8. WASTE MANAGEMENT

8.1 Introduction

Construction and Demolition Materials

8.1.1 The waste assessment examines the quantity, quality and timing of potential sources of waste which will arise from the construction and operation of the proposed secondary drainage channel KT13. Both construction waste and solid waste are considered. Solid waste includes domestic waste, commercial and industrial waste, chemical waste, special wastes and other wastes, while construction and demolition waste includes most wastes arising from the construction. Where unacceptable waste impacts are identified, appropriate mitigation measures are recommended. Disposal options are outlined for each type of waste, and the responsibilities for disposal or recycling discussed.

8.1.2 The methodology follows the criteria laid out in the Technical Memorandum on EIA Process (Annexes 7 and 15). The principal legislation regulating waste is the Waste Disposal Ordinance (WDO) (Cap 354).

8.1.3 The main objectives of the waste assessment are to:

(i) identify the sources, volumes, quality and timing of wastes arising from the construction activities;

(ii) recommend construction waste management strategies and control measures/routings (including final disposal sites) in accordance with the current legal and administrative requirements for the disposal of construction waste, including waste reduction, re-use and recycling for inclusion into contract documents; and

(iii) recommend measures for the disposal of inert materials and wastes.

Waste from Operation of Project

8.1.4 Approximately 20m³ of inert silty material will arise during annual clearance of channel bed during dry season. This will be reused after de-watering in other Public Works Projects (subject to approval by relevant authorities) or public filling facilities.

8.2 Sources and Types of Construction and Demolition Materials

8.2.1 Construction waste from this Designated Project will include waste arising from land excavation, formation, civil/building construction, or demolition activities. Waste includes various types of construction debris, rubble, earth, concrete, timber and mixed site clearance materials.

8.2.2 The drainage channel works will involve excavation works along some sections of the channel alignment. The main construction wastes generated from these construction activities will be:

- site clearance waste/demolition waste
- excavated materials (including contaminated sediments)
- waste concrete
- wooden material
- chemical waste
- wheel wash waste
- sewage
- municipal/domestic waste

Site Clearance Waste/Demolition Waste

8.2.3 The proposed drainage channel flows through the villages of Ho Pui and Ma On Kong an area comprising village houses, agricultural land, fish ponds, pig farms and temporary structures. The drainage channel also passes through the ecologically important Ho Pui Egretry. Site clearance works will involve the removal of vegetation (mainly grasses and shrubs), demolition and building materials (from temporary structures and village houses) and a small portion of the available topsoil. Some contaminated sediments will also be removed.

8.2.4 Demolition of temporary structures and houses will generate concrete rubble, plastics, metal, glass, asphalt from surfaces, wood and refuse. Some good quality reusable, currently undisturbed topsoil is expected from site clearance works across agricultural land aligning the north east section of the channel in particular. This will be re-used later in final landscaping works. The twin box bypass culvert connecting the two channelised stream sections will be located at fishponds filled by excavation materials from other projects. This material consists of an assortment of inert rubbish such as plastic and concrete, as well as rubble and mixed soils.

8.2.5 All construction wastes shall be sorted on site into inert and non inert

components. Non inert materials (wood, glass and plastic) shall be recycled or reused and disposed to landfill as a last resort. Inert materials (soil, rubble, sand, rock, brick and concrete) shall be separated and reused on or off site. In case of surplus inert material, it shall be recycled at the Construction and Demolition (C&D) Material Recycling Plant at Tuen Mun Area 38 or to public filling areas approved by the Public Fill Committee (PFC). Scrap metals shall be recovered from demolition waste and recycled.

Excavated Materials

General

8.2.6 The majority of materials excavated will arise from the twin box culvert connecting the two channelised gabion sections for the formation of the drainage channel through fishponds already in-filled by spoils from nearby completed civil projects in the Kam Tin area. It was observed from site visit that most of this material will be inert rubbish, such as broken concrete, plastics, rubble and mixed soils. This material is not suitable for re-use in this Project. It constitutes approximately 50% of all estimated material required to be disposed off site under this project. Some of the excavated materials from current river bottoms have been found to be contaminated sediments, as classified by ETWB TCW No. 34/2002. No suitable material is likely to be generated from stream beds. Table 8.1 gives a detailed breakdown of the quantities of surplus materials likely to arise from each element of the proposed works under the KT13.

8.2.7 Any excavated material from the stream shall be removed within 1 day of excavation, taking measures to reduce odour and potential runoff. Some of this material is contaminated with high levels heavy metals and organics (from surrounding pig farms) and therefore unsuitable for re-use on site. In this case spoil should be drained and disposed of in accordance with ETWB TCW No. 34/2002 and WBTC No. 12/2000.

Contaminated Sediments

8.2.8 Sediment sampling under this study in 2000 showed that heavy metals, particularly zinc levels were high at 3 of the 4 sediment quality monitoring locations, where sediments exceeded the Category H sediment classification (under the classification in the superseded WBTC No. 3/2000). Sampling location KT13B (Figure 7.1) exceeded Category H levels for all metals tested, except chromium where it exceeded Category M and cadmium which was below the classification. No testing of silver, arsenic and PCB was carried out because there was no evidence to suspect these parameters would be above acceptable

levels. Both sampling locations KT13B and KT13D exceeded Category H sediment classification for one or more criteria, whilst both KT13A and KT13C exceeded Category M. A full set of results obtained in 2000 is attached in Appendix G1.

8.2.9 A detailed Sediment Quality Report (SQR) was conducted in 2005 in accordance with ETWB TCW 34/2002 to further ascertain the degree of sediment contamination since the 2000 sampling and to estimate the volume of sediment that required disposal such that appropriate marine disposal sites can be allocated by the relevant authorities.

8.2.10 The result of the 2005 sampling is attached in Appendix G2. According to the chemical testing results, the sediments are classified as Category L and M, with high levels of lead and zinc found at KT13B and KT13C. The apparent improvement of sediment quality compared with the 2000 results is possibly due to the long time gap coupled with the effective implementation of the Livestock Waste Control Scheme.

8.2.11 Biological screening was conducted for the sediments classified as Category M. Biological testing results (Appendix G2) revealed pass for amphipod test but failed the polychaete and bivalve tests. According to ETWB TCW 34/2002, the sediment is deemed to have failed the biological test if it fails in any one of the three toxicity tests.

8.2.12 For sediment classified as Category L, the disposal option is Type 1 – Open Sea Disposal whereas for Category M failing the biological screening, the disposal option is Type 2 – Confined Marine Disposal. The location of the sediment sampling, the sediment classification as well as the disposal type are shown in Figure 8.1.

8.2.13 The SQR was approved by EPD and subsequently the Marine Fill Committee (MFC) of CEDD allocated the East Sha Chau facility as the marine disposal site for the excavated sediment arising from KT13. Under the general allocation conditions by MFC, the following information should be submitted to the relevant authorities once they are available.

<u>General Allocation Conditions for Type 1 – Open Sea Disposal</u>

8.2.14 Prior to the commencement of dumping the Engineer shall submit to the Director of Environmental Protection and the Secretary MFC, an estimated programme for the dumping of mud at the mud disposal site(s) during the contract. This programme shall be resubmitted whenever significant programme changes occur.

8.2.15 The Contractor shall submit, through the Engineer, to the Director of Environmental Protection and the Secretary MFC, monthly returns showing the volumes of sediments dumped at the mud disposal site(s) in the previous month together with an estimation of the volumes to be dumped in the following month.

General Allocation Conditions for Type 2 – Confined Marine Disposal

8.2.16 The Contractor shall submit to the Director of Environmental Protection, a method statement covering the disposal of contaminated mud and this method must be approved before a licence for marine dumping can be issued.

8.2.17 At least one week prior to commencement of the excavation works, the Engineer shall submit to the Secretary MFC a programme of work showing the volume of contaminated sediment to be excavated per month during the term of the contract. Thereafter, on a monthly basis, the Engineer shall submit a revised programme taking into account the volume disposed of during the preceding month.

Dumping Permit

8.2.18 The Contractor shall make a formal application to EPD for a dumping permit under the Dumping at Sea Ordinance (DASO) (Cap.466). If the permit is granted, the Contractor shall ensure the permit conditions are met to the satisfaction of EPD.

Mitigation Measures

8.2.19 Excavation of contaminated sediments is of particular concern. The Contractor should implement the proposed water quality mitigation measures (see Chapter 7) to prevent inadvertent release of contaminated sediment or runoff to the surrounding water bodies during excavation.

Waste Concrete

8.2.20 Concrete is the material to be used in the construction of bypass culvert. Of the volume of concrete supplied, it is assumed that approximately 3-5% of the concrete used will be lost to waste. Dry concrete waste will be sorted out from the other wastes and recycled at recycling plant at Tuen Mun Area 38 to form aggregates for road sub-base.

Wooden Materials

8.2.21 Different kinds of wooden materials are essential to the construction project, such

as wooden boards used as falsework and formwork for concrete structures, erection of site boundaries, as well as bamboo for scaffolding. Wooden materials are important and valuable resources.

8.2.22 All wooden materials used on site should be kept separate from other wastes. Wooden boards will be reused on site several times until the quality of the boards is no longer suitable for re-use. Boards used should be capable of being reused at least five times, thus keeping the wastage rate down to around 20%. Timber which cannot be reused again should be sorted and stored separately from all inert waste before being disposed of to landfill. On-site incineration of wooden waste is prohibited under the Air Pollution Control Ordinance, Open Burning Regulation. It is an offence under law to burn construction waste in open space. On completion of construction phase, remaining reusable wooden material shall be sorted and used at other construction sites by the same contractor or sold to other construction sites.

8.2.23 Reusable steel and concrete panels shall be used as a preferred alternative to wooden formwork, falsework, and site fencing.

8.2.24 The Contractor shall pay attention to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards. This was introduced to reduce the amount of timber used on construction sites.

Chemical Waste

8.2.25 Where the construction processes produce chemical waste, the Contractor must register with EPD as a Chemical Waste Producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation. EPD requires information on the particulars of the waste generation processes including the types of waste produced, their location, quantities and generation rates. A contact person shall be registered with EPD. Storage areas for chemical wastes shall have adequate ventilation and be covered to prevent rain entering.

8.2.26 Storage, handling, transport and disposal of chemical waste shall be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD.

8.2.27 The main chemical waste types arising from the construction sites are likely to be engine oils, lubricants, paints and solvents. Oily waste may be in the form of raw waste, or as sundries such as spent oil filters, or materials used to absorb oil leaks. Various storage and disposal measures are recommended in the Code of Practice to minimize impacts from these chemical sources. The expected quantity of such waste is limited.

8.2.28 Any construction plant which is likely to leak oil, shall have absorbent inert material e.g. sand, placed beneath it. This material shall be replaced on a regular basis and the contaminated material stored in a designated, secure place.

8.2.29 Lubricants, waste oil, waste paints and solvents shall be collected by a licensed collector for chemical waste and disposed at the Chemical Waste Treatment Centre, Tsing Yi or other licensed facility.

Wheel Wash Waste

8.2.30 All vehicles leaving any of the works areas will pass through a wheelwash at the site access/exit. If, at any time, further entry/exit points are created, they will be provided with similar facilities. The wheelwash will be regularly cleaned to remove sediment, a process which may produce muddy wastewater. These wastewaters shall be directed into settlement ponds. Clarified wheel waste water will be recycled at the wheel wash facility. Settled sediments will be dried and disposed in the same way as inert excavated material. The maintenance of the wheelwash will be the responsibility of the Contractor undertaking the construction works.

Sewage

8.2.31 Mobile chemical toilets shall be provided for site staff at locations away from stream sides. The Contractor shall arrange for regular collection of sewage by licenced contractors for disposal to government sewer. There will not be any temporary canteen. It will be the responsibility of the Contractor to ensure that sewage disposal complies with the standards set out in the Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.

Municipal/Domestic Waste

8.2.32 Solid and liquid wastes will be generated by the construction workers during the clearance/construction period. The quantity of municipal waste generated is estimated to be 1.21 kg/employee/day (EPD, 1999). A temporary refuse collection station shall be set up by the Contractor. Municipal waste shall be collected regularly and delivered to the Northeast New Territories (NENT) Landfill.

8.2.33 Provision and collection of skips for different types of recyclable waste is the responsibility of the Contractor. Arrangements shall be made directly with the recycling companies, for example, the paper merchants, to collect the waste as required.

8.3 Quantity of Construction and Demolition Material Arising from DP

8.3.1 A summary of the solid waste generated as a result of the construction phase is presented in Tables 8.1a, 8.1b, 8.1c and 8.2.

8.3.2 An estimate of the maximum material volumes involved during construction and potential for re-use of excavated material is shown in Tables 8.1a and 8.1c. The method and the programme of the disposal of the C&D materials are shown in Table 8.1b.

Table 8.1a
Breakdown of Surplus Material Types and Volumes Likely to Arise during Construction of KT13

Location	Inert Excavated Material (not contaminated) including Rock (Grade III or below) (m^3)	Sediments (m^3)	C&D Waste (m^3)
KT13 Section A (CH0 – CH401) Trapezoidal, gabion	26,540	8,218	44
KT13 Bypass Culvert (CH0 – CH400) Twin box, concrete	17,690	800	45
KT13 Section B (CH0 – CH301) Trapezoidal, gabion	21,500	5,421	35
Total	65,730	14,439	124

Table 8.1b
Method and Programme of the Disposal of Construction and Demolition Materials (m^3)

	KT13 Section A (CH0 – CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0 – CH301)
2007			
Reuse on site	957	652	774
Reuse at other projects or to public filling facilities	4,624	3,149	3,741
Disposal to East Sha Chau facility	2,876	800	1,897
Disposal to NENT landfill	10	10	7
Imported fill	142	97	116
2008			
Reuse on site	1,149	783	929
Reuse at other projects or to public filling facilities	9,522	6,292	7,718

	KT13 Section A (CH0 – CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0 – CH301)
Disposal to East Sha Chau facility	3,287	0	2,168
Disposal to NENT landfill	17	18	14
Imported fill	171	116	138
2009			
Reuse on site	766	522	620
Reuse at other projects or to public filling facilities	9,522	6,292	7,718
Disposal to East Sha Chau facility	2,055	0	1,356
Disposal to NENT landfill	17	17	14
Imported fill	114	77	19

Remarks :

1. The exact programme and quantities of the disposal and filling works will depend on the contractor's programme after the contract is awarded.

2. C&D materials should be disposed of at designated public filling facilities or landfills. Disposal of the materials for use at other construction projects is subject to the approval of the Engineer and/or relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the requirements stipulated in the ETWB TCW No. 31/2004 - Trip Ticket System for Disposal of Construction & Demolition Materials.

Table 8.1c
Summary of Estimated Quantity of Construction and Demolition Materials (m^3) Arising from this Designated Project

	KT13 Section A (CH0–CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0–CH301)	Total
C&DM to be reused on site	2,872	1,957	2,323	7,152
C&DM to be reused on other projects or delivered to public filling facilities	23,668	15,733	19,177	58,578
Sediments for marine disposal	8,218	800	5,421	14,439
C&D waste to be disposed of at NENT landfill	44	45	35	124
Total	34,802	18,535	26,956	80,293

Remark:

1. The exact programme and quantities of the disposal and filling works will depend on the contractor's programme after the contract is awarded.

2. C&D materials should be disposed of at designated public filling facilities or landfills. Disposal of the materials for use at other construction projects is subject to the approval of the Engineer and/or relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the requirements stipulated in the ETWB TCW No. 31/2004 - Trip Ticket System for Disposal of Construction & Demolition Materials.

8.3.3 It is estimated that the quantity of C&D material to be transported off site is 73,141m³. The amount of fill need to be imported is 990m³. The amount of material reused on site is 7,152m³. Amount of material required to be reused at other public works project (subject to approval by relevant authorities as stipulated in ETWB TCW No. 31/2004) or disposed of to designated public filling facilities amounts to 58,578m³. Worst case estimate of sediments quantity is 14,439m³. Approximately 12,062m³ and 2,377m³ of sediment will require Type 1 – open sea disposal and Type 2 – confined marine disposal respectively. Amount of C&D waste to be disposed to landfill is 124m³. The designated landfill to accept C&D waste generated from this Project will be the NENT Landfill. The designated public filling facility to dispose the public fill generated from this Project will be the Public Filling Facility at Tuen Mun Area 38. The locations of disposal of the sediment were obtained from the Marine Fill Committee. Type 1 – open sea disposal will be Pit IVa / Pit IVb of the East Sha Chau facility as capping material while for Type 2 – confined marine disposal will be Pit IVc of the East Sha Chau facility.

8.3.4 C&D materials should be disposed of at designated public filling facilities or landfills. Disposal of the materials for use at other construction projects is subject to the approval of the Engineer and/or relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the requirements stipulated in the ETWB TCW No. 31/2004 - Trip Ticket System for Disposal of Construction & Demolition Materials.

Table 8.2
Construction Wastes Generated by the Proposed Works

Area	Major Activities	Waste Type
All	Site clearance	Vegetation Topsoil
All	Demolition	Concrete Bricks/Tiles Scrap Metals Wooden material and other non-inert waste
All	Excavation	Fill Material (Assorted spoil from previous civil projects nearby. Contains rocks of various size and soil, debris of pipes and other inert rubbish such as plastic. Not suitable for re-use on site or other projects.) Clean sediments Contaminated sediments
All	General site Activities	Sewage Municipal Wastes Packaging Materials Chemical Waste (including waste oil, lubricants, paints and solvents)

8.4 Responsibilities for Construction Waste Management

8.4.1 When handling the waste material the Contractor shall follow and comply with the following legislation and guidelines:

(i) The Contractor shall be aware of, and comply with, the *Waste Disposal Ordinance*, the *Public Health and Municipal Services Ordinances*, the *Water Pollution Control Ordinance* and the *Waste Disposal (Chemical Waste) (General Regulation).*

(ii) The Contractor's attention is drawn to *A Guide to the Chemical Waste Control Scheme*; *A Guide to the Registration of Chemical Waste Producers*; and the *Code of Practice on the Packing, Labelling and Storage of Chemical Wastes.*

(iii) The Contractor shall comply with and complete the procedures in the following Works Branch Technical Circulars (WBTC) and Environment, Transport and Works Bureau Technical Circulars (Works) (ETWB TCW):

- WBTC No. 2/93 – Public Dumps
- WBTC No. 2/93B – Public Filling Facilities
- WBTC No. 16/96 – Wet Soil in Public Dumps
- WBTC No. 4/98) Use of Public Fill in Reclamation

4/98A) and Earth Filling Projects
- WBTC No. 25/99) Incorporation of Information on
  25/99A) Construction and Demolition
  25/99C) Material Management in PWSC Papers
- WBTC No. 12/2000 – Fill Management
- WBTC No. 19/2001 Metallic Site Hoardings and Signboard.
- WBTC No. 12/2002 – Specification Facilitating the Use of Recycled Aggregates
- ETWB No. 33/2002 - Management of Construction and Demolition Material including Rock.
- ETWB TCW No. 34/2002 – Management of Dredged/Excavated Sediment.
- ETWB TCW No. 31/2004 – Trip-ticket System for Disposal of Construction and Demolition Material
- ETWB TCW No. 19/2005 – Environmental Management on Construction Sites.

8.4.2 Appropriate waste management measures should be incorporated as part of the Environmental Management Plan (EMP) to be prepared and implemented by the Contractor and to be submitted to the Engineer for approval. This EMP shall include all factors dependent on individual works sites including designation of areas for the segregation and temporary storage of materials for future use or recycling. Contractors shall follow the recommendations of ETWB TCW No. 19/2005 for environmental management on construction site. In particular, a trip ticket system in accordance with ETWB TCW No. 31/2004 shall be incorporated to control fly-tipping and monitor the disposal of C&D and solid wastes at public filling facilities and landfills. Also the EMP shall include a recording system for the amount of wastes generated, recycled and disposed, as well as the identities of the disposal sites. The Contractor shall refer to the Construction and Demolition Material Management Plan (C&D MMP) in Appendix K.

8.4.3 Training of construction staff should be undertaken by the Contractor in order to increase awareness of waste management issues. Requirements for staff training should be included in the Contractor's site Environmental Management Plan.

8.4.4 The Public Fill Committee (PFC), review and co-ordinate the provision and operation of land based public filling facilities, whilst the Marine Fill Committee (MFC) co-ordinates marine based facilities. Responsibilities for recycling, re-use or disposal of waste materials will be the Contractors generating the waste. These responsibilities are described below and summarised in Table 8.4. All site activities shall be in line with the recommendations of ETWB TCW No. 19/2005.

8.4.5 The appendices and requirement of the ETWB TCW No. 19/2005 shall form part

of the construction contract specification and shall be followed when preparing the outline Environmental Management Plan.

8.4.6 The Contractor is responsible for re-use, recycle and dispose the construction waste according to the methods detailed in Table 8.3. A summary of the responsibilities of the Contractor is provided in Table 8.4.

Table 8.3
Potential for Recycling and Reuse and Disposal Options for Different Construction Waste Type

Waste Type	Works Generating Waste	Volumes Lost as Waste	Potential Re-Use or Recycling	Destinations
Inert Fill Material and Topsoil/Pond Material	Excavation works	None	Excess fill material produced during construction can be re-used.	Fill material to be reused on or off-site by Contractor. Excess fill to be sent to C & D Material Recycling Plant at Tuen Mun Area 38 or approved Public Filling areas.
Stream bed material and material from previously filled ponds	Excavation along channel and along construction spoil in ponds filled by other nearby civil projects	Amount Significant (approximate 50%)	Dried and reusable if clean or considered of an engineering suitable grade. Otherwise to be disposed. Pond bottom deposits not likely to be suitable engineering material. Rubble filled material from previously in-filled ponds will have to be checked to see if it is of a grade suitable for re-use.	Clean deposits and spoil should be sorted and reused within works. Any excess shall be sent to C & D Material Recycling Plant at Tuen Mun Area 38 or to approved Public filling areas.
Concrete	Demolition of current channel sides; Construction of channel	3 - 5%	Needs to be separated; re-useable material needs to be crushed.	To C & D Material Recycling Plant at Tuen Mun Area 38.
Wooden Material	Construction Demolition	20%	Reusable as lower grade shuttering or fencing on-site or other sites.	To NENT Landfill (final disposal).
Scrap metals	Construction Demolition	Small amounts	Cannot be reused on site. It will be sold to recycling company.	To NENT Landfill only if rejected by recycling companies.

Waste Type	Works Generating Waste	Volumes Lost as Waste	Potential Re-Use or Recycling	Destinations
Stream sediments	Excavation	100%	None	Uncontaminated sediment to East Cha Chau facility as capping material. Contaminated sediment to East Sha Chau facility.
Chemical Waste (including waste oil, lubricants, paints and solvents)	General Construction site activities/Cleaning and maintenance of site equipment/ grease traps	Small amounts	Waste oil may be collected by oil companies. For other types of chemical wastes, the recycling potential is low.	To be collected by licensed collectors for disposal at the Tsing Yi Chemical Waste Treatment Facility or other licensed facilities.
Wheel Wash Waste	Vehicle use during general works	Total volume when replaced	Settled at sedimentation ponds and recycled.	Settled sediments to be dried and disposed at public filling areas or C&D Material Recycling Plant.
Sewage	Where site workers are present	Small	None.	Chemical toilet waste to be disposed to government sewer by licensed contractor.
Municipal/ Domestic Waste	General site activities	Putrescible waste, wet paper, fabrics	Aluminium cans, dry paper, and clean plastic containers (not used to contain hazardous chemicals)	To NENT Landfill after extracting recyclable items from waste stream.

Table 8.4
Responsibilities for Waste Collection, Recycling and Disposal during the Construction Phase

Waste Type	Responsibility for Collection of Waste	Responsibility for Transport of Waste Off-Site	Responsibility for Recycling	Responsibility for Disposal
Excavated Material	Contractor	Contractor	Contractor, for the portion of fill re-used on site. For surplus fill, CEDD (Port Works) defines sites that require fill.	Contractor
Concrete	Contractor	Contractor	CEDD (Port Works) defines sites which require fill.	Contractor
Wooden Material	Contractor	Contractor	Contractor	Contractor
Scrap Metals	Contractor	Contractor	Contractor	Contractor

Waste Type	Responsibility for Collection of Waste	Responsibility for Transport of Waste Off-Site	Responsibility for Recycling	Responsibility for Disposal
Municipal / domestic waste	Contractor to arrange licensed contractors	Licensed contractors	Not applicable	Contractor
Wheel Wash Waste	Contractor	Contractor (settled material)	Contractor	Contractor
Sewage	Contractor to arrange licensed contractors	Licensed contractors	Not applicable	Licensed contractors to sewage treatment works operated by DSD
Sediments	Contractor	Contractor	Not applicable	Contractor to location approved by Marine Fill Committees (MFC).
Chemical Waste (including waste oil, lubricants, paints and solvents)	Contractor to arrange licensed collectors	Licensed collectors	Not applicable	Licensed collectors of chemical wastes to Chemical Waste Treatment Facility at Tsing Yi or other licensed facilities

8.4.7 In particular, the Contractor shall be required to:

i) All excavated materials should be sorted to recover the inert portions (e.g. soil and broken rock) for reuse on site or disposal to designated outlets (e.g. public filling areas):

ii) All metal should be recovered for collection by recycling contractors;

iii) All cardboard and paper packaging (for plant, equipment and materials) should be recovered, properly stockpiled in dry and covered condition to prevent cross contamination by other C&D materials; and

iv) All demolition debris from demolition works should be sorted to recover broken concrete, reinforcement bars, mechanical and electrical fittings as well as other building services fittings / materials that have established recycling outlets.

8.4.8 Contractors are required to carry out on-site sorting of C&D materials to recover the inert portion, and those reusable and/or recyclable materials. The contractors should include a system of work in his EMP to set out the proposed arrangement for on-site sorting and temporary storage of C&D materials. Where the contract involves demolition works, the contractor is required to prepare a method

statement to facilitate effective recovery of reusable/recyclable C&D materials at an early stage, so as to minimize the need for subsequent sorting. He should submit the method statement to the Architect/Engineer for approval prior to commencement of the demolition.

8.4.9 The Contractor shall comply with the trip-ticket system for the disposal of C&D materials as outlined in ETWB TCW No. 31/2004 - Trip-ticket System for Disposal of Construction and Demolition Material.

8.4.10 The Contractor will be required to complete the relevant details on a standard form and submit them for stamping and collection by site supervisory staff and submit to the Engineer the receipt issued by the operator of the public filling facility/landfill after the disposal of the C&D materials. Details to be included in the standard form and the receipt are included in ETWB TCW No. 31/2004.

8.5 Summary

8.5.1 Waste will inevitably be produced during the construction phase of KT13. Waste types, quantities and timing have been estimated as far as possible and mitigation measures evaluated in terms of the avoidance-minimization-recycling-disposal hierarchy. This will minimize the disposal requirement and to conserve void space at landfill sites.

8.5.2 Construction phase wastes will include site clearance and demolition material, excavated materials, contaminated sediments, waste concrete, wooden material, chemical waste, aqueous waste, wheel wash waste, sewage, and municipal/domestic waste. The potential for re-use and re-cycling has been discussed and appropriate pathways for disposal have been identified. The responsibilities for recycling and disposal have also been identified.

8.5.3 The quantity of operation waste arising from the project is limited. The material is reusable under other construction projects or to public fill areas after de-watering.

8.5.4 Provided that all the requirements listed in the EIA are met, construction waste will be minimized and potential pollution from construction waste prevented.

REFFERENCES

EPD (1999) *Monitoring of Solid Waste in Hong Kong 1998*. Hong Kong Government