

VCAB Compliance Checklist Item 5: Landscaping Design Aesthetic (5.2)



Figure 5.2 - 1



Figure 5.2 - 2

Fig. 5.2 - 1 & 2

- Sha Tin Sewage Treatment Works (STW) occupies an area of 28 hectares and is open to public during DSD Open Day and group visits by appointment.
- **Landscape theme: Four Seasons Planting** with a welcoming atmosphere for visitors and a comfortable environment for staff.



Figure 5.2 - 3

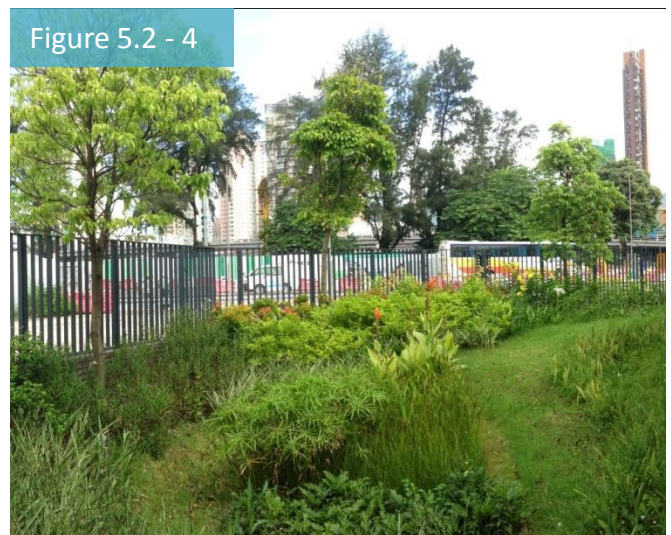


Figure 5.2 - 4

Fig. 5.2 - 3 & 4

- Kowloon City Sewage Pumping Station (SPS) No. 2 occupies an area of 2000m² with a green ratio over 50% and has achieved a BEAM Plus Platinum Rating.
- **Landscape theme: Green Oasis** with native plants to attract wildlife and enhance biodiversity and low maintenance plants to suit the unmanned site.
- For projects involving facilities with a **high green ratio**, sufficient recurrent cost should be earmarked at the funding stage. Early engagement of a maintenance team allows **reservation of appropriate resources for future maintenance**.

VCAB Compliance Checklist Item 5: Landscaping Design Aesthetic (5.2)

Figure 5.2 - 5



Fig. 5.2 - 5

- Consideration is given to preserve existing mature trees/tree groups on site for the sense of place and instant greening effect.

VCAB Compliance Checklist Item 5: Landscaping Design Life cycle costing (5.3)

Figure 5.3 - 1a



As-built condition

Figure 5.3 - 1b



Condition after two years

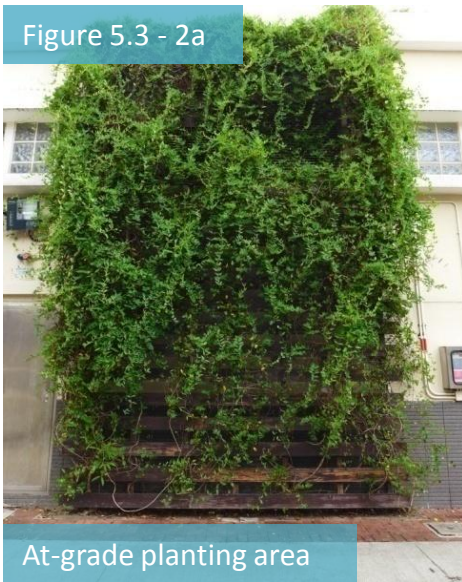
Fig. 5.3 - 1a & 1b

- Narrow planters (less than 450mm wide and deep) along the roof edge do not provide sufficient soil mass for sustainable plant growth and should be avoided.
- Two years after installation, the plants in narrow planters perform poorly due to insufficient soil depth.

VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

Figure 5.3 - 2a



At-grade planting area

Figure 5.3 - 2b

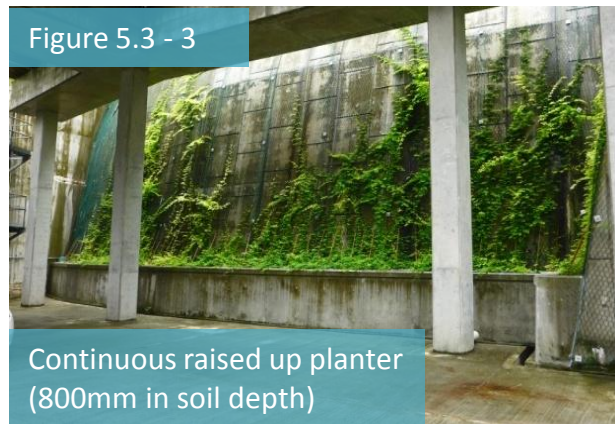


Pot planters without irrigation

Fig. 5.3 - 2a & 2b

- The figures show the performance of climbers in two different types of planters in an unmanned site without automatic irrigation after two years of handover. Climbers in the at-grade planting area (Fig. 5.3 - 2a) still perform very well, whereas those in pot planters died (Fig. 5.3 - 2b). At-grade planting areas have deeper soil to retain more moisture for sustainable plant growth. Plants in pot planters usually die due to limited soil mass and moisture.
- Plants in raised up planters/pot planters perform well only with sufficient soil depth and irrigation (Fig. 5.3 - 3 & 4).

Figure 5.3 - 3



Continuous raised up planter (800mm in soil depth)

Figure 5.3 - 4



Pot planters (>450mm in soil depth with irrigation)

VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

Figure 5.3 - 5



Fig. 5.3 - 5
Tree species with large mature size (e.g. *Ficus* trees) should not be planted next to the building/boundary as they tend to lean towards the light and become lopsided. Their aggressive root systems may also affect the building structure.

Figure 5.3 - 6



Fig. 5.3 - 6
Tree species with vigorous root systems (such as *Ficus spp.*, *Delonix regia*, etc.) should not be planted at the boundary edge/narrow planter/pit as their roots may twist and become unstable, or cause pavement uplifts or damage to the adjacent property.

Figure 5.3 - 7



Fig. 5.3 - 7
Tree species with large mature size (e.g. *Ficus spp.*, *Delonix regia*, etc.) should be planted in locations where sufficient spacing and setback from the building are allowed for sustainable tree growth.

VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

Figure 5.3 - 8a



Figure 5.3 - 8b



Fig. 5.3 - 8a & 8b are examples of trees planted right beside the wall and pipes. Some day either the wall and pipes or trees will be damaged/have to be removed.

Fig. 5.3 - 8c to 8e show how the trees were damaged by the too-close building/utilities.



Figure 5.3 - 8c



Figure 5.3 - 8d



Figure 5.3 - 8e

VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

Figure 5.3 - 10



Figure 5.3 - 11



Figure 5.3 - 12



Figure 5.3 - 13



Fig. 5.3 - 10 to 12 are some appropriate planting designs for narrow planters (i.e. 800 to 1500mm wide **open bottom planters**) adjoining the building/boundary wall/fence.

For plant species,

- i) tall shrubs (e.g. *Caesalpinia pulcherrima* in Fig. 5.3 - 10) mixed with vertical greening;
- ii) short bamboos (e.g. *Bambusa ventricosa* in Fig. 5.3 - 11); and
- iii) small to medium size palm trees (e.g. *Chrysalidocarpus lutescens* in Fig. 5.3 - 12) may be considered.

Planters along the wall/fence should be 300 to 500mm wide. Fig. 5.3 - 13 shows a good example of vertical greening with a climber species (*Lonicera japonica*) on mesh system with an **open bottom planter** of 300mm wide.

VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

Fig. 5.3 - 14

Proper tree protective measures shall be specified in the contract and implemented to minimize temporary/long term impacts on preserved trees.

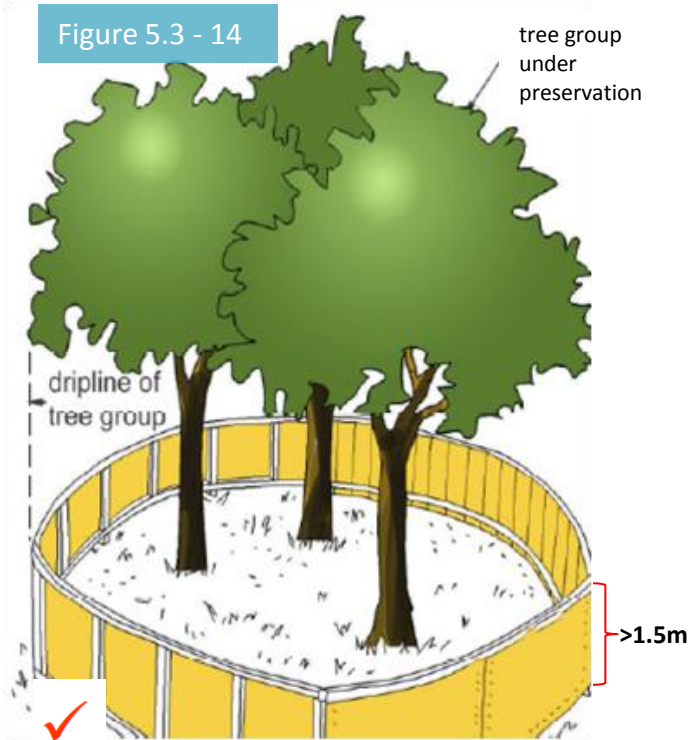


Fig. 5.3 - 15

Orange mesh is not an acceptable tree protection fence.



Fig. 5.3 - 16

Works within the tree dripline shall be avoided.

If inevitable, planks shall be erected around the tree trunk and sand bags and steel plates laid on roots as temporary protection for trees.



Fig. 5.3 - 17

A sturdy fence with high grade steel mesh and posts shall be put up to protect the preserved tree at the construction site entrance.



VCAB Compliance Checklist Item 5: Landscaping Design

Life cycle costing (5.3)

For tree transplanting works, project team should first consider on-site transplanting (i.e. minimum pruning and more adaptable to the environment), then permanent off-site recipient site. Keeping them in a temporary holding area and then transplanting them back to project site is the least preferred option as trees would suffer two transplanting shocks. Project team shall seek LU, ST1/ST2 /MN/MS 's agreement to find the optimal locations for transplanted trees.

Detailed requirements for tree transplanting works and holding nurseries shall be specified in the contract. Proper compliance will help minimize temporary/long term impacts on preserved trees.

Figure 5.3 - 18a



Fig. 5.3 - 18a
Tall trees shall not be transplanted off-site, as it will require extensive pruning and greatly reduce their amenity value.

Figure 5.3 - 18b



Fig. 5.3 - 18b
Transplanted trees at the holding nursery shall not be:

- topped/deformed;
- too close without sufficient space and sunlight for growth; and
- with rootballs directly sitting on the ground.

Figure 5.3 - 19a



Figure 5.3 - 19b



Figure 5.3 - 19c



Fig. 5.3 - 19a to 19c
Proper setup of the holding nursery can help reduce impacts on tree health. Sufficient space for tree growth and proper drainage shall be provided. Rootball wrap shall allow room for root growth and free drainage. Wrapping materials shall not encourage root girdling. Mulch shall be applied to prevent weed growth.

VCAB Compliance Checklist Item 5: Landscaping Design

Sustainability (5.4) – Right plant at the right place

Figure 5.4 - 1



Fig. 5.4 - 1

- Fast growing trees with large crown size (e.g. *Ficus elastic*) should not be planted near biogas burners and other electrical and mechanical (E&M) installations liable to produce sparks.

Fig. 5.4 - 2 & 3

- Trees should be provided with sufficient space/setback from the building for growth.
- Trees should not be planted adjacent to any open sedimentation tank as broken branches may fall into the tank and disrupt its operation.
- Low branching trees (e.g. *Hibiscus tiliaceus*/*Macaranga tanarius*) should not be planted alongside any maintenance access as they require frequent pruning to keep the path unobstructed.

Figure 5.4 - 2

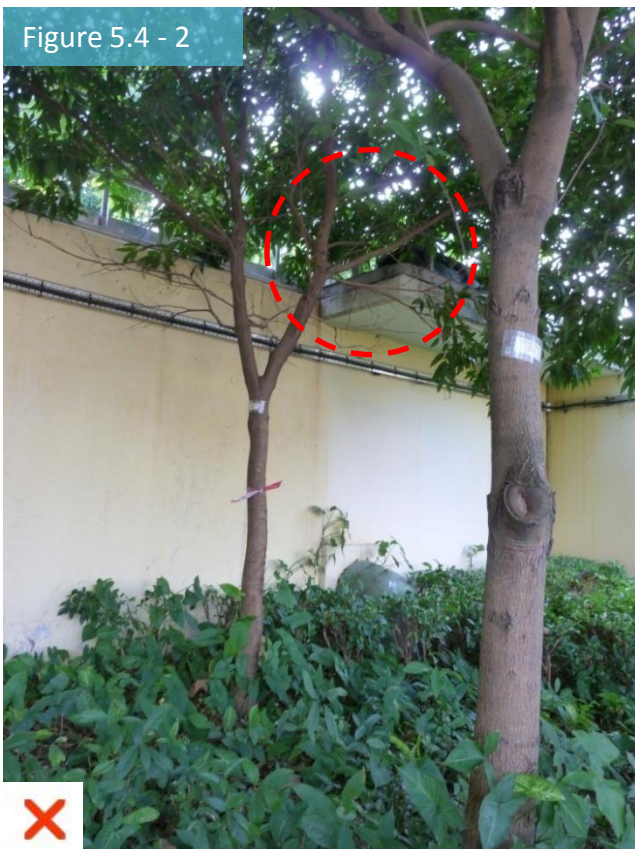


Figure 5.4 - 3



VCAB Compliance Checklist Item 5: Landscaping Design Sustainability (5.4) – Right plant at the right place



Fig. 5.4 - 4a & 4b

Plants should not be planted right next to E&M installations given the high fire risk and that maintenance access should be provided for E&M equipment inspection and repair works.



Fig. 5.4 - 5a & 5b

In siting the plant equipment, preserved trees should be taken into account. Lifting equipment should not be located under a Ficus tree as it requires frequent pruning, otherwise the aerial roots may twist around the lifting arm and affect its operation.

VCAB Compliance Checklist Item 5: Landscaping Design Sustainability (5.4) – Right plant at the right place

Figure 5.4 - 6a



Fig. 5.4 - 6a & 6b

Planting Ficus species and other tree species with aggressive root systems next to utilities is not recommended. Also, siting new utilities adjoining preserved/newly planted trees with aggressive root systems should be avoided.

Figure 5.4 - 6b



VCAB Compliance Checklist Item 5: Landscaping Design Sustainability (5.4) Right plant in the right place

Figure 5.4 - 7a



Figure 5.4 - 7b



Fig. 5.4 - 7a to 7e show two examples of proprietary grass pavement at frequently used vehicular access. For frequently used vehicular access to, e.g. inlet screen, proprietary grass pavement system is not recommended and hard paved surface is preferred.

Figure 5.4 - 7c



Safety Concern

Grass surface is slippery and may cause hazard, especially at a sloping location and when carrying out emergency maintenance under adverse weather conditions.

Poor Growth Performance in Frequently Used Areas

Vehicles carrying sludge from inlet screen in SPS remove patches of grass in every ride after heavy rain. The grass does not have sufficient time for recovery or re-establishment after replacement and thus the green coverage cannot be maintained.

Figure 5.4 - 7d



Figure 5.4 - 7e



For any incorporation of green infrastructure elements, consider sustainability including but not limited to its functionality, maintenance cost and safety concern. Before finalizing the design, consult the maintenance team.

VCAB Compliance Checklist Item 5: Landscaping Design Sustainability (5.4) Right plant in the right place



The performance of grasscrete at low-use and sunny maintenance access (Fig. 5.4 - 8a) is much better than that in main entrance and shady areas (Fig. 5.4 - 8b).

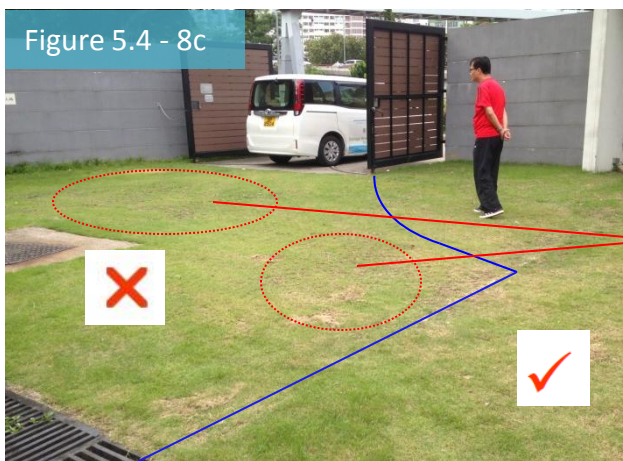


Fig. 5.4 - 8c
Grass pavement for entrances and exits is not recommended, as daily access by contract cars will compact the soil and impede grass growth. The concerned area will be hard paved.



Suggestion on the use of proprietary grass pavement in different parts of DSD facilities

	Main vehicular access, vehicular access at entrance	Frequently used vehicular access (e.g. access to inlet screen)	Shady location	Sloping location	Footpath	Low-use vehicular access	Low-use parking area	Maintenance access for vertical greening (VG)/building facade
Proprietary grass pavement	Not recommended					Acceptable		

“Frequently used” is defined as at least once per month, while “low-use” is defined as less than once per month. In applying the proprietary grass pavement, consider sustainability including but not limited to its functionality, maintenance cost and safety concern. Before finalizing the design, consult the maintenance team.

VCAB Compliance Checklist Item 5: Landscaping Design Sustainability (5.4) - Biodiversity

Figure 5.4 - 9a



Figure 5.4 - 9b



Figure 5.4 - 9c



Figure 5.4 - 9d



Figure 5.4 - 9e



Fig. 5.4 - 9a to 9e

Native species and wildlife attracting plants shall account for more than 60% of the vegetation in total. Nectar plants for butterflies include but not limited to *Lantana camara* (9a), *Caesalpinia pulcherrima* (9b), *Stachytarpheta jamaicensis* (9c), *Clerodendrum japonicum* (9d), *Cassia alata* and *Buddleja spp* (9e), etc. could be considered for large Sewage Treatment Plants.