

Sustainable Asset Management

Take every opportunity to introduce green,
And maintain road like a well-oiled machine,
A streetscape that's safe and a 'sight for sore eyes',
To reduce and recycle – the sustainable prize



Investigation Study for Greening of Highway Structures

Highways Department has been actively participating in enhancing the urban environment by incorporating more greenery whenever new roads are planned. Planting at grade along footbridges; parapets, and around structure columns have been implemented in some areas. To further enhance the environment with more greenery and to soften the appearance of road structures, HyD has been carrying out an investigation study into the feasibility of providing greenery on road structures, such as, decks, structure roofs, columns and piers etc. in a safe, user and maintenance friendly, cost effective, sustainable as well as aesthetically pleasing manner. The study is anticipated to complete in 2008.

Also, there are various proprietary greening treatments available in the market, their application to both existing and new highway structures may not be always appropriate in terms of safety, sustainability, cost effectiveness and attractiveness. Different current greening treatments in Hong Kong and 4 other oversea countries are being studied and reviewed in the study. Greening Guidelines on highway structures will be developed for future planning use. On site trials will be

conducted once the study is complete to check the long-term practicality of the recommended greening options.



Greening along Gascoigne Road Flyover



Hanging planter along Arsenal Street Footbridge



Investigation Study for Greening and Aesthetic Design of Noise Barriers

Noise barriers and enclosures are commonly used for roadway noise mitigation. To further improve the general appearance of this particular kind of noise mitigation measures, HyD carried out a study in 2006 on noise barrier aesthetic design practices and greening. Three types of greening measure on noise barriers have been explored and trials have been arranged. They are green walls, earth mound, and planters with climbers. The current progress of the trials of these greening measures is described below;



a) Green Walls:

Green wall comprises a proprietary growing medium sandwiched within vertical meshes to act as noise barrier. A green wall around 180 metres long was completed in June 2007 along the north bound of Kong Sham Western Highway near San Sang San Tsuen. The performance of the growing medium and climbers on the wall is being monitored. Other trial green wall noise barriers have been included in Contracts No. HY/2007/07 and HY/2007/08 for construction along Tseung Kwan O Road and an area along Tsing Tsuen Bridge at Tsing Yi and Tsuen Wan Approaches respectively.



Green wall along Kong Sham Western Highway San Sang San Tsuen

b) Earth Mound:

Earth mound is considered to be effective and aesthetically pleasing as it looks natural, requires minimal maintenance. However, the use of earth mound is generally not common in Hong Kong as it needs more space. An engineered earth mound occupies less space and can still be appropriate for use in some places in Hong Kong. An engineered earth mound in Route 8, Eagle's Nest Tunnel and Associated Works Contract has been completed recently to test its



Route 8 engineered earth mound

effectiveness in traffic noise mitigation and in supporting appropriate greenery to improve the general external appearance. Another earth mound, around 28m long, has also been completed in October 2007 near Yuen Long Highway north bound to Kong Sham Western Highway north bound.



Earth mound along Yuen Long Highway north bound to Kong Sham Western Highway north bound

c) Planters with Climbers:

Planter is provided at the base of noise barriers or retaining wall for planting of vegetation including climbing plants. Supporting frame or cables are mounted on the surface of the wall or noise barriers to facilitate the attachment of the climbing plants. A retaining wall, around 40m long, at Kong Sham Western Highway north bound near Ngau Hom Shek was identified for the trial. The construction works were completed in June, 2007. The whole system is being monitored.



The climbing system along Kong Sham Western Highway north bound near Ngau Hom Shek

Maintenance of Roadside Slope Vegetation

Under Environment, Transport and Works Bureau Technical Circular (Works) No. 2/2004, Highways Department is responsible for the maintenance of vegetation within the boundary of expressways and man-made roadside slopes registered in the "SIMAR" database set up by Lands Department.

The Department maintains vegetation along expressways and on about 10,000 roadside slopes in the territory. Our aim is to keep the vegetated areas in a green, tidy and safe condition. Routine inspections and maintenance operations on the vegetation are carried out every six months. If required, maintenance frequency may be increased for special planting areas.

Maintenance operations include removal of debris and dead trees, weeding, grass cutting, watering, pruning, thinning, fertilizing, pest control and arboricultural treatment, etc. No tree would be unnecessarily felled or pruned. If a tree is inevitably required to be removed for road development, transplanting the tree to another location would be the preferred course of action. The photos below indicate measures used to preserve trees on slopes.



Clearing of rubbish and improvement planting afterward along slopes on high speed road



Slope No. 11SW-A/FR135 at Caine Lane – Preservation of existing trees in-situ as part of the slope upgrading works



Horticultural maintenance – removal of dead tree



Improvement planting work to enhance the landscape setting of the slopes and along expressways will be carried out whenever resources are available. Both native and exotic species are used in harmony to improve the landscape quality of the roadside environment and to achieve a sustainable green setting. In 2007, HyD planted around 12,000 trees and 230,000 palms/shrubs/groundcovers/climbers of which 70% of the plants are native species.



Improvement planting work on slope 6NW-C/C288 along Castle Peak Road - Langnan, Tuen Mun

For the efficient management of slope vegetation, a Slope Vegetation Inventory was completed in 2004 containing information on vegetation grown on individual slopes maintained by HyD. In addition, a register of the valuable trees on slopes has been established and incorporated in the HyD Central Slope Inventory in order that trees requiring special preservation or maintenance measures can be easily identified when any projects/ works affecting a roadside slope are proposed.



Streetscape Enhancement and Greening

Apart from providing a safe and effective road network in Hong Kong, it has also been HyD's goal to provide a green and attractive street environment for pedestrians. Streetscape enhancement work carried out in conjunction with the pedestrianisation schemes in the urban area has been well received by the general public.

Streetscape Enhancement in Urban Area

Streetscape enhancement work, started in 2006 includes upgrading the quality of paving, street furniture, street lighting and incorporation of more greening eg. street trees and/or roadside planter. Work has been carried out in SOHO, Sham Shui Po and Jordan. Footpath widening and improvement were also carried out in Mid-levels including the surrounding area of the newly renovated historic building Kam Tong Hall and converted into the Dr. Sun Yat Sen Museum.



Street enhancement work along SOHO area



Upgraded paving and road side hanging planter along Canton Road

HyD also cooperates with other government departments such as Transport Department and Planning Department on area improvement as well as streetscape and greening upgrading work. This enables a comprehensive upgrading of the streetscape of an area with a coordinated design. The enhancement work will be ongoing from area to area.



Upgraded paving and road side planting along Fenwick Street



Upgraded paving and road side planting along Ashly Road

As the private sector has expressed an eagerness to participate in local street environment improvement work, HyD therefore partners with District Councils, developers and community organizations to carry out streetscape enhancement work. Past examples include the upgrading of the Central District around Hong Kong Landmark initiated by Hong Kong Land Ltd, and the upgrading of Hollywood Road by Henderson Land Ltd. Urban Renewal Authority has also been invited to participate in several of the streetscape enhancement projects in Tsim Sha Tsui and Tai Kok Tsui.



Greening

The Greening Master Plan (GMP) promoted by Civil Engineering and Development Department (CEDD) involves improvement work along public roads and highway structures. Apart from providing necessary advice during the study and design stage of GMP in each district, HyD coordinates with CEDD closely to enable their implementation of the short term measures of the GMP. In general, HyD will upgrade the street paving, lighting and street furniture in tandem with the greening work implemented by CEDD. A recent example is Nathan Road in Tsim Sha Tsui.



Upgraded paving and road side planting along Nathan Road

Use of Reclaimed Asphalt Pavement

Hong Kong generates several types of waste, one of which is construction and demolition materials (C&D materials) arising from activities such as construction, renovation, demolition, land excavation and road works. Although this waste is now separated and inert material is used as fill in reclamation sites when available, a significant portion of the C&D materials still go to landfills. With economic growth and higher expectation in living standards, the volume of C&D materials is on the rise and available landfill space in Hong Kong is fast declining.

Highways Department constructs and maintains the road systems of Hong Kong which generates a substantial quantity of C&D materials every year. As a responsible and environmentally conscious department, it is our continual goal to reduce C&D materials from our day to day activities. One means of reduction is often associated with recycling whenever suitable technology is available.

One source of road work C&D materials comes from periodic resurfacing of the top layer of deteriorated pavement. Resurfacing is being carried out extensively in Hong Kong due to high traffic volume resulting in a very

large quantity of milled surface material being removed and disposed. As the milled material still has certain structural strength when compacted, it has often been re-used in forming the pavement of open air temporary car parks.

Further, re-using the milled material as part of its constituent material, Reclaimed Asphalt Pavement (RAP), has been successfully used in many overseas countries in recent years for road construction. To assist in reduction of waste and recycling of useful material, HyD has decided to recycle this type of resurfacing material and reuse in road construction. In December 2007, about 500 square metres of Pak Tam Road in Sai Kung was constructed using RAP for the first time. Although it may take time for this new application to be widely used in Hong Kong's construction industry, it is expected that this material will be more widely used in future with HyD as the lead user. The use of RAP has been included as a mandatory requirement in the new road maintenance term contract no.11/HY/2007 due to commence on 1 April 2008. We intend to progressively promulgate the mandatory use of RAP to other contracts.



Laying of reclaimed asphalt pavement in Sai Kung