

# LAYMAN'S GUIDE

TO LANDSCAPE TREATMENT OF SLOPES



Geotechnical Engineering Office  
Civil Engineering and Development Department

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# Foreword

This Layman's Guide is intended for the use of the general public. It provides information and general guidance on landscape treatment for slope works and natural terrain landslide mitigation measures.



It is Government's policy to make slopes in Hong Kong look as natural as possible. We are striving to improve the quality of our living environment through active planting, preservation of trees and other vegetations, together with proper maintenance. With this commitment and effort, we believe that we can achieve the overall aim of creating a greener, more harmonious and ecologically sustainable slope environment.

The first edition of this document was published in 2002. There had since been continuous development in slope engineering and landscaping techniques, which led to the issue of GEO Publication No. 1/2011 "Technical Guidelines on Landscape Treatment for Slopes" by the Geotechnical Engineering Office. We have therefore taken the opportunity to update this Layman's Guide in order to promulgate the latest best practice.

We trust that this document will continue to serve the purpose of helping and encouraging private slope owners to provide appropriate landscape treatment to their slopes when planning maintenance, upgrading and new developments.

For more detailed guidance, readers may refer to GEO Publication No. 1/2011.

**Y C Chan**  
Head, Geotechnical Engineering Office  
July 2012





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# Why bother with landscape treatment for slopes?

**Enhance  
Property  
Value**

**Improve  
Appearance**

**Create a Greener  
Environment**

**Contribute to  
Local Ecology**

**Achieve  
Sustainability**



## Landscaped man-made slope



Before

After



Fat Kwong Street, Homantin



## Landscaped retaining wall



Before

After



South Lantau Road, Lantau Island



## Landscaped natural terrain landslide mitigation measures



Before

After



Artist's impression of the mitigation measures upon maturing of landscaping plants

Yu Tung Road, Tung Chung

# What are the landscape design objectives?

## 1. Minimise impacts on the natural environment



Minimise the extent of engineering works and retain as much existing vegetations as practicable

## 2. Fit in with surrounding landscape/natural topography

The slope topography and composition should be designed to match the surrounding landform and landscape





### 3. Create a greener environment



Vegetation is aesthetically pleasing and environmentally friendly

### 4. Contribute to environmental sustainability and local ecology

Native tree species provide natural habitats for wild life to thrive, and they can spread naturally. Planting them improves the local ecology





## 5. Achieve a natural appearance



Solutions using natural materials (e.g. rock and vegetation) are visually preferable to artificial materials

## 6. Mitigate visual impact



Where artificial or built elements are used, efforts should be made to blend these elements into their surroundings



## 7. Aesthetically pleasing

The landscape design of features should conform to the principles of good aesthetic design

### i. Unity and coherence



Planting at the toe and above a retaining wall successfully creates a unified appearance to the whole slope

### ii. Proportion and scale



Buttresses with masonry facing suitably sized and disposed to create a sense of proportion

### iii. Pattern and texture



Various techniques used in a co-ordinated manner, resulting in a composition having both pattern and texture

### iv. Rhythm and complexity



Ribbed finish and plain concrete create a scene with both rhythm and complexity

### v. Colour



Colours of random patterned masonry complement the surroundings

### vi. Albedo (Reflectivity)



Small-sized surface blocks mingled with vegetation reduce the reflectivity of a hard surface



# Tips for landscaping slopes

*Tip 1*

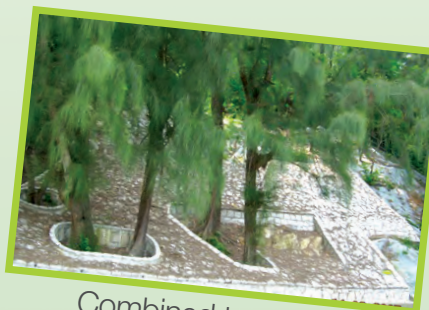
## Preserve existing trees



Providing tree protection zone and/or protective wrapping around tree trunks during construction



Planting strips above and below masonry wall to promote root growth of wall trees



Combined tree rings



Localised wall to retain existing trees

## Examples of tree preservation



Existing wall trees are retained after upgrading works using soil nails



Use of soil nails to stabilise an existing masonry wall allows attractive “wall trees” to remain undisturbed

Soil nail heads are concealed behind blocks in the wall face





## Select the planting goal (plant the right vegetation at the right place)

Slopes in rural areas or urban fringe areas – connected to natural vegetation



**Ecological Planting**  
Integration with the surrounding natural vegetation

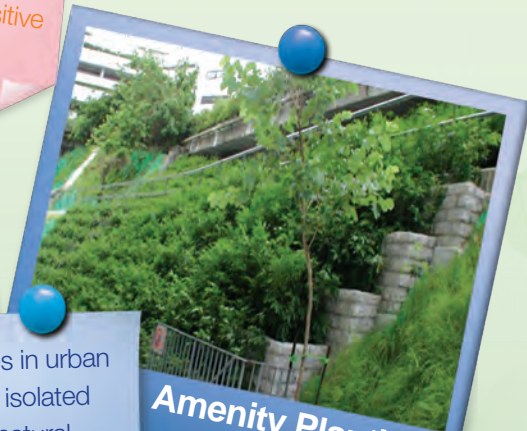


Slopes in parks/gardens or other visually sensitive areas



**Ornamental Planting**  
Emphasis on a pleasing appearance

Slopes in urban areas isolated from natural vegetation



**Amenity Planting**  
Basic landscape enhancement

Note: Consult a landscape architect on the selection of the planting goal as necessary



## Examples of different planting goals



**Ecological Planting** | Improve visual appearance and enhance ecological value by planting native species



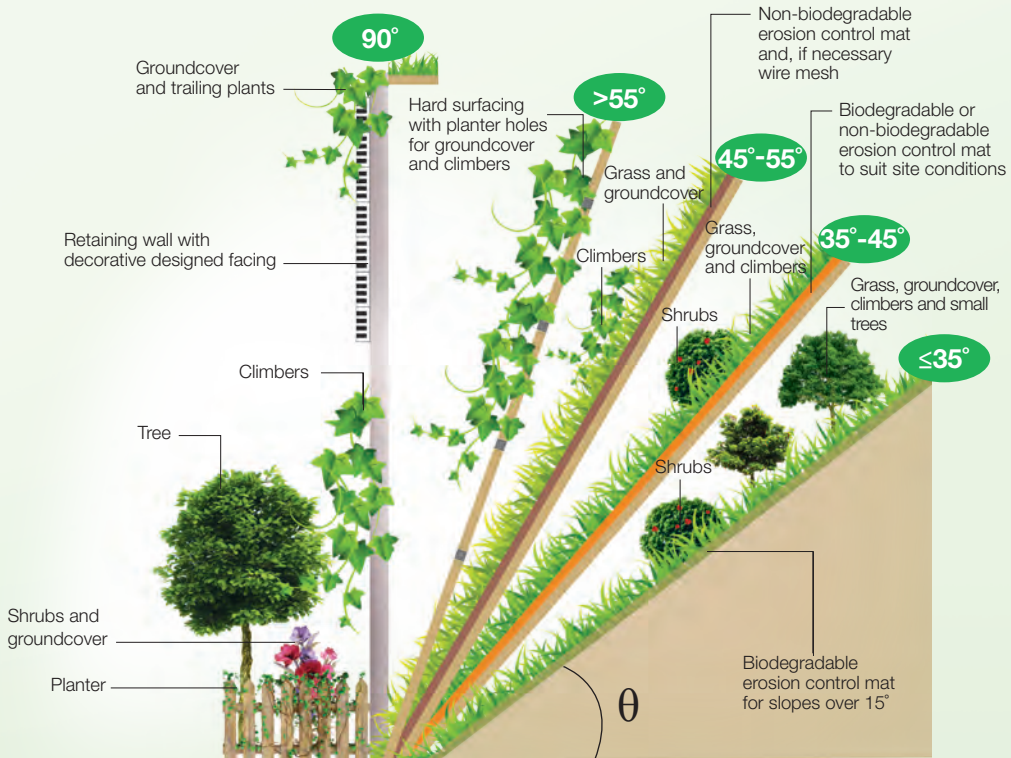
**Amenity Planting** | Basic landscape enhancement by planting a mixture of exotic and native species on slopes that are isolated from the natural vegetation



**Ornamental Planting** | Emphasis on a pleasing appearance by planting of flowering shrubs and trees



## Create planting opportunities



### Slope Gradient ( $\theta$ )

### Possible Planting on Slope Face\*

$$\theta \leq 15^\circ$$

Grass hydroseeding with pit planting of trees, shrubs, groundcover and climbers

$$15^\circ < \theta \leq 35^\circ$$

Grass hydroseeding with pit planting of small trees (up to about 3 m height when mature), shrubs, groundcover and climbers

$$35^\circ < \theta \leq 45^\circ$$

Grass hydroseeding with pit planting of shrubs, groundcover and climbers

$$45^\circ < \theta \leq 55^\circ$$

Grass hydroseeding with groundcover and climbers in root tube planters

$$\theta > 55^\circ$$

Planter holes through hard surface cover for planting of groundcover and climbers

Source: Figure 2.15 and Table 2.2 of GEO Publication No. 1/2011

Note: (\*) Recommendations are not mandatory and consult a landscape architect as necessary



# Examples of creating planting opportunities

Climbers  
and screen  
planting at  
the toe



Terracing of a retaining wall for  
planting



Toe and berm planters



# Species commonly planted in Hong Kong

Use of native species is encouraged



Climbers



*Ficus pumila* (Creeping Fig)



*Parthenocissus dalzielii*  
(Diverse-leaved Creeper)

# Species commonly planted in Hong Kong

Use of native species is encouraged

Groundcover



*Dicranopteris pedata*  
(Dichotomy Forked Fern)



*Blechnum orientale* (Oriental Blechnum)



# Species commonly planted in Hong Kong

Use of native species is encouraged



*Melastoma sanguineum*  
(Blood-red Melastoma)



*Rhamphiolepis indica*  
(Hong Kong Hawthorn)



*Ardisia crenata*  
(Hilo Holly)



# Species commonly planted in Hong Kong

Use of native species is encouraged

## Small Trees



*Melicope pteleifolia*  
(Thin Evodia)



*Polyspora axillaris*  
(Hong Kong Gordonia)



## Landscape the engineering elements and slope furniture

### Landscape the engineering elements



Use of grillage system to retain existing vegetation



Establishment of climbers on retaining wall

### Landscape the slope furniture



Stairways blended in with the surroundings to minimise visual impact



# Examples of landscape treatment



## 1. Landscape softworks

Ecological planting to achieve a sustainable environment



Well maintained trees and ornamental shrubs on a slope



Provide ferns and other shade tolerant species under tree cover

# Examples of landscape treatment

## 2. Landscape hardworks



Decorative designs on a retaining wall, enhanced by trees and shrubs in a toe planter



Masonry facing, common landscape hardwork for slopes



Apply masonry-like finish to a hard surface



Subdue grey colour paint applied to concrete rock slope preventive measures



# Examples of landscape treatment

## 3. Hybrid landscape treatment

Climbers forming a green curtain to screen the concrete buttresses



Openings on slope to allow planting to green the hard surface

Climbers on a retaining wall with palm trees and decorative shrubs in front



# Typical maintenance of landscape works

## Landscape softworks:

- inspecting trees and plants
- trimming vegetation as necessary
- replacing vegetation where necessary
- spraying against pests
- removing invasive species

## Landscape hardworks:

- repairing damage to surface finishes



## Are landscape works costly?

Landscape works are generally not costly. Advice on the cost of the landscape works should be obtained from a landscape architect.





1

**Slope Safety  
above all**

2

**Seek advice  
from a  
landscape  
architect**

3

**Retain existing  
vegetation  
where possible**

4

**Create  
planting  
opportunities**

5

**More use  
of native  
species**

6

**Choose hard  
surface  
materials that  
minimise  
visual impact**

7

**Proper  
maintenance  
of landscaping  
works**

**Seven Things  
to Remember**



# Assistance

**More guidance can be found in GEO Publication No. 1/2011  
“Technical Guidelines on Landscape Treatment for Slopes”  
which is available from:**

Publications Sales Unit  
Information Services Department

<http://www.bookstore.gov.hk>

Tel. No.: (852) 2537 1910

**or from the following website:**

<http://www.cedd.gov.hk/eng/publications/>



**For more information on slope related matters, please contact**

Community Advisory Unit  
Geotechnical Engineering Office  
Civil Engineering and Development Department  
Tel. No.: (852) 2760 5800

**Other relevant websites:**

Civil Engineering and Development Department  
<http://www.cedd.gov.hk>

Greening and Landscape Office of Development Bureau  
<http://www.greening.gov.hk>

Hong Kong Slope Safety  
<http://hkss.cedd.gov.hk>

The Hong Kong Institute of Landscape Architects  
<http://www.hkila.com>



# Relevant publications

