

## 5. WASTE MANAGEMENT

### 5.1 Introduction

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

The proposed re-use, recycling, storage, collection, transport and disposal methods for various types of waste which are recommended to avoid or minimise potential adverse impacts are detailed below. Specifically, it is recommended that during the construction phase, the contractors incorporate the recommendations into an on-site waste management plan.

The contractors shall also comply with 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 appropriate waste management. They shall obtain all relevant licenses/permits, such as: effluent discharge license, chemical waste producer registration, etc. The contractors shall refer to the relevant booklets issued by EPD when applying for licenses/permits.

During site inspections and document review procedures, the ET Leader shall pay special attention to issues relating to waste management, and check whether the contractors have followed the relevant contract specifications and the procedures specified under the laws of Hong Kong.

### 5.2 Waste Mitigation Measures

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. The contractors shall incorporate these recommendations into comprehensive on-site waste management plans. Such management plans shall incorporate site specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.

#### *Waste Management Hierarchy*

The various waste management options can be categorised in terms of preference from an environmental viewpoint. The options considered to be 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, complying with relevant laws, guidelines and good practice.

The contractors shall consult the EPD on the final disposal of waste.

This hierarchy shall be used to evaluate waste management options, thus allowing maximum waste reduction and often reducing costs. Waste reduction measures shall be introduced at the design stage and carried through construction activities, wherever possible, by careful purchasing control, reuse of formwork 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 waste.

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

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

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

- handle and store waste in a manner which ensures that it is held securely without loss or leakage, thereby minimising the potential for pollution;
- use waste hauliers authorised or licensed to collect specific categories of waste;
- remove waste in a timely manner;
- maintain and clean waste storage areas regularly;
- minimise windblown litter and dust during transportation by either covering trucks or transporting waste in enclosed containers;
- obtain the necessary waste disposal permits from the appropriate authorities 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 waste does not occur; and
- maintain records of the quantities of waste generated, recycled and disposed.

#### *Surplus Excavated Material*

The excavated material may have to be temporarily stockpiled on-site for subsequent re-use. Control measures shall be taken at stockpiling areas to prevent the generation of dust and pollution of stormwater channels. Key control measures are highlighted below:

#### *Dust*

- wetting the surface of the stockpiled soil with water to keep the surface wet especially during the dry season;
- covering the stockpiled soil with sheets; and
- enclosure of the stockpiling area.

#### *Water Quality*

- separating surface water drainage systems for stockpiling areas;
- installation of silt traps for surface water drainage system; and
- covering stockpiled materials with tarpaulins during heavy rainstorm.

#### *Marine Dredged Materials*

All vessels for marine transportation of dredged sediment shall be fitted with tight fitting seals to their bottom openings to prevent leakage of materials. In addition, loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water. Barges or hoppers shall under no circumstances be filled to a level which will cause the overflowing of materials or polluted water during loading or transportation.

#### *Construction and Demolition Waste*

In order to minimise waste arising and to keep environmental impacts within acceptable levels, the environmental control measures described below shall be adopted.

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 shall maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork or plastic facing shall be considered to increase the potential for reuse.

contractors shall recycle C&D material on-site. Proper segregation of waste on site will increase the feasibility of recycling of certain components of the waste stream. For example, concrete and masonry can be used as general fill and steel reinforcement bars can be used by scrap steel mills. Different areas of the worksite shall be designated for such segregation and storage wherever site conditions permit.

The handling and disposal of bentonite slurries shall be undertaken in accordance with ProPECC Note PN 1/94 on construction site drainage.

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 materials 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.

Government has established a charging scheme for the disposal of waste to landfill. When it is implemented, this will provide additional incentive to reduce the volume of waste generated and to ensure proper segregation of waste to allow free disposal of inert material to public filling areas

#### *Chemical Waste*

For those processes which generate chemical waste, it may be possible to find alternatives which reduced or eliminate waste, or produce less dangerous types of chemical waste.

Chemical waste that is produced, as defined by *Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation*, shall be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes* as follows.

Containers used for the storage of chemical waste shall:

- 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*.

The storage area for chemical waste shall:

- 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, a 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.

Disposal of chemical waste shall:

- 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.

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.

#### *General Refuse*

General refuse shall be stored in enclosed bins or compaction units separate from C&D and chemical wastes. Reputable waste collectors shall be employed by the contractors to remove general refuse from the sites, separately from C&D and chemical wastes, on a daily or every second day basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law.

General refuse is generated largely by food service activities on site, so reusable rather than disposable dishware shall be used if feasible. Aluminium 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 shall be provided where feasible.

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