

Guidelines on Yard Waste Reduction and Treatment

**Greening, Landscape and Tree Management Section
Development Bureau
The Government of the Hong Kong Special Administrative Region**

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1. Background

1.1 Yard waste is also known as green or garden waste which consists of all types of vegetation waste matters and is usually biodegradable. Typical types of yard waste include grass clippings, leaves, branches, tree trunks, cut flowers, bushes and shrubs, festive plants, etc.

1.2 According to ‘A Food Waste & Yard Waste Plan for Hong Kong 2014–2022’¹ promulgated by the Environment Bureau (ENB) in February 2014, about 127 tonnes of yard waste (or 1.5% of municipal solid waste disposal) is disposed of at the landfills each day in 2011. Although the figure constitutes a small part of the total, in support of the strategy of the ENB in waste reduction, the Greening, Landscape and Tree Management Section (GLTM) of the Development Bureau (DEVB) together with the relevant departments have prepared the ‘Guidelines on Yard Waste Reduction and Treatment (the Guidelines)’.

1.3 These Guidelines provide general reference on implementing measures on yard waste reduction and treatment in various stages from planting design to maintenance and suggest ways of how yard waste can be reduced, reused and recycled (3Rs). The main aim is to minimise the yard waste that will otherwise be dumped as part of the municipal solid waste and take up the spaces of the landfills. Though the Guidelines are mainly for the use and reference of government departments, the private sector may find the information useful.

2. Yard waste reduction and treatment strategy

2.1 According to ‘A Food Waste & Yard Waste Plan for Hong Kong 2014–2022’, the strategy to deal with yard waste is to collect data, promote reduction at source, encourage separation and collection, and find the best ways to treat the unavoidable portion.

¹ Source: <http://www.enb.gov.hk/en/files/FoodWastePolicyEng.pdf>

2.2 We are drawing reference to the strategy and guidance from the ENB and Environmental Protection Department (EPD) in implementing yard waste reduction treatment.

2.3 Yard waste is mainly generated from the soft landscape work and vegetation maintenance. There are measures in various stages from planting design to maintenance that can reduce yard waste, e.g. through implementing sustainable planting design and converting grass clippings, leaves, twigs, etc. into compost or mulches.

2.4 The following measures are suggested based on the principle of how yard waste can be reduced, reused and recycled (3Rs). Due consideration should be given to that of pest and disease control as mentioned in Section 3.

Reduce

2.5 Emphasis should be placed on reduction of waste at source. Annuals or seasonal flowers are displayed temporarily and yard waste will be generated when they are replaced or removed. It is pertinent to consider the quantity and choice of planting species to minimise wastage and thus the resulting yard waste. The key measures to reduce yard waste at source are:

- Maintaining a simple and elegant planting design instead of a plant palette that requires constant pruning/trimming, e.g. formal hedge or topiary of complicated patterns.
- Minimising the use of annuals as they require constant replacement and generate substantial yard waste. Shrubs do not require constant replacement with colourful flowers/foliage or perennials instead of annuals, should be used e.g. *Ixora* spp. (龍船花), *Rhododendron* spp. (杜鵑), *Catharanthus* spp. (長春花), *Rhaphiolepis indica* (石斑木), *Ardisia crenata* (朱砂根), *Melastoma* spp. (野牡丹).

- Reducing the use of plants that are displayed during festive seasons, e.g. decorative potted plants such as *Euphorbia pulcherrima* (一品紅) during Christmas, *Paeonia suffruticosa* (牡丹), *Paeonia lactiflora* (芍藥), *Chrysanthemum* spp. (菊花), or tangerine (年桔) during Chinese New Year. To balance the needs of using these plants during festive seasons and reducing waste, several measures are recommended:
 - Use decorative plants at main locations only and reduce the quantity.
 - Plant shrubs or trees permanently that blossom or can be used in festive seasons, e.g. planting coniferous trees and decorate as Christmas trees, and peach blossom that flowers during Chinese New Year.

2.6 To reduce the waste generated by the use of large plastic bags for collection and transportation of yard waste, the use of alternatives such as reusable bags, bins, baskets, etc. in collecting yard waste instead of plastic bags is recommended.

2.7 Wood logs whether they are tree trunks, limbs or tree stumps take up considerable space at the landfills. It is recommended to leave a tree stump for natural decomposition at areas that are inaccessible to the general public and have no safety concern. A tree stump in a natural habitat, such as countryside or woodland, is suitable to be retained for ecological purposes as it is an important component of a properly functioning forest ecosystem and plays a key role in sustaining biodiversity, soil fertility and energy flow.²

² For more details about the treatment of tree stump, please refer to the DEVB's Guideline on Tree Stump Treatment at http://devb.host.ccgo.hksarg/en/tree_preservation/Guideline_on_Tree_Stump_Treatment.pdf

Reuse

2.8 Tree logs generated in vegetation maintenance can be used and arranged as recreational facilities or decoration such as benches, site furniture, perches in an aviary or decorative features at the landscape corners. Where appropriate, wood logs can also be used for training purposes, such as in demonstration and practice on the use of chain saw or pruning work, or for sculptural use.



Photo 1

Wood log can be cut into manageable sizes and rearranged as part of a garden design



Photo 2

Simple wood logs can be reused as decorative features

2.9 Planting pots, flower trays, etc. are reusable and should be properly cleaned and stored for use in future.

2.10 Decorative potted plants after events or functions can be rearranged and donated to charitable organisations or Non-Government Organisations (NGOs). Examples include Food and Environmental Hygiene Department (FEHD) after the Chinese New Year Fair or Leisure and Cultural Services Department (LCSD) after the annual Hong Kong Flower Show giving plants to the charitable organisations after the events.



Photo 3

Plants collected after the Chinese New Year Fair are donated to charitable organisations as part of the waste reduction campaign

2.11 To boost environmental awareness of reducing and recycling domestic waste at source among the public rental housing (PRH) tenants, the Hong Kong Housing Authority (HA) launched a pilot scheme to collect and replant disposed citrus plants after Chinese New Year. The pilot scheme was well received by over 30 participating estates and more than 1,000 pots of citrus plants were collected in 2013 for replanting and display in the next Chinese New Year. To keep up the momentum in reducing waste, the scheme was formally launched in 2014 to include all PRH Estates. There are also other programmes launched by green groups/NGOs in reusing festive plants.

Recycle

2.12 Grass clippings and leaves after decomposition become natural fertilisers. Shredded waste wood can be reused as mulch after proper treatment. They can be put back into the ecological cycle as nutrients. Clean soil and potting mix from the potted plants can be returned to the planter bed or the soil depot for planting use.

2.13 Yard waste can be recycled mainly through the following measures: natural degradation, composting, mulching and fuel production. Maintenance parties are encouraged to adopt these measures where space is available and after taking into consideration the relevant concerns on hygienic and other environmental factors and impact to the surroundings. Appropriate recycling measures should be applied to suit the sites and conditions.

- Natural degradation

Yard waste can be left in situ or taken to a place where it can be left to degrade over time, for instance in a country park setting away from recreational sites and facilities.



Photo 4

Wilted leaves can be left in the planting areas as source of natural nutrients

- Composting

Composting is a cost-effective and environmentally sensitive means to treat yard waste. It is a biological process which micro-organisms convert organic matter into a soil like material that benefits soil aeration, drainage, water holding capacity, percentage of organic

materials in soils and the ability of soils to absorb and hold nutrients. It can be arranged on site using the 3-Bin Composting System or delivered off-site to the composting plants.

- On-site composting using the 3-Bin Composting System or other composters
 - ✧ It is environmentally friendly and cost effective if composters can be located near larger sources of yard waste, such as some of the larger open spaces, theme parks, housing estates, and the large commercial establishments where space is available in the maintenance yards.



Photo 5

The 3-Bin Composting System is to convert yard waste into compost. The process is to start from the left bin wherein the pile will be transferred to the next bin on its right when it is full. Turning and mixing the compost pile will add oxygen and accelerate the process of decomposition. Finished compost will eventually be removed from the last bin to the end users.

- ✧ For relatively small quantity of yard waste collected and space limitation in areas such as smaller housing estates and gardens, garden type composters can be used. A typical composter can handle yard waste of a volume over 440 litres.

➤ Off-site at the Composting Plants

Both Waste Recycling Centre in Kowloon Bay (KBWRC) and Animal Waste Composting Plant (AWCP) in Ngau Tam Mei are currently operated in the collection of food waste, animal waste and yard waste for composting. Departments can arrange sorting of yard waste and delivery to EPD's or other composting plants subject to prior arrangement with EPD (see details in Annex).

● Mulching

Twigs and branches can be shredded into smaller particles of appropriate size which can be used as mulch. Mulch is applied to the soil surface modifying the soil environment and enhancing plant growth. A chipper on site is recommendable for a large park or garden so that yard waste collected on site can be sorted and reverted as mulch for application back to the planting areas. On the one hand the yard waste can be reused and on the other hand the need for incoming mulch from other sources is reduced.

The chipper has to be located away from residential areas/major paths to minimise the nuisance arising during the operation of the chipper.



Photo 6

A chipper can shred twigs and branches into smaller and finer pieces for use as mulch on site

- Fuel production

Wood waste, twigs and branches can be sorted and recycled as fuel materials e.g. turning into fuel pellets after proper treatment. Reference can be made to good examples of NGOs on recycling peach blossom tree collected in Lunar New Year to wood fuel (http://www.ecopark.com.hk/en/CNY_Peach_Blossom_Recycling_Campaign-2014.aspx³)

³ The campaign, jointly organized by the Environmental Protection Department (EPD) and the Hong Kong Environmental Protection Association (HKEPA) in 2014, delivered the peach blossom trees to the EcoPark, Tuen Mun for recycling into wood fuel pellets (a useful type of renewable energy) and composting materials with a view to raising the public's awareness in waste reduction and relieving the pressure on landfill disposal.



Photo 7

Peach Blossom Tree Recycling Campaign 2014⁴

2.14 Departments are encouraged to adopt the waste reduction campaign in collaboration with interested organisations in the recycling of yard waste.

3. Plants with pests and diseases

3.1 Although planting materials as part of the ecology can be returned as natural nutrients through mulching or composting, care should be taken on the possible spread of diseases, pests and invasive weed plants. Any part of a diseased tree/plant if not properly handled may spread the disease further. It would be necessary to dispose the diseased parts properly and make use of the yard waste without suspected diseases, pests and invasive weed plants for

⁴ To facilitate the recycling process downstream, participants are required to dry up the peach blossom tree first leaving only the tree branches. EcoPark recyclers also take other tree types with tree trunks and branches size less than 2cm. The dried trees collected will be delivered to the waste wood recycler for recycling into wood fuel pellets.

mulching or composting.⁵

3.2 It is important to note that *Phellinus noxius* is an aggressive fungal pathogen causing Brown Root Rot Disease and its fruiting bodies can spread the disease through dissemination of basidiospores. *Phellinus noxius* could survive in decayed root tissues in the soil for 10 years or more. Hence any infected roots in the soil or the soil medium containing the infected debris should be properly disposed or disinfected. For details, please refer to the ‘Guidelines on Brown Root Rot Disease’ issued by the GLTM⁶.

4. Contract specifications

4.1 New works where site clearance is required, new planting and vegetation maintenance works usually generate yard waste. To better manage the resulting yard waste, where appropriate the contract specifications are suggested to contain appropriate clauses on treatment of yard waste.

4.2 The following should be considered and incorporated where appropriate in the new contracts⁷:

- Yard waste generally includes but is not limited to grass clippings, leaves, branches, weeds, tree trunks, cut flowers, bushes and shrubs, festive plants and shall be screened to exclude contaminants, chemical residues, diseased parts of plants, dry and free of soil, etc.

⁵ Invasive weed plants, such as *Leucaena leucocephala* (銀合歡) and *Mikania micrantha* (薇甘菊) are not suitable for reuse and recycle. Reference on clearing Mikania can be referred to the Nature Conservation Practice Note No. 01, 2006 from AFCD at http://www.afcd.gov.hk/english/conservation/con_tech/files/common/NCPN_No.01_Clear_Mikania_ver.2006.pdf.

⁶ Source:
[http://www.trees.gov.hk/filemanager/content/attachments/Guidelines_on_Brown_Root_Rot_Disease\(version_for_the_general_public\)EN.pdf](http://www.trees.gov.hk/filemanager/content/attachments/Guidelines_on_Brown_Root_Rot_Disease(version_for_the_general_public)EN.pdf)

⁷ Reference should be made to the prevailing requirements of mulch and compost in appropriate general specifications of various types of contracts.

- Yard waste is recyclable materials which shall be sorted on site for the purpose of recycling and should not be considered as waste for disposal except for the diseased parts of plants.
- All parts of plants carrying diseases or pests have to be bagged and sealed in a strong bag and properly disposed of at designated sites for dumping, such as designated landfill sites to avoid contamination.
- The final disposal of the yard waste should be at designated sites for dumping, such as designated landfill sites, site for organic waste conversion, etc. and be subject to the prior agreement of the Government Department.
- Where appropriate, the Contractor should be responsible to cut and shred the yard waste in order to meet the collection requirement of the recycling outlet for processing.

Applicable for new planting contracts

- At least 20% (*the percentage can be adjusted to meet the market supply*) of the organic compost and mulches shall be sourced locally. Proper documentation indicating the source of origin should be provided before implementation.

Applicable for maintenance contracts

- (*For sites with appropriate space and location for composting*):
The Contractor shall be responsible to set up and operate the 3-Bin Composting System (or garden type composters, select a suitable type to suit site situations) in the location as specified on site. The Contractor shall collect and sort the yard waste appropriate for composting. The compost produced shall be used on site.

- *(For sites with appropriate space and location for installing a chipper for mulch production):*
The Contractor shall procure and install a chipper on site in the specified location. The Contractor shall collect and sort the yard waste intended for production of wood chips and mulch that are dry, free from contaminants, soil, chemical residues and plant diseases.
- For projects where wood logs are produced, it is recommendable to coordinate with relevant parties for making use of them, e.g. for making into furniture, wood fuel, or sculptures when suitable. The relevant specifications should be incorporated to suit the need and arrangement.
- For projects with arrangement made with KBWRC in Kowloon Bay or AWCP in Ngau Tam Mei, the Contractor shall sort and arrange for all grass clipping and leaves collected during vegetation maintenance to be transported to the Waste Recycling Centre/Composting Plant as specified.

5. Conclusion

5.1 Yard waste reduction and treatment can save public expenses as well as the resulting costs on waste treatment.

5.2 The 3R strategy should be implemented to minimise the generation of yard waste as far as practicable. Departments are advised to keep track of and monitor waste arising and review 3R arrangements and disposal options on a regular basis. Arrangements should be revised and adjusted according to the local situations, the actual requirements and latest guidelines and advice from ENB/EPD from time to time.

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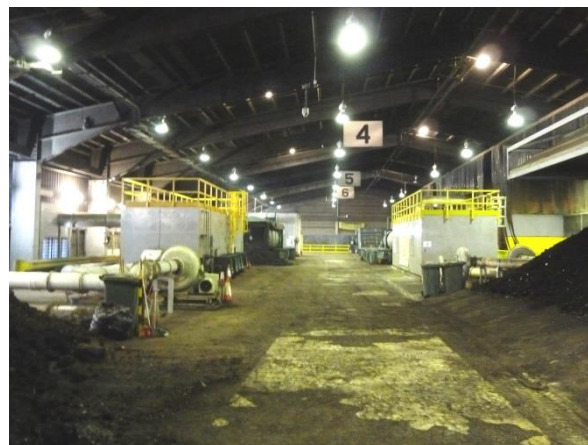
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Waste Recycling Centre and Composting Plant

The following plants collect food waste, animal waste and yard waste for composting.

Kowloon Bay Waste Recycling Centre (KBWRC)

KBWRC commenced operation in 2008 with treatment capacity of 1.5 tonnes per day for food waste from food production industries, hotels, shopping malls and wet markets. KBWRC is operated with green/yard waste supplied by LCSD and Housing Department at about 40kg per day. The green/yard waste has been sorted and cut into small pieces before it is mixed with the food waste.



The waste recycling centre in Kowloon Bay (KBWRC) collects food waste and yard waste for recycling purpose

Animal Waste Composting Plant (AWCP)

AWCP commenced operation in 2008 with a maximum designed capacity of 40 tonnes per day. In 2013, AWCP received an average of about 22 tonnes horse stable waste from Hong Kong Jockey Club for co-composting with an average of about 0.6 tonnes sorted yard waste (grass clippings and

leaves) from LCSD per day. The facility also treated small amount of other organic wastes from special events such as wilted flowers from LCSD's annual Flower Show and food waste from the Hong Kong Rugby Sevens. The quantity of sorted yard waste to be received and treated at AWCP has a potential to increase to 2-3 tonnes per day. Interested departments could approach EPD for necessary arrangement if potential yard waste is anticipated in the neighbouring areas. However at the moment, incoming yard waste should not include too many woody parts/branches while grass clippings/leaves would be more appropriate.

All waste delivered to AWCP will be pre-treated to remove undesirable objects such as metals and plastics, followed by thermophilic active composting in rotary in-vessel composters at a temperature of 55°C to 60 °C. The compost will be cured until mature at the plant.



The composting plant in Ngau Tam Mei (AWCP) co-composts animal waste with yard waste and occasionally with food waste

In 2013, around 2,850 tonnes of compost was produced at AWCP. Subject to a ceiling of 660 tonnes per year, the contractor shall return to the Government compliant compost for use by government departments, schools and non-profit organisations upon application to EPD on a first-come, first-served basis.