至二五年度進行了碳審計，監察溫室氣體減排工作的成效。有關資料現正由大廈管理處進行研究。

近年審核結果顯示，何文田政府合署的溫室氣體淨排放量整體下降。我們將繼續致力於綠色管理最佳實踐，進一步減少碳足跡。

The annual carbon audit for 2024/25 was conducted for Ho Man Tin Government Offices by the Building Management Office to monitor the effectiveness of greenhouse gas emission reduction efforts. The relevant data are being studied by the Building Management Office.

Past audit findings indicate a general decline in net greenhouse gas emissions in recent years. We remain committed to green management best practices to further reduce our carbon footprint.