

9.0 WASTE MANAGEMENT

9.1 Introduction

The purpose of this section is to identify the quantity, quality and timing of the waste materials that are to be produced as a result of construction activities and to propose appropriate measures for waste handling and disposal in accordance with current legislation.

As part of the EIAO Technical Memorandum on Environmental Impact Assessment Process, the criteria for assessing waste management implications are listed below:

- (i) To provide adequate, environmentally acceptable waste handling, storage, collection, transfer, treatment and disposal facilities to deal with waste arising from the development.
- (ii) To meet all the relevant requirements under the Waste Disposal Ordinance and its regulations.
- (iii) To provide proper handling, storage, collection and disposal of waste generated during the construction phase in accordance with the requirements of the Waste Disposal Ordinance and the Dumping at Sea Ordinance.
- (iv) To provide adequate facilities to facilitate waste reduction and explore beneficial use of waste generated, taking into account:
 - the quantity of waste arisings
 - the physical and chemical nature of the waste materials
 - all practicable on site measures to render the waste acceptable for beneficial use
 - the availability of outlets for beneficial use of the waste in Hong Kong
 - the environmental effect in any waste reduction practice and additional handling of waste for beneficial use.
- (v) To explore alternative which generate minimal amount of waste throughout design modifications and programming of works.

The following section has been prepared to address the above items and those listed in Clause 6.14.4.1 of the Study Brief.

9.2 Construction Waste Management

9.2.1 *Type of Construction Waste Generated*

The activities that will be carried out during the construction phase of the project may result in the generation of a variety of wastes which can broadly be classified into categories based on their nature and the options for their disposal. These include:

- (i) excavated materials including soil and demolition waste (asphalt and concrete);

- (ii) general construction waste;
- (iii) chemical waste;
- (iv) general refuse; and
- (v) sewage.

The quantity and nature of the materials that are expected to be generated from construction of the project are described in the following sections.

9.2.2 Excavated and Demolition Materials

Excavated materials (comprised primarily of soil and rock material) and demolition materials (comprised primarily of broken concrete, asphalt and rock) will account for the majority of the waste arisings from the Project.

The approximate quantity and timing of the hard materials (concrete, asphalt and rock) and the soft materials (soil) have been determined from the preliminary design and construction schedule. The quantity and timing of this material is provided below in Table 9.1.

Table 9.1: Quantity and Timing of Waste Material

Timing of Material Disposal (year)	Type of Material (cubic metres)	
	Hard	Soft
2002	1,128	385
2003	4,017	9,590
2004	4,532	9,643
2005	3,430	7,910

Some of this material may be used as fill on site, however, it is expected that a large portion of this material will require off-site disposal to public fill sites.

The impacts associated with the excavated soil, broken concrete, asphalt and rock materials will be dependent upon the storage and stockpiling of this material. If the materials are stored without cover they may result in dust generation, run off containing high suspended solid loads, and aesthetic impacts.

9.2.3 General Construction Waste

The general construction waste will arise from a number of site activities and may include:

- (i) wood from formwork and vegetation requiring removal;
- (ii) equipment and vehicle maintenance;
- (ii) materials and equipment wrappings; and
- (iv) unusable cement/grouting mixes.

If construction wastes are stored in large quantities or improperly handled, they may attract pests and vermin. The volume of this type of waste materials will depend upon the operating procedures and site practices, and cannot be quantified at this stage. It is expected that if good site practices such as encouraging recycling are applied, that general construction waste will comprise a very small amount of material.

9.2.4 Chemical Waste

The chemical wastes that may be generated during the construction will, for the most part, arise from the maintenance of plant and equipment. These could include, the following:

- (i) spent filter cartridges containing heavy metals;
- (ii) scrap batteries or spent acid/alkali from their maintenance;
- (iii) used hydraulic and lubricating oil;
- (iv) spent mineral oils/cleaning fluids from mechanical machinery;
- (v) spent solvents/solutions, which may be halogenated, from equipment cleaning; and
- (vi) paints and paint containers.

Chemical wastes pose serious environmental and health and safety hazards if not stored and disposed of in an appropriate manner. However it is unlikely that any large quantities of chemical wastes will be generated during the construction of this project. If chemical wastes do arise during the construction they should be handled, stored, transported and disposed of in accordance with the Code of Practice on the Package, Labelling and Storage of Chemical Wastes and A Guide to the Chemical Waste Control Scheme published by EPD.

9.2.5 General Refuse

The construction works will result in the generation of a variety of general refuse requiring disposal. These wastes will arise mainly at the major work sites. General refuse may include office waste, newspapers, food wastes from canteen and packaging waste and will generally be disposed of at landfill.

The storage of general refuse has the potential to give rise to a variety of adverse environmental impacts. These include odour if waste is not collected frequently (e.g. daily), windblown litter, water quality impacts if waste enters water bodies, and visual impact. The site may also attract pests and vermin if the waste storage area is not well maintained and cleaned regularly.

9.2.6 Sewage

The construction workforce will produce sewage which requires proper disposal. It is expected that the Contractor will provide connection to either the foul sewer or will use chemical toilets as indicated in the mitigation measures for control of water pollution (Section 7.4.7). If chemical toilets are used, to avoid

unacceptable odour problems and to safeguard the health of the workers, nightsoil must be removed and disposed of regularly.

9.3 Waste Handling Measures

The following measures are recommended to be carried out to reduce the potential for environmental impacts resulting from construction waste handling:-

9.3.1 *Excavated/Demolition Waste*

Excavated material consisting of soil and rock, the materials should be balanced on site as much as possible and remaining waste not used on site should be disposed of at a public fill site. The excavated and demolition materials should be stockpiled in designated areas away from the streams and drainage areas. The material should be covered at all times to avoid run off during rain storms and dust generation during windy conditions.

9.3.2 *General Construction Waste*

General construction waste material should be sorted on-site to remove material which is suitable for re-cycling or use in public dumps. The remainder will be disposed of at the nearest landfill site. A designated sorting area should be established on the site to carry out sorting activities in such a manner to avoid safety hazards. Materials should be collected on a regular basis. Vegetation waste arising from works should be composted or chipped and then recycled for plantings or disposed of at landfill.

9.3.3 *Chemical Waste*

For the handling and disposal of chemical waste, the Contractor should register with EPD as a chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation. A licensed Contractor should be employed to collect chemical waste for delivery to a licensed treatment facility. Suitable chemical waste storage areas should be formed on the site for temporary storage pending collection. Chemical waste materials should be kept covered and should be sited well away from drainage areas (watercourses) and contained within paved and bunded areas.

9.3.4 *General Refuse*

Temporary storage areas for general refuse should be provided which are enclosed to avoid the attraction of pests. General refuse should be stored on site for the minimum time practical and should be disposed of to the nearest landfill.

9.3.5 *Sewage*

If chemical toilets are used on site, nightsoil should be removed on a regular basis to reduce the potential for odours and the generation of pests.