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The Government of the Hong Kong Special Administrative Region

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發展局  
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**Development Bureau**  
**Technical Circular (Works) No. 3/2012**

**Site Coverage of Greenery for Government Building Projects**

**Scope**

This Circular sets out the standards and requirements on site coverage of greenery for new Government building projects and the methodology of measurement and calculation for the purpose of the required Site Coverage of Greenery. For the purpose of this Circular, Government building projects refer generally to all building works under the Public Works Programme irrespective of building types and including those associated with infrastructure development.

**Effective Date**

2. This Circular takes immediate effect on new Government building projects from 18 June 2012 at planning and inception stage prior to approval of a Technical Feasibility Statement (TFS) if applicable. Projects in advanced stages with approved TFS and beyond are not affected.

## Effect on Existing Circulars

3. This Circular has no effect on existing circulars. The Circular should be read in conjunction with WBTC No. 7/2002 on Tree Planting in Public Works.

## Background

4. Government is committed to promoting a quality living environment for the community. Measures to promote green buildings for a quality and sustainable built environment, including compliance with sustainable design guidelines on site coverage of greenery as recommended by the Sustainable Development Council in its "Report on the Public Engagement Process on Building Design to Foster a Quality and Sustainable Built Environment" promulgated in June 2010<sup>1</sup>. Currently, requirements of site coverage of greenery are imposed in planning briefs for public as well as private projects and in land lease conditions where practicable. The Building Department (BD) promulgated the Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-152 on "Sustainable Building Design Guidelines"<sup>2</sup> effective from 1 April 2011, requiring the minimum site coverage of greenery of 20% or 30% as a prerequisite for approval of Gross Floor Area concessions for new private buildings with site areas of 1 000 m<sup>2</sup> or more.

## Policy

5. Government has all along been taking the lead in the promotion of

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<sup>1</sup> The Sustainable Development Council recommends a minimum site green coverage requirement of 20-30% for sites not less than 1,000 m<sup>2</sup>, with greening at the ground level as a priority, and podium and roof levels, depending on the size of the sites.

<sup>2</sup> BD's PNAP APP-152 stipulated that new building developments with site areas of 1 000 m<sup>2</sup> or more, shall be provided with greenery areas at the pedestrian zone up to 15 m above the ground level, communal podium roof / flat roof / main roof, slopes and retaining structures, where appropriate, to meet the minimum site coverage of greenery as follows: for 1 000 m<sup>2</sup> ≤ Area < 20 000 m<sup>2</sup> (total minimum 20% greenery coverage, in which minimum 10 % shall be provided at the pedestrian zone); and for Area ≥ 20 000 m<sup>2</sup> (Total minimum 30% greenery coverage, in which a minimum 15% shall be provided at the pedestrian zone) as a prerequisite for approval of Gross Floor Area concessions.

greening due to its benefits in enhancing the quality of the environment and contributing to quality living by providing visual relief and psychological comfort, improving aesthetic quality, mitigating urban heat island effect, enhancing air quality, improving micro-climate, and promoting biodiversity.

6. The benefits of greening may vary according to the type of vegetation, and the extent and location of planting. Tree planting is a lot more effective than other vegetation due to the significant biomass and the environmental/ecological benefits; and it should be given priority in consideration from planning stage. Tree planting creates long term greening benefits and provides more direct enjoyment and appreciation of greening by the general public, and hence should be promoted. Greening on the ground level would provide greater opportunities for planting of trees and larger size vegetation. Trees planted at the ground or street level help with cooling the air by providing shade and reducing solar radiation. In general, sustainable greenery designs with due considerations of cost-effective methods and lifecycle maintenance implications, particularly for vertical greening and roof greening, are also recommended.

7. In light of the above, with the aim to promote and facilitate the implementation of greening initiatives in Government building projects, a set of guidelines with the method of measurement and calculation of Site Coverage of Greenery is stipulated in **paragraphs 8 to 16**.

### **Site Coverage of Greenery**

8. Government should take the lead in promoting greening to the community as it works towards a quality and sustainable living environment. Project proponents responsible for Government building projects, regardless of types, are encouraged to maximise greening opportunities of the sites.

### **Definition**

9. The terms used in this paper are defined as follows:

- a) **Site Coverage of Greenery** is the percentage of total Greenery Areas divided by the Area of the Site.

- b) **Greenery Area** is an area planted with trees, shrubs, annuals, groundcovers, climbers and grasses and any other types of living plants. The Greenery Areas could be at ground level, podium level, sky gardens, slopes, vertical walls, roof of the buildings, etc. For the purpose of calculating countable greenery, Greenery Areas should be built in or fixed permanently to buildings with recommended minimum soil depths of 1 200 mm for trees, 600 mm for shrubs/climbers/bamboos and 300 mm for grass/ground covers. Continuous planting areas instead of fragmented areas should be designed, where practicable. For proprietary greening systems on roof, sky gardens, vertical greening, etc. the soil provision is subject to performance based criteria.
- c) **Area of the Site** refers to the overall site area. For phased development, the total sum of site areas of different phases of the development is counted. For ancillary building works associated with infrastructure development on unallocated government land, they are defined by District Lands Office (DLO)'s approved permanent land allocation plans for the building works specifically and departments should ensure that the required Site Coverage of Greenery has been considered and allowed in applying for land allocation for the building works.
- d) **At-grade Greenery Area**, is an encompassing term which generally refers to greenery planted at-grade, on ground level or street level, with or without structural slabs underneath as far as the greenery areas is adjoining to pedestrian circulation and immediately connected to public areas, including greenery at formed platforms or slopes between different levels.
- e) A **Tree** refers to a woody plant usually having a dominant trunk or trunks. Reference should be made to the 'Checklist of Hong Kong Plants' (latest edition) issued by Agriculture, Fisheries and Conservation Department for the definition of the species as trees. The trees included in the calculation of Site Coverage of Greenery may be retained existing trees, transplanted trees, compensatory tree planting as well as new planting trees of the site.

## Minimum Requirements on Site Coverage of Greenery

10. All new Government building projects are required to achieve the minimum standards and requirements on Site Coverage of Greenery as set out below and summarised in **Table 1**:

Area of the Site	Minimum Site Coverage of Greenery		Remark
	Total Greenery Areas	At-grade Greenery Areas	Greenery Areas at other locations
$\geq 20\,000\text{ m}^2$	30%	15%	No minimum Greenery Areas requirement at other locations
$\geq 1\,000\text{ m}^2$ , but $< 20\,000\text{ m}^2$	20%	10%	

**Table 1-** Minimum Requirements on Site Coverage of Greenery

- a) Achieve a total **Site Coverage of Greenery** of 30% for site areas of 20 000 m<sup>2</sup> or more and 20% for site areas less than 20 000 m<sup>2</sup> as minimum. Sites with areas less than 1 000 m<sup>2</sup> are exempted;
- b) Provide **At-grade Greenery Area** of at least half of the required Site Coverage of Greenery, where greenery is at locations that benefit the public, such as at-grade, at ground level or street level. **At-grade tree planting** should be given priority over other vegetation for optimising greenery effect and benefits of providing shade for pedestrians and the public. Opportunities should be explored for tree planting in the feasibility, planning and design stages. Tree planting along the route of pedestrian circulation should be optimised. Omission of tree planting in the design should be fully justified and only accepted in exceptional cases.

11. Apart from the required minimum standards of Site Coverage of Greenery to be achieved, departments are encouraged to set a target, preferably 30% Site Coverage of Greenery for sites over 10 000 m<sup>2</sup> as a planning or design parameter, which is recommended by the 'Urban Climate Map and Standards for Wind Environment Study' of the Planning Department and a minimum 20% for sites below 10 000 m<sup>2</sup> preferably at grade. In fact, the

greening ratio of an overall 30% is recommended as a design parameter for Kai Tak Development for both public and private sites, including Government/Institutional and Community (G/IC) sites. Planning Department and Housing Department have developed an internal guidance on green coverage in new public housing developments i.e. "Guiding Principles on Green Coverage for Public Housing Developments", requiring housing development sites to target at an overall 30% green coverage. Subject to individual site characteristics and constraints of building footprint, a lower percentage of green coverage could be considered on a case by case basis.

### **Method of Measurement and Calculation of Site Coverage of Greenery**

12. The method of measurement for the calculation of Site Coverage of Greenery is set out below. A worked example on computation of Site Coverage of Greenery is appended in **Appendix A**.

#### **a) Countable Greenery Areas for calculation of Site Coverage of Greenery**

- i) All Greenery Areas shall be measured horizontally based on the soil areas, including that on soil mounding as shown on plans except those other types of greenery or greening features described in **Table 2** which are subject to location, application, reduction factor and a total/combined total of 30% cap for all individual types of other greenery to the required Site Coverage of Greenery.
- ii) Greening on slopes<sup>3</sup> with gradient NOT exceeding 45 degrees is measured by projecting horizontally based on the soil areas as shown on plans. Greening on slopes with gradient exceeding 45 degrees is measured in projected elevation based on the soil areas as shown on plans (see **Appendix B**).

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<sup>3</sup> For the avoidance of doubt, cases like (i) where mixed rock and soil slope having scarce and scattered pockets of soil with vegetation growing on it, only soil pocket areas are countable for Site Coverage of Greenery; (ii) rock slope (without soil areas) having only trees dotting over it are not countable for Site Coverage of Greenery; and (iii) in shotcreted slopes with trees growing in tree rings, only the soil areas of the tree rings are countable for Site Coverage of Greenery.

- iii) Tree planting in tree pit on hard pavement with tree surround or tree grille is countable and measured by the soil area of the pit.

Other types of greenery/ greening features	Application/ measurement method	Countable for At-grade Greenery Area	Reduction factor in computing the Greenery Area	Capped contribution to Site Coverage of Greenery
(a) Vertical greening	<p>i) Living wall type with built-in growing medium shall be measured by the elevational area of the vegetated panel/modular planter or panel where the greenery will grow. For free-standing living walls type, vegetated areas on both sides of the wall, if provided, are countable.</p> <p>ii) Self-clinging climbing plants on hard surfaces/walls and other climbers needing support should be measured by the running length of corresponding soil multiplied by the height of the support/wall for planting, capped at 10 m max. in height.</p>	Not Applicable (N/A)	N/A	The total / combined total of all other types of greening or greening features capped at 30% of the required total greenery areas, i.e. (a) + (b) + (c) + (d) + (e) should <b>NOT</b> be more than 30% of the minimum Site Coverage of Greenery in <b>Table 1</b>
(b) Greening on slopes with gradient > 45°	Measured by the projected elevational area of slopes for planting (see <b>Appendix B</b> ).	Applicable	N/A	
(c) Grass pavers	Countable only for application at the specific locations for the functions of vehicular access and circulation areas including emergency vehicular access, maintenance access and open car parking.	Applicable	50%	

Other types of greenery/ greening features	Application/ measurement method	Countable for At-grade Greenery Area	Reduction factor in computing the Greenery Area	Capped contribution to Site Coverage of Greenery
(d) Covered greenery areas	Measured from the 45° projected line taken from the edge of the overhang projection and the greenery areas that fall within (see <b>Appendix C</b> ).	Applicable	50% for At-grade Greenery Areas,  N/A for other locations	
(e) Aquatic planting in water features/ bodies	Measured by clear areas of water surface with aquatic planting.	Applicable	50%	

**Table 2** – Method of measurement and calculation of other types of greenery/ greening features on Site Coverage of Greenery

**b) Non-countable greenery areas for calculation of Site Coverage of Greenery**

- i) Greenery areas must comprise of living plants. Artificial plants/greenery is not countable.
- ii) Greenery in removable pots or planters not permanently fixed is not normally countable except where removable planters are proved to be the last resort for providing the required minimum greenery and are designed to support the plant growth in a sustainable manner in the long run and the provision is justifiable under internal vetting as stated in **paragraph 16** below.
- iii) Water features/bodies without planting are not countable.

**Application and Implementation**

13. The Site Coverage of Greenery requirements shall be applied to all new Government building projects and sites for G/IC facilities as well as minor buildings associated with road projects (ventilation buildings, administration buildings, drainage and pumping stations, service reservoirs, etc.). Where



there are infrastructure development with structures to be built underground with above-ground site areas, the Area of the Site should refer to DLO's approved permanent land allocation plan of the above ground space in counting the required Site Coverage of Greenery. Government entrusted G/IC facilities not in composite buildings with stand-alone building sites would be subject to the same Site Coverage of Greenery requirements. For government subvention projects under 'Government Capital Works Projects', subventing bureaux/departments should draw subvented bodies and NGO's attention to the requirements. It is highly recommended that the standards and requirements on Site Coverage of Greenery should be adhered to, as far as practicable.

14. For effective implementation, bureaux/departments with responsibility for delivering new government buildings should make every effort and their best endeavour to ensure that meeting the Site Coverage of Greenery requirements will be carefully considered and properly incorporated in their project planning and design.

15. It is observed that facilities and projects with restricted space and particular operational requirements, such as fire stations, police stations and swimming pool complexes, may have difficulties in meeting the required Site Coverage of Greenery, particularly for at-grade greenery. A relaxation of requirement on Site Coverage of Greenery could be considered for cases with restrictive sites that are proved to be impractical for meeting the requirements due to operational or functional need of the space.

16. For assurance of compliance with Site Coverage of Greenery standards, the responsible Departments/project proponents should have their own internal control/monitoring mechanism in place for vetting and endorsement of exceptional cases. Non-conforming cases should be fully justified and endorsed by respective department heads or their delegated officers in D3 capacity. For ensuring consistency, all non-conforming cases which deviate from the required standards on Site Coverage of Greenery endorsed by departments should be reported to the Greening, Landscape and Tree Management Section (GLTM Section) of the Development Bureau (DEVB) for information. GLTM Section of DEVB would assist departments on considering cases upon requests and may carry out checking if considered appropriate and necessary.

## **Enquiries**

17. Enquiries on this circular can be addressed to Assistant Secretary (Greening and Landscape)2 of GLTM Section of DEVB.



**( C S Wai )**

**Permanent Secretary for Development (Works)**

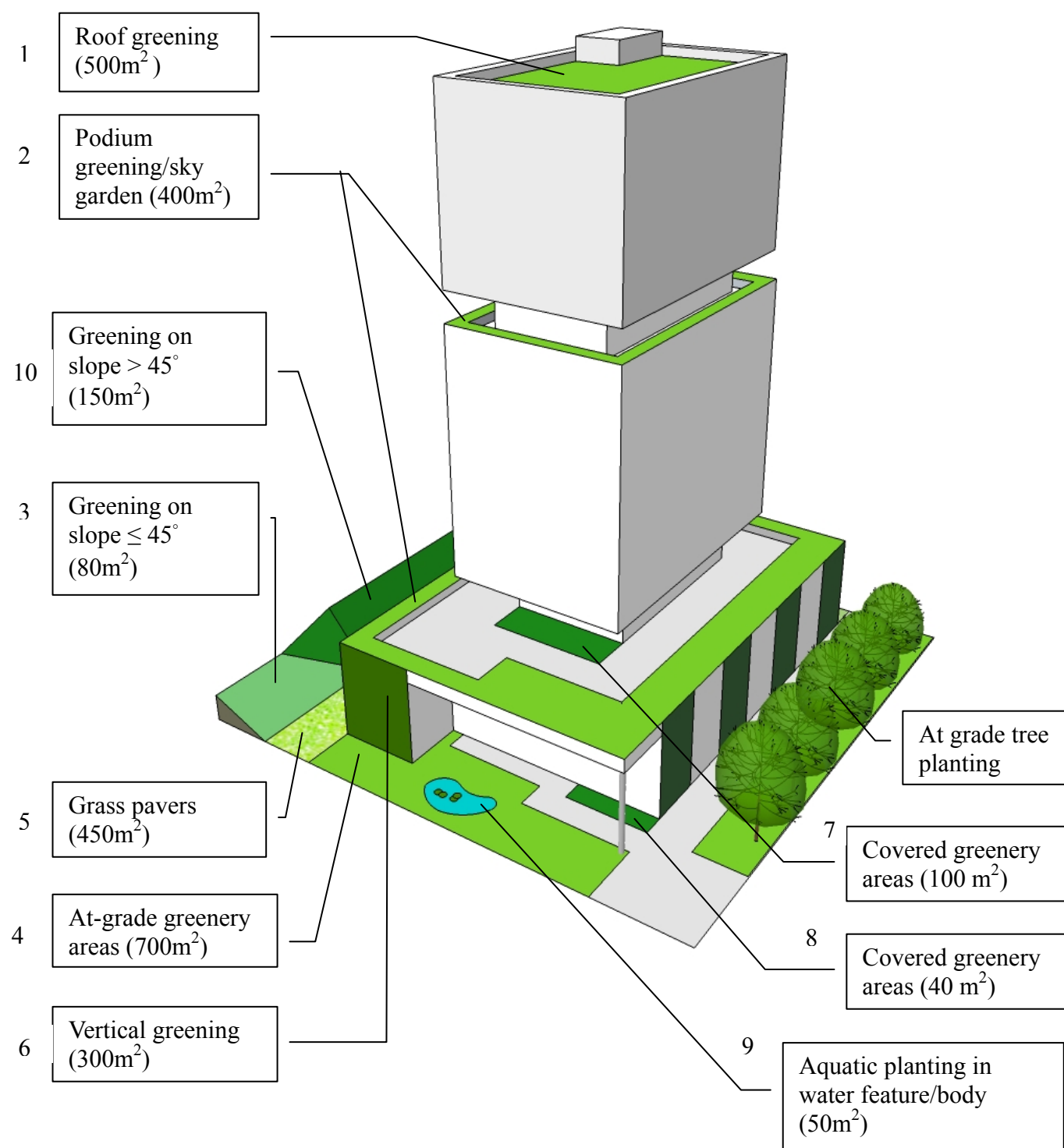
**A Worked Example for Calculation of Site Coverage of Greenery****Example:**Area of the Site = **12 000 m<sup>2</sup>****Site Coverage of Greenery requirements:**(a) Minimum total Greenery Areas = **2 400 m<sup>2</sup>** (*i.e. 20% of Area of the Site*)(b) Minimum At-grade Greenery Area = **1 200 m<sup>2</sup>** (*i.e. 10% of Area of the Site*)

Types of countable Greenery Areas	Greenery Areas (m <sup>2</sup> )	Reduction Factor (%)	Greenery Areas (m <sup>2</sup> ) contributing to Site Coverage of Greenery	
			At-grade Greenery Areas	Greenery Areas at other locations
Items <b>without</b> cap requirement				
1. Roof greening <sup>Note 1</sup>	500	N/A	0	500
2. Podium greening/sky garden	400	N/A	0	400
3. Greening on slopes ≤45°	80	N/A	80	0
4. At-grade Greenery	700	N/A	700	
Sub-total (A)			780	900
Other types of Greenery Areas <b>with</b> cap requirement				
5. Grass pavers <sup>Note 2</sup>	450	50	225	0
6. Vertical greening	300	N/A	N/A	300
7. Covered greenery areas (at other locations)	100	N/A		100
8. Covered greenery areas (at-grade greenery)	40	50	20	
9. Aquatic planting in water features/bodies	50	50	25	0
10. Greening on slopes >45°	150	N/A	150	0
Sub-total			420	400
Exceeding the total / combined total cap for other types of greenery areas (i.e. 30% of minimum greenery areas =720 m <sup>2</sup> ) ?:			Yes, 420 + 400 = 820 (i.e. > 720)	
Adjustment required			0	-100
Adjusted sub-total (B)			420	300
Total (A) + (B)			1 200	1 200
Attaining the minimum At-grade Greenery Area?			Yes (i.e. ≥ 1,200)	
Attaining the minimum total Greenery Areas ?			Yes, 1 200 + 1 200 = 2 400 (i.e. ≥ 2 400)	
Percentage of countable Greenery Areas over Area of the Site			1 200 / 12 000 = 10%	1 200 / 12,000 = 10%
Site Coverage of Greenery			10% + 10% = 20%	

**Table 1- Calculation of the required Site Coverage of Greenery****Notes:**

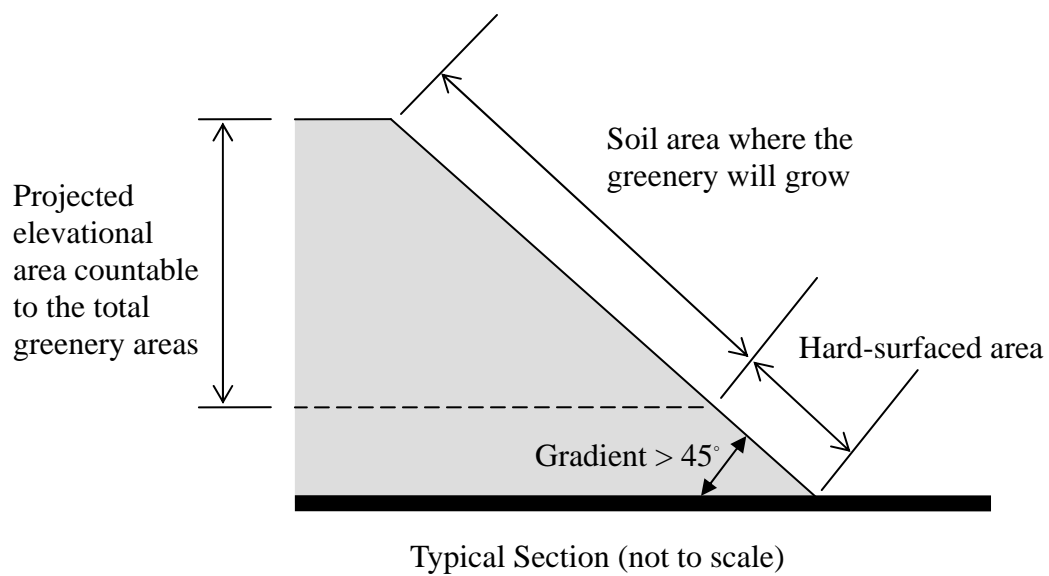
- The greenery areas on the roof are uncovered.
- The grass pavers applied at vehicular access and circulation areas including access, maintenance access and open car parking are countable for Site Coverage of Greenery.

**A Worked Example for Calculation of Site Coverage of Greenery**

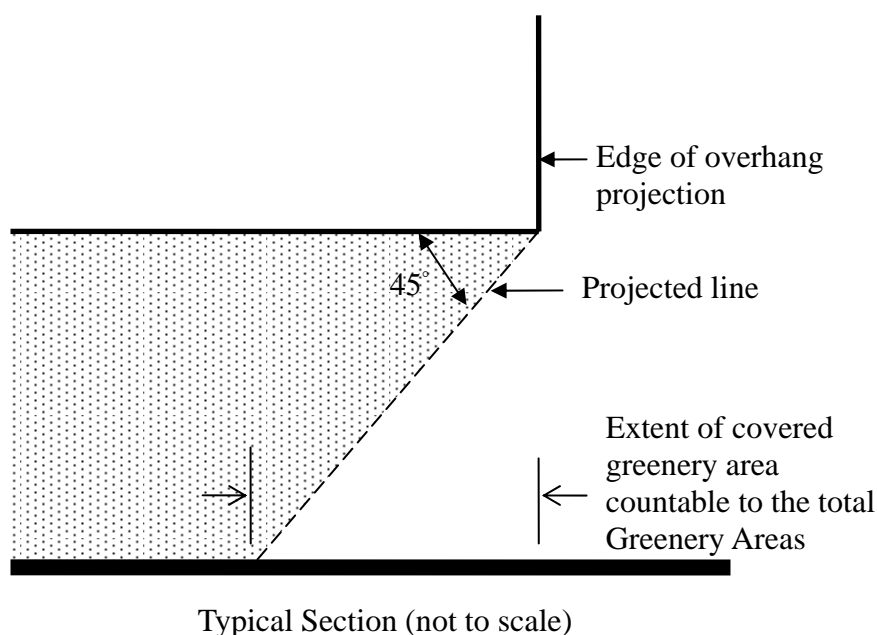


**Figure 1 – Types of Greenery Areas (Diagrammatic illustration only)**

**Measuring greenery area on slope with gradient  $> 45^\circ$**



**Figure 1 – Projected elevational area of soil area on slopes with gradient  $> 45^\circ$**

**Measuring countable covered greenery area****Figure 1 – Countable greenery area within the covered area**

Notes: Buildings or structures in proximity of the covered area have significant effect on the availability of daylight for planting at covered area. The project proponents shall fully consider the site context, light intensity and the adaptation of plant species when determining suitable locations for planting under cover. In planting design and species selection, consideration of headroom is required as recommended in “Proper Planting Practice- Provide Sufficient Growing Space between Trees and Adjacent Buildings/Structures”, issued by GLTM Section of DEVB ([www.greening.gov.hk](http://www.greening.gov.hk))