

## **5. WASTE MANAGEMENT**

### **5.1 Introduction**

5.1.1 The Contractor is responsible for waste control within the construction site, removal of the waste material produced from the site and to implement any mitigation measures to minimise waste or redress problems arising from the waste from the site. The waste material may include any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land, storm sewer, sanitary sewer, or any waste matter or refuse to be deposited anywhere within the site or onto any adjoining land.

### **5.2 Mitigation Measures**

5.2.1 This section sets out recycling, storage, transportation and disposal measures which are recommended to avoid or minimise potential adverse impacts associated with waste arising from the construction of the West Kowloon Section. The Contractor should incorporate these recommendations into an on-site waste management plan for the construction works. Such a management plan should incorporate site specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.

5.2.2 It is the Contractor's responsibility to ensure that only approved licensed waste collectors are used and that appropriate measures to minimise the adverse impacts, including windblown litter and dust from the transportation of these waste are employed. In addition, the Contractor must ensure that all the necessary waste disposal permit are obtained.

#### **5.2.3 Waste Management Hierarchy**

5.2.3.1 The various waste management options can be categorised in terms of preference from an environmental viewpoint. The options considered to be more preferable have the least impacts and are more sustainable in the longer term. Hence, the hierarchy is as follows:

- avoidance and minimisation, ie not generating waste through changing or improving practices and design;
- reuse of materials, thus avoiding disposal (generally with only limited reprocessing);
- recovery and recycling, thus avoiding disposal (although reprocessing may be required); and
- treatment and disposal, according to relevant laws, guidelines and good practice.

5.2.3.2 This hierarchy should be used to evaluate waste management options, thus allowing maximum waste reduction and often reducing costs. Waste reduction measures should be introduced at the detailed design stage and carried through the construction activities, wherever possible, by careful purchasing control, reuse of formworks and good site management. By reducing or eliminating over-ordering of construction materials, waste is avoided and costs are reduced both in terms of purchasing of raw materials and in disposing of wastes.

5.2.3.3 Training and instruction of construction staff should be given at the site to increase awareness and draw attention to waste management issues and the need to minimise waste generation. The training requirement should be included in the site waste management plan.

#### **5.2.4 Storage, Collection and Transport of Waste**

5.2.4.1 Permitted waste hauliers should be used to collect and transport wastes to the appropriate disposal points. The following measures to minimise adverse impacts should be instigated:

- handle and store wastes in a manner which ensures that they are held securely without loss or leakage, thereby minimising the potential for pollution;
- use waste hauliers authorised or licensed to collect specific category of waste;
- remove wastes on a daily basis;
- maintain and clean waste storage areas daily ;
- minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers;
- obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the *Waste Disposal Ordinance (Cap 354)*, *Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)*, the *Land (Miscellaneous Provisions) Ordinance (Cap 28)*;
- Dispose of waste at licensed waste disposal facilities;
- Develop procedures such as a ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur; and
- Maintain records of the quantities of wastes generated, recycled and disposed.

5.2.5 Surplus Excavated Material

5.2.5.1 The excavated material may have to be temporarily stockpiled on-site for subsequent re-use. Control measures should be taken at the stockpiling area to prevent the generation of dust and pollution of stormwater channels. However, to eliminate the risk of excavated materials falling into the existing nullah and blocking the main drainage channel in Butterfly Valley during the wet season, it is recommended that stockpiling of excavated materials at Butterfly Valley during wet season should be avoided as far as practicable. In addition, due to the high risk of loose material being washed into the existing nullah, stockpiled materials should be properly compacted and covered from water erosion and located at least 10m away from the nullah wall. Key control measures are highlight below:

Dust:

- wetting the surface of the stockpiled soil with water when necessary especially during the dry season;
- covering the stockpiled soil with sheets;
- minimising disturbance of the stockpiled soil; and
- enclosure of the stockpiling area.

Water Quality:

- installation of silt traps for the surface water drainage system; and
- covering stockpiled material with tarpaulin during heavy rainstorm.

5.2.5.2 In addition, potential dust impacts due to the haulage of excavated materials should be minimised by undertaking the following control measures:

- dropping heights for excavated materials should be controlled to a practical height to minimize the fugitive dust arising from unloading;
- materials should not be loaded to a level higher than the side and tail boards, and should be dampened or covered before transport;
- the travelling speed should be reduced to 10 km hr<sup>-1</sup> to reduce dust dispersion and re-suspension from the operating haul trucks;
- wheel washing facilities should also be installed and used by all vehicles leaving the site.

#### 5.2.6 Construction & Demolition Waste

- 5.2.6.1 Careful design, planning and good site management can minimise over-ordering and generation of waste materials such as concrete, mortars and cement grouts. The design of formwork should maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork or plastic facing should be considered to increase the potential for reuse.
- 5.2.6.2 The Contractor should recycle as much of the C&D material as possible on-site. Proper segregation of wastes on site will increase the feasibility of certain components of the waste stream by the recycling contractors. For example, concrete and masonry can be used as general fill and steel reinforcement bar can be used by scrap steel mills. Different areas of the main worksite should be designated for such segregation and storage.
- 5.2.6.3 The handling and disposal of bentonite slurries should be undertaken in accordance with *ProPECC PN 1/94* on construction site drainage.
- 5.2.6.4 Construction and demolition wastes currently comprise approximately 35% of waste inputs to landfills. To maximise landfill life, Government policy discourages the disposal of C&D wastes with more than 20% inert material (by volume) at landfill. Inert C&D material (public fill) are directed to reclamation areas, where they have the added benefit of offsetting the need for removal of materials from borrow areas for reclamation purposes, or to an approved public filling areas (PFAs). Due to limited space at landfills, disposal at reclamation sites or an PFA would be the preferred method. The Contractor should contact the Civil Engineering Department (CED) for details of available PFAs. Only when recycling is not feasible on technical and/or economic grounds should the Contractor dispose of the wastes at an approved landfill site.
- #### 5.2.7 Chemical Waste
- 5.2.7.1 For those processes which generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.
- 5.2.7.2 Chemical waste that is produced, as defined by *Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation*, should be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes* as follows.
- 5.2.7.3 Containers used for the storage of chemical wastes should:
- be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed;
  - have a capacity of less than 450 litres unless the specifications have been approved by the EPD; and

- display a label in English and Chinese in accordance with instructions prescribed in *Schedule 2 of the Regulations*.

5.2.7.4 The storage area for chemical wastes should:

- be clearly labelled and used solely for the storage of chemical waste;
- be enclosed on at least 3 sides;
- have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- have adequate ventilation;
- be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and
- be arranged so that incompatible materials are adequately separated.

5.2.7.5 Disposal of chemical waste should:

- be via a licensed waste collector; and
- be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers; or
- be to a reuser of the waste, under approval from the EPD.

5.2.7.6 The Centre for Environmental Technology operates a Waste Exchange Scheme which can assist in finding receivers or buyers for the small quantity of chemical waste to be generated from the project. The Contractor should obtain the Centre's assistance, if necessary.

5.2.8 General Refuse

5.2.8.1 General refuse should be stored in enclosed bins or compaction units separate from C&D and chemical wastes. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from C&D and chemical wastes, on a regular basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law.

5.2.8.2 General refuse is generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Aluminum cans are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate labelled bins for their deposit should be provided if feasible.

5.2.8.3 Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.

5.2.9 The Contractor shall also pay attention to the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance, and carry out the appropriate waste management work. The relevant licence/permit, such as the effluent discharge licence, the chemical waste producer registration, etc. shall be obtained. The Contractor shall refer to the relevant booklets issued by EPD when applying for the licence/permit.

### **5.3 Site Inspection**

- 5.3.1 It is recommended that auditing of each waste stream should be carried out periodically to determine if wastes are being managed in accordance with approved procedures and the site waste management plan. The audits should look at all aspects of waste management including waste generation, storage, recycling, treatment, transport and disposal. An appropriate audit programme would be to undertake a first audit at the commencement of the construction works, and then to audit quarterly thereafter.
- 5.3.2 During the site inspections and the document review procedures as mentioned in Sections 7.1 and 7.2 of this manual, the ET Leader shall pay special attention to the issues relating to waste management, and check whether the Contractor has followed the relevant contract specifications and the procedures specified under the laws of Hong Kong.
- 5.3.3 Commencement of the construction works should be defined as the commencement of any related physical activity undertaken with the site boundary.