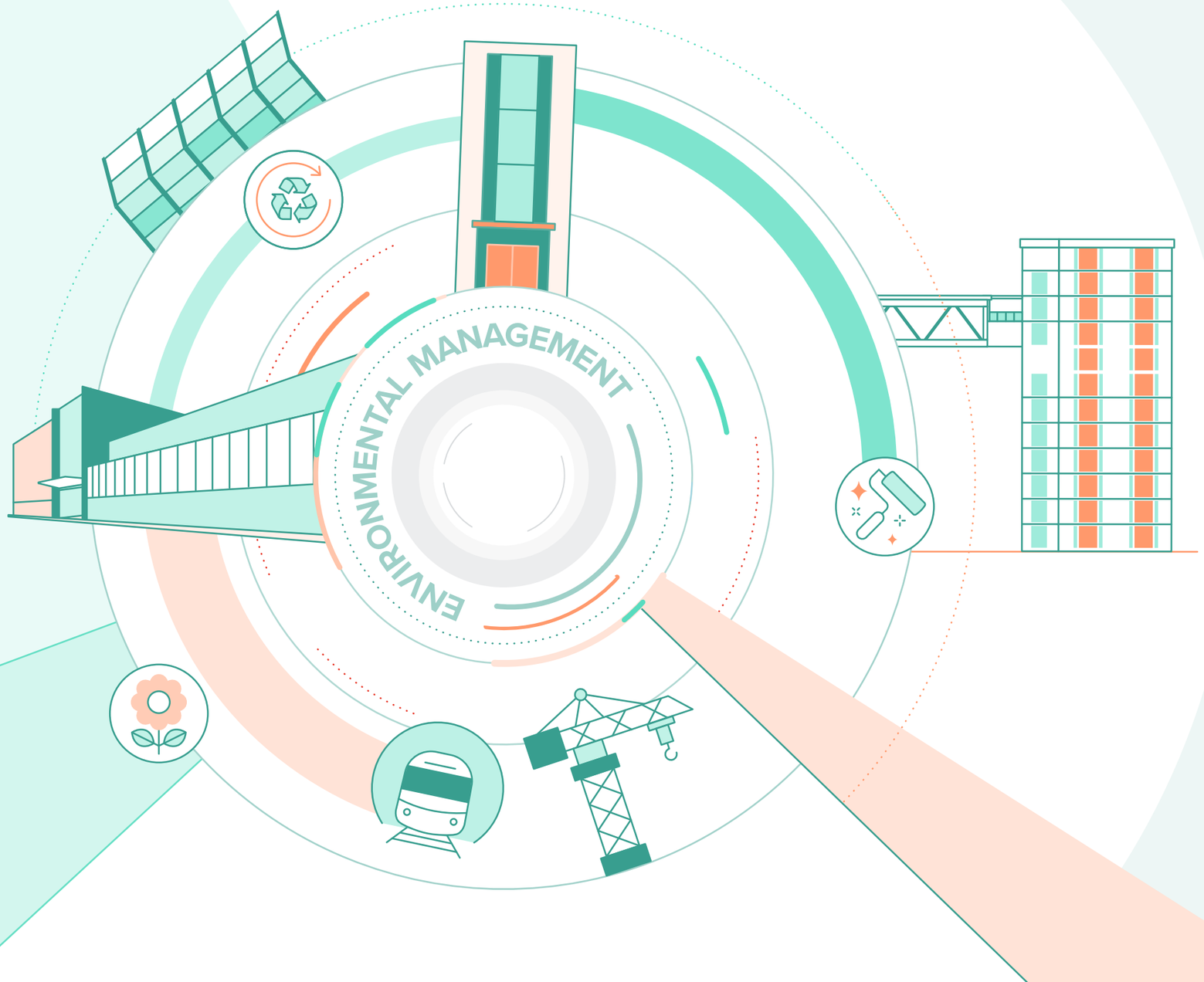
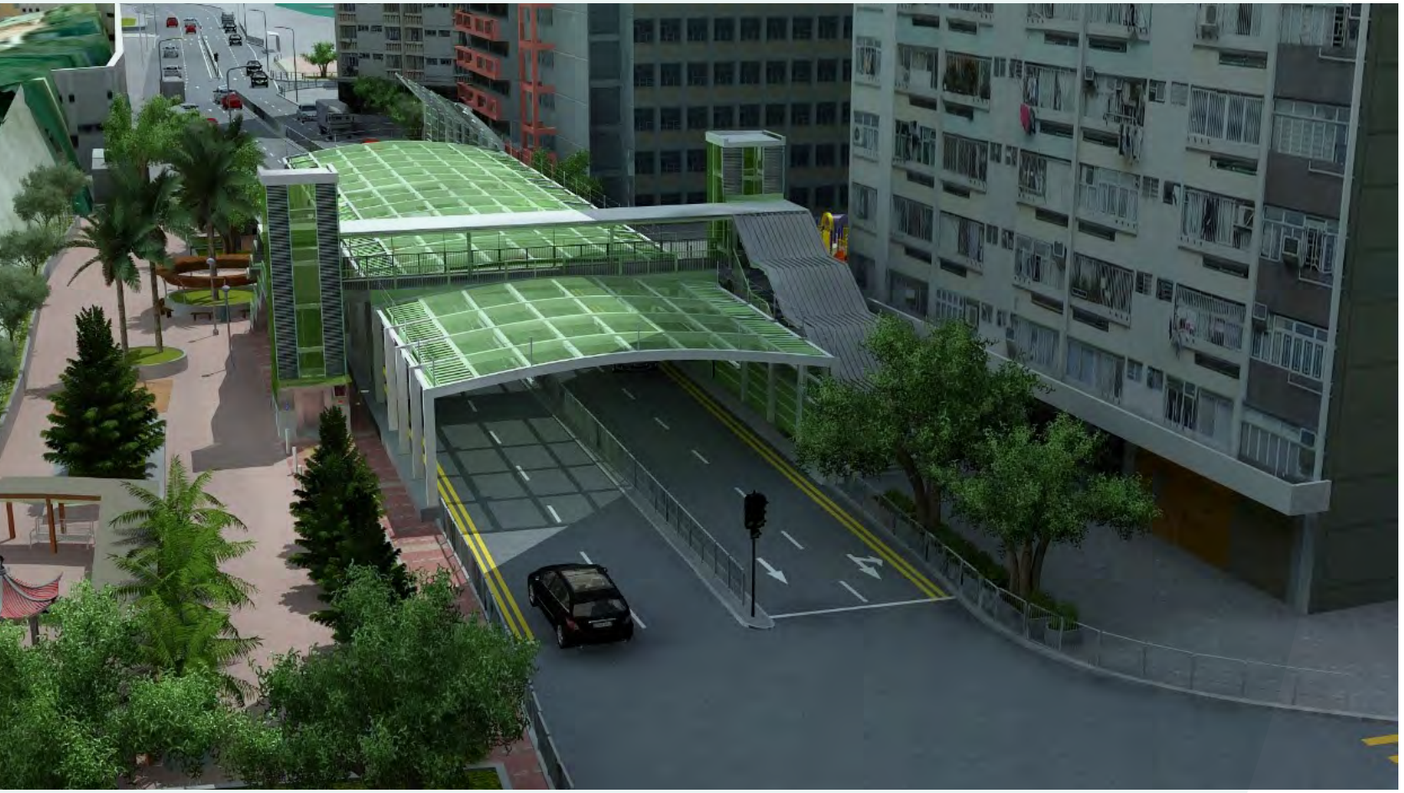


ENVIRONMENTAL MANAGEMENT

Sustainable Construction in
ROAD WORKS

Widening of Castle Peak Road – Castle Peak Bay Project



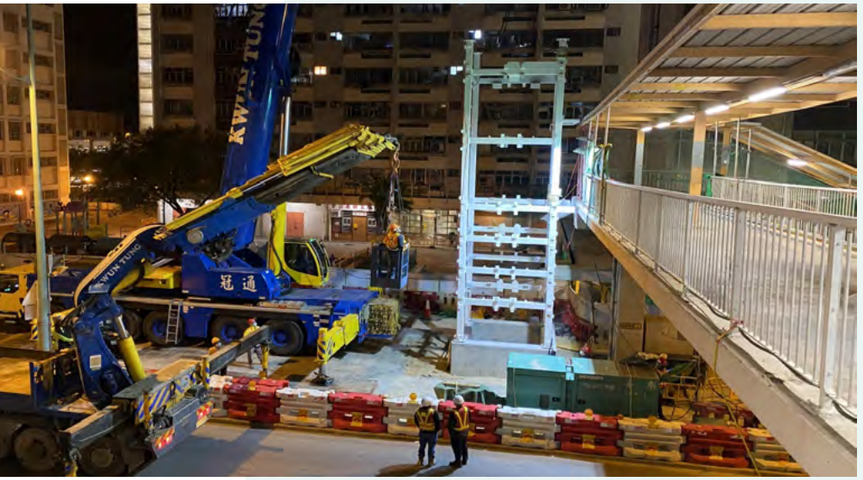
Computer composed image of noise semi-enclosures and footbridge

Introduction

The existing Castle Peak Road – Castle Peak Bay between Hoi Wing Road and Hong Kong Gold Coast Phase 1 is the main road connecting So Kwun Wat, Hong Kong Gold Coast, Cafeteria Bay, Castle Peak Bay and Sam Shing Hui. This project is to widen the above section of Castle Peak Road (about 1.9 km long) from single two-lane carriageway to a dual two-lane carriageway to cope with the future traffic demand. The project also involves the construction of a series of ancillary facilities, including two noise semi-enclosures and a section of noise barrier and two lifts for the existing footbridge near Ki Lun Kong Public Park. The project site is surrounded by densely populated residential buildings. Due considerations are given to address the potential environmental concerns and various measures are implemented to achieve sustainable construction.

The project layout

Widening of Castle Peak Road – Castle Peak Bay Project



Installation of prefabricated lift tower using mobile cranes

Adoption of Modular Integrated Construction (MiC) for Construction of Lift Tower

Two noise semi-enclosures and a section of noise barrier are to be constructed near Sam Shing Estate, Tuen Mun to mitigate the traffic noise impact on the nearby residents during the operation stage of the widened road. The two noise semi-enclosures would be constructed along the two sides of an existing footbridge. To provide necessary space for the noise semi-enclosures construction, the existing ramps of the footbridge would have to be demolished and lifts would be installed at the two ends of the footbridge to provide barrier-free access facilities for the local community.

MiC was adopted in the construction of the lift tower as a high-productivity construction method. Unlike the conventional lift tower construction in which various parts of the lift were installed on site one by one, MiC follows the principle of "factory assembly followed by on-site installation". Under the MiC construction method, self-standing modules, fully equipped with finishes, fixtures and fittings, are fabricated and assembled in the factory as much as possible, leaving minimal amount of installation work on site.

On the contrary, the conventional construction method is highly dependent on weather conditions as well as the progress of the preceding activities, and therefore prone to delays. To make things worse, the limited working space in the densely populated areas significantly restrains the productivity on site. In addition, extensive temporary works, which require greater cost and energy to erect, are also required to facilitate large amount of on-site installation work in the conventional construction method.

By adopting the MiC, sustainable construction could be effectively achieved in the following ways:

Reduced Wastage

With the precise simulation of the forthcoming installation processes in factory, MiC allows for early detection of potential clashes and interferences between different elements. Therefore, it could reduce abortive work and material waste during on site installation.

Increased Efficiency

MiC utilizes standardized components manufactured by standardized setup, making it easier to be replicated with less time and energy. In the case of lift installation, while the lift is being fabricated and assembled in the factory, underground utilities diversion, lift tower foundation works and lift pit construction could be carried out on site in parallel. The overall construction time is therefore reduced significantly.

Improved Safety and Productivity

As the prefabricated modules are assembled in factory, which is a safer and more controlled environment, the risk of accidents and injuries could be largely reduced. Besides, the productivity and the product quality could also be enhanced as the occupational safety and health of workers is greatly improved.

Reduced Environmental Impacts

The environmental impacts of fabrication process such as emission, waste disposal, etc. could be much more effectively controlled in the factory. With less amount of site works, the nuisances caused by the on-site installation works to the nearby residents and pedestrians could also be minimized.

Widening of Castle Peak Road – Castle Peak Bay Project

Temporary noise barriers erected at construction site

Temporary noise insulation screens used in road breaking works

Other Sustainable Measures Adopted

Temporary Noise Barriers

To minimise the noise nuisance caused to nearby residents by the construction works, temporary noise barriers were erected at construction sites near residential area such as Sam Shing Estate. In addition, noise monitoring had all along been carried out throughout the whole construction stage to make sure the noise levels are within allowable limit.

Road breaking operations were frequently carried out in this road-widening project, and some of them were in close proximity to the residential buildings. To further mitigate the noise impact arising from road breaking works, temporary noise insulation screens made from noise absorbing fabric were adopted to enclose the noisy equipment such as percussive breaker for reducing the noise.

These temporary noise barriers and insulation screens were portable and could be easily adjusted to suit various applications at different locations, allowing a quick and convenient deployment.

Reuse of Modified Containers

Reuse of materials was also adopted in this project to achieve sustainability. Modified containers were deployed at different workplaces of this project serving as temporary resting shelters, which were equipped with fan, bench and drinking water dispenser. These container shelters provided a safe and comfortable location for workers to take rest.

Apart from resting shelters, some of these modified containers were also used as temporary bus-stop shelters at the public road nearby. These bus-stop shelters were equipped with PV panels, fans and lights, providing a comfortable environment for passengers.

In summary, adoption of MiC in this project not only enhanced productivity, but also improved construction quality and works site safety. Various measures were implemented to mitigate the noise impact on the residential areas close to the works site. The project also reused modified containers as temporary shelters for different purposes, which further contributed to sustainable construction.

Modified container used as temporary bus-stop shelter

Modified container as resting shelter for workers

Sustainable Construction in
ROAD WORKS

Re-provisioning of Gascoigne Road Flyover and Demolition of Yau Ma Tei Carpark Building under Central Kowloon Route Project

Reprovisioning of Gascoigne Road Flyover

Introduction

The Central Kowloon Route (CKR) is a 4.7km-long dual 3-lane trunk road connecting east and west Kowloon, 3.9km of it being a tunnel underneath central Kowloon. It offers an alternative route to bypass the congested at-grade road network in 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.

The CKR tunnel section along Kansu Street passes through the foundation stratum of a section of the Gascoigne Road Flyover (GRF) and the Yau Ma Tei Carpark Building (YMTCB). To provide the required space for the tunnel construction, the concerned section of the GRF had to be reconstructed and shifted northward (i.e. re-provisioning of GRF). In addition, the YMTCB on which part of the GRF was founded had to be permanently demolished.

Some sustainable and innovative construction methods and equipment were employed in the CKR project, including the form traveller for re-provisioning of GRF and the use of hydraulic crusher for YMTCB demolition.

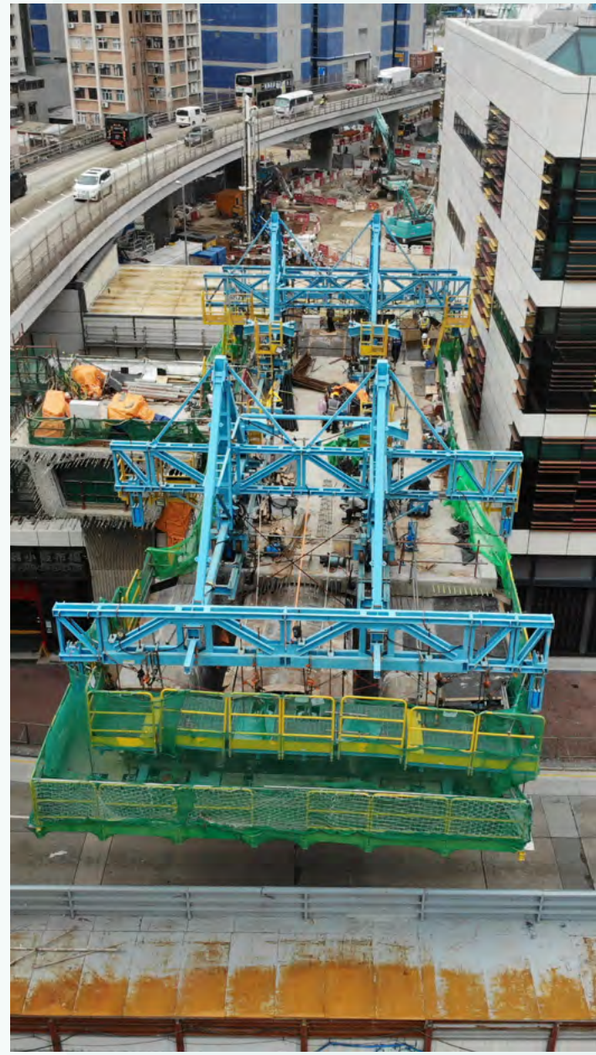
Re-provisioning of Gascoigne Road Flyover and Demolition of Yau Ma Tei Carpark Building under Central Kowloon Route Project

Adoption of Form Traveller Construction Method for Re-provisioning of GRF

Yau Ma Tei is one of the busiest districts in Hong Kong with heavy traffic flows. The reconstructed section of GRF spans across fives public roads, namely Canton Road, Battery Street, Reclamation Street, Shanghai Street and Temple Street. To minimize disturbances to the traffic flow and the neighborhood, the project team opted to adopt form traveller as the construction method for re-provisioning of GRF, rather than the traditional cast in-situ method.

The form traveller is a suspended working platform consisting of an upper frame mounted on the finished section of bridge deck and a hanging deck segment formwork for the bridge deck to be constructed. This setup allows for overhead construction activities spanning across existing roads with live traffic, eliminating the need for erecting temporary supports or scaffolding from the ground. The form traveller can slide along the top of the bridge deck, providing a working platform for construction of bridge deck. This significantly reduces disturbances to the heavily trafficked public roads below.

In addition, once the form travellers are set up on the bridge deck, the self-launching operation can be carried out by hydraulic jacks. This is more energy-efficient when compared with using heavy lifting machinery for erecting temporary supports from the ground. More importantly, the form travellers could be easily adjusted to fit nearly any type of bridge deck profile, allowing them to be reused from one works site to another. The reuse of form travellers substantially reduces the use of heavy metalwork and hence bring down the carbon footprint generated from the production of metal materials.



Bridge deck construction by form travellers

Quiet Demolition of Yau Ma Tei Carpark Building

Adoption of Hydraulic Crushers

The YMTCB was located at the heart of the densely populated Yau Ma Tei District, closely surrounded by residential developments. The nearest residential building was less than 20 meters away. Special measures had to be put in place to minimize the noise impact and disturbance to the neighborhood.

Traditionally, excavator-mounted breakers are usually used for building demolition because of their effectiveness and popularity in the construction industry. However, these breakers are notoriously noisy due to the percussive striking process of the breaker chisel.

To mitigate the noise impact to the local community, hydraulic crushers were used instead of the conventional hydraulic breakers for the building demolition works in the CKR project as far as possible. Unlike the breakers, hydraulic crushers operate without percussive actions, making them significantly quieter. This alternative method could achieve at least 20dB(A) noise reduction, as measured 7 meters away from the equipment, during the concrete breaking process. The crusher was also wrapped by sound-insulating canvas to further minimize noise level.

Hydraulic crusher mounted on excavator

Re-provisioning of Gascoigne Road Flyover and Demolition of Yau Ma Tei Carpark Building under Central Kowloon Route Project

Noise Mitigation Measures

To further reduce the noise impact on the surrounding community, several noise mitigation measures were implemented during the demolition works. First of all, temporary noise barriers were erected surrounding the works site to block and absorb noise. These barriers were made from sound-absorbing materials, such as acoustic panels and canvas. Provision of such acoustic enclosures could provide approximately 10 dB(A) noise reduction. Full acoustic covers to noisy machinery were also provided to suitable construction equipment to effectively cut down the noise level.

Moreover, comprehensive noise monitoring was implemented to ensure the compliance with the noise control requirements. Noise monitoring stations at strategic points around the demolition site were established to continuously measure noise levels. If the noise levels approached the permissible limits, immediate actions would be taken, such as temporarily halting the noise generating works and/or adjusting the use of equipment. With the above measures in place, the noise levels of the demolition works were kept in an acceptable range.

In addition to various noise control measures, the project team also engaged with the local community to keep them informed about the demolition schedule and the latest progress. Regular updates were provided to the community through newsletters and community meetings. A hotline was also established for the local residents to reach out or report any noise nuisance. This proactive communication approach helped maintain a good relationship with the local community and facilitate the prompt resolution of any concern raised.

Temporary noise barriers surrounding the demolition site

The YMTCB being demolished

Conclusion

The CKR project successfully demonstrated how sustainable development was promoted through adopting innovative construction methods and equipment for complex infrastructure project in dense urban environment. The use of form travellers for re-provisioning GRF minimized the disruptions to traffic flows on public roads and enabled material reuse. Moreover, the adoption of hydraulic crushers and comprehensive noise mitigation measures for demolishing the YMTCB greatly reduced noise impacts on the surrounding residential community. With foresight and careful planning, 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.

Sustainable Construction in
ROAD WORKS

Lift and Pedestrian Walkway System between

Castle Peak Road and Kung Yip Street, Kwai Chung

The lift and pedestrian walkway system under the Kung Yip Street Project

Introduction

The topography of Hong Kong is characterized by its hilly terrain, with numerous residential and commercial developments situated upon elevated areas. The residents of these areas are therefore frequently required to navigate up and down the slopes during their daily commutes. To tackle this challenge, various "Hillside Escalator Links and Elevator Systems" (HEL) projects have been implemented by the Highways Department with the aim of enhancing the accessibility of these hillside areas and facilitating the movement of pedestrians, thereby reducing their reliance on road-based public transport. The Project “Lift and Pedestrian Walkway System between Castle Peak Road and Kung Yip Street, Kwai Chung” (“Kung Yip Street Project”) is one of the HEL projects.

Lift and Pedestrian Walkway System between Castle Peak Road and Kung Yip Street, Kwai Chung

The Kung Yip Street Project serves to connect the Shek Lei area, which is home to a population about 18,000 residents, with the Kwai Hing MTR Station. It consists of three footbridges and three lift towers with a total of five lifts for overcoming a vertical distance of more than 60 meters, equivalent to the height of a 20-story building. Under this project, a comfortable, convenient, safe, environmentally sustainable and barrier-free access would be provided to the community. By improving the walking environment between Shek Lei area and the nearby public transportation hub, the overall connectivity and pedestrian mobility within the district would be enhanced, while promoting walking as one of the non-motorized modes of transport.

In an effort to minimize the environmental impacts and promote sustainable development, the Kung Yip Street Project had adopted a wide range of environmentally friendly construction methods and equipment during the construction stage.

Modular Integrated Construction for Footbridge across Castle Peak Road

An innovative construction method, namely MiC was adopted for the construction of a footbridge spanning across Castle Peak Road. Unlike the conventional footbridge construction method, most of the footbridge components, including the structural steel frames, roof panels, drainage system, lighting, etc., were assembled in an off-site assembly yard. The following environmental benefits were brought by using MiC:

Original route (a staircase) connecting Kung Yip Street and Castle Peak Road

1

More Efficient Use of Resources

Assembly of the footbridge components in a more controlled environment allowed the project team to precisely measure and assemble the various structural and non-structural elements of the footbridge. As the assembly process was carefully planned and managed, the wastage of materials was minimized. Moreover, any offcuts or leftover of the footbridge components could be easily collected, sorted, recycled or reused, and therefore further minimizing wastage resulted.

2

Reduction of Temporary Works

Under MiC, most of the footbridge components were assembled in the assembly yard before they were moved to the final destination for installation. This eliminated the need of erecting heavy temporary platform over Castle Peak Road for on-site construction works under the conventional construction method. Large amount of materials, fuel and construction waste associated with the temporary working platform erection were therefore avoided using MiC.

Construction of "Footbridge 2" using MiC

Installation of "Footbridge 2" by mobile crane

Lift and Pedestrian Walkway System between Castle Peak Road and Kung Yip Street, Kwai Chung

Use of Prefabricated Steel Reinforcing Bars

In lieu of the conventional on-site fabrication of steel reinforcing bars (rebars), the Kung Yip Street Project widely adopted prefabricated steel rebars during construction. Most of the steel rebars were prefabricated in a highly automated off-site prefabrication yard under the List of Approved Steel Reinforcing Bar Prefabrication Yards administered by the Civil Engineering and Development Department. Processing rebars in a factory-like prefabrication yard helped enhance productivity, uplift quality, improve construction safety and promote environmental performance. The environmental benefits of using prefabricated steel rebars include:

More Efficient Use of Steel

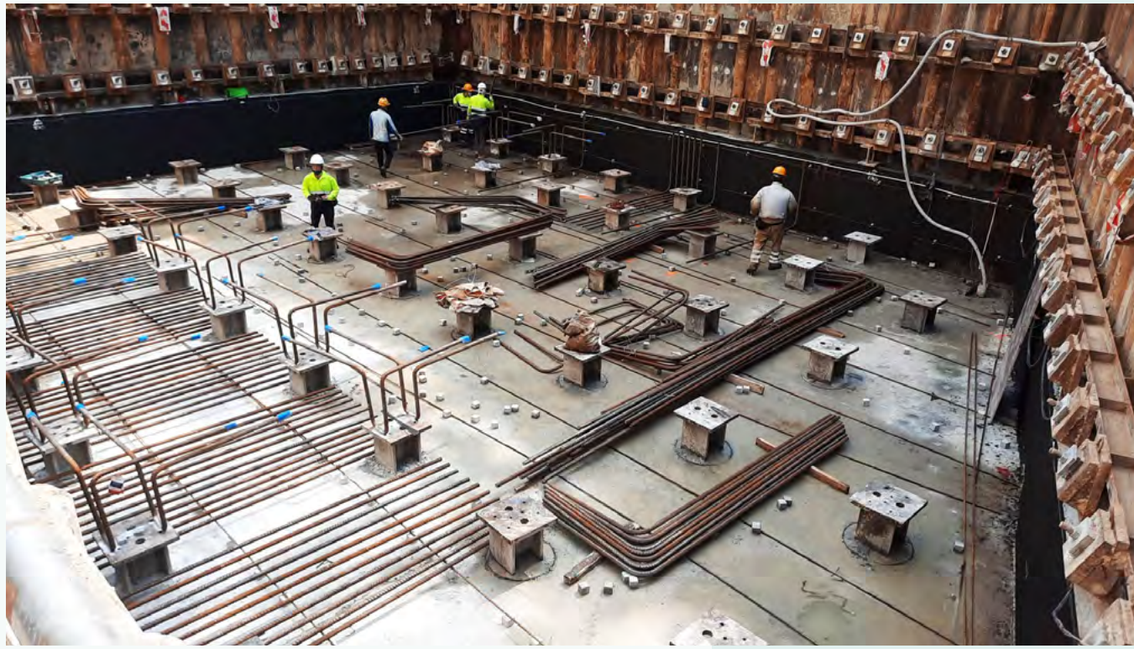
The prefabrication process was computer-monitored. Cutting and bending of rebars were precisely calculated to achieve the highest utilization rate. The wastage was therefore greatly reduced.

Improved Construction Site Environment

With the cutting and bending of rebars performed at the off-site prefabrication yard, the noise and dust generated from these processes were largely avoided at the construction site. This was particularly important to the Kung Yip Street Project as the project site area was in close proximity to the residential areas.

Reduction in Energy Consumption

In prefabrication yard, cutting and bending of rebars were performed by automated machinery in bulk, which was more energy efficient. This reduced the use of on-site machinery for cutting and bending of rebars individually.



Use of prefabricated steel reinforcing bars

Lift and Pedestrian Walkway System between Castle Peak Road and Kung Yip Street, Kwai Chung

Energy Storage Systems for Tower Cranes

Tower cranes are essential construction machinery for lifting and moving heavy materials and components for the construction of lift towers of over 40 meters high. However, the energy-intensive nature of tower cranes and their reliance on traditional diesel generators for providing high-power supply could cause significant environmental impacts. Therefore, the project adopted energy storage systems instead of traditional diesel generators given the following environmental benefits:

Energy Storage System for Tower Cranes

Reduced Greenhouse Gas Emissions

The use of diesel generators to power tower cranes inevitably resulted in the emission of greenhouse gases, such as carbon dioxide, which would be a direct contributor to the global challenge of climate change. However, by employing the energy storage systems in lieu of diesel generators to provide high power supply, tower cranes were able to operate while significantly reducing the greenhouse gas emissions, thereby mitigating the project's overall carbon footprint and environmental impacts.

Improved Air Quality

With the energy storage systems in place, the decreased use of diesel generators led to a remarkable reduction in various air pollutants, including particulate matter, nitrogen oxides and sulfur oxides. This strategic shift in power source for tower cranes helped improve the air quality within the immediate vicinity of the construction site.

Reduced Noise Pollution

The energy storage systems were quieter in operation as compared to diesel generators. This not only created a more pleasant work environment for workers, but also effectively minimized the noise impact on the nearby residential areas surrounding the construction site.

Tower crane for construction of lift tower

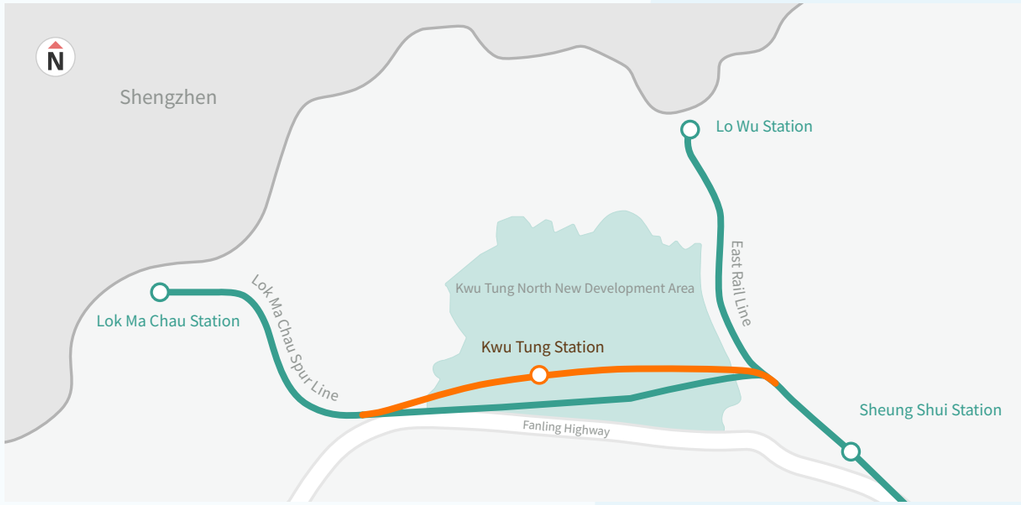
In summary, Kung Yip Street Project brings long-term environmental benefits to the community by providing a barrier-free pedestrian link which makes walking an environmentally friendly transport mode for the neighborhood residents. Short-term environmental impacts during the construction stage were effectively mitigated by adopting new construction methods and technologies, including MiC, prefabricated steel reinforcing bars and energy storage systems. The project has demonstrated our determination to achieve sustainable development while uplifting the quality of our infrastructure.

Sustainability in
RAILWAY DEVELOPMENT

Sustainable Design and Construction Method of

Kwu Tung Station

Computer composed image of the exterior of proposed Kwu Tung Station



Location of proposed Kwu Tung Station

Introduction

The Government has been developing a comprehensive public transportation system, including the railway system to provide efficient and convenient transportation services for citizens. The Kwu Tung Station project being Phase 1 of the Northern Link proposed in the Railway Development Strategy 2014, involves the construction of a new railway station on the existing Lok Ma Chau Spur Line of East Rail Line.

Located at the heart of the Kwu Tung North New Development Area, Kwu Tung Station will serve as an important transportation hub, bringing new development opportunities to the surrounding areas. After the commissioning of the Kwu Tung Station, local residents will be able to easily walk to the station and enjoy efficient, convenient, and low-carbon railway services. Kwu Tung Station will be the first new station in Hong Kong to be constructed on an operating railway tunnel, making it unprecedented. The main construction works of the station commenced in 2023, and targeted to be completed in 2027.

Sustainable Design and Construction Method of Kwu Tung Station

Sustainable Design of Kwu Tung Station

The design of Kwu Tung Station has obtained provisional “BEAM Plus” Gold certification. The average carbon emissions of the station will be reduced by approximately 20% compared to traditional designs. The project team will adopt the following designs to achieve sustainability.

Computer composed image of Kwu Tung Station's ground level lobby featured with skylights and high canopies

1

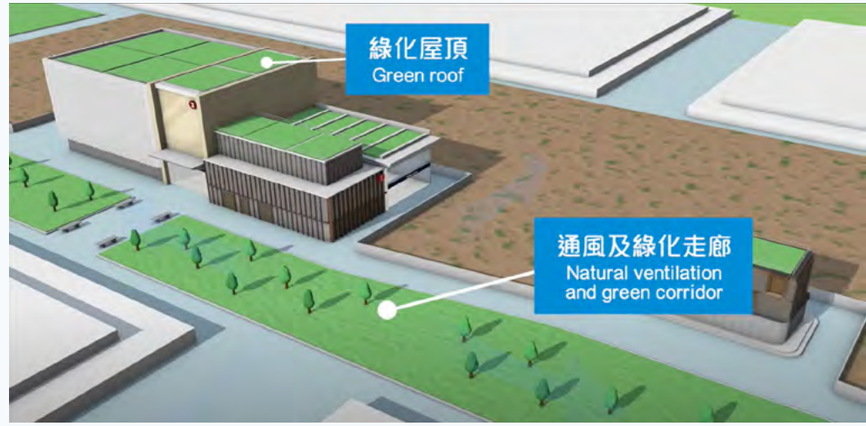
Natural Lighting and Ventilation

The design of ground level lobby of Kwu Tung Station maximizes the use of natural lighting and ventilation. The top of station features skylights and high canopies to introduce natural light into the interior, reducing artificial lighting and creating a comfortable environment. Additionally, the station's natural ventilation system connects the lobby to nearby green corridors, greatly enhancing air circulation. This design also helps to reduce energy consumption by minimizing the use of ventilation equipment.

2

Green Roof

Kwu Tung Station will have a green roof, which helps lower the temperature inside the station and mitigates the heat island effect on the surrounding environment. The green roof also provides space for planting vegetation, which enriches the ecological environment, absorbs carbon dioxide, and improves air quality.



Computer composed image of the green roof and green corridor of Kwu Tung Station

Sustainable Design and Construction Method of Kwu Tung Station

3

Utilization of District Cooling System (DCS)

Kwu Tung Station will use chilled water provided by DCS in the Kwu Tung North New Development Area for station air conditioning at underground concourse and platforms. Compared to traditional individual water-cooled air-conditioning systems using cooling towers, the DCS has a higher energy efficiency which could lower power consumption, and in turn decreasing carbon emissions.

4

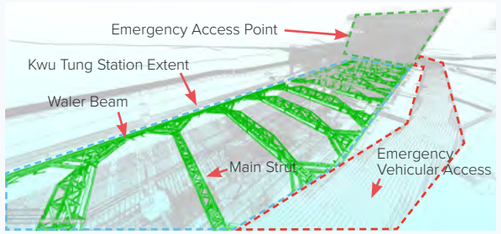
Energy-saving Strategies

Kwu Tung Station will also implement energy-saving strategies to further reduce energy consumption. For example the station will be equipped with a Comprehensive Energy Consumption Monitoring System with energy management functions to continuously monitor the energy consumption of different railway facilities such as the station and trains. Furthermore, the station will utilize energy-efficient lighting equipment such as LED lighting to reduce electricity consumption.

5

Application of Innovative Technology and Techniques

The Kwu Tung Station project utilizes Building Information Modelling (BIM) to facilitate design and construction. The construction of Kwu Tung Station involves large-scale underground excavation of about 10m deep. With the 3-dimensional computer models, the project team can clearly understand the structural layout and interconnections between each component of the excavation and lateral support system that needs to be installed during the excavation process. Through visualizing each step of construction process with the aid of BIM, the project team can also identify potential issues or conflicts in advance and hence reduce redundant work or wastage.

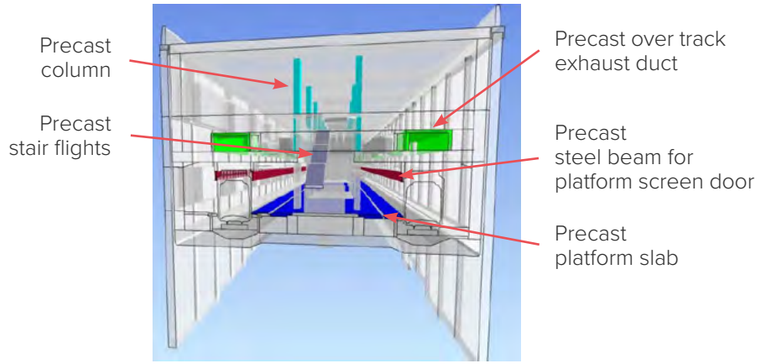


Building Information Model of the excavation and lateral support system for Kwu Tung Station

Actual view of the excavation and lateral support system for Kwu Tung Station

Sustainable Construction Method of Kwu Tung Station

Additionally, the project team proactively adopts innovative construction methods, including Design for Manufacture and Assembly (DfMA) to construct structural components such as over track exhaust ducts, platform slabs and stair flights of the station. Such method can help shortening construction time, improving the construction site environment and safety, while reducing environmental impacts, including less noise, waste, dust, and wastewater, thereby promoting sustainable development and environmental protection.



DfMA precast components of Kwu Tung Station

Sustainability in
RAILWAY DEVELOPMENT

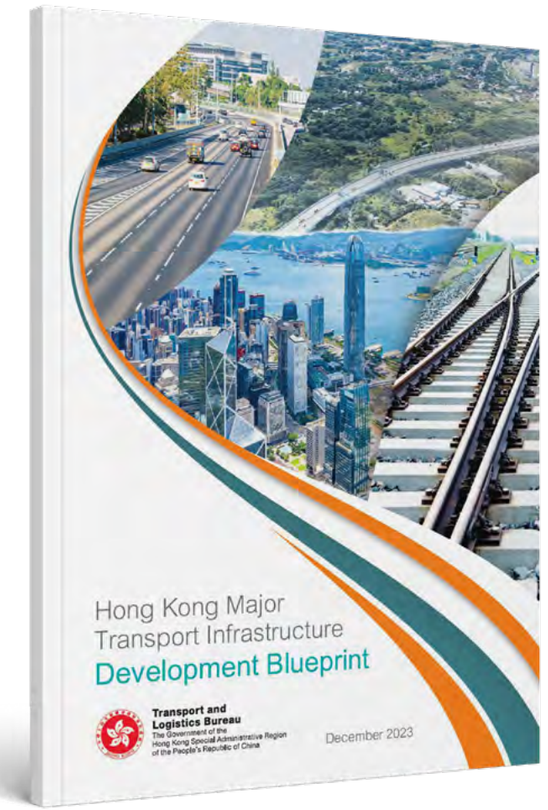
Development of Environmentally Friendly Railway System

Railway provides efficient and environmentally friendly public transportation service. To continue the development of a passenger transportation system centred on public transport with railway as the backbone, the Highways Department is taking forward new railway projects in a proactive and orderly manner.

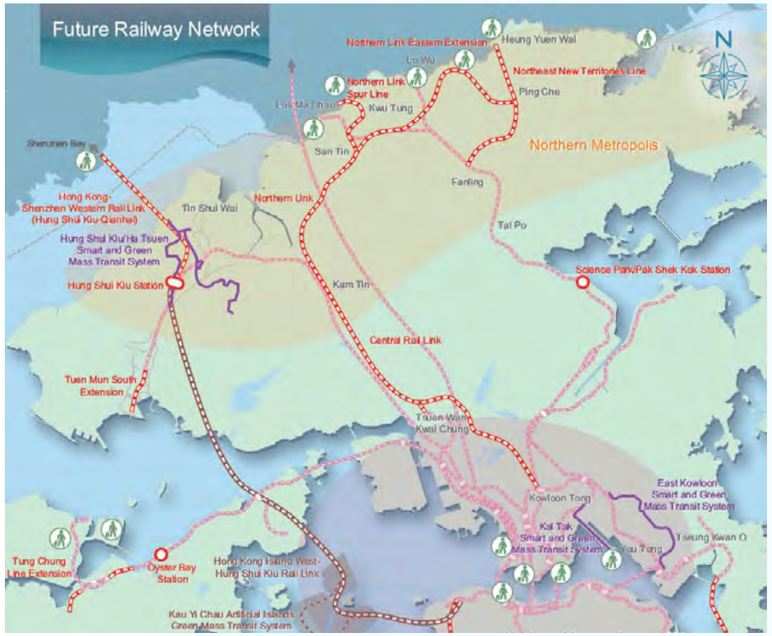
Hong Kong Major Transport Infrastructure Development Blueprint

In December 2023, the Government promulgated the Hong Kong Major Transport Infrastructure Development Blueprint ("Blueprint") to formulate a planning framework for the city's future transport infrastructure development and outline a forward-looking vision for strategic railway and major road networks, with a view to meeting Hong Kong's long-term transport and logistics demand up to 2046 and beyond.

In addition to projects that are currently under planning, design and construction, the Blueprint has recommended the implementation of three railways, namely the Hong Kong-Shenzhen Western Rail Link (Hung Shui Kiu-Qianhai), the Central Rail Link and the Tseung Kwan O Line Southern Extension, and the two railways which will serve the eastern developments of the Northern Metropolis, namely the Northern Link Eastern Extension and the Northeast New Territories Line.



Development of Environmentally Friendly Railway System



The Major Transport Infrastructure Development Blueprint

Environmental Benefits of the Expanded Railway Network

Railway can save land, minimise the reliance on road traffic and reduce the use of energy. It will also help curbing roadside pollutant emissions. In 2024, our railway system carried an average of about 5.1 million passengers every day, which account for about 44% of all trips made on public transport each day. With the implementation of these railway projects, the railway share in the public transport patronage would further increase, and a reduction in road-based transport emission is expected. As people switch from road-based transport to railway, this would translate into environmental benefits amounting to a reduction in roadside air pollutants by some 66 tonnes of nitrogen oxide per year, and 160,000 tonnes of green house gases per year.

Smart and Green Mass Transit Systems

In addition to developing large-scale transport infrastructure, the Government recommends introducing smart and green mass transit systems (SGMTS) as an efficient feeder service to connect nearby railways and major public transport interchanges in areas with limited space or lower transport demand. The Government suggests implementing SGMTS in East Kowloon, Kai Tak, and the Hung Shui Kiu/Ha Tsuen (HSK/HT) New Development Area (NDA).

The SGMTS is a transportation system that combines environmentally friendly and smart technologies to improve transport efficiency, safety and convenience. In contrast to heavy rail systems, the SGMTS has a medium-to-low carrying capacity and is characterized by its energy efficiency, intelligence, and user convenience.

The SGMTS prioritises the adoption of energy-efficient technologies to reduce energy consumption, thereby promoting environmentally sustainable and efficient transportation. By integrating new technologies, the system will facilitate real-time monitoring of traffic conditions and passenger demand, leading to smarter traffic management and responsive service adjustments. This not only enhances the convenience of the transportation system but also minimises carbon emissions and reduces congestion, contributing to cleaner air and a healthier urban environment. Moreover, the provision of real-time information to passengers will improve their commuting experience, encouraging greater use of public transport and further supporting the reduction of private car usage. With the above environmental benefits, SGMTS can help foster a more sustainable future for our communities.

The Highways Department is now actively taking forward a number of new railway projects, such as Tung Chung Line Extension, Tuen Mun South Extension, Kwu Tung Station, Hung Shui Kiu Station and the East Kowloon SGMTS, according to the planned timeline, with a view to enabling the public to enjoy a more interconnected, efficient and environmentally friendly commuting system as early as possible.

Streetscape Beautification Works
at Three Selected Locations

1 **The Outlying Islands Ferry Pier**
Central

2 **Lo Tak Court**
Tsuen Wan

3 **Tsuen Nam Road**
Tai Wai

Background and Objectives

In early 2023, the Highways Department (HyD) collaborated with the Task Force on District Governance to enhance the environmental hygiene and the cityscape of Hong Kong. The objective was to create a clean and livable environment by focusing on streetscape beautification. The beautification works aimed to improve the aesthetics of public spaces, promote placemaking, and revitalize the streetscape and neighborhoods. Three locations were selected for pilot street beautification works: the Outlying Islands Ferry Pier in Central, Lo Tak Court in Tsuen Wan and Tsuen Nam Road in Tai Wai. These locations were chosen due to their high pedestrian flow and popularity among residents and tourists.

Streetscape Beautification Works at Three Selected Locations

1

Streetscape Beautification Works at
the Outlying Islands Ferry Pier in Central

The Outlying Islands Ferry Pier in Central is a vital transportation hub, connecting major islands and the Kowloon Peninsula. It is also one of the most valuable tourism assets in Hong Kong, thanks to its strategic location and proximity to the beautiful Victoria Harbour and various commercial and cultural facilities. To enhance the image and appeal of this important transportation node, we have undertaken a comprehensive beautification project for the area.

Before the transformation, the Outlying Islands Ferry Pier faced several issues. Due to prolonged usage, many streetscape facilities including the pavement had started to age, and the paint on the walkway cover had begun to peel off. This provided a good opportunity to undertake a thorough renovation. The piers also lacked a distinct identity that could effectively reflect and promote the unique tourism characteristics and cultural heritage of the destination islands including Lamma Island, Cheung Chau and Peng Chau. The pedestrian experience along the pier square was also rather ordinary and lacked visual interest, necessitating a revitalization to attract both locals and tourists.

To address these issues, a remarkable transformation was implemented on Piers 4, 5, and 6 with high pedestrian flow. Each pier was assigned a specific theme to represent its corresponding island. Pier 4, known as "Island Vibe," was designed to immerse passengers in the fishing culture of Lamma Island, featuring a light blue color scheme. Pier 5 adopted the theme of "Joyful Celebration" to capture the festive spirit of Cheung Chau, incorporating thematic stickers depicting the iconic "Ping On Bun" and the sail of windsurfer Lee Lai-shan. Pier 6, named "Secret Garden," highlighted Peng Chau's industrial history, with thematic stickers representing its leather factory and natural landscape, creating a relaxing atmosphere. The renovated painting works on the covered walkways connecting the piers together with the thematic stickers, have helped establish a distinct identity for each pier area.

Before beautification



After beautification





Streetscape Beautification Works at Three Selected Locations

1

Before beautification

After beautification

Furthermore, the pedestrian experience was greatly enhanced through the introduction of a thematic paving pattern featuring dynamic geometric lines and patterns. This not only added visual interest but also created a more engaging and immersive environment for visitors. The old and dirty pavement was replaced, giving a refreshing and rejuvenated feel to the pier. Additionally, the thematic manhole covers, showcasing the Victoria Harbour's skyline, became popular spots for capturing photos, further enhancing the overall experience. These improvements have made the pier an inviting destination for both locals and tourists, encouraging them to explore and connect with the islands' rich heritage and tourism offerings.

Streetscape Beautification Works at Three Selected Locations

2

Streetscape Beautification Works at
Lo Tak Court, Tsuen Wan

The location of Lo Tak Court in Tsuen Wan was formerly the site of Ho Pui Village, which was demolished in the 1960s. The theme of 'Tsuen Wan Walled Village' is inspired by the unique historical, cultural and architectural features of the old walled village in Tsuen Wan. A set of new paving design, thematic wallpaper design on HyD's structures, thematic manhole covers and featured paving plates have been created to highlight the traditional features and bring the historical scene to life.

The original condition of the pavers in Lo Tak Court was dilapidated with mixed paving patterns. The new paving design has adopted a dynamic paving pattern with selected colors that match with its surroundings, adding a vibrant atmosphere to Lo Tak Court. Also, the paving design for the area with scattered planters creates subdivided zones that visually aligned those scattered planters and improved the spatial arrangement of the area.

Before beautification

After beautification

Before beautification

After beautification

Streetscape Beautification Works at Three Selected Locations

The dilapidated and scattered planters were refurbished through repainting and application of thematic wallpapers that created a scene of looking into the room from the village courtyard throughout the area, while the design of lamp post thematic wallpaper extracted the feature of brick walls, tile roofs and decorative ceilings of the old village. These thematic wallpapers visually linked up the elements within the area and added a distinct cultural hue to Lo Tak Court.

Before beautification

After beautification

Original cast iron manhole cover

Thematic manhole cover

Featured paving plate

Further, the existing manhole covers were replaced by thematic manhole covers and featured paving plates that illustrated the surrounding natural environment (such as Tree Cotton, red whiskered bulbul and pallas's squirrel) to echo with the thematic design of adjacent footbridge at Tai Ho Road.

Thematic design of the footbridge at Tai Ho Road

Streetscape Beautification Works at Three Selected Locations

3

Streetscape Beautification Works at
Tsuen Nam Road, Tai Wai

Tai Wai MTR Station has always been an important station on the MTR East Rail Line, and with the opening of Tuen Ma Line and the extension of East Rail Line to Admiralty Station, it has become an important interchange station for the railway network, leading to an increase in pedestrian flow on the streets around Tai Wai MTR Station. In view of this, we have renovated the footpath along Tsuen Nam Road adjoining Tai Wai MTR Station with new paving design, thematic manhole covers and featured paving plates, new planter and thematic wallpaper design on HyD's structures in the vicinity.

In the past, the pavers were in earthy tones which could be mundane to daily users. The new paving design has adopted a brighter color scheme, yet still cohered with the adjoining footpaths. The stripe pattern was designed to address the layout of existing structures and pedestrian's daily movement, as well as providing rhythmic walking experience to pedestrians.

Before beautification

After beautification

Before beautification

After beautification

Streetscape Beautification Works at Three Selected Locations

Original cast iron manhole cover

Thematic manhole cover

Featured paving plate

Thematic manhole covers and featured paving plates were also installed along with the new paving pattern to enhance the overall design. The design of thematic manhole covers and featured paving plates adopted an “Urban River” theme, which depicts common scenes of egrets in the nearby Shing Mun River. The thematic manhole cover is not only a beautified version of the original cast iron cover, the orientation and margin treatment were also adjusted. So that the manhole covers could be better aligned and integrated with the paving design, which enhanced the overall tidiness of streetscape.

Thematic manhole cover integrated with paving design

On the other hand, the newly built curved planter with lush planting have replaced part of the original railings surrounding the roundabout. Apart from achieving the traffic management purpose of original railings, the simple curved planter with selection of plantings in different shades of green has enhanced the overall aesthetics appeal of the environment.

Replace existing railings into planter (before)

Replace existing railings into planter (after)

Streetscape Beautification Works at Three Selected Locations

Outcome and Way Forward

The beautification efforts in the three aforementioned locations have yielded successful results, with positive feedback from social media, contributing to the integration of street facilities with the surrounding environment while optimizing community landscapes and infusing vitality into the city. Our designs have encouraged residents to visit these areas and admire the transformed streetscapes. Moving forward, it remains crucial to continue striving for the beautification and enhancement of streetscapes, ensuring the walkability and livability of our urban spaces for both residents and visitors in the future.

Thematic manhole covers become a popular photo spot

The beautified seating area being more attractive to residents

Adding fun to the lift with thematic stickers

Planter wall becomes a resting place

Hong Kong Flower Show 2024

The Hong Kong Flower Show, organized annually by the Leisure and Cultural Services Department (LCSD), is a vibrant celebration of horticulture in the city. HyD actively participates in this festive event almost every year and consistently delivers a visually stunning and immersive display. The Hong Kong Flower Show 2024 was held from 15 to 24 March 2024 at Victoria Park. Our theme for this year was “Enchanted Journey - Joyful Inheritance”, and our display booth was honored to receive the Grand Award for Design Excellence (Landscape Display) under the category of Displays Section (Local).

Prize presentation ceremony of the Hong Kong Flower Show 2024

Enchanted Journey - Joyful Inheritance

Enchanted Journey - Joyful Inheritance

The HyD's display booth, in line with this year's theme of the whole event 'Floral Joy Around Town', incorporated the elements of "wood" and "birds" into its design. Colorful lines representing the road network were interwoven to showcase the department's projects, namely the "Succeed Sustain Slopescape – Phased Replacement of Senescent Acacia" and the "Thematic Design of Highway Structures." As visitors journeyed through the tunnels and roads adorned with blossoming flowers, they immersed themselves in the lively atmosphere that these projects have brought to the streets of Hong Kong. Visitors could explore road facilities and infrastructure projects closely related to their daily living, while also enjoying the fun of travelling through the road network and experiencing the convenience it provides.

Hong Kong Flower Show 2024

Adorable railway display with succulent plants

Foxgloves along the booth

Eye-catching Bougainvillea in the middle

The wooden horses are favoured by both children and adults

Blossoms in Guangzhou Cherry attract visitors to take photos

The planting design incorporated this year's theme flower, *Angelonia spp.* (香彩雀), along with other vibrant flowers like Delphinium (飛 燕草), Foxgloves (毛地黃), and Bougainvillea (簕杜鵑), creating a delightful and colorful floral landscape. The design concept was to bring joy and a sense of delight to visitors, evoking heartfelt smiles. During the show, it was observed that not only did the theme flowers capture attention, but the Guangzhou Cherry (廣州櫻), Pom Pom Mum (乒乓菊), and succulent plants (多肉植物) we chose also attracted many people due to their adorable appearances. Additionally, wooden horses made from recycled materials became a highlight, drawing the attention of many children.

Our display not only appealed to visitors visually, but also prioritized environmental sustainability. To achieve this, we had incorporated various eco-friendly elements into our design.

The lighting effect at night

Hong Kong Flower Show 2024

Welcoming paving pattern at the entrance paved with eco-pavers

Use of Eco-pavers

At the main entrance of our display, eco-pavers were used to form a pathway with a welcoming and directive pattern, showcasing the harmonious integration of nature and hardscape elements as well as our commitment to sustainability and promoting the use of environmentally friendly paving materials.

The vibrantly painted wooden horses crafted from the recycled tires and wood

Recycling of Materials

Within the enchanted journey, an interesting display of wooden horses crafted from recycled tires and wood awaited visitors. These forgotten materials, once discarded, were given a new life through vibrant paints and blossoming flowers. These transformed creations became captivating and joyful attractions within our display.

The wooden horses provided unforgettable fun for kids

Hong Kong Flower Show 2024

The circular wood bench

Wood Recycling and Upcycling

To promote "Succeed Sustain Slopescape – Phased Replacement of Senescent Acacia" initiative, we have proactively utilized recycled yard waste generated through the programme. These waste materials were transformed into upcycled wood planks and boards, which were used to make wood decorations and furniture in our display, including wooden horses, decorative skyline sculpture, seats and bench, and plant name plates. By embracing wood recycling and upcycling, we not only reduced waste, but also creatively crafted interesting wooden furniture and resting spots for visitors.

The decorative skyline sculpture

Plant name plates

Wood log seats

Potted flowers in good condition were given away to the public

Large shrubs were transplanted to the slopes maintained by our department

New Life of the Display Materials after the Show

After the 10-day display period of the exhibition, we embarked on a mission to give a second life to the beautiful plants and furniture featured in our display. Potted flowers in good condition were collected by the volunteers of LCSD and given away to the public. Other trees and large shrubs including *Handroanthus chrysotrichus* (黃花風鈴木), *Prunus yunnanensis 'Guangzhou'* (廣州櫻) and *Bougainvillea spectabilis* (簕杜鵑) were transplanted to the slopes maintained by our department and became part of our roadside landscape.

Furthermore, the wood furniture and decorations used in the display found a new purpose through donation to the non-government organisations. For example, the circular wood bench is now placed in the Urban Forestry Education Centre in Nam Cheong for the enjoyment of the general public. Through these endeavors, we breathed new life into these plants and wood items, offering them a meaningful and sustainable future.

The circular wooden bench was placed in the Urban Forestry Education Centre

Green Office Management

Resources Saving: Water, Paper & Waste Recycling

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.

Water Saving

100% of toilets in HMTGO were installed with **water saving devices**

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 HMTGO were installed with water saving devices.

Paper Saving

In 2023/24, we consumed **20,309 reams of paper** and **100%** of which were recycled paper

To align with the green office initiative, we would continue with the following measures on paper saving:

Photocopying/Printing

Photocopy/print documents only when it is unavoidable and both sides of paper should be used

Use of Paper

Encourage the use of recycled paper and reuse of paper office items

Use of Electronic Means

Use e-mails for communication as far as practicable and adopt electronic templates of letterheads, memoranda and forms to avoid pre-printing for adjustment

Handling of Fax Machines and Faxes

Exclude leader page for outgoing fax documents

Delivery/Circulation of Documents

Send unclassified documents without envelopes

Proper Recycling

Put up a single-sided paper collection box (yellow box) and a waste paper recycling box (green box) near photocopiers

Green Office Management

New Measure on Paper Saving:

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.

Waste Recycling

In 2023/24, **27,804 kg** of waste paper and **658** printer toners and ink cartridges were collected for recycling

To treasure waste with recycling value, we would continue taking the following measures to promote waste recycling:

Place separated recyclables into recycling bins for collection by cleansing contractors or local recyclers

Put up recycling boxes to collect other recyclables such as rechargeable batteries for recycling

Green Office Management

Special Measures to Cope With Poor Air Quality

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.

Indoor Air Quality Certification

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

By 2023/24, HMTGO has received the Good Class IAQ Certificate for 20 consecutive years. In the year, both the North Point Government Offices and 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.

IAQ Certificates of our offices

Green Office Management

Green Advice

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

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

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

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

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

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

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

Green Procurement of General Goods and Services

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 the procurement of general goods and services established by the Environmental Protection Department (EPD) as far as practicable. In 2023, our total value of purchase of such goods and services with EPD's green specifications adopted was about HK$ 8.7 million. The major categories of green procurements were inks/toner cartridges, computer equipment, digital cameras, and clothing and textile products. We will continue to select goods and services that are better for the environment comparing to conventional products, thereby promoting sustainable development.

Environmental Audit and Carbon Audit

Annual Environmental Audit

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:

to assess compliance with the green housekeeping guidelines

to identify non-compliance and recommend remedial actions

to promote good environmental management

to increase staff awareness of green management and occupational safety and health initiatives

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.

Carbon Audit

Carbon audit was conducted for Ho Man Tin Government Offices by the Building Management Office in 2023/24 to monitor the effectiveness of greenhouse gas emission reduction efforts. The relevant data are being studied by the Building Management Office.

Based on previous audit findings, the total net greenhouse gas emissions have shown a general decline over the past few years. We will continue to adopt best practices in green management to further minimize our carbon footprint.