



Civil Engineering and Development Department
The Government of the Hong Kong
Special Administrative Region



Environment and Sustainability Services



Michelia Chapensis



Hibiscus rosa sinensis "Yellow"
(Hibiscus)



Ixora chinensis
(Chinese Ixora)



Rhododendron spp.
(Azalea)



Loropetalum chinense 'Purple Majesty'
(Purple Strap Flower)



Terminalia mantaly
(Madagascar Almond)



Liquidambar formosana
(Sweet Gum)



Cinnamomum burmannii
(Batavia Cinnamon)

Some of the plant species commonly recommended in the Greening Master Plans

GREENING

Greening works contribute to the improvement of air quality in addition to the aesthetic of an area. They are essential to the protection, rehabilitation and enhancement of our landscape and ecological environment, which helps create sustainable environmental outcomes. Apart from fulfilling the functional requirements of the development projects, the Civil Engineering and Development Department (CEDD) has been actively promoting greening through a wide range of initiatives, including (1) development and implementation of the Greening Master Plans (GMPs) and other greening initiatives; (2) greening works associated with infrastructure projects; (3) greening works associated with the Landslip Prevention and Mitigation works; (4) greening works for quarry rehabilitation; (5) soil erosion control planting on natural hill slopes; and (6) tree risk assessment and management within works sites.

DEVELOPMENT AND IMPLEMENTATION OF GREENING MASTER PLANS AND OTHER GREENING INITIATIVES

A Greening Master Plan (GMP) seeks to define comprehensively the greening framework of an area by

studying its characteristics and particular needs, and providing a guide to the planning, design and implementation of greening works. To ensure high-level commitment to the GMPs, each GMP is approved by the Greening Master Plan Committee chaired by the Director of Civil Engineering and Development, and endorsed by the Steering Committee on Greening, Landscape and Tree Management chaired by the Permanent Secretary for Development (Works).



Greening Master Plans Planting Ceremonies

We promote public participation in the GMP formulation process and adopt the “Enhanced Partnering Approach” whereby each relevant District Council forms a District Participation Group to partner with us in reviewing the contents of the GMPs and to advise us on the greening of the districts. The successful implementation of greening measures is made through expertise and coordination of multiple disciplines, including landscape architecture, town planning, civil and traffic engineering and even public relations. We organise community planting ceremonies and school talks and invite local residents to participate in our planting activities. We believed that public participation not only enables us to tap into valuable local knowledge but also creates a sense of ownership of the GMPs in the community. We have received very encouraging responses and appreciation of our works from the public.

Following the successful completion in 2011 of the GMPs for the urban areas, we commenced the greening works in the GMPs for Sha Tin, Sai Kung, Tuen Mun and Yuen Long in 2014, and had completed in 2017. We have planted about 4 000 trees and 2.6 million shrubs in the four aforementioned districts. We have also started the implementation of GMPs for New Territories in Tsuen Wan, Kwai Tsing, Islands, Tai Po and North District in December 2020 and plan to plant about 1 850 trees and 830 000 shrubs in the five districts.

Here are photos of some of the completed greening works in urban areas and the New Territories:



Before



After

Greening works at Kwai Tsing Tsing King Road

LANDSCAPE IMPROVEMENT WORKS IN NGONG PING

The Sustainable Lantau Blueprint announced in June 2017 by the Government dedicated part of Lantau Island to be used for conservation with sustainable leisure and recreational purposes. In view of the cool climate, good transport connectivity as well as the synergy with the existing tourist attractions in Ngong Ping, we started the landscape improvement works in Ngong Ping in January 2018 and planted over 400 cherry trees and native spring-flowering trees in Ngong Ping for visitors’ enjoyment during the blooming season.

The planting works in Ngong Ping was completed in the third quarter of 2018. The establishment works for the newly planted trees are now in progress. During the blooming season, the public can visit the planting sites in Ngong Ping for appreciation of the blossoms of the planted cherry trees and native spring-flowering trees.

Before



After

Greening works at U Lam Terrace, Sheung Wan



Landscape improvement works in Ngong Ping

Central and Western District Promenade (Central Section) in Central Reclamation Phase III



GREENING WORKS ASSOCIATED WITH INFRASTRUCTURE PROJECTS

To fulfill the community's growing need for well-being and quality of living, most of our infrastructure projects include the provision of planting schemes serving as landscape/ecological enhancement and impact mitigation measures. Such greening works involve planting in a variety of settings like roadsides, footbridges and flyovers, podiums, slopes, river channels and promenades.

In our major infrastructure projects with planting schemes (including the Kai Tak Development Infrastructure Works at Former North Apron Area, Cross Bay Link at Tseung Kwan O and Advance Engineering Works for the Development of Lok Ma Chau Loop etc.), approximately 420 000 plants were planted in 2021/22.



Advance Engineering Works for the Development of Lok Ma Chau Loop



Kai Tak Development Infrastructure Works at Former North Apron Area

GREENING WORKS ASSOCIATED WITH LANDSLIP PREVENTION AND MITIGATION WORKS

While our primary objective is to safeguard the public from slope failures, we have always given priority attention to blend in the engineering works with the surrounding environment by making them look as natural as possible. It aims to create a sustainable and biodiversified ecosystem that create habitats for wild lives, reduce susceptibility to pests and diseases, and allow natural plant succession. Every effort is therefore made to establish sustainable slope appearance and ecology and establish suitable vegetation around natural terrain hazard mitigation measures under the Landslip Prevention and Mitigation Programme (LPMitP). As a general rule, a hard surface cover is used only as emergency repairs to landslide scars and as a last resort on slope stability grounds. On average, we plant about 2.7 hundred thousand plants each year in connection with our landslip prevention and mitigation works, and most of the plants are native species.

SUSTAINABLE SLOPE EXCELLENCE AWARD

Year 2020 marked the 10th Anniversary of the LPMitP, we specially held the Sustainable Slope Excellence Award to recognise the contribution of the engineering sector in improving slope safety while maintaining the sustainability of the natural ecology. The Award is divided into two categories, namely Man-made Slope/Retaining Wall Category and Natural Terrain Category.

The award-winning project of the Man-made Slope/Retaining Wall Category has adopted the concept of terraced planter walls to stabilise the slope. Apart from installation of soil nails to reinforce the slope at its toe, trial pit-by-pit excavation with backfilling of concrete was carried out from the middle to the top of the slope. Such slope stabilisation method could provide space for planting and enhance the biodiversity of the slope at the same time. The slope is right next to the dam of Kowloon Byewash Reservoir, a Grade 2 Historic Building with a history of 90 years, adopting the method of terraced planter walls could minimise the impact on the dam during construction. Besides, the planter walls and adjacent areas are paved with masonry blocks to integrate the slope with the dam in their appearance.



Champion of the Man-made Slope/Retaining Wall Category. Picture shows the changes of the slope next to the dam of Kowloon Byewash Reservoir before and after the works.

The award-winning project of the Natural Terrain Category has adopted soil bioengineering measures to design and improve the appearance of the natural hillside. Due to emergency slope stabilisation works conducted after a number of landslides at the natural slope of Upper Keung Shan in West Lantau, shotcrete scars of about 4 500 square metres were left in the natural terrain. Therefore, the project team had to remove the shotcrete scars on the terrain first and then adopt various measures to mitigate the risk of landslide according to the geological conditions of the slope. The use of soil bioengineering is not simply growing plants, but also about assessing biodiversity, and it is self-sustaining, natural and aesthetically unobtrusive terrain management approach. Besides, the works project has innovative sustainable features, such as upcycling the broken-up shotcrete surface to integrate it with rock drains to avoid the generation of construction and demolition materials.



Champion of the Natural Terrain Category. The project team has successfully integrated the slope works with the natural environment, so that the original sullen grey terrain can return to its natural green glory.

**Greener Slopes
Better Cityscape**





A view of the rehabilitated Anderson Road Quarry

SOIL EROSION CONTROL PLANTING ON NATURAL HILL SLOPES

Under the soil erosion control planting programme on natural hill slopes, we establish primary vegetation covers on the eroded or erosion-prone slopes on unleased or unallocated land outside country park. The objectives are to control soil erosion and enhance the ecological and landscape value of the degraded land. The planting of about 12 000 seedlings in Shui Chuen O, Shatin was completed in early 2019, and relevant 3-year establishment works have been completed in early 2022. The upcoming planting works are under planning.

GREENING WORKS FOR QUARRY REHABILITATION

The plan to rehabilitate quarries was formulated in 1989 as an outcome of the Metrolan Landscape Strategy for Urban Fringe and Coastal Areas, which identified quarries as areas of degraded landscape requiring rehabilitation. The rehabilitation works typically involve major recontouring and extensive planting. Upon completion of the quarry rehabilitation works, attractive greened areas will be formed for a variety of uses beneficial to the community.

Under an innovative scheme developed by the Government and the quarrying industry, we completed the rehabilitation works at Lamma Quarry at the end of 2002, Shek O Quarry at the end of 2011 and Anderson Road Quarry in mid 2017 and are currently managing the quarry rehabilitation contract at Lam Tei. In the course of quarry rehabilitation, slopes are vegetated extensively in order to blend with the surrounding natural environment and provide favourable habitats for wildlife. In 2021/22, we had planted about 1 000 trees and shrubs in connection with our quarry rehabilitation project.

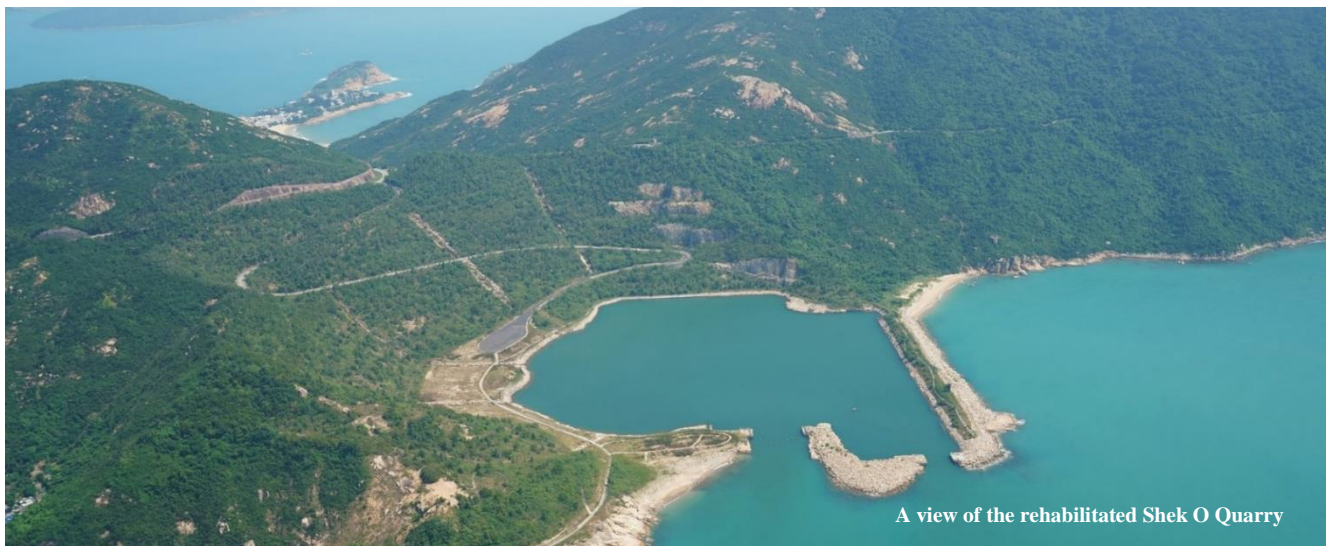


Soil Erosion Control Planting in Shui Chuen O, Shatin

In the planting schemes, we adopt a mixture of plant species, which includes native species to promote vegetation diversity and pioneer species to arrest any further soil erosion. We also continue to exchange knowledge and experience with other government departments to further enhance our effective greening works for different soil erosion situations.

TREE RISK ASSESSMENT AND MANAGEMENT

To ensure public safety and for sustainable development and tree care, we conducted an annual tree risk assessment and management exercise for approximately 35 000



A view of the rehabilitated Shek O Quarry

trees located in various CEDD's works sites in early 2022 prior to onset of the rainy season, according to the guidelines promulgated by the Greening, Landscape and Tree Management Section of the Development Bureau. This annual exercise included conduction of tree inspections, tree risk assessments, appropriate mitigation tree works and the related tree audits.



Tree inspection and audits for annual tree risk assessment and management exercise



Chai Wan Public Fill Barging Point

MANAGEMENT OF CONSTRUCTION WASTE

The composition of construction waste varies, depending on the nature of the construction works. In general, about 90% of it is inert construction materials, also known as public fill, which is suitable for reuse in reclamation and earth filling works, or recycle for use in other construction works. The remaining non-inert construction waste, subject to recovery of reusable/recyclable items, is disposed of in landfills.

The local construction industry annually generates a large quantity of public fill. While part of the public fill are directly reused in local construction projects, the rest are delivered to the two temporary fill banks located in Tseung Kwan O Area 137 and Tuen Mun Area 38 for storage and future reuse in reclamation or earth filling projects. As at May 2022, we stockpiled about 14 million tonnes of public fill in the temporary fill banks.

In managing this huge volume of construction waste, our objective is to promote the reduction, reuse and recycling of public fill and to prevent public fill from being disposed of in landfills, which are designed primarily for putrescible waste. Specific measures include:

- Avoiding and minimising construction waste generation at sources through better planning, design and construction management
- Implementing Construction Waste Disposal Charging Scheme to provide an economic incentive for waste producers to reduce construction waste that requires disposal
- Processing/recycling public fill
- Setting up sorting facilities to facilitate the reuse of inert materials
- Establishing temporary fill banks to stockpile surplus public fill temporarily to facilitate later reuse
- Setting up barging facilities for collection of surplus public fill and delivery to the fill banks
- Reusing surplus public fill in Mainland/local reclamation projects

To ensure proper disposal of public fill arising from local construction activities, we are operating the temporary fill banks and construction waste sorting facilities at Tseung Kwan O and Tuen Mun and the barging facilities at Chai Wan and Mui Wo.



REUSE OF SURPLUS PUBLIC FILL IN THE MAINLAND

Since the reclamation projects in Hong Kong are unable to absorb all the public fill generated by local construction, excavation, renovation, demolition and road works, we are currently relying on two fill banks for temporary storage of public fill. Notwithstanding different management measures taken to reduce fill generation at source and to promote its reuse and recycling, we still face the problem of surplus public fill.

To tackle the problem, we continue to explore opportunities to reuse our surplus public fill in Mainland. We signed a Cooperation Agreement with the State Oceanic Administration (SOA) in March 2004. It provides a foundation for delivery of our public fill in Mainland waters. We further reached an agreement with the South China Sea Branch of the State Oceanic Administration (SOA (SCSB)) in June 2005 on the implementation details, including the material specifications, delivery requirements, inspection and control measures, to ensure that the use of public fill in the Mainland's reclamation projects will not cause insurmountable environmental problems.

In January 2006, SOA (SCSB) designated a trial reclamation site in Guang Hai Wan (廣海灣) of Taishan (台山) to receive public fill from Hong Kong. Contracts were subsequently awarded for the cross-boundary delivery of surplus public fill to the reclamation site concerned. The delivery of public fill to Taishan commenced in July 2007 and about 133 million tonnes of public fill have been delivered up to May 2022.

This arrangement helps alleviate our pressure in accommodating surplus public fill and enables reuse of our public fill in the Mainland. In the absence of the scheme, the fill banks would have already been filled up and any surplus public fill would have to be disposed of in landfills, of which the capacity is fast depleting.

CONSERVATION WORK

We are carrying out infrastructure and development projects in Lantau following the planning principle of “Development in the North, Conservation for the South” under the Sustainable Lantau Blueprint. We set up the Lantau Conservation Fund and its Advisory Committee in 2020 to promote the conservation of Lantau, and implement minor local improvement works to support conservation initiatives. Up to end 2022, a total of 31 conservation and related projects and nine minor local improvement works have been approved and commenced progressively.

We have completed the review of the existing ecological information of three priority areas with high ecological significance in South Lantau and are exploring appropriate conservation measures for these sites. The second batch of ecological study for Sau Tau to Shum Wat, Yi O and Shap Long has commenced in September 2021. Apart from encouraging non-profit making organisations' participation in conservation projects by leveraging the funding resources, we strive to promote conservation in Lantau through community engagement and education activities.

We are undertaking studies in phases, with a view to studying the culture and history of the rural villages in Lantau, exploring suitable conservation and revitalization proposals, as well as, facilitating the preparatory work for the setting up of cultural and historical database of Lantau. We commenced cultural and historical studies for North-west and South-east Lantau in 2019 and 2020 respectively. Among which, the part on rural villages along the coastal area from Tung Chung to Tai O and a study through deploying design thinking approach for revitalisation proposal for the area were completed in 2021. To take forward the recommendations of the above studies, we erected thematic signages in the area with a view to enriching visitors' experience. We also launched a thematic website to enhance public understanding on Lantau cultural stories in December 2022.

On sustainable recreation and leisure, we have been taking forward the proposed projects and initiatives of 2020 Lantau Trails and Recreation Plan in phases. They include improving and constructing new trails for developing a Round the Lantau Route and expanding the network of mountain bike trails in South Lantau so as to connect heritage, ecological and recreational hotspots as far as practicable, enabling visitors' diverse sustainable leisure experiences and enhancing public awareness of nature and cultural conservation. We are carrying out preliminary design work for the sustainable and low-impact eco-recreation and education initiatives in South Lantau, including Shek Pik Reservoir, along the catchwater and the areas nearby.

We will commence the study of the about 60 kilometres long “Round-the-Island Trail” on Hong Kong Island in 2023, by connecting the waterfront promenades on the northern shore and a number of existing promenades and countryside walking trails in the Southern District, with a view to forming 90% of the Trail within five years.

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