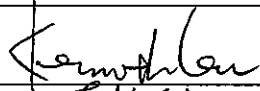



Contract No. SS M333

**Reprovisioning of Diamond Hill Crematorium**

**Waste Management Plan for Phase II Works**

January 2008

	Name	Signature
Reviewed & Checked:	Kenneth Lau	
Approved:	Y.T. Tang (ET Leader)	

Version:	1.2	Date: 7 January 2008
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The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and ENSR Asia (HK) Ltd. accepts no responsibility for its use by others.

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**MEMO**

<b>From</b> Director of Environmental Protection <b>Ref.</b> ( ) in EP2/K11/Q/05 pt.7 <b>Tel. No.</b> 2835 1106 <b>Fax No.</b> 2591 0558 <b>Date</b> 23 January 2008	<b>To</b> ArchSD <b>(Attn.:</b> Ms Renata CHENG ) <b>Your Ref.</b> ( ) In <b>dated</b> Fax No. 2524 8194 <b>Total Pages</b> 1
--	---

**Reprovisioning of Diamond Hill Crematorium  
 Submission under Environmental Permit (EP No. - 179/2004/C)**

**Condition 5.2 – Waste Management Plan for Phase II Works (Phase II WMP)**

I refer to the revised Phase II WMP (version 1.2) submitted by your ET on your behalf vide his letter dd.16.1.08 for the captioned project as per Condition 5.2 of the Environmental Permit No. EP-179/2004/C.

2 I am pleased to inform you that we have no further comment on the revised Phase II WMP and we will arrange to deposit a copy of the Phase II WMP in the EIAO Register Office for public access. Please submit an electronic copy of the revised Phase II WMP for our record as per the Environmental Permit condition. You should upload the Phase II WMP onto the designated project website for public access via internet.



(David Cox)

Senior Environmental Protection Officer  
 for Director of Environmental Protection

C.C.

MEMCL	(Attn : Mr. YT Tang	Fax : 2891 0305)
CRC Co. Ltd	(Attn : Mr. David Tse	Fax : 2326 1502)
Hyder Consulting Ltd.	(Attn : Mr. Adi Li	Fax : 2805 5028)

Internal S(RE)2 – with copy of Phase II WMP

**ENSR Asia (HK) Ltd.**

(formerly Maunsell Environmental Management Consultants Ltd)  
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**安社亞洲(香港)有限公司**

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Our Ref.: S07904/C/klcw801061

**By Hand**

China Resources Construction Company Limited

Room 1001-5,

China Resources Building,

26 Harbour Road,

Wanchai

Hong Kong

Attn: David Tse

6 January 2008

Dear Sir,

**Contract No.SS. M333****Reprovisioning of Cremators at Diamond Hill Crematorium****Waste Management Plan for Phase II Works (Version 1.2)**

In accordance with Condition 5.2 of the Environmental Permit EP-179/2004/C, please find attached 1 hard copy of the Waste Management Plan for Phase II Works (Version 1.2) for the captioned certified by myself and verified by the IEC for your consideration. Please be noted that the Report has been incorporated with response to comment table which is also attached at Appendix J.

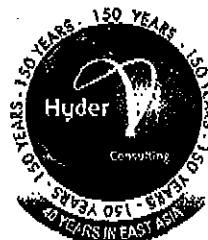
Should you have any queries, please do not hesitate to contact our Kenneth Lau at 3105 8973.

Yours faithfully  
for and on behalf of  
**ENSR Asia (HK) Ltd.**



Y.T. Tang  
Environmental Team Leader

Encl.



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Hyder Consulting Limited is incorporated in Hong Kong with limited liability.  
 COI Number 125012

14 January 2008

**BY POST & FAX (2524 8194)**

Architectural Services Department  
 Queensway Government Offices  
 66 Queensway  
 Hong Kong

Your Ref:

Our Ref: EA01148-05/E08-1467

For attention of: Ms. Renata Cheng

Dear Renata,

**Reprovisioning of Diamond Hill Crematorium  
 Waste Management Plan (WMP) for Phase II Works (Version 1.2)**

We refer to the email of 8 and 12 January 2008 with the enclosure of the Waste Management Plan (WMP) for Phase II Works (Version 1.2) from ENSR Asia Ltd.

We have no further comment and hereby verify the captioned report.

Should you have any queries, please do not hesitate to contact the undersigned on 2911 2729 or Winnie Ma on 2911 2912.

Yours sincerely

**Adi Lee**  
 Independent Environmental Checker  
 HYDER CONSULTING LIMITED

cc ENSR Asia Ltd – Mr. Y. T. Tang/Mr. Kenneth Lau  
 CRCCL – Mr. Whyment Leung

(Fax: 2891 0305)  
 (Fax: 2827 2921)

AL/WM/ds



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Appendix F	Weekly Environmental Site Inspection Checklist
Appendix G	Monthly and Yearly Waste Flow Tables
Appendix H	Daily Site Cleanliness Checklist
Appendix I	Weekly Site Tidying Checklist
Appendix J	Response to Comment Table for WPM Version 1.1

## 1. PROJECT BACKGROUND

1.1 Works under Reprovisioning of Cremators at Diamond Hill Crematorium (hereinafter called the "Project") under Contract No. SS M333 was awarded to China Resources Construction Company Limited (hereinafter called the "Contractor") by the Architectural Services Department of the Hong Kong Special Administrative Region (HKSAR) in September 2004.

1.2 The Project is divided into two phases. Details of the two phases of works are as follows:

### *Phase I*

- Demolition of facilities in Existing Crematorium in the southern side of the Project site, including
  - Existing siting out area
  - Garden of remembrance
  - Existing building structure, including CLP secondary substation, toilets, pavilion and retaining walls
- Construction of the New Crematorium main facilities, including
  - One cremator plant room housing six cremators
  - Three fuel tanks (with total capacity of 34,000L)
  - Two service halls (each can hold 120 people)
  - One pulverizing room
  - One mortuary
  - One office
  - Toilets for public
  - Ancillary service rooms including battery fork lift, transformer and switch room, emergency generator room and joss burners
  - Two automatic transportation systems for coffins and part of an underground service tunnel for coffin circulation
  - Vehicular loading bay for coffin van, coach
  - Landscape area
  - Dangerous goods store
  - Installation of temporary CLP electricity transformer at Phase II boundary

### *Phase II*

- Demolition of Existing Crematorium main facilities, including
  - Two service halls
  - One cremation room with six (6) cremators
  - One transformer room
  - One underground oil fuel storage tank (9,092 L)
  - One mortuary
  - One machine room
  - One general store plus water tank
  - One dangerous goods store
  - One chimney (10m in height)
- Construction of the rest of the New Crematorium, including
  - Two service halls (each can hold 120 people)
  - Two automatic transportation systems for coffins and remaining part of the underground service tunnel for coffin circulation
  - Vehicular loading bay for coffin van, coach etc.
  - Landscape area

1.3 Layout of the work site is shown in **Figure 1.1**.

1.4 As stipulated in Special Conditions of Contract SCC70(2) and SCC70(4) and Condition 5.2 of the Environmental Permit EP-179/2004/B, a Waste Management Plan for the Phase II Works should be submitted. This Waste Management Plan for Phase II Works is prepared to fulfil these requirements.

## 2. PURPOSE OF THE PLAN

2.1 This Waste Management Plan (WMP) aims to describe the arrangement for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the demolition and construction activities of Phase II of the Project. This WMP includes the recommended mitigation measures on waste management as contained in the Particular Specification of Contract Document (No. SS M333).

2.2 This WMP also estimates the quantity of waste generation of Phase II Works throughout the entire construction period. This WMP and the appended Waste Generation and Handling Procedure would be revised when deemed necessary.

## 3. WASTE MANAGEMENT POLICY AND STRATEGIES

3.1 The Waste Management Policy of China Resources Construction Company Limited is provided in **Appendix B**. The management's approach, commitment and targets/measures for the waste management on-site were stated in the policy statement. Core elements of waste management are listed in Table 3.1.

**Table 3.1 Core Elements of Waste Management**

Elements	Reference Section
License or Permit Requirements	4
Legislation and Guidelines	5
Organization, Duties and Responsibilities for Waste Management	6
Classification and Analysis of Waste	7
Control Measures for Different Categories of Waste	8
Waste Monitoring and Audit	9
Training	10

3.2 The various waste management options will be categorised in terms of preference from an environmental viewpoint and the hierarchy of waste management is as follows:

- Avoidance and minimisation, i.e. not generating waste through changing or improving practices and design;
- Reuse of materials, thus avoiding disposal;
- Recovery and recycling, thus avoiding disposal; and
- Treatment and disposal, according to relevant laws, guidelines and good practice.

3.3 This hierarchy will be used to evaluate waste management options, thus allowing maximum waste reduction. Waste reduction measures will be introduced at the planning stage and will be carried through the demolition and construction activities, whenever 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 disposing of wastes.



#### 4. LICENSE OR PERMIT REQUIREMENTS

##### Registration as a Chemical Waste Producer

- 4.1 Under the Waste Disposal (Chemical Waste) (General) Regulation, producers of chemical wastes (including asbestos) must register as a chemical waste producer with the Environmental Protection Department. The registration will be applied for as required.

##### Dumpling license to Public Filling Area

- 4.2 The Land (Miscellaneous Provisions) Ordinance requires that dumping licences are obtained by individuals or companies who deliver inert portion of construction and demolition material (i.e. Public Fill) to Public Filling Areas. The licences are issued by the Civil Engineering and Development Department under delegated powers from the Director of Lands. The license will be applied for as required.

#### 5. LEGISLATION AND GUIDELINES

##### Statutory Requirements

- 5.1 The following legislation covers, or has some bearing upon, the storage, collection, treatment and disposal of wastes in Hong Kong:
- Waste Disposal Ordinance (Cap 354);
  - Waste Disposal (Chemical Waste) (General) Regulation (Cap 354);
  - Waste Disposal (Charge for Disposal of Construction Waste) Regulations (Cap 354);
  - Land (Miscellaneous Provisions) Ordinance (Cap 28);
  - Public Health and Municipal Services Ordinance (Cap 132) — Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws;
  - Dumping at Sea Ordinance (Cap 466); and
  - Air Pollution Control Ordinance (Cap 311).

##### Non-statutory Requirements

- 5.2 Other guiding documents which detail how the contractor should comply with the regulations are as follows:
- *Waste Reduction Framework Plan, 1998 to 2007*, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
  - *2001 Review of the Waste Reduction Framework Plan*, Waste Reduction Committee;
  - *Site Practice for Waste Reduction in Construction Industry (2001)*, Environmental Protection Department;
  - *Environmental Guidelines for Planning in Hong Kong (1990)*, Hong Kong Planning and Standards Guidelines, Hong Kong Government;
  - *New Disposal Arrangements for Construction Waste (1992)*, Environmental Protection Department & Civil Engineering Department;
  - *A Guide to the Registration of Chemical Waste Producers (2001)*, Environmental Protection Department;
  - *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992)*, Environmental Protection Department;
  - *A Guide to the Control on Import and Export of Waste (1999)*, Environmental Protection Department;
  - *Guidelines for Admission Ticket System (1997)*, Environmental Protection Department;
  - *Works Bureau Technical Circular No. 10/92, Provision of Refuse Containment Booms in Reclamation Contracts Involving Public Dumping*, Works Bureau;
  - *Works Bureau Technical Circular No. 2/93, Public Dumps*, Works Bureau;
  - *Works Bureau Technical Circular No. 2/93B, Public Filling Facilities*, Works Bureau;

- *Works Bureau Technical Circular No. 16/96, Wet Soil in Public Dumps, Works Bureau;*
- *Works Bureau Technical Circular No. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Projects, Works Bureau;*
- *Works Bureau Technical Circular No. 25/99, 25/99A and 25/99C, Incorporation of Information on Construction and Demolition Material Management in Public Works Sub-committee Papers, Works Bureau;*
- *Works Bureau Technical Circular No. 12/00, Fill Management, Works Bureau;*
- *Works Bureau Technical Circular No. 19/01, Metallic Site Hoardings and Signboards, Works Bureau;*
- *Works Bureau Technical Circular No. 6/02 and 6/02A, Enhancement Specification for Site Cleanliness and Tidiness, Works Bureau;*
- *Works Bureau Technical Circular No 12/2002, Specification Facilitating the Use of Recycled Aggregates, Works Bureau;*
- *Works Bureau Technical Circular No. 21/2002, Trip-ticket System for Disposal of Construction and Demolition Material, Works Bureau;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 33/2002, Management of Construction and Demolition Material including Rock, Environment, Transport and Works Bureau;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No 34/2002, Management of Dredged/ Excavated Sediment, Environment, Transport and Works Bureau;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 15/2003, Waste Management on Construction Sites, Environment, Transport and Works Bureau;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No 24/2004. Specification Facilitating the Use of Concrete Paving Unit Made of Recycled Aggregate, Environment, Transport and Works Bureau;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No 31/2004, Trip Ticket System for Disposal of Construction & Demolition Materials, Environment, Transport and Works Bureau;*
- *Memo Ref. (15) in FM PF/GEN/18.01 Pt.4 dated 22 December 2004 on "Enhancement of Trip Ticket System for Disposal of Construction and Demolition Materials – Commencement of Implementation of Using Bar-coded Disposal Delivery Form (DDF) on 15.1.2005", Secretary, Public Fill Committee, Civil Engineering & Development Department;*
- *Civil Engineering and Development Department Technical Circular No 05/2005, Management of Construction and Demolition Materials, Environment, Civil Engineering and Development Department;*
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 19/2005, Environmental Management on Construction Sites, Environment, Transport and Works Bureau; and*
- *Memo Ref. (014KN-01-7) in ETWB (W) 517/91/01 dated 20 June 2006 on "Dust Control on Vehicles Transporting Dusty Materials off Site". Secretary for the Environment, Transport and Works.*
- *Code of Practice on Asbestos Control: Preparation Work Using Full Containment or Mini Containment Method*
- *Code of Practice on Asbestos Control: Asbestos Work Using Glove Bag Method*
- *Code of Practice on Asbestos Control: Safe Handling of Low Risk Asbestos Containing Material*
- *Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste*
- *Code of Practice on Asbestos Control: Preparation of Asbestos Investigation Report, Asbestos Management Plan and Asbestos Abatement Plan*
- *ProPECC PN2/97 Handling of Asbestos Containing Materials in Buildings*

## 6. ORGANISATION, DUTIES AND RESPONSIBILITIES FOR WASTE MANAGEMENT

### Project Organisation

- 6.1 The project organisation with respect to waste management is outlined below. The organisation structure for waste management is shown in **Figure 6.1**. Contacts of key waste management personnel of the Project are listed in **Appendix A**.

### Duties and Responsibilities of Key Waste Management Personnel

#### *The Architect*

- 6.2 The Architect should be responsible for:
- Providing full support on the implementation of the approved WMP;
  - Ensuring the WMP is fully implemented throughout the construction period;
  - Reviewing the waste monitoring and audit report submitted by the ET;
  - Following up and ensuring the carrying out of corrective actions in accordance with the WMP; and
  - Investigating and auditing of the equipment and work methodologies with respect to waste management.

#### *Independent Environmental Checker (IEC)*

- 6.3 The IEC should be responsible for the following duties in relation to the implementation of the WMP:
- Review effectiveness of the waste mitigation measures recommended in the WMP.

#### *The Contractor*

- 6.4 The Contractor should:
- Work within the scope of the construction contract and other tender documents;
  - Participate in the waste management site inspections undertaken by the ET and the IEC as required and undertake any corrective actions instructed by the Architect; and
  - Take responsibility and strictly adhere to the provisions of the WMP and the contract specifications.

#### Project Manager

- 6.5 Project Manager should be responsible for overall planning, site operations, appointment of committee members for waste management staff supervision control co-ordination and external liaison. The waste management responsibilities of the Project Manager include:
- Overseeing waste management of the Project, which they achieve by implementation of the WMP;
  - Participating and providing necessary support to the ET for the preparation and review of WMP;
  - Ensuring that staff attends environmental training with regard to waste management organized by the WM;
  - Implementing environmental controls and mitigation as set out in this WMP as well as any additional measures necessary for compliance with environmental control measures;
  - Ensuring the recommendations and instructions from the Architect or ET are implemented to improve the waste management practice and carry out immediate action to rectify the non-compliance of waste management requirements;
  - Providing leadership in the efficient management of project and in meeting project's waste management objectives; and
  - Anticipating waste generation impacts that may require mitigation before the problem arises.

#### Waste Manager (WM)

- 6.6 The waste management responsibilities of the WM include:
- Arranging routine joint site inspection with ET and review environmental inspection report submitted by the ET;
  - Ensuring works are undertaken in accordance with the recommendations made and instructions

- given by the Architect and ET;
- Monitoring and controlling the works including those of subcontractors to ensure compliance with specified requirements;
  - Ensuring appropriate waste management mitigation measures are properly implemented;
  - Ensuring follow up actions are properly undertaken in the event of non-compliance of the WMP;
  - Reviewing method statement to ensure appropriate mitigation measures are implemented prior to execution of works;
  - Liaise with the Architect and ET on waste management issues;
  - Monitor records of all trained personnel in the site offices;
  - Monitor the following documents:
    - any statutory required waste management permits/licenses including dumping licence, chemical waste producer, admission ticket and etc.;
    - C&D material disposal delivery record; and
    - waste reuse / recycle / disposal summary.
  - Ensuring all relevant legislation and the Contractor's duty of care is complied with throughout the duration of the Project;
  - Initiating waste reduction scheme on site;
  - Ensuring that all the Contractor's employees and nominated subcontractors' employees are aware of their responsibilities regarding the content of the WMP; and
  - Coordinating waste management on site, gathering data on waste and keeping accurate records on waste movement both on and off site.

#### Engineer

6.7 The Engineer should have the following duties in relation to waste management:

- Assisting the WM in the implementation of WMP;
- Monitoring and controlling works including those of subcontractors to ensure compliance of WMP;
- Review the WMP at monthly intervals and submit a revised and updated WMP if necessary;
- Preparing and updating the yearly or monthly summary waste flow tables and the summary table for use of timber in temporary works construction;
- Reporting to the Project Manager or WM regarding non-compliance of waste management issues; and
- Ensuring the remedial actions or mitigation measures to be carried out as planned.

#### Site Agent

6.8 Site Agent should be responsible for the following duties in relation to waste management:

- Assisting the Engineer in the implementation of WMP;
- Controlling works including those of subcontractors to fulfill the requirements of waste management;
- Reporting to the Engineer any non-compliance of waste management issues;
- Maintaining the on-site waste management facilities including sorting area, temporary storage area, general refuse bins and recycling bins etc;
- Carrying out remedial actions or mitigation measures to rectify non-compliance; and
- Carrying out routine maintenance of waste management facilities and keeping proper maintenance records in site office.

#### Subcontractor and other Employees

6.9 Every employee and subcontractor has the duty to carry out the waste management practices instructed by the Engineer and Site Agent. Copies of WMP would be issued to all subcontractors.

6.10 Every employee and subcontractor should report promptly to foreman any non-compliance of waste management issues.

#### ***Environmental Team (ET)***

6.11 The ET is an independent environmental consultant employed by the Contractor. The waste management responsibilities of the ET include:

- Provide specialist advice on waste management issues to the Contractor;
- Conduct site inspections and investigate and inspect Contractor's equipment and work methodologies with respect to waste management mitigation measures stipulated in the WMP, and anticipate waste management issues that may require mitigation;
- Review the programme of works to anticipate potential waste management implications;
- Report the implementation status of waste management mitigation measures from site inspections;
- Follow the procedures stipulated in the agreed Event and Action Plans in the event of non-compliance or complaint.

## 7. CLASSIFICATION AND ANALYSIS OF WASTE

### **Classification of Waste**

7.1 The waste generated from the demolition and construction activities of Phase II of the Project will be divided into distinct categories based on their composition, as follows:

- Excavated Material;
- Construction and Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Contaminated Material.

#### ***Excavated Material***

7.2 Excavated materials comprise clean rock and soil generated during demolition and construction.

#### ***Construction and Demolition (C&D) Material***

7.3 C&D materials comprise unwanted materials generated during demolition and construction including:

- Existing Crematorium structures (e.g. concrete, steel, glass, bricks, wood, plastics, etc.)
- Wood from formwork and falsework
- Materials and equipment wrappings
- Unusable/ surplus concrete/ grouting mixes
- Damaged construction materials

Those are rejected structures and materials, materials which have been over ordered or are surplus to requirements, and materials used and discarded.

7.4 C&D material will be divided into two categories according to whether they are inert or non-inert. Inert material such as debris, rubble, bitumen material, earth and concrete is known as "Public Fill", while the non-inert part, sub-divided into recyclables and non-recyclables, such as metal, timber, vegetation, packaging waste, organic material. Recyclables materials can be reuse and non-recyclables will be disposed to landfill.

#### ***Chemical Waste***

7.5 Chemical wastes are the substances defined by the Schedule I of the Waste Disposal (Chemical Waste) (General) Regulation. Chemical wastes generated from the construction site would primarily arise from the maintenance of plant and equipment. These may typically include oils, lubricants, paints and solvents.

#### ***General Refuse***

7.6 General refuse include food waste and other debris arising from various construction activities, site workforce and site housekeeping.

#### ***Contaminated Material***

7.7 Contaminated Material anticipated includes Asbestos containing materials (ACM) likely from building structures, Dioxin containing materials (DCM) likely from ash wastes and contaminated soil,

Polyaromatic Hydrocarbons (PAHs) likely from ash waste; Total Petroleum Hydrocarbon (TPH) (diesel range) likely from contaminated soil, and Heavy metal containing materials (HMCM) whose heavy metal content(s) exceed the 'Dutch B' level as quoted in the Practice Note for Professional Persons (ProPECC) Note PN 3/94, "Contaminated Land Assessment and Remediation" – likely from ash waste and from contaminated soil which would be demolished during Phase II of the Project.

#### Subsurface Soil

- 7.8 According to the land contamination site investigation under EIA study, soil samples were analyzed within the site boundary for testing of dioxin, heavy metals, TPH and PAH. According to the test results, no exceedance was found in any of the soil samples, except S3 and S5 that were found to be contaminated with heavy metals. (lead and tin)
- 7.9 Toxicity Characteristic Leaching Procedure (TCLP) tests were carried out on samples S3 and S5 during the EIA stage, to determine the solubility and mobility of lead and tin in these samples and hence determined the suitability for landfill disposal. The TCLP testing had been undertaken, and the concentrations of lead and tin were several orders of magnitude lower than the Landfill Disposal Criteria. Hence pre-treatment of the soil prior to landfill disposal is not deemed necessary.
- 7.10 According to the EP (No. EP-179/2004/B) of the "Reprovisioning of Diamond Hill Crematorium EIA (EIA Report Register No. AEIAR-076/2004)", further contamination to the Site could have occurred due to the continuous operation of the existing crematorium since the completion of the SI works in 2003. Therefore, confirmatory site investigation works has been carried out on 22 March and 16 April 2007 under in accordance with the sampling and testing schedule stated in the CAP and CAR/RAP of the previous EIA. Based on the analytical results, contamination with tin was found at sampling locations S4 and S5 and remediation would be required at these two locations.
- 7.11 The analytical test results indicated that two soil samples from S4 and S5 were found with tin exceeding Dutch B/C values. Together with the contaminated soil at S3 identified in the SI works in the previous EIA in 2003, the total volume of contaminated soil for remediation is estimated to be approximately 120m<sup>3</sup>. The contaminated soils have been found compliance with the criteria for landfill disposal. The detailed analytical results are presented in the confirmation report and remediation action plan for confirmatory analysis of subsurface soil (July 2007). In the approved CAR/RAP as part of the EIA, excavation and landfill disposal was recommended as the method for handling the contaminated soil. Considering the updated volume of contaminated soil is small, the excavation and landfill disposal method is valid and shall be adopted as the remediation method.
- 7.12 To ensure complete removal of contaminated soil, a closure assessment in the form of confirmatory testing has been carried out after excavation, the laboratory results indicated that no exceedance of Dutch B level was found in the surrounding soil and no further excavation would be required.
- 7.13 Confirmation Report and Remediation Action Plan for confirmatory analysis of subsurface soil was approved by DEP on 6 August 2007.

#### Ash

- 7.14 Due to the long operation history of the existing crematorium, potential contamination inside the cremation chambers due to combustion activities is suspected. Depositions (mainly in the form of ash waste) were observed at the bottom of the cremators and suspected to be accumulated in the flue and chimney. At the opposite side of the cremators is the air extractor room with 6 air extractors in operation. Ash-like substance was also found on the surface of air extractors.
- 7.15 A contaminated materials investigation has been conducted for the existing Diamond Hill Crematorium, in particular for the chimney, flue, cremators and air extractors, following the Environmental Permit (EP) Clauses 5.3 – 5.5 [Submission of Contaminated Materials Investigation Report (CMIR) for Phase II Work] as well as the Particular Specification PS.G.11 Clause 4.5.5 [Contaminated Materials Investigation Report (CMIR) for Phase II Work] and Clause 4.6.4.4 [Contaminated Material] of the Project.

- 7.16 A total of 3 ash samples were collected from cremator, flue and air extractors in accordance with the approved Sampling and Analysis Plan for laboratory analysis where all samples were found with elevated levels of heavy metals. The sample collected at the cremator was also found with pyrene exceeding Dutch B level while the sample collected at the flue was found with dioxin exceeding the USEPA criterion. The estimated quantity of contaminated ash waste is about 1.55m<sup>3</sup>.
- 7.17 In accordance with the EP and PS.G.11, the ash wastes in the cremators, chimney, flue and air extractors were classified as Moderately Contaminated DCM or Moderately/Severely Contaminated HMCM/PAHCM. Special demolition, handling, treatment and disposal measures/methods detailed in the demolition plan shall be followed and implemented.
- 7.18 The ash attached to the contaminated parts shall be removed by scrubbing and utilizing of High Efficiency Particulate Air (HEPA) vacuum. The ash waste should then be stabilized by mixing with cement followed by disposal at landfill.
- 7.19 Protection clothing of the workers, materials used for wet wiping, HEPA vacuum cleaner for DCM removal work, all polythene sheeting, decontamination facility and air movers should be bagged and labeled as dioxin contaminated waste for landfill disposal.
- 7.20 Pilot mixing and TCLP tests by a HOKLAS accredited laboratory were carried out on 1 August 2007 to establish the appropriate ratio (1 : 1) of cement to ash waste and the TCLP test result was submitted to EPD Waste Facilities Group. A total of 3.1m<sup>3</sup> of dioxin waste with cement after solidification has been disposal to landfill as chemical waste.
- 7.21 After scrubbing and HEPA vacuuming, the building structures where contaminated materials were found are considered to be cleaned. Such building structures can be handled and disposed as construction and demolition (C&D) materials.
- 7.22 Contaminated Materials Investigation Report (CMIR) was approved by DEP on 29 October 2007.
- 7.23 In accordance with the approved Asbestos Abatement Plan (AAP), asbestos containing materials (ACM) were identified at 4 locations. Two locations with ACM identified, including insulation board of chimney exhaust (a section of flue from cremators No. 1 to No. 4) and exhaust pipe gasket at cremator No. 5, were also found with moderately contaminated DCM and/or moderately contaminated HMCM/PAHCM. Given that the contaminated ash waste was located inside the cremators and chimney exhaust which are wrapped by ACM, such ash waste would be recommended to be removed prior to any asbestos abatement measures on these building structures described in Asbestos Abatement Plan (AAP).

#### Underground Fuel Tank

- 7.24 The fuel tank has been used for storage of diesel rather than petrol, so lighter range petroleum fractions (e.g. BTEX) are not likely to be present. An underground fuel pipe is believed to lead from the main buried tank to a small tank inside the main building, in the roof space. The exact alignment of this pipe could not be precisely determined either from the available plans or from the site visit.
- 7.25 Underground fuel tank was found enclosed within a concrete casing (about 3.5m (L) X 6.5m (W) X 4m (H)) in which some fuel-like liquid potentially leaked from the tank was contained. Prior to the tank removal, the content of the underground fuel tank and the associated fuel pipeline was emptied and certified by Associated Consultants & Surveyors Ltd. on 6 July 2007. Sludge or sediment remaining in the tank and pipeline as well as 3 containers (200L each) fuel-like liquid outside the tank were removed for disposal as chemical waste to Dunwell Ind. (Holdings) Ltd. After removal of the tank and fuel-like liquid on 17 July 2007, the concrete casing (~300mm thick, 13m<sup>3</sup>) surrounding the tank was broken down and the soil surface immediately next to the concrete layer was inspected.
- 7.26 Concrete casing has been removed and disposed to public fill, no detection of odour and apparent soil discolorization was noted during the inspections (18 July 2007 and 23 July 2007) and the notification was issued to EPD on 23 July 2007. To further confirm the soil without fuel contamination, a total of six surface soil samples (two from the base and four from the sidewalls) were collected for testing.

- 7.27 All six surface soil samples (four from the sidewalls; two from the base) were analyzed for Total Petroleum Hydrocarbons (TPH). The locations of soil samples collected are shown in the attached figure. The Dutch B Level as stipulated in the Practice Note ProPECC PN 3/94 "Contaminated Land Assessment and Remediation" would be used as the soil contamination criterion.
- 7.28 Among the six soil samples collected, concentration of TPH was found below the Dutch B level (i.e. 1,000 mg/kg presented as mineral oil). Based on the soil sampling results, potential land contamination due to the underground fuel tank is not expected and soil remediation would therefore not be required.

#### Asbestos

- 7.29 Asbestos Containing Material (ACM) is one of the mainly contaminated materials generated during demolition of the Existing Crematorium during Phases II construction work. ACM are expected to be concentrated around cremators/ flues/ chimney.
- 7.30 According to the Diamond Hill Crematorium Asbestos Investigation Report (March 2003), an asbestos investigation was carried out and identified the locations by a registered asbestos consultant:
- Cremator room (cloth insulation on chimney duct) (Type 2 asbestos materials, according to Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste)
  - Machine room (gaskets on air burners and fan ducts) (Type 2 asbestos materials)
  - Offices of the Existing Crematorium (vinyl floor tile adhesive in offices and waiting rooms) (Type 1 asbestos materials)
- 7.31 The DHC comprises several elements as well as the main cremation plant. The structures which remain to be demolished at Phase II: DHC chimneys, DHC Buildings, toilets, sitting out area and garden and store rooms (former staff quarters). When ACM is handled, such as demolition and handling of demolition waste, all ACM will be properly labeled by a registered asbestos consultant.
- 7.32 Asbestos Investigation Report (AIR) and Asbestos Abatement Plan (AAP) were approved by DEP on 8 October 2007.
- 7.33 According to the approved Asbestos Investigation Report (AIR) and Asbestos Abatement Plan (AAP), submitted on September 2007, ACM was identified in accordance with field inspection and the results are shown in Table 7.1.

**Table 7.1 List of Identified Asbestos- Containing Materials**

Description	Location	Estimated Quality	Type of Asbestos
Pipe lagging	Cremation room G/F	2m	70% Chrysotile
Insulation board of chimney exhaust	Exhaust of cremator No.1-4, cremation room, G/F	40m <sup>2</sup>	40% Amosite
Exhaust pipe gasket	Exhaust of Cremator No.5, cremation room, G/F	3 nos.	80% Chrysotile
Insulation sheet (Debris)	Near entrance of cremation room, G/F	2 sheets	70% Chrysotile



- 7.34 The chimney stack was carefully examined and confirmed to be non- ACM during the survey. Asbestos pipe lagging was found only in one of the exposed section and no consealed pipe lagging was found. Interior of the chimney was confirmed to be metal and no suspected ACM was found.
- 7.35 The exhaust of the cremator was centralized and connected to the chimney stack. Asbestos insulation board were found on the exhaust of cremator No.1-4 only. Insulation material for cremator No.5 & 6 were confirmed to be non-ACM materials (glass fibre).
- 7.36 Dioxin Contaminated Materials (DCM) was identified inside the chimney exhaust, therefore the RAC recommended that the DCM should be removed prior to any asbestos removal work.

#### **Analysis of Waste Generation**

- 7.37 Different types and quantities of waste will be generated throughout Phase II of the Project from various demolition and construction activities and daily operation of the constructions site.
- 7.38 The estimated amount of waste to be generated from Phase II of the Project and their respective handling procedure are provided in Table 7.2.

Table 7.2 Waste Generation and Handling Procedures

Construction Activity	Waste Generation Period	Waste Generation Operation	Estimated Quantities of C&D Materials and Control Measure																			
			City (m³)	Control Measure	Transport Route	Public Fill (m³)	City (m³)	General Recyclables	City (m³)	General Recyclables	City (m³)	General Recyclables	City (m³)	General Recyclables								
Site clearance building mobilization	12 Jun 07 - 26 Jun 07	Establishment of site offices and handling erection						Trucks via Po Kwoi Tong Rd & TKO		Dispose to TKO Landfill												
Existing building demolition and EVA road (zone B)	12 Jun 07 - 03 Aug 07	Covered railway siding at zone A&C	50 m³	Dispose to Kai Tak PFBP	Trucks via Po Kwoi Tong Rd & Kai Tak Road				Dispose to TKO Landfill	Trucks via Po Kwoi Tong Rd & TKO Tunnel												
Asbestos Removal Work	30 Oct 07 - 14 Nov 07	Removal of piping lighting installation chimney of exhaust pipe gasifier and acid and alkali solution (Dobris)																				
Contaminated materials investigation (soil)	30 Oct 07 - 14 Nov 07	Removal of ash from chimney, flue, crematorium and air exhausters.																				
Contaminated materials investigation (soil)	18 Jun 07 - 17 Jul 07	Subsurface soil removal location S2.54 and S3.																				
Existing UG tank removal	08 Jun 07 - 17 Sep 07	Removal of UG fuel tank and contaminated Soil	13 m³	Dispose to Kai Tak PFBP	Trucks via Po Kwoi Tong Rd & Kai Tak Rd																	
Main building demolishing works	18 Nov 07 - 20 Dec 07	Main building demolishing	50 m³	Dispose to Kai Tak PFBP	Trucks via Po Kwoi Tong Rd & Kai Tak Rd				Dispose to TKO Landfill	Trucks via Po Kwoi Tong Rd & TKO Tunnel												
New building construction (zone C&D)	21 Dec 07 - 31 Dec 07	Excavation work from existing ground level (+80.2) to +82.2 approx	6400 m³	Dispose to Kai Tak PFBP	Trucks via Po Kwoi Tong Rd & Kai Tak Rd				Dispose to TKO Landfill	Trucks via Po Kwoi Tong Rd & TKO Tunnel												
	18 Jan 08 - 02 Feb 08	Open cut from level +79.2 to +71.65	20500 m³	Dispose to Kai Tak PFBP	Trucks via Po Kwoi Tong Rd & Kai Tak Rd				Dispose to TKO Landfill	Trucks via Po Kwoi Tong Rd & TKO Tunnel												

Construction Activity	Waste Generation Period	Waste Generation Operation	Estimated Quantities of Excavated Materials and Control Measures					Estimated Quantities of CAD Materials and Control Measures					Estimated Quantities of General Waste and Control Measures					Estimated Quantities of Hazardous Waste and Control Measures					Estimated Quantities of Estimated Contaminated Material and Control Measures (Contaminated soil / materials)											
			City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route	City (m³)	Control Measure	Transport Route		
																																	Public Fill (hect)	Non-Recyclables
Zone A construction	13Jul 07 - 11Aug 07	Excavation work including retaining wall, +78.20 approx	1400 m³	Dispose off to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		300 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
The ramp near site entrance (zone B)	29Apr 08 - 16May 08	Open cut to levels +78.2	1000 m³	Dispose off to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		300 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
UG machole / drainage installation / pumping / cable pits (inside building area)	12Dec 07 - 14Apr 08	Bending & cutting of steel reinforcement, Piling, Concrete		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																													
UG machole / drainage installation / pumping / cable pits (outside building area)	26May 08 - 30Oct 08	Bending & cutting of steel reinforcement, Piling, Concrete		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																													
UG machole / drainage installation / pumping / cable pits (building area)	25Jun 08 - 20Dec 08	Bending & cutting of steel reinforcement, Piling, Concrete		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																													
Internal finishing	18Oct 08 - 13Jan 09	Blockwork, Plastering & Tiling, Slabbing, Installation		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		100 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Suspended ceiling installation	14Nov 08 - 08Feb 09	Fabric Ceiling Installation, Ceiling of ducts, pipe work		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
External finishing	18Oct 08 - 19Jan 09	Blockwork, Plastering & Tiling, Slabbing, Installation		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		100 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Roofing / finishing system	27Oct 08 - 2Jun 09	Blockwork, Plastering & Tiling, Slabbing, Installation		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		50 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Plumbing & installation	19Aug 08 - 27Dec 08	Blockwork, Plastering & Tiling, Slabbing, Installation		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Electric system	19Aug 08 - 1Dec 08	Cutting of ducts, pipe work		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
FS System	18Jan 08 - 3Jan 09	Cutting of ducts, pipe work		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
MVAC system	27Jul 08 - 18Dec 08	Cutting of ducts, pipe work		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Lift installation	25Sep 08 - 3Jan 09	Lift installation		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Fire alarm system	24Nov 08 - 24Nov 08	Cutting of ducts, pipe work		Dispose to Kai Tak PFBP	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO		20 m³	Dispose to TKO Landfill	Trucks via Po Kong Village Rd, Kwan Tong Rd & TKO																									
Installation	22Nov 08 -	Cutting of		Dispose to Kai Tak PFBP	Trucks via		20 m³	Dispose to TKO Landfill	Trucks via																									

Construction Activity	Waste Generation Period	Waste Generation Operation	Estimated Quantities of Excavated Materials and Control Measures		Estimated Quantities of CED Materials and Control Measures		Estimated Quantities of CED Materials (Non-inert)		Estimated Quantities of Chemical Waste and Control Measures		Estimated Quantities of General Refuse and Control Measures		Estimated Quantities of Compressed Inert Materials (Asbestos / Furnace containing materials)		Estimated Quantities of Control Measures		Estimated Quantities of Control Measures		
			City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)	Control Measure	City (m³)
works in AVG service corridor	20Dec 08	conduits, pipe work																	
Removal of existing temp structures at section I	12Dec 08 - 30Dec 08	Cutting of steel																	
Demolish existing wall between section I & II	30Dec 08 - 10Dec 08																		
Site Housekeeping	12 Jun 07 - 14 Feb 08	Office operation and routine maintenance including of site																	
Plant & Equipment Maintenance	Phase 2 period	Replacing of lubricating oil and accidental spillage of oil																	
<b>Total Generation</b>			<b>29,500 m³</b>		<b>54,9m³</b>		<b>27,750m³</b>		<b>40m³</b>		<b>100m³</b>		<b>80m³</b>		<b>11.1m³</b>		<b>120m³ &amp; 600L</b>		

\* Appointed disposal site designated by EPD  
 \*\* According to the Master Programme of Section II (Rev. D) provided by the Contractor

- Asbestos (AAP & AMP)

- Ash (CMIR)

- Soil (confirmation analysis of subsurface soil)

- Underground Fuel Tank (inspection findings and confirmatory soils sampling with Remediation Action Plan, if necessary)

## 8. CONTROL MEASURES FOR DIFFERENT CATEGORIES OF WASTE

### General

- 8.1 Preliminary sorting of waste generated from various demolition and construction activities as detailed in Section 7 will be conducted on-site into distinct categories based on their composition, as follows:
- Excavated Materials;
  - Construction and Demolition (C&D) Materials;
  - Chemical Waste;
  - General Refuse; and
  - Contaminated Materials.
- 8.2 The reuse, recycling, treatment and disposal can be affected by proper segregation practices exercised on-site.
- 8.3 Based on engineering review, open cut excavation method instead of the sheet piling method in phase 2 has been adopted, a larger site area would be required for excavation and the excavation materials would be substantially greater than the estimation in the approved EIA, detailed programme and information are shown in **Appendix D**. In addition, excavated materials will be disposed off site due to limited space available and temporary on site sorting C&D materials area is shown in **Figure 8-1**.

### Excavated Materials

- 8.4 Excavated materials will be segregated from other material or waste to avoid contamination thereby ensuring acceptability at Public Fill Facility and avoiding the need for disposal at Landfill.
- 8.5 Prior to the re-use of inert excavated material, it is required that appropriate handling method in order to avoid air quality (dust generation) and water quality (run-off) impacts. Procedures to be followed during the storage of excavated materials would include:
- Wetting of the surface of stockpiles as necessary, particularly during dry periods;
  - Minimization of disturbance to stockpiles by enclosing and covering, particularly during prolonged wet, dry or windy periods; and
  - Separation of stockpiles from, and installation of silt traps into, the surface water drainage system
- 8.6 Excavated material will be transported within the site by trucks. During truck loading and excavated material transportation, consideration would be given to potential environmental impacts caused by fugitive dust emissions. Accordingly, prior to transfer and transport, excavated material will be dampened and / or covered as necessary.
- 8.7 For each and every vehicular trip transporting surplus excavated material off-site (Kai Tak Public Filling Area), a trip ticket will be provided by the disposal site.
- 8.8 The original of the trip ticket from the disposal site will be submitted to ArchSD. A copy of the trip ticket will also be maintained by the WM for reference.
- 8.9 Transportation routes are listed as follows:
- All excavated material will be disposed off site due to limited space available and will be transported to Kai Tak PFBP by trucks via Po Kong Village Road, Kwun Tong Road and Kai Tak Road.

### Construction and Demolition (C&D) Material

- 8.10 Low waste construction technologies together with careful planning will be adopted to avoid/minimise C&D material generation. Such measures include:
- Management of construction materials such that over-ordering, poor storage and maintenance,

- mishandling as well as improper operation procedures would be avoided;
- Restriction on use of hardwood such that softwood, metal props and/or proprietary steel system would be considered for falsework;
  - Formwork would be designed to maximize the use of standard wooden panels so that high reuse levels could be achieved. More durable alternatives such as steel formwork or plastic facing would be considered for repetitive areas to increase the potential for reuse;
  - C&D materials will be, as much as possible and practicable, separated into reusable items and materials to be disposed of or recycled. It will be conducted at the immediate working area to avoid loss or leakage during handling;
  - All C&D materials arising from or in connection with the construction and demolition work will be sorted on-site and be separated into different categories for disposal at landfills, public filling areas, or refuse and recycling as appropriate. The sorting area might be revised from time to time in order to suit the demolition and construction activities;
  - Useful materials such as timber, rubble and steel/metal will be segregated for reuse. For example concrete and masonry will be crushed and used as fill, steel reinforcing bar will be used by scrap steel mills, formwork and timber will be cleaned for reuse, off-cuts of reinforcement will be sorted into usable lengths and short off cuts stacked for scrap metal. Where it is no longer reusable, scrap steel and metal items will be collected by recycling companies;
  - Segregated material will be temporary stored at designated areas for reuse on site.
  - The remaining non-reusable C&D materials will be sorted on-site into the inert portion (e.g. rock, brick, bituminous material, concrete and soil, etc.) as the "public fill" and the non-inert portion (e.g. timber, vegetation and paper, etc.) as the "C&D waste". The public fill will be delivered to the Government approved Public Fill Facility. The hard inert construction and demolition (C&D) materials, such as broken rock and concrete which will be recycled into aggregates for reuse in construction works, would be delivered to Kai Tak PFBP. The non-recyclable portion of C&D waste, (containing no more than 50% by weight of inert content) would be tipped at TKO landfill. Recycling companies will be arranged to collect the recyclable portion of C&D waste.
  - Transportation routes are listed as follows:
    - Inert portion of C&D materials will be transported to Kai Tak PFBP by trucks via Po Kong Village Road, Kwun Tong Road and Kai Tak Road.
    - Non- inert and non recyclables portion of C&D materials will be transported to Tseung Kwan O (TKO) Landfill by trucks via Po Kong Village Road, Kwun Tong Road and Tseung Kwan O Tunnel.
    - Non- inert and recyclables portion of C&D materials will be reused on site.

### Chemical Waste

- 8.11 Chemical waste that is produced (mainly spent lubricating oil), as defined by Schedule 1 of the *Waste Disposal (Chemical Waste) (General) Regulation* (e.g. Used oil and spent solvent), would be handled in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* as follows:
- Packaging*
- 8.12 Chemical waste will be packed and held in containers of suitable design so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport.
- 8.13 Containers used for the storage of chemical wastes will 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.

### *Storage*

- 8.14 The Contractors will provide a suitable area for temporary storage of chemical waste. The storage area will be specially constructed and bunded, and located close to the source of waste generation as far as is practicable. The tentative location of the chemical waste storage area is provided in **Figure 8.1**.
- 8.15 The storage area for chemical wastes would:
- Be clearly labeled and used solely for the storage of chemical waste;
  - Be enclosed on at least 3 sides;
  - Have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of 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 of as chemical waste if necessary); and
  - Be arranged so that incompatible materials are adequately separated.

### *Disposal*

- 8.16 Chemical waste will be disposed of via a licensed waste collector:
- To an off site facility licensed to receive chemical waste such as the Chemical Waste Treatment Facility located in Tsing Yi; or
  - To a reuser of the waste, under the approval from the EPD.
  - Transportation and collection of chemical waste will be carried out by licensed waste collector.
- 8.17 A Spill Response Plan as attached in **Appendix E** would be developed and implemented to deal with any accidental spillage of chemicals on-site. The spill response plan would contain procedures for:
- Spill prevention and precaution;
  - Response actions; and
  - Spill clean up and disposal.

### **General Refuse**

- 8.18 Measures that encourage waste avoidance or minimisation include:
- Reducing the number of photo-copies to a minimum and by copying on both sides of paper for internal documents and external documents where appropriate;
  - Preventing over-ordering of office equipment and consumables;
  - Procuring green office equipment and consumables in terms of energy efficiency, recycled content and durability;
  - Providing drinking facility and encouraging employees to bring their own cup; and
  - Discouraging take-out food.
- 8.19 Additional measures that facilitate reuse/recycling and orderly disposal include:
- Deploying sufficient recycle bins at convenient locations to facilitate collection of recyclables including wasted aluminum cans, plastic bottles and papers;
  - Deploying sufficient refuse collection bin at convenient locations to facilitate collection of non-recyclables for disposal at landfills; and
  - Participating local collection scheme (e.g. scheme launched by District Board) if available.
- 8.20 Transportation route is listed as follows:
- General refuse will be transported to Tseung Kwan O Landfill by trucks via Po Kong Village Road, Kwun Tong Road and Tseung Kwan O Tunnel.

### **Contaminated Material**

- 8.21 The aforementioned DCM, PAHs and HMCM are classified as chemical waste. The packaging, labelling

and storage practices of chemical waste as stipulated in the previous paragraphs should also be applied to DCM, PAHs and HMCM. The packaging, labelling and storage practices for ACM would be prepared in due course in accordance with the *Code of Practice (COP) on Asbestos Control for Safe Handling of Low Risk ACM and Asbestos Work Using Full Containment or Mini Containment Method* published by EPD. A registered asbestos consultant would be supervised the abatement works. For the disposal of ACM, the contractor would observe the *COP on Handling, Transportation and Disposal of Asbestos Waste under the Waste Disposal (Chemical Waste) (General) Regulation*.

8.22 The quantity and quality of contaminated material disposal, treatment and handling methods were confirmed by the following reports and findings:

- Subsurface soil – confirmation analysis of subsurface soil
- Ash - Contaminated Materials Investigation Report (CMIR)
- Underground Fuel Tank – inspection findings and confirmatory soils sampling with Remediation Action Plan
- Asbestos - Asbestos abatement plan (AAP) & Asbestos Management Plan (AMP)

8.23 Transportation and collection of contaminated waste will be carried out by licensed collector.

#### Subsurface soil

8.24 In order to minimize the duration of contact between contaminated soil and workers, excavation works should be done within a short period of time. No excavation should be held during rainy days to avoid the migration of contaminants on site.

8.25 General construction practice should be exercised to control the spread of dust from the site to the nearby areas. Decontamination shall be properly executed to workers and vehicles before leaving the site. Vehicle wheel and body washing facilities should be provided on site at the exit point.

8.26 Excavated soil should be transported to designated landfill everyday. Due care must be exercised during the transportation of the excavated contaminated soil to the landfill for disposal. The soil should be properly contained and covered by impermeable sheet to avoid spillage during the transportation. Speed control of vehicles should be imposed to minimize dust emission. Suitable warning signs about the nature of the contaminated soil should be displayed on both the vehicle and the soil itself.

8.27 A closure assessment in the form of confirmatory testing was carried out to confirm the clean-up for the excavation of the contaminated location. One sample from the base of the excavation pit and four (if available) subsurface soil samples immediately to the north, south, east and west of excavation pit was collected in each location. Tin and lead should be analyzed in accordance with USEPA Method 6020 with detection limits of 0.5mg/kg and 1 mg/kg respectively.

8.28 Laboratory results from closure assessment indicated that no exceedance of Dutch B level was found and no further excavation would be required.

8.29 During the course of the site remediation works, the health and safety precautions and environmental mitigation measures stated in the CAR/RAP would be retained to minimize the potential impacts on workers and environment. In addition, the following basic health and safety measures should be implemented as far as possible:

- Set up a list of safety measures for site workers;
- Provide written information and training on safety for site workers;
- Keep a log-book and plan showing the contaminated zones and clean zones;
- Maintain a hygienic working environment;
- Avoid dust generation;
- Provide face and respiratory protection gear to site workers;
- Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and
- Provide first aid training and materials to site workers.



- 8.30 Contractor for the excavation works shall take note of the following points for excavation:
- Excavation profiles must be properly designed and executed.
  - Quantities of soil to be excavated must be estimated.
  - Temporary storage of soil at intermediate depot or on-site may be required. The storage site should include protection facilities to prevent leaching into the ground e.g. a liner may be required.
  - Supply of suitable clean backfill material is needed after excavation.
  - Care must be taken of the existing buildings and utilities.
  - Precautions must be taken to control of ground settlement.

#### Ash

- 8.31 As stated in the EP Clause 5.6 [Measures to Control Demolition of the Existing Crematorium Building] and PS.G.11 Clause 4.5.6 [Measures to Control Demolition of the Existing Crematorium Building] as well as Clause 4.6.4.4.5 [Demolition, Handling, Treatment and Disposal of Moderately Contaminated DCM and Moderately/Severely Contaminated HMCM/PAHCM from the Demolition of the Existing Crematorium], all contaminated materials shall be removed prior to the demolition of the existing crematorium unless contaminant could only be removed when access is granted to particular areas as the demolition progresses.
- 8.32 Special measures/methods for demolition, handling, treatment and disposal as laid down in the CMIR (Pilot mixing and TCLP-tests by a HOKLAS accredited laboratory were carried out to establish the appropriate ratio (1 : 1) of cement solidification to ash waste) shall be followed and fully implemented for both moderately contaminated DCM and moderately/severely contaminated HMCM/PAHCM to minimize the exposure to the contaminants during the demolition of cremation room.
- 8.33 Except the cremators/flue/chimney/air extractors, all removable items inside the crematorium building shall be removed as far as practicable to avoid obstructing the decontamination activities. Preliminary site decontamination of all debris shall be carried out using High Efficiency Particulate Air (HEPA) vacuum cleaner.
- 8.34 The cremation room where moderately contaminated DCM or moderately/severely contaminated HMCM/PAHCM is found shall be covered up to avoid fugitive emission. The following procedures shall be implemented at least 24 hours before the commencement of demolition:
- i. Enclosing the top portion of the chimney above the roof by a chamber lined with three layers polyethylene sheets;
  - ii. Constructing a 3-chamber decontamination unit at the entrance to the cremators/flue/chimney/air extractors. The 3-chamber decontamination unit shall comprise a dirty room, a shower room and a clean room, each room of a minimum size of 1m (W) X 1m (L) and be lined with 3 layers of fire retardant polyethylene sheet. The shower room shall be fitted with an adequate size tray to collect wash water.
  - iii. Warning signs in both Chinese and English should be put up at the entrance of the decontamination unit (at the clean end).
  - iv. Negative air filtration system shall be provided and equipped to minimize escape of contaminated ash wastes to the surroundings.
- 8.35 Full protection gear including disposable coverall (such as Tyvek) (with hood and shoe covers), nitrile gloves, rubber boots (or boot covers), and full-face positive pressure respirators equipped with a combination cartridge that filters particulate and removes organic vapour shall be provided and worn by all workers. Workers shall carry out decontamination procedures at the 3-chamber decontamination unit before leaving the work area.
- 8.36 The cremators/flue/chimney/air extractors shall be removed from top down starting from the chimney. Any ash or residues attached to the cremators/flue/chimney/air extractors shall be removed by scrubbing and HEPA vacuuming before and after the removal. For ash waste disposal, appropriate ratio (1 : 1) of cement solidification to ash waste was carried out.

- 8.37 After the scrubbing and HEPA vacuuming, the cremators/flue/chimney/air extractors are considered to be cleaned. Such building structures can be handled and disposed of as construction and demolition (C&D) materials.
- 8.38 Site personnel, tools, instrument and sealed wastes should be thoroughly decontaminated in the decontamination unit before leaving the work area. Detailed demolition and decontamination method statements shall be prepared by the Contractor for the Architects' Representative's approval.
- 8.39 In particular, DCM shall be stored in new and good condition steel drums of No. 16 gauge or heavier and fitted with removable lids as well as leak-proof polythene sacks in accordance with the *Code of Practice on the Handling, Transportation and Disposal of (PCB) Wastes*.
- 8.40 Besides the above requirements, Containers used for storage of chemical waste shall:
- i. Be suitable for the substance they are holding, resistant to corrosion, maintained in good condition and securely closed;
  - ii. Be bottom-lined to prevent generation of contaminated runoff;
  - iii. Be equipped with leachate sump to collect any leachate;
  - iv. Have a capacity of 200 litres unless specifications have been approved by the EPD; and
  - v. Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations.
- 8.41 The storage area for chemical waste shall:
- i. Be clearly labeled and used solely for the storage of chemical waste;
  - ii. Be enclosed on at least 3 sides;
  - iii. 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.
  - iv. Have adequate ventilation and air emissions control system that will provide a continuous negative pressure on the building, and will fully treat all air discharged from the building to prevent discharge of soil particles;
  - v. Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary);
  - vi. Have a leachate collection system that completely prevents any liquids that may have contacted the contaminated ash waste from being released to the environment without suitable treatment; and
  - vii. Be arranged so that incompatible materials are adequately separately.
- 8.42 The relevant requirements under the Occupational Safety and Health Ordinance (OSHO) (Chapter 509) and their subsidiary Regulations shall be strictly followed throughout the Project. During the course of demolition, the following basic health and safety measures shall be implemented:
- i. Set up a list of safety measures for site workers;
  - ii. Provide written information and training on safety for site workers;
  - iii. Keep a log-book and plan showing the contaminated zones and clean zones;
  - iv. Fence off the contaminated zones to restrict unauthorized entrance;
  - v. Maintain a hygienic working environment;
  - vi. Provide adequate and appropriate personal protective equipment and clothing such as air purifying respirator and Latex gloves to all workers engaged in the demolition of contaminated building structures;
  - vii. Prohibit smoking, eating and cooking inside the contaminated zones;
  - viii. Avoid dust generation;
  - ix. Provide first aid training and materials to site workers.
- 8.43 Health and Safety Plan (HASP) shall be prepared by the Contractor for Architects' Representative's approval to establish guidelines for the safety of personnel prior to the commencement of works.

All personnel shall follow the site safety regulations:

- i. Contact with contaminated or suspected contaminated surfaces should be avoided;
- ii. Alcoholic beverages and controlled substances shall not be allowed on-site;
- iii. All personnel shall be familiar with standard operating safety procedures and any additional instructions and information contained in the site HASP.

- iv. All personnel shall adhere to the site HASP. Personnel entering the site will be required to read and sign the HASP, demonstrating their concurrence with the requirements and their understanding of the safety procedures of the plan.
  - v. All personnel going on-site shall be adequately trained and thoroughly briefed on anticipated hazards, safety equipment to be employed, safety practices to be followed, emergency procedures and communications, and responsible safety personnel on-site.
  - vi. Entrance and exit locations shall be designated and posted, and emergency escape routes shall be delineated. Warning signals for site evacuation must be established and communicated to all personnel.
- 8.44 During transportation, the treated ash waste shall be properly contained and covered by impermeable sheet to avoid spillage. Dump truck shall never be overloaded. Speed control of vehicles should be imposed to minimize dust emission.
- 8.45 Vehicle wheel and body washing facilities at the Site's existing points shall be established and used.
- 8.46 Separate equipment shall be employed for transport of treated materials to prevent any potential for recontamination. A "contaminated" loader shall load only the contaminated materials into the decontamination system, and a "clean" loader shall be assigned to remove the treated materials at the outlets of the decontamination system.
- 8.47 The following environmental mitigation measures should be taken during immobilization:
- i. The loading, unloading, handling, transfer or storage of ash wastes should be carried out in enclosed system;
  - ii. Handling and mixing of cement shall follow Air Pollution Control (Construction Dust) Regulation to limit cement emission;
  - iii. The impacts of dust containing dioxin and/or heavy metals on air quality and workers' health shall be mitigated during the handling and transportation of the contaminated materials;
  - iv. The mixing process and other material handling activities should be properly planned and scheduled to avoid cross contamination;
  - v. Excessive addition of water shall be avoided during the process; and
  - vi. The mixing area should be sited as far as practicable to the nearby noise sensitive receivers.
- 8.48 The wash water collected from the decontamination unit and equipment decontamination as well as leachate from the leachate sump shall be stored properly in a sealed drum and collected by licensed chemical waste collector for disposal. Direct discharge of such wastewaters shall not be allowed without proper treatment.

#### Underground Fuel Tank

- 8.49 Underground fuel tank was found enclosed within a concrete casing and fuel-like liquid potentially leaked from the tank was contained. Concrete casing has been removed and disposed to public fill. Sludge or sediment remaining in the tank and pipeline as well as the fuel-like liquid (3 containers 200L each) outside the tank were removed for disposal as chemical waste to Dunwell Ind. (Holdings) Ltd.
- 8.50 C&D materials arising from underground fuel tank removal works will be sorted on-site and be stored at designated areas for disposal public filling areas. The sorting area might be revised from time to time in order to suit the demolition and construction activities.
- 8.51 C&D materials will be transported to Kai Tak PFBP by trucks via Po Kong Village Road, Kwun Tong Road and Kai Tak Road.
- 8.52 Chemical waste that is produced (fuel-like liquid potentially leaked from the tank), as defined by Schedule 1 of the *Waste Disposal (Chemical Waste) (General) Regulation* would be handled in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* as follows:
- Packaging*
- 8.53 Chemical waste will be packed and held in containers of suitable design so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport.

8.54 Containers used for the storage of chemical wastes will 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.

*Storage*

8.55 The Contractors will provide a suitable area for temporary storage of chemical waste. The storage area will be specially constructed and bunded, and located close to the source of waste generation as far as is practicable. The tentative location of the chemical waste storage area is provided in **Figure 8.1**.

8.56 The storage area for chemical wastes would:

- Be clearly labeled and used solely for the storage of chemical waste;
- Be enclosed on at least 3 sides;
- Have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of 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 of as chemical waste if necessary); and
- Be arranged so that incompatible materials are adequately separated.

*Disposal*

8.57 Chemical waste will be disposed of via a licensed waste collector:

- To an off site facility licensed to receive chemical waste such as the Chemical Waste Treatment Facility located in Tsing Yi; or
- To a reuser of the waste, under the approval from the EPD.
- Transportation and collection of chemical waste will be carried out by licensed waste collector.

8.58 A Spill Response Plan as attached in **Appendix E** would be developed and implemented to deal with any accidental spillage of chemicals on-site. The spill response plan would contain procedures for:

- Spill prevention and precaution;
- Response actions; and
- Spill clean up and disposal

Asbestos

8.59 Detailed quality and quantity of ACM present in the Asbestos Management Plan (AMP) with Asbestos Abatement Plan (AAP) by a registered asbestos consultant prior to the decommissioning work.

8.60 To facilitate the effective control of asbestos works, works area shall be vacated prior to any site preparation work and shall be fenced off to prevent entry of personnel who are not involved in the work and / or not properly protected from asbestos fibers.

8.61 For construction of the containment and decontamination unit, transparent plastic sheeting of 0.15 mm thickness manufactured from extruded low-density polythene to B.S. 4932:1973 or equivalent, shall be used and all polythene sheeting, transparent or colour-coded bags and containers used for packing of asbestos waste shall meet the specifications given in the "Code of Practice on the Handling, Transport and Disposal of Asbestos Wastes" by EPD.

8.62 HEPA vacuum cleaners shall be fitted with a high efficiency particulate air filter capable of trapping and retaining 99.97% of particles (asbestos fibres) greater than 0.3 micron mass median aerodynamic equivalent diameter.

- 8.63 All asbestos workers, supervisors and visitors upon entering the abatement area shall wear approved respirators and protective clothing, such as full face positive pressure respirators, Tyvak disposable coverall and overboots and nitrile glove.
- 8.64 All openings of the work zone such as windows, doors, grilles, power points, exhaust units, HVAC ducts, etc. shall be individually sealed off with 2 layers of polythene sheeting securely taped in place.
- 8.65 The registered asbestos contractor shall maintain a single entrance with a decontamination unit to each working zone for site entry and exit of all asbestos personnel's and a central 3-chamber airlock decontamination hygiene unit comprising dirty, shower and clean rooms shall be constructed in the entrance of working zone for workers' decontamination.
- 8.66 Warning notices and signs worded in English and Chinese characters shall be displayed around the working zone, on the temporary partitions, at entrances of decontamination units and in areas for asbestos waste storage. Warning notices to be posted shall comply with the requirements as specified in the "Code of Practice on Asbestos Control" prepared by EPD. Segregation and warnings shall remain throughout the abatement work.
- 8.67 Asbestos wastes shall be disposed of in accordance with the "Code of Practice on the Handling, Transport and Disposal of Asbestos Waste" issued by the Environmental Protection Department and only at the appointed disposal site designated by the Environmental Protection Department. The Registered Asbestos Contractor shall obtain the necessary permit and arrange a licensed collector for the dumping of the asbestos waste to the Government appointed disposal site.
- 8.68 The quantity and quality of contaminated material disposal, treatment and handling methods are subjected to the approved reports. Table 8.1 presents the summary of contaminated materials to be disposed of to the CWTC, landfill or treated on-site before disposal to landfill.

**Table 8.1 Summary of Contaminated Materials Disposal Locations**

Contaminated Materials	Estimated quantities	Disposal Location
Asbestos	The volume of insulation boards, exhaust pipe gaskets and protective clothing for landfill disposal : 80 m <sup>3</sup>	Dispose to landfill
Dioxin, PAH and Heavy metals contaminated ash wastes	3.1m <sup>3</sup> ash waste with cement mixing (1:1 cement mixing ratio will be adopted)	On-site treatment (mixing with cement) and dispose to landfill
Protection clothing of the workers, materials used for wet wiping, HEPA vacuum cleaner for DCM removal work, all polythene sheeting, decontamination facility and air movers	8 m <sup>3</sup>	Bagged and labeled as dioxin contaminated waste for landfill disposal
Heavy metals (Lead and Tin) contaminated soil	120 m <sup>3</sup>	Dispose to landfill
Fuel-like liquid outside the tank	600L (3 containers, 200L each)	Dunwell Ind. (Holdings) Ltd. as chemical waste

**Site Cleanliness and Tidiness**

- 8.69 The Contractor will perform Daily Cleaning and Weekly Tidying of the Site including the Public Cleaning Areas. The extent of the Public Cleaning Areas required for cleaning should include, but not limited to, areas within 3 metres on the peripheral outside the barriers or hoardings, or as determined by the Architect on-site for each work location based on the requirements of the Contract, and taking into account the actual site condition before work commences.

*Daily Cleanliness*

- 8.70 "Daily Cleaning" will include cleaning and tidying up after work of tools, equipment, unused materials, storage areas and common areas such as passageways, daily removal of waste materials from works areas, removal of any rubbish and debris dumped onto the Site by the public and, without derogating from the generality of the foregoing, would include, but not limited to, all the items subject to checking.
- 8.71 The Contractor would develop inspection checklist for Daily Cleaning for the Architect's approval. The inspection checklist would be reviewed and updated whenever there is a change in work nature or work location and re-submitted for the Architect's approval. The inspection checklist would include an assessment on the cleanliness and tidiness of all work locations, plus the Public Cleaning Areas. Items to be checked against for each work location would include, but not limited to, the following:
- Clearing of stockpiling and wastes arising from the work;
  - Maintenance of passageways, common accesses and public areas free of obstruction;
  - Proper storage and stacking of materials;
  - Proper placement and storage of tools and equipment after work;
  - Proper sorting, storage and/or disposal of waste materials in accordance with the WMP;
  - Proper securing of hoarding, barriers, guarding, lighting and signing of works;
  - Prevention and removal of water pond, stagnant water and flooding;
  - Conditions of cleanliness and tidiness of Site including Public Cleaning Areas in the perspective of the general public; and
  - Other cleaning requirements as instructed by the Architect.
- 8.72 The Contractor will assign a person to inspect the Site after each Daily Cleaning. The assigned person will check and ensure the cleanliness and tidiness of the Site, complete the inspection checklist, record the areas requiring improvements, and take photographs of areas where cleaning and tidying up works have been done and where improvement actions are required.
- 8.73 The Contractor should notify the Architect the time schedule for Daily Cleaning and the name of assigned person responsible for inspection and checking after each Daily Cleaning.
- 8.74 The Contractor should submit, in the morning of the day (which is not a General Holiday) following a Daily Cleaning, the inspection checklist, records and photographs prepared for the Architect's checking and record. The records of the daily cleanliness checklists, records and photographs will also be available on site for relevant parties to inspect.
- 8.75 The Architect may carry out inspection and surprise checks to verify the Contractor's performance on cleanliness and tidiness of the Site before the noon of the day (which is not a General Holiday) following a Daily Cleaning. The Architect should notify the Contractor and record in the Site Diary for any non-payment of the item for "Daily Cleaning" on that day in question and the areas of dissatisfaction for improvement by the Contractor.
- 8.76 The Contractor should, in the morning of everyday and before work commences, inspect and remove any rubbish and debris that may be littered by the public over the night within the Site including the Public Cleaning Area prior to the inspection by the Architect.

*Weekly Tidying*

- 8.77 "Weekly Tidying" should include the cleansing and tidying up of the common areas and accesses, cleaning and/or re-conditioning of hoardings, barriers, guarding, lighting, signage and/or traffic cones, cleansing of external covers for plant and equipment, hoardings, as well as Site as a whole, are clean and tidy in the perspective of the general public and, without derogating from the generality of the

foregoing, would include, but not limited to, all the items subject to checking.

- 8.78 The Contractor should develop inspection checklist for the Weekly Tidying for the approval of the Architect. The inspection checklist would be reviewed and updated whenever there is a change in work nature or work location and re-submitted for approval by the Architect. The inspection checklist would include an assessment on the cleanliness and tidiness of the Site conditions at various work locations, including the Public Cleaning Areas. Items to be checked against each work location would include, but not limited to, the following:
- Thorough cleansing of passageways, common accesses and public areas;
  - Re-organizing of storage materials for better utilization of storage spaces and safe stacking if appropriate;
  - Maintenance of re-conditioning of tools and equipment;
  - Cleansing of external covers for plant and equipment;
  - Collection and removal of disposed waste materials off site in accordance with the WMP;
  - Cleansing, re-conditioning and/or replacement of hoarding, barriers, guarding, lighting, and signage of works to good working condition;
  - Clearing of drains and channels to prevent flooding; and
  - Other cleansing requirements as instructed by the Architect from the perspective of the general public.
- 8.79 The Contractor should assign a person to inspect the Site after each Weekly Tidying. The assigned person should check and ensure the overall cleanliness and tidiness of the Site, complete the inspection checklist, record the areas requiring improvements, and take photographs of areas where cleaning and tidying up actions have been done and where improvement actions are required.
- 8.80 The Contractor should notify the Architect the time schedule for Weekly Tidying and the name of assigned person responsible for the inspection and checking after each Weekly Tidying.
- 8.81 The Contractor should submit, in the morning of the day (which is not a General Holiday) following a Weekly Tidying, the inspection checklist, records and photographs prepared for the Architect for checking and record. The records of the daily cleanliness checklists, records and photographs would also be available on site for relevant parties to inspect.
- 8.82 The Architect should check and inspect the overall cleanliness and tidiness of the Site on the day (which is not a General Holiday) following the Weekly Tidying. The Architect should advise the Contractor whether his performance is to his/her satisfaction, or if not, where improvement actions are required.
- 8.83 The Contractor should promptly rectify the defects identified by the assigned person and/or the Architect. The Contractor should not be entitled to any payment for the item for "Weekly Tidying" for a Cleaning Week Day if the Contractor fails to rectify the identified defects pursuant to Section 8.28 and 8.31 above to the satisfaction of the Architect before the end of the day (which is not a General Holiday) following the Cleaning Week Day.
- 8.84 Daily Site Cleanliness Checklist and Weekly Site Tidying Checklist are presented in **Appendix H** and **Appendix I** respectively.
- 8.85 The Contractor should in the morning of every Cleaning Week Day before work commences inspect and remove any rubbish and debris that might be littered by the public over the night within any area which cleanliness and tidiness the Contractor is required to maintain under this Contract before the inspection by the Architect.

## 9. WASTE MONITORING AND AUDIT

### Trip Ticket System

- 9.1 The Contractor will use a Construction and Demolition Material Disposal Delivery Form (the Form) for each and every vehicular trip transporting C&D material off site. The Contractor would complete all relevant details on the Disposal Delivery Form (DDF). A specimen of the DDF is contained in **Appendix**

**C.**

- 9.2 Prior to the vehicle leaving the site, the Contractor will present to the Architect the completed Form. The Architect will insert the Time of Departure and stamp the Form. The Architect should retain a copy of the Form and return the original to the Contractor. The Form should be carried on board the vehicle at all times throughout the vehicular trip.
- 9.3 For each vehicular trip, the Contractor will present to the operator of the Designated Public Filling Facility or Landfill (the Operator) the stamped Form prior to the disposal of C&D material. The operator will stamp and return the Form to the Contractor together with a computer print-out receipt to acknowledge the disposal of public fill. The Contractor will submit the stamped Form and the original receipt to the Architect within 2 working days of the vehicular trip. The copies of the Form and the receipt will be maintained on site for future reference.
- 9.4 For each trip of off site disposal of chemical waste, trip tickets issued for every chemical waste collection made by the licensed waste collection should be copied to the Architect and the original should be maintained on site for future reference.
- 9.5 The Contractor acknowledges and would permit the Architect to request and obtain information from the operator of the Designated Public Filling Facility/Landfill verifying the receipt and the accuracy of the information on the receipt.
- 9.6 All C&D material should become the property of the Contractor when it is removed from the Site.

**Inspection Programme**

- 9.7 The objectives of weekly environmental site inspection are:
- To ensure that the waste arising from works are handled, stored, collected, transported and disposed of in an environmentally acceptable manner;
  - To ensure that the handling, storage, collection and disposal of waste arising from the demolition works comply with the relevant requirements under the Waste Disposal Ordinance and its regulations; and
  - To encourage the reuse and recycling of materials.
- 9.8 The ET, with assistance from the WM, would audit the waste management practice during the weekly environmental site inspection to evaluate the overall performance of the implementation of the WMP and ensure the appropriate control measures are properly implemented. Immediately after the weekly inspection, a summary table of follow up actions should be agreed. A sample of the Checklist for Weekly Environmental Site Inspection Checklist is provided in **Appendix F**. The results of the waste management audits will be reported in the monthly environmental monitoring and audit reports.
- 9.9 In the event of any identified non-compliance against the provisions of this WMP, actions will be taken in according to the Event and Action Plan for non-compliance as shown in Table 9.1. Non-compliance is included the following situations:
- Infringement of legal requirements with respect to waste issues.
  - Persistent outstanding of control measures stated in the WMP as identified during the site inspection or audit by the ET/IEC.



**Table 9.1 Event Action Plan for Non-compliance**

Step	Day	Action	Contractor /ET	Architect	IEC
1.	1	Create a new non-compliance record within 1 working day after making an observation during a site audit accompanied by Project Manager or his delegate. ET sends a Notice of Non-Compliance (NNC) to the Contractor and copy to the Architect and IEC. The NNC would include the observations and the reasons for non-compliance.	■		
2.	2	Propose corrective actions within 1 working day after the receipt of the NNC.	■	□	
3.	2	Review and agree with the proposed corrective actions and make additional recommendations as required.	■	□	□
4.	2	Implement the proposed corrective actions once they have been agreed.	■		
5.	-	Check the implementation of the corrective actions at the next site audit. Close the non-compliance record if the implementation of the corrective actions is satisfactory.	■	□	
6.	-	Propose preventive actions within 3 working days after the closure of the non-compliance record.	■	□	

■ Action party

□ Comments on the non-compliance record where applicable.

### Record Keeping and Reporting

#### General

- 9.10 The Contractor should keep adequate and proper records such as delivery dockets and measurement records relating to the implementation of the WMP. The records would include trip-ticket, completed inspection checklists and training records.

#### Monthly Summary Waste Flow Table

- 9.11 As part of the WMP, a mechanism should be established to record the quantities of C&D materials generated each month, using the monthly summary "Waste Flow Table" (WFT) as given in **Appendix G**. The monthly summary WFT should be completed and submitted to the Architect by not later than the 15<sup>th</sup> day of each month following the reporting month, or if it is a General Holiday, the day following the General Holiday.

#### Yearly Summary Waste Flow Table

- 9.12 Estimated quantities of C&D materials that will be generated each year from the site should also be provided by the Contractor, using the yearly summary WFT as given in **Appendix G**. The yearly summary WFT covering the whole construction period will be included in the WMP, and thereafter updated on a half-yearly basis and submitted to the Architect by not later than 1<sup>st</sup> of June and December of each year, or if it is a General Holiday, the day following the General Holiday, throughout the construction period in order to account for the revised works programme and latest outturn on the quantities of C&D materials generated from the site.

## 10. TRAINING

- 10.1 The Project Manager should arrange the WM and other site personnel to attend the training on waste management organized by training institutes or organizations (e.g. the Business Environment Council, Hong Kong Polytechnic University, etc.) as considered appropriate by the Architect if they have not

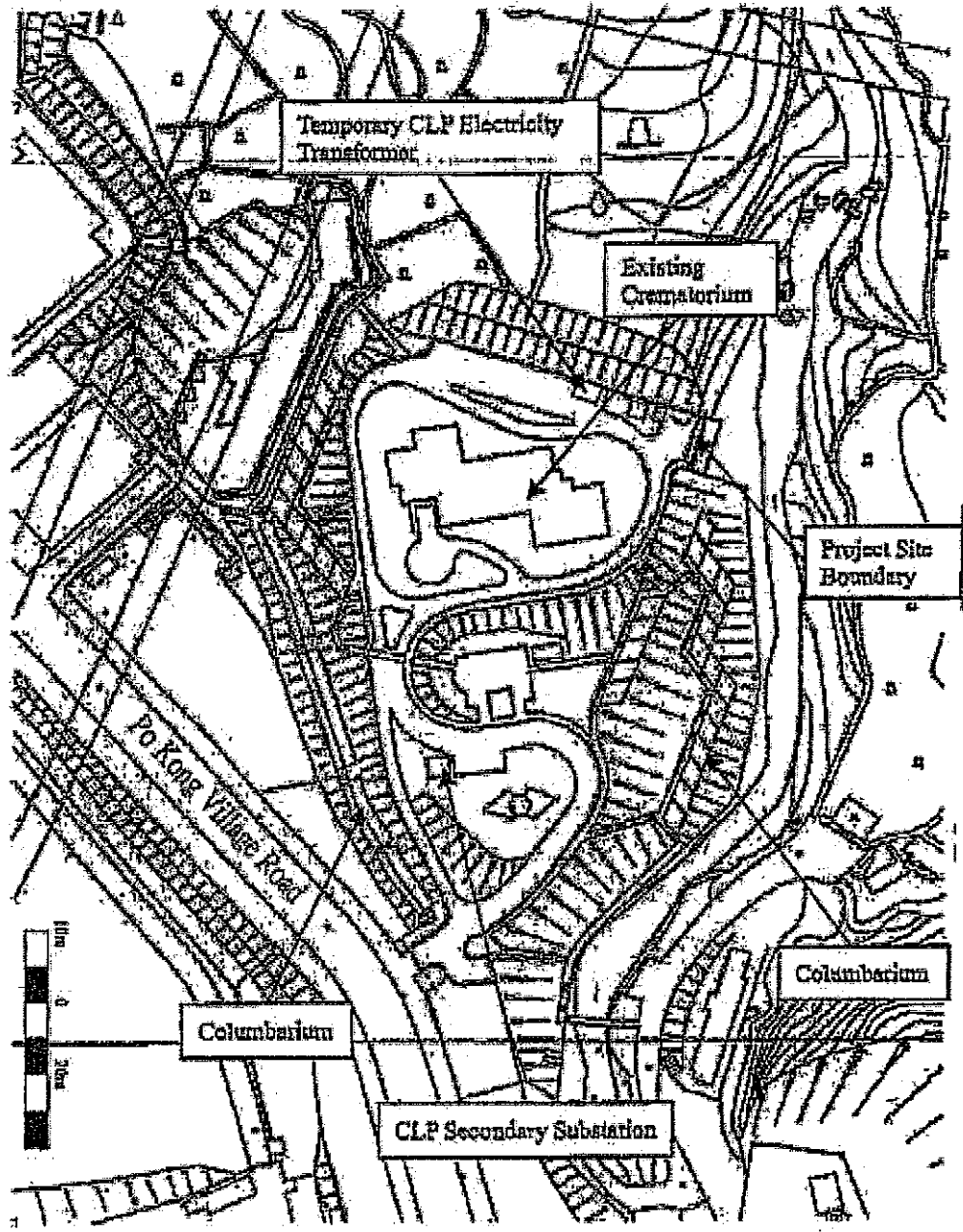
attended similar courses before.

- 10.2 The WM should arrange and provide training on waste management in the site-specific induction and its refresher training for all persons employed by the Contractor or his sub-contractor on the Works or in connection with the Contract. The training should cover the waste management policy, targets, measures for on-site sorting of C&D materials and measurement on waste management performance on Site.
- 10.3 The WM is allowed to develop and provide toolbox talks for the topic on on-site sorting of C&D materials to promote the worker's awareness on handling, sorting, reuse and recycling of C&D materials. Training material for environmental toolbox talks with regard to waste management should be prepared by the WM and disseminated to supervisor/foremen and subcontractor's representatives for conducting tool-box talks to all workers or labourers at regular intervals.

**FIGURE 1.1**

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Title	Contract No. : SS M353 Re-provisioning of Diamond Hill Crematorium Layout of Work Site	Scale	N.T.S.	Project No.	S07904	
		Date	2005	Figure No.	1.1	

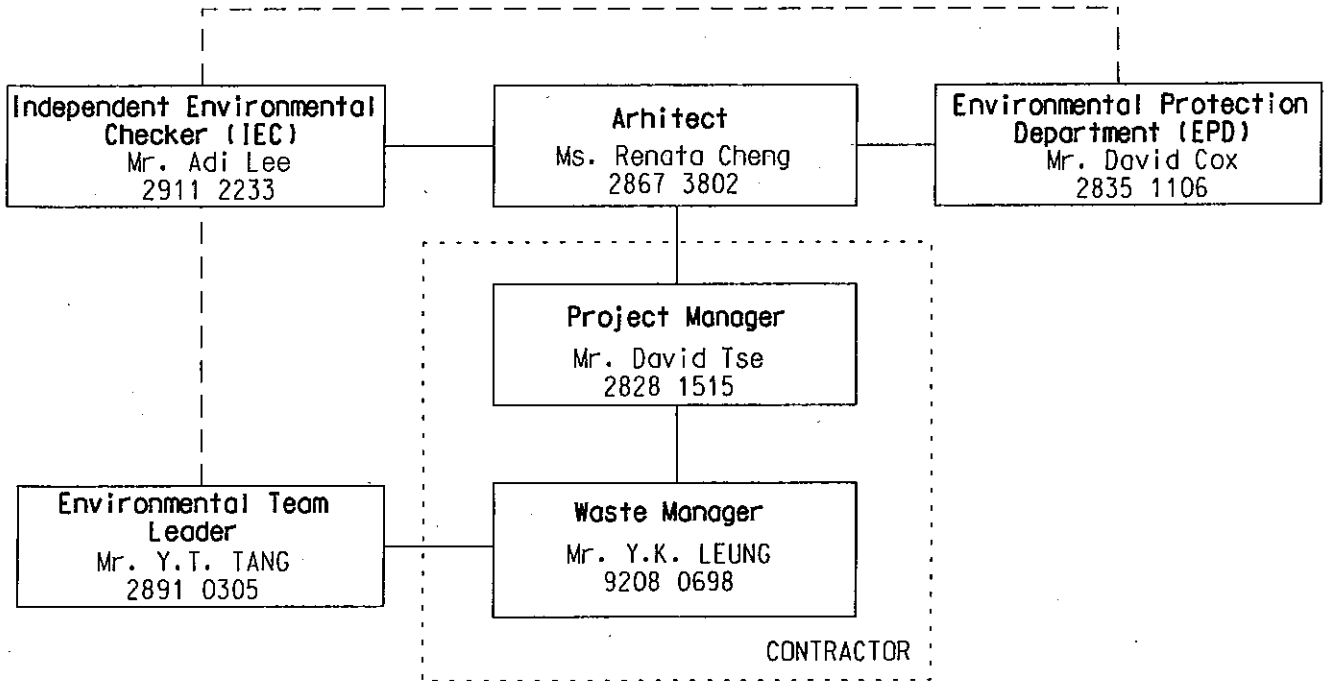
**FIGURE 6.1**

# Project Organization for Waste Management

Legend:

———— Direct Communication

- - - - Liaison



**Maunsell**  
ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD.  
茂盛環境管理顧問有限公司

CONTRACT NO: SS H333  
REPROVISIONING OF CREMATORS  
AT DIAMOND HILL CREMATORIUM  
**PROJECT ORGANIZATION FOR  
WASTE MANAGEMENT**

SCALE  
比例 N.T.S.

DATE  
日期 OCT 2004

JOB No.  
項目編號 S07904

DRAWING No.  
圖號 6.1

**FIGURE 8.1**

Waste Sorting Area & Storage Area  
 Chemical Waste Storage Area

SITE LAYOUT PLAN(SECTION 1)



- WATER TREATMENT PLANT
- ▨ WHEEL WASH AREA
- GUARD HOUSE/WORKER'S ENTRANCE
- ⊗ TOWER CRANE
- ▧ FL OPC FOR REFUSE DISPOSAL
- ▩ FL OPC(ABOVE) FOR REFUSE DISPOSAL

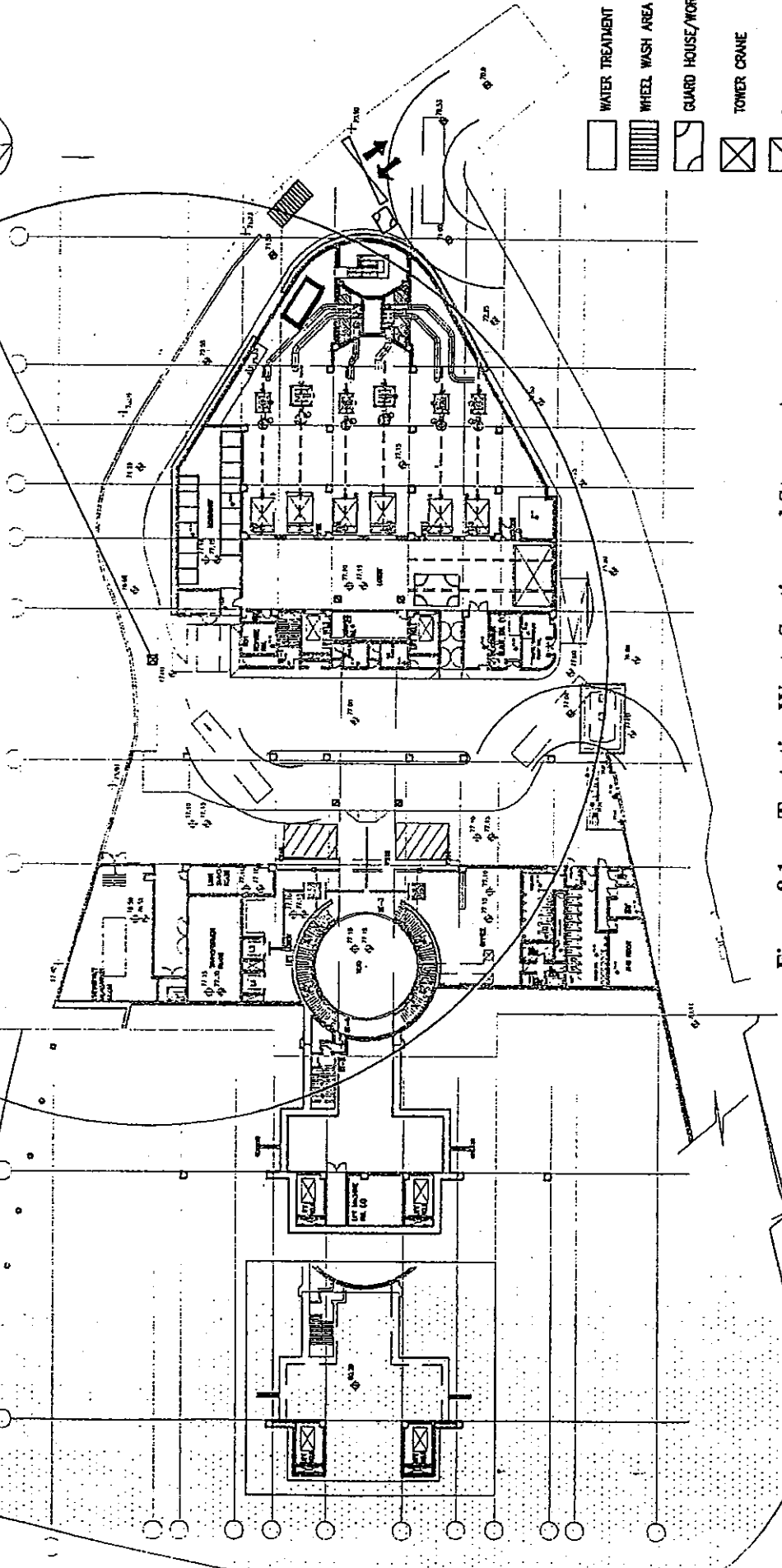


Figure 8.1 Tentative Waste Sorting and Storage Area



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**APPENDIX A**

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### Contacts of Key Waste Management Personnel

Party	Name	Telephone No.	Fax No.
<b>Environmental Protection Department</b>			
SEPO	Mr. David Cox	2835 1106	2591 0558
EPO	Ms. Marlene Ho	2835 1186	2591 0558
EPO (LCO)	Mr. Charles Wu	2117 7540	2756 8588
<b>Architect</b>			
Architectural Services Department			
Project Architect	Ms. Renata Cheng	2867 3802	2524 8194
<b>Independent Environmental Checker</b>			
Hyder Consulting Limited			
IEC	Mr. Adi Lee	2911 2233	2805 5028
Assistant to IEC	Ms. Winnie Ma	2911 2912	2805 5028
<b>Contractor</b>			
China Resources Construction Company Limited			
Project Manager	Mr. David Tse	2828 1515	2827 2921
Waste Manager	Mr. Y. K. Leung	9208 0698	2827 2921
Engineer	Mr. Frankie Cheung	9259 4546	2827 2921
Foreman	Mr. C. M. Wong	9219 8021	2827 2921
<b>Environmental Team</b>			
Maunsell Environmental Management Consultants Limited			
ET Leader	Mr. Y.T. Tang	3105 8686	2891 0305
Audit Team Leader	Ms. Kenneth Lau	3105 8686	2891 0305
Monitoring Team Leader	Mr. Eddie Yang	3105 8686	2891 0305

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**APPENDIX B**

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### Environmental Policy

China Resources Construction Company Limited (CRCC), a building contractor, is committed to control and maintain a high standard of environmental protection.

It is our goal to support environmental protection and prevention of pollution in balance with socio-economic needs and address the needs of a broad range of interested parties.

Through the implementation of Environmental Management System which based on the requirements of the ISO14001:1996 international standard, CRCC is committed to:

- Carrying out the construction works in compliance with all relevant environmental regulatory and statutory requirements, and with other requirements to which CRCC subscribes;
- Adopt innovative construction technologies and effective utilization of resources to minimize pollution and wastage;
- Educate the employees and subcontractors to enhance environmental awareness; and
- Seeking continuous improvement in environmental performance by setting appropriate objectives and goals throughout the Company.

To reflect the current needs of the environmental protection issues, this Environmental Policy shall be reviewed annually or when necessary by top management and each CRCC staff is being addressed on the importance of this policy.

Terence Fung  
Deputy Managing Director

01 January 2004

Revision No.: 0

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**APPENDIX C**

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入帳票編號: 02103444  
Chit No.:

選擇「」一個訂明設施:  
Tick () One Prescribed Facility:  
 堆填區 Landfills  
 篩選分類設施 Sorting Facilities  
 公眾填料接收設施 Public Fill Reception Facilities  
 離島廢物轉運設施 Outlying Islands Transfer Facilities  
車牌號碼 Vehicle Registration Mark:

入帳票編號: 02103444  
Chit No.:

選擇「」一個訂明設施:  
Tick () One Prescribed Facility:  
 堆填區 Landfills  
 篩選分類設施 Sorting Facilities  
 公眾填料接收設施 Public Fill Reception Facilities  
 離島廢物轉運設施 Outlying Islands Transfer Facilities  
車牌號碼 Vehicle Registration Mark:

使用日期:  
Date of Use:

簽發人:  
Issued by:

建築廢物產生地點:  
Construction Waste Generated Site:  
BUILDING SITE AT 199 PO KONG VILLAGE ROAD.

使用日期:  
Date of Use:

簽發人:  
Issued by:

帳戶名稱:  
Name of the Account-holder:  
CHINA RESOURCES  
CONSTRUCTION COMPANY,  
LIMITED

帳戶編號:  
Account No.: 5000254

甲部份: 由帳戶主保留  
Part A: retained by Account Holder

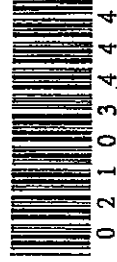
帳戶編號:  
Account No.: 5000254

乙部份: 由廢物運輸商保留  
Part B: retained by Waste Transferer

香港法例第354章廢物處理條例  
廢物處理(建築廢物處理費)規例  
Waste Disposal Ordinance (Chapter 354)  
Waste Disposal (Charges for Disposal of Construction Waste) Regulation

載運入帳票

CHIT



車牌號碼:  
Vehicle Registration Mark:

有效期至:  
Valid Until: 24/08/2008

建築廢物產生地點:  
Construction Waste Generated Site:

BUILDING SITE AT 199 PO KONG VILLAGE ROAD.

帳戶名稱:

Name of the Account-holder:  
CHINA RESOURCES CONSTRUCTION COMPANY  
LIMITED



EDD  
Civil Engineering and  
Development Department

丙部份: 由政府保留  
Part C: retained by Government

B 612783

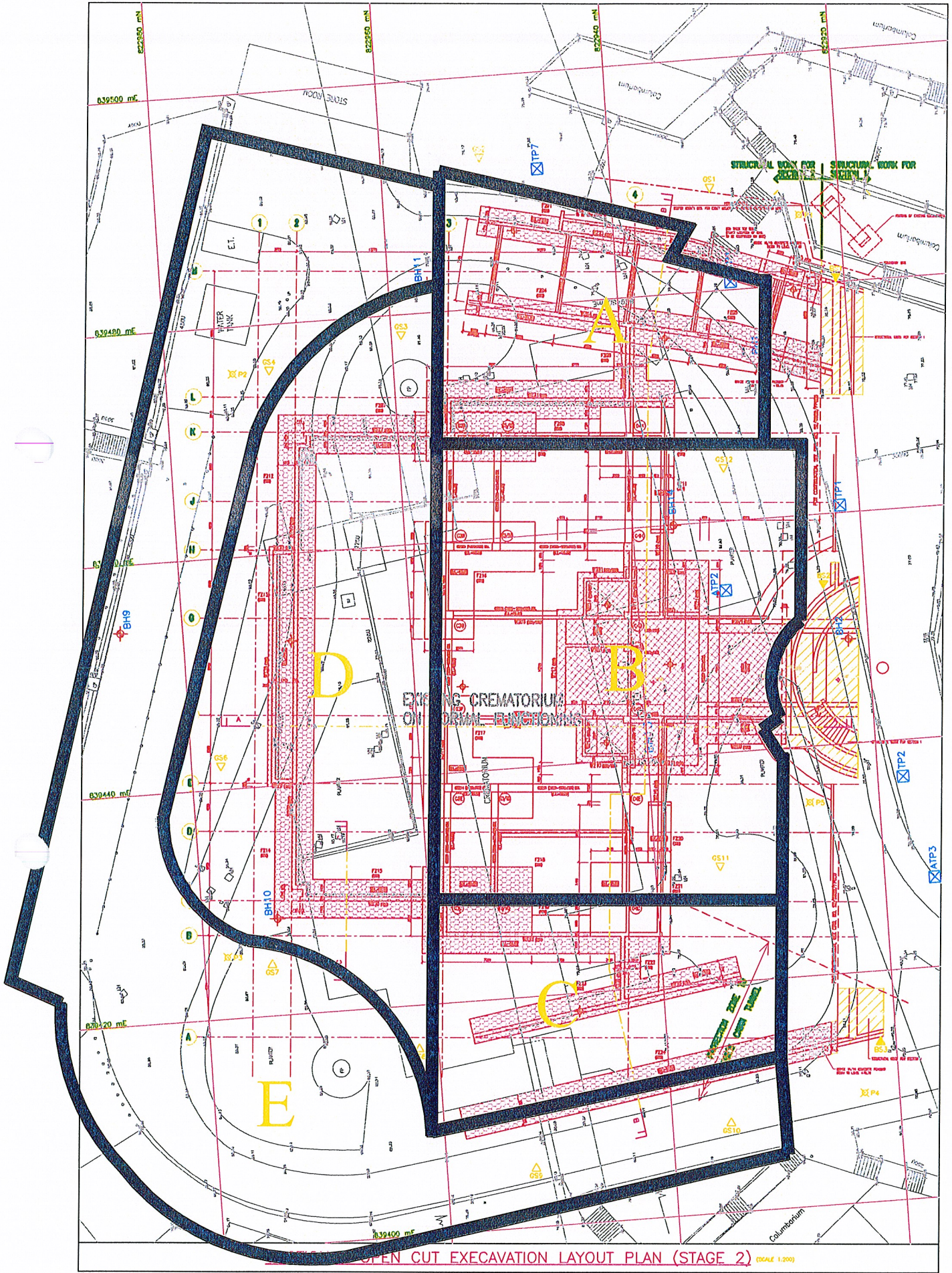
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**APPENDIX D**

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OPEN CUT EXCAVATION LAYOUT PLAN (STAGE 2) (SCALE 1:200)



Appendix D

Programme and information on Phase 2 Open Cut Method

	Waste Generation Period	Waste Generation Operation	Estimated quantities of excavated materials(m <sup>3</sup> )
New Building Construction (Zone B,C,D)	12-10-07 - 20-10-07	Excavation work from existing ground level (+80.2) to +78.2 approx	6400
	07-11-07 - 22-11-07	Open cut from level +78.2 to 71.65	20500
Zone A Construction	19-7-07 - 11-8-07	Excavation work from existing ground level (+80.2) to +78.2 approx	1400
The ramp near site entrance (Zone E)	29-4-08 - 16-5-08	Open cut from level +78.2	1000
Demolish the existing sepatated the brick wall (Phase 1 & 2)	12-11-08 - 25-11-08	n/a	20

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**APPENDIX E**

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# **SPILL RESPONSE PLAN**

## **1. SPILL PREVENTION AND PRECAUTION**

### **General Precaution**

- Avoid disorder and storage of unnecessary materials in working areas.
- Prevent obstructions and tripping hazards
- Prepare all required equipment prior to commencement of work
- Prohibit smoking at or near the dangerous goods stores

### **Storage Precautions**

- Use solid and impermeable enclosure walls or storage containers
- Reduce the danger of falling of stacked containers
- Provide tightly closed lips to avoid leakage of chemical wastes to further reduce the danger of container falling
- Store compatible chemical wastes in the same storage area
- Inspect the storage area to detect if any leakage or defective containers on a regular basis
- Use suitable containers, which are resistant to the stored chemical wastes, to avoid leakage or spillage
- Check the conditions of the storage containers regularly
- Identify and provide suitable notices in storage area
- Provide adequate ventilate in the storage area
- Prohibit open flame and smoking near the chemical waste storage area
- Prevent mixing of incompatible chemical wastes
- Carry Out mixing of compatible chemical wastes outside if the storage area
- Store large and heavy containers on the floor as far as possible or avoid storage of these containers higher than 2 feet from the floor
- Keep chemical waste containers below eye level
- Provide adequate space for handling of the containers
- Maintain a log of chemical wastes
- Separate incompatible chemicals from each other

### **Transfer and Transport Precautions**

- Consider the size of the container to avoid overfilling
- Use pumps to transfer chemical wastes instead of simple pouring
- Provide containment structure to hold the chemical wastes when leakage or spillage of chemical waste occurs
- Use safety and suitable labelled containers
- Use suitable carriers to transfer the chemical waste containers from one location to another
- Employ licensed waste collectors to be responsible for chemical waste transport

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**APPENDIX F**

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# EM&A Environmental Audit Checklist

Project: Contract No. SS M333  
Reprovisioning of Diamond Hill Crematorium

Inspection  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Inspected by  
 Client: ArchSD  
 IEC: Hyder Consulting Ltd.  
 ET: ENSR  
 Contractor: CRC

## PART A: GENERAL INFORMATION

Weather:  Sunny  Fine  Cloudy  Rainy

Temperature: \_\_\_\_\_ °C

Humidity:  High  Moderate  Low

Wind:  Strong  Breeze  Light  Calm

## PART B: SITE AUDIT

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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### Section 1: Water Quality

01	Is an effluent discharge license obtained for the Project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.02	Is the effluent discharged in accordance with the discharge licence?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.03	Is the discharge of turbid water avoided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.04	Are there proper desilting facilities in the drainage systems to reduce SS levels in effluent?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.05	Are there channels, sandbags or bunds to direct surface run-off to sedimentation tanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.06	Are there any perimeter channels provided at site boundaries to intercept storm runoff from crossing the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.07	Is drainage system well maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.08	As excavation proceeds, are temporary access roads protected by crushed stone or gravel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.09	Are temporary exposed slopes properly covered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10	Are earthworks final surfaces well compacted or protected?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.11	Are manholes adequately covered or temporarily sealed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	Are there any procedures and equipment for rainstorm protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.13	Are wheel washing facilities well maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.14	Is runoff from wheel washing facilities avoided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.15	Are there toilets provided on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.16	Are toilets properly maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.17	Are the vehicle and plant servicing areas paved and located within roofed areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.18	Is the oil leakage or spillage avoided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.19	Are there any measures to prevent leaked oil from entering the drainage system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.20	Are there any measures to collect spilt cement and concrete washings during concreting works?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.21	Are there any oil interceptors/grease traps in the drainage systems for vehicle and plant servicing areas, canteen kitchen, etc?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.22	Are the oil interceptors/grease traps maintained properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

# EM&A Environmental Audit Checklist

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
4.04	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.08	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 5: Landscape &amp; Visual</b>						
5.01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.03	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.04	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 6: Others</b>						
6.01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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**APPENDIX G**

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Name of Department: ArchSD CED / DSD / EMSD / HyD / TDD / WSD

Contract No.: SS M333

**Monthly Summary Waste Flow Table for \_\_\_\_\_ (year)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly				Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated (in '000 m <sup>3</sup> )	Broken Concrete (see Note 4) (in '000 m <sup>3</sup> )	Reused in the Contract (in '000 m <sup>3</sup> )	Reused in other Projects (in '000 m <sup>3</sup> )	Disposed as Public Fill (in '000 m <sup>3</sup> )	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 3) (in '000 kg)	Chemical Waste (in '000 kg)	Others, e.g. general refuse (in '000 m <sup>3</sup> )
Jan										
Feb										
Mar										
Apr										
May										
Jun										
Sub Total										
Jul										
Aug										
Sep										
Oct										
Nov										
Dec										
Sub Total										

Notes:

- (1) The performance targets are given in Sub-clause 2(5) (c) in Clause 1.63 in Part 14 of the Employer's Requirements.
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
- (4) Broken concrete for recycling into aggregates



Name of Department: **ArchSD CED / DSD / EMSD / Hyd / TDD / WSD**

Contract No. :

SS M333

### Yearly Summary Waste Flow Table

Year	Estimated Annual Quantities of Inert C&D Materials (in '000 m <sup>3</sup> )						Estimated Annual Quantities of C&D Wastes														
	Total Quantity Generated		Broken Concrete (see Note 4)		Reused in the Contract		Reused in other Projects		Disposed as Public Fill		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. general refuse		
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	
2007																					
2008																					
2009																					
2010																					
2011																					
2012																					
2013																					
2014																					
2015																					
2016																					
Grand Total	0		N/A		0		N/A		0		0		0		0		0		0		0

- Notes:
- (1) The performance targets are given in Sub-clause 2(5) (c) in Clause 1.63 in Part 14 of the Employer's Requirements.
  - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (4) Broken concrete for recycling into aggregates.

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APPENDIX H

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**Site Cleanliness Checklist (Daily)****地盤清潔檢查表(每日)**

檢查日期:

時間:

Date of Inspection: \_\_\_\_\_

Time: \_\_\_\_\_

地點:

檢查員:

Location: \_\_\_\_\_

Inspected by: \_\_\_\_\_

項目 Item	每日地盤清潔要求 Daily Site Cleanliness Requirement	*遵守? *Compliance?		N/A	重新檢查 Re-inspection
		Yes	No		
1	通道及公共地方沒有阻塞? Are passageways, common accesses and public areas free of obstruction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	通道及公共地方是否清楚分開? Are passageways, common accesses and public areas clearly demarcated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	工地入口是否清潔及整齊? Are all site entrances clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	工地入口是否有沖洗車輪設施? Are all site entrances provided with wheel washing facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	易生塵埃地方是否有噴水設施或其他防塵設施? Are water spraying facilities or other dust suppression means deployed in dusty site areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	未用之物料是否已整齊排列及儲存於適當地方? Are unused materials piled up and stored in appropriate areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	儲存未用物料之地方是否清潔及整齊? Are the stockpiling and storage areas for unused materials clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	易生塵埃的物料堆有否覆蓋? Are stockpiles of excavated materials properly covered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	工具是否清潔及恰當地儲藏? Are tools cleaned and returned to appropriate storage places or tool boxes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	儲藏工具之地方是否清潔及整齊? Are the storage places and tool boxes for tools clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	儀器是否清潔及恰當地放回適當之儲存地方? Are equipment cleaned and set back to appropriate storage/parking locations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	儲存儀器之地方是否清潔及整齊? Are the storage and parking locations for equipment clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	廢物已根據廢物管理計劃分類,儲存及清理? Proper sorting, storage and/or disposal of waste materials in accordance with the Waste Management Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	地盤之廢物是否已清理? Are waste materials including rubbish removed from the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	圍板,欄河,照明,指示是否妥善安放? Are hoarding, barriers, guarding, lighting and signing of works properly secured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	積水已清除及防止水災? Are water ponds, stagnant water and flooding prevented and removed from the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17	渠道及排水渠是否沒有阻塞及保持良好狀態? Are drains, gullies free from blockage and maintained in good working order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18	地盤範圍放置足夠廢物箱/籃? Are there enough refuse collection tanks /bins available on site areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Signatures:

Contractor's Representative(s)

Checked by:

(Name: \_\_\_\_\_)

(Name: \_\_\_\_\_)

\*不遵守項目之跟進工作必須即日完成及重新檢查

\*Non compliance item(s) shall be rectified on the same day and arrange re-inspection.

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**APPENDIX I**

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**Site Tidying Checklist (Weekly)****地盤整理檢查表(每週)**

檢查日期:

時間:

Date of Inspection: \_\_\_\_\_

Time: \_\_\_\_\_

地點:

檢查員:

Location: \_\_\_\_\_

Inspected by: \_\_\_\_\_

項目 Item	每週地盤整理要求 Weekly Site Tidying Requirement	*遵守? *Compliance?		N/A	重新檢查 Re-inspection
		Yes	No		
1	通道及公共地方已全面清潔? Thorough cleansing of passageways, common accesses and public areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	儲存之物料已適當地重新整理以更有效地使用儲存地方? Re-organizing of storage materials for better utilization of storage spaces if appropriate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	儲存未用物料及儲泥地方已清潔? Cleansing of stockpiling and storage areas of unused materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	工具已有適當保養及修復? Maintenance and re-conditioning of tools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	工具已清洗? Cleansing of tools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	儲存工具及工具箱之地方已清潔? Cleansing of storage places of tools and tool boxes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	機器設備已有適當保養及修復? Maintenance and re-conditioning of equipment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	機器設備之外殼已清洗? Cleansing of external covers of equipment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	儲存及放置機器設備之地方已清潔? Cleansing of storage and parking locations of equipment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	機械設備之外殼已清洗? Cleansing of external covers of plant?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	廢物已根據廢物管理計劃收習及清走? Collection and removal of disposed waste materials off site in accordance with the Waste Management Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	圍板,欄河,照明,指示已清洗及修復? Cleansing, re-conditioning and/or replacement of hoarding, barriers, guarding, lighting, and signage of works to good working condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	渠道及排水渠是否已清理以防止氾濫? Clearing of drains and channels to prevent flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	有否進行每日地盤清潔檢查? Are daily site cleanliness inspections carried out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Signatures:

Contractor's Representative(s)

Checked by:

(Name: \_\_\_\_\_)

(Name: \_\_\_\_\_)

\*不遵守項目之跟進工作必須即日完成及重新檢查

\*Non compliance item(s) shall be rectified on the same day and arrange re-inspection.

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**APPENDIX J**

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**Reprovisioning of Cremators at Diamond Hill Crematorium  
Comments from EPD on WMP (Phase II) (version 1.1)**

Item No.	Document Reference	Comment	Response to Comments
i.	S.7	According to the CMIR, protective clothing and materials used for wet wiping, HEPA vacuum cleaner, polythene sheeting, decontamination facility / unit would also be generated. These should be mentioned in the relevant section and included in Table 7.2 and / or Table 8.1.	S.7.19 has been added. Table 7.2 and Table 8.1 have been amended.
ii.	S.7.7	Based on the confirmatory analytical results for subsurface soil presented in the confirmation report and remediation action plan for confirmatory analysis of subsurface soil (July 2007), the subsurface soil is only found to be contaminated with heavy metals, but not dioxin and TPH. Instead of just stating some general statements, the consultant shall carefully review the findings of the said Report and any other contamination investigation report(s) and amend this paragraph accordingly.	Detailed findings (heavy metals contamination subsurface soil) have been reviewed under S.7.8 -- S.7.13.
iii.	S.7.9	1 <sup>st</sup> sentence – Please add “during the EIA stage” after “samples S3 and S5”.	S.7.9 has been amended accordingly.
iv.	S.7.11	Please clarify when the TCLP test was done and whether the TCLP test results have been submitted or agree by our Waste Facilities Group colleagues.	S.7.11 has been amended.
v.	S.7.12 last line	Please add “in the surrounding soil” after “Dutch B level was found”.	S.7.12 last line has been amended accordingly.
vi.	S.7.19	Please clarify when the pilot test was conducted and whether the test details and results have been submitted to EPD for comment / agreement. If affirmative, to which the division with EPD were the pilot test results submitted.	Since S.7.19 has been added, original S.7.19 is re-numbered to S.7.20, this section has been amended accordingly.
vii.	S.7.24 and Table 7.2	According to S.7.24, sludge and sediment removed from the underground tank was disposed as chemical waste. The volume and disposal outlet shall be included in Table 7.2. Beside, the volume and type of wastes generated from the tank removal (says the concrete casing, the tank) shall also be mentioned in S.7.24 and included in Table 7.2.	Since S.7.19 has been added, original S.7.24 is re-numbered to S.7.25, S.7.25, S.7.26 and Table 7.2 have been amended accordingly.
viii.	S.8.21	As the contamination investigation was already mentioned in S.7.7 and this section is to talk about the control measures, it is suggested to delete the whole paragraph.	S.8.21 has been deleted.
ix.	S.8.33 1 <sup>st</sup> line	Please add “as laid down in the CMIR” after “...treatment and disposal”.	Since S.8.21 has been deleted, S.8.33 is re-numbered to S.8.32. S.8.32 1 <sup>st</sup> line has been amended accordingly.
x.	S.8.35	Please add “negative air filtration system shall be provided and equipped to minimize escape of contaminated ash wastes to the surroundings” (which was recommended in the CMIR) as a new bullet.	Since S.8.21 has been deleted, S.8.35 is re-numbered to S.8.34. A new bullet point has been added in S.8.34

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xi.	S.8.45	Please add a new paragraph / sentence to discuss the treatment (cement solidification) of the contaminated ash wastes.	Discussion on cement solidification on contaminated ash wastes has been added in S.8.32 and S.8.36.
xii.	S.8.50-53	It is noted that these paragraphs are just duplication of S.7.24-7.27. The measures for handling, disposing and disposal for the different types of wastes (e.g. chemical wastes, tanks) generated from the underground fuel tank removal should be discussed instead.	Discussion on measures for handling and disposal for C&D wastes and chemical waste have been added in S.8.50 to S.8.58.
xiii.	Table 8.1	Please amend "Dioxin" in the 3 <sup>rd</sup> row to "Dioxin, PAH and heavy metals contaminated ash wastes"	Amended accordingly.