

## 5 SOLID WASTE MANAGEMENT

### Introduction

- 5.1 Waste management will be the Contractor's responsibility to ensure that all wastes produced during the construction phase of the Project are handled, stored and disposed of in accordance with good waste management practices and EPD's regulations and requirements.
- 5.2 Other waste materials generated during construction activities, such as construction and demolition (C&D) materials, chemical wastes and general refuse from the workforce, are recommended to be audited at regular intervals (at least monthly) to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes generated during construction are not disposed of into the surrounding marine waters. The Contractor will be responsible for the implementation of any mitigation measures to minimize waste or redress problems arising from the waste materials.

### Mitigation Measures

- 5.3 Mitigation measures recommended in the EIA Report for waste management are summarized below. With the appropriate handling, storage and removal of waste arising during the construction of the Project as defined below, the potential to cause adverse environmental impacts would be minimized.

### Construction Phase

#### Good Site Practices and Waste Reduction Measures

- 5.4 It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are strictly followed. Recommendations for good site practices for the construction waste arising include:
- (a) Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site;
  - (b) Training of site personnel in proper waste management and chemical handling procedures;
  - (c) Appropriate measures to minimize windblown litter and dust during transportation of waste by transporting wastes in enclosed containers;
  - (d) Provision of sufficient waste disposal points and regular collection for disposal;
  - (e) Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility;
  - (f) Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and

- (g) Maintain records of the quantities of wastes generated, recycled and disposed.
- 5.5 Good management and control can prevent the generation of significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:
- (a) Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
  - (b) To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the work force;
  - (c) Any unused chemicals or those with remaining functional capacity should be recycled;
  - (d) Use of reusable non-timber formwork to reduce the amount of C&D material;
  - (e) Prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimize the quantity of waste to be disposed of to landfill;
  - (f) Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and
  - (g) Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

#### General Site Wastes

- 5.6 A collection area should be provided where waste can be stored prior to removal from site. An enclosed and covered area is preferred for the collection of the waste to reduce 'wind blow' of light material.

#### Chemical Wastes

- 5.7 After use, chemical waste (e.g. Cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Spent chemicals should be properly stored on site within suitably designed containers, and should be collected by a licensed chemical waste collector for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance.
- 5.8 Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

## Construction and Demolition Material

5.9 The C&D material should be separated on-site into three categories:

(i) public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area. It is estimated that 7,000m<sup>3</sup> inert C&D material will be generated and 6,500 m<sup>3</sup> will be disposed of at public filling area, such as Penny's Bay Reclamation, Central Reclamation or other CED designated public filling facilities.

(ii) C&D waste for re-use and/or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, wood, glass and plastic) which is to be recycled as much as possible;

(iii) C&D waste which cannot be re-used and/or recycled. The waste producers are responsible for its disposal at strategic landfills.

5.10 In order to minimize the impact resulting from collection and transportation of materials for off-site disposal, it was recommended that inert material should be re-used on-site where possible. Prior to disposal of C&D material, it was also recommended that steel and other metals should be separated for re-use and/or recycling where practicable to minimize the quantity of waste to be disposed of to landfill.

## Dredged Marine Mud

5.11 The requirements and procedures for dredged mud disposal are specified under the WBTC No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection.

5.12 The uncontaminated dredged sediment will be loaded onto barges and transported to the designated marine disposal site. Appropriate dredging methods have been incorporated into the recommended water quality mitigation measures including the use of closed grab dredgers and silt curtains. Category L sediment would be suitable for disposal at gazetted open sea disposal ground.

5.13 During transportation and disposal of dredged marine sediments, the following measures should be taken to minimise potential impacts on water quality:

(a) Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of hopper barges before the vessel is moved.

(b) Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation.

## **Operational Phase**

5.14 Wastes generated during normal STW operations would include inlet screenings, grit from detritors and sludge from secondary treatment units. Two sludge

dewatering arrangements have been adopted. The digested wet sludge would be barged away for centralised treatment and disposal of as the duty operation procedures in the initial stage of STW operation. Sludge can also be dewatered on site by drying bed to 30% solid content and for disposal of at designated landfill site when necessary. The operation will be reversed (i.e. drying bed for duty and export for standby) if the export option turns out to be constrained by the treatment capacity of designated dewatering facility or be less cost effective due to higher volume of wet sludge to be barged away.

5.15 **Table 5-1** provides a summary of the various waste types likely to be generated during construction and operational phases, together with the recommended handling and disposal methods. The implementation schedule of mitigation measures is presented in **Appendix A**.

**Table 5-1 Summary of Waste Handling Procedures and Disposal Routes**

Waste Type	Handling	Disposal
<b>Construction</b>		
Construction & Demolition Material	<ul style="list-style-type: none"> <li>▪ Where possible should re-used on-site</li> <li>▪ If off-site disposal required, separate into:                             <ul style="list-style-type: none"> <li>- Public fill (e.g. concrete and rubble)</li> <li>- C&amp;D waste for re-use and/or recycling (e.g. steel and other metals, wood, plastic)</li> <li>- C&amp;D waste which cannot be re-used and/or recycled</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ On-site for pavement re-instatement</li> <li>▪ Off-site disposal:                             <ul style="list-style-type: none"> <li>- Public filling area (e.g. inert C&amp;D materials)</li> <li>- Steel and other metals should be separated for re-use and/or recycling where practicable before disposal of at landfill</li> <li>- Landfill (e.g. C&amp;D wastes)</li> </ul> </li> </ul>
Maintenance and Chemical Waste	<ul style="list-style-type: none"> <li>▪ Recycle on-site or by licensed companies. Stored on-site within suitably designed containers</li> </ul>	<ul style="list-style-type: none"> <li>▪ By licensed contractor to Chemical Waste Treatment Facility</li> </ul>
Workforce Wastes	<ul style="list-style-type: none"> <li>▪ Provide on-site refuse collection facilities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Landfill, collection by private hygiene company</li> </ul>
Marine Dredged Mud	<ul style="list-style-type: none"> <li>▪ Disposal</li> </ul>	<ul style="list-style-type: none"> <li>▪ Open Sea Disposal according to Dumping Permit issued by EPD.</li> </ul>
<b>Operation</b>		
Sewage sludge*	<ul style="list-style-type: none"> <li>▪ Export to other STW such as Cheung Chau STW for centralised treatment and disposal of (duty)</li> <li>▪ Dewatered on site by drying bed when necessary (standby).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Landfill (ultimately)</li> <li>▪ Land fill</li> </ul>

\* Note: The future operation will be reversed (i.e. drying bed for duty and export for standby) if the export option turns out to be more expensive due to the build up of sludge amount.