Contract No. HY/2013/04 HZMB HKBCF – Infrastructure Works Stage II (Southern Portion)

Waste Management Plan

August 2015

Mott MacDonald

Our ref JFP/TK/bw/T355861/02/02/L024
T 2828 5757
E Terence.Kong@mottmac.com.hk
Your ref -

Mott MacDonald

China State Construction Engineering (Hong Kong) Ltd.
27/F, China Overseas Building,
139 Hennessy Road,
Hong Kong

13 August 2015
By Email

Attn: Mr. Gary Ng – Environmental Officer

Dear Sir,

Contract No. HY/2013/04 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage II (Southern Portion)
Waste Management Plan

In accordance with Condition 2.10 of the Environmental Permit (EP-353/2009/I) covering the captioned contract, we are pleased to submit the certified Waste Management Plan for your onward submission to the Engineer and ENPO/IEC for approval.

Yours faithfully
For MOTT MACDONALD HONG KONG LIMITED

Terence Kong
Environmental Team Leader

Encl.

cc. AECOM – Mr. Alfred Cheng (by Email)
ENPO/IEC – Mr. Y.H. Hui & Mr. Raymond Dai (By Email)

RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_3281L.15

14 August 2015

By Fax (3468 2076) and By Post

AECOM Asia Co. Ltd.
The PRE's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

Attention: Mr. Alfred Cheng

Dear Sir,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2013/04 – HZMB HKBCF – Infrastructure Works Stage II (Southern Portion)
Waste Management Plan

Reference is made to the Environmental Team's submission of Waste Management Plan certified by the ET Leader (ET's ref.: "JFP/TK/bw/T355861/02/02/L024" dated 13 August 2015) and provided to us via e-mail on 13 August 2015.

We are pleased to inform you that we have no adverse comment on the captioned Plan. We write to verify the captioned submission in accordance with Condition 2.10 of the Environmental Permit No. EP-353/2009/I.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,
For and on behalf of
Ramboll Environ Hong Kong Limited

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Horace Hong	(By Fax: 3188 6614)
	Mott MacDonald	Mr. Terence Kong	(By Fax: 2827 1823)
	CSCE	Mr. Eddie Tang	(By Fax: 2459 4336)

Internal: DY, YH, LP, CL, ENPO Site

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Contents

1 Introduction

1.1 Background

This Waste Management Plan (WMP) is prepared for Contract No. HY/2013/04 "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage II (Southern Portion)" ("the Contract") for the Highways Department of HKSAR Government.

The Contract is part of the "Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities" (HZMB HKBCF) Project which is a "Designated Project" under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and for which an EIA Report (Register No. AEIAR-145/2009) was prepared and approved. The current Environmental Permit (EP) for HKBCF, namely No. EP-353/2009/I, was issued on 17 July 2015. These documents are available through the EIA Ordinance Register.

1.2 Project Description

The Proposed works under this Contract comprise the following:

- Construction of vehicular bridge and at-grade roads at the southern portion of Hong Kong Boundary Crossing Facilities;
- Construction of associated street lighting, street furniture, road marking, road signage, box culverts and outfalls, drainage, sewerage, fresh water and flushing water supply, irrigation, landscape, electrical and mechanical (E&M), utilities and services works;
- Provisioning of civil engineering works and power supply for Traffic Control and Surveillance System (TCSS); and

Other works which are shown on the Drawings or specified in the Specification or which may be ordered in accordance with the Contract.

The major works areas are presented in **Appendix A.**

1.3 Purpose and Scope of the Plan

This construction WMP describes the arrangements for avoidance, minimisation, recovery, recycling, reuse, storage, collection, treatment and disposal of different categories of waste generated from the construction activities of the project, and has been prepared in accordance with Condition 2.10 of the EP:

"The Permit Holder shall deposit with the Director, at least 1 month before the commencement of the construction of the project, three hard copies and one electronic copy of a waste management plan (WMP) for the construction stage of the project. The WMP shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall include the recommended mitigation measures on waste management in the EIA Report. The WMP shall indicate the disposal location(s) of all surplus excavated spoil and other waste. A trip ticket system shall be included in the WMP. Surplus excavated spoil and other wastes shall only be disposed of at designated disposal locations unless otherwise

approved by the Director. All measures recommended in the WMP shall be fully and properly implemented by the Permit Holder and any person working on the Project throughout the construction period."

The key objectives of this WMP include:

- Determine the statutory and non-statutory waste management requirements;
- Set out the organisational structure, roles and responsibilities of key personnel responsible for the waste management and appropriate mitigation measures;
- Identify quantities and types of waste materials are anticipated to be generated during construction phase of the project;
- Identify the potential for waste minimisation measures for adoption during the construction phase of the project; and
- Defining the waste management practices and treatment procedures to be adopted throughout construction including the locations of designated disposal locations and details of the Trip Ticket System (TTS) to be implemented.

1.4 Waste Management Legislation, Guidance and Standards

1.4.1 Statutory Requirements

There are a number of ordinance and regulations in Hong Kong which are relevant to this project as they control the storage, treatment and disposal of different waste types, including but not limited to:

- Waste Disposal Ordinance (Cap. 354)
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)
- Land (Miscellaneous Provisions) Ordinance (Cap. 28)
- Dumping at Sea Ordinance (Cap. 466)
- Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK)
- Summary Offences Ordinance (Cap. 228).

The ***Waste Disposal Ordinance (WDO)*** prohibits the unauthorised disposal of wastes, requiring disposal only at designated waste disposal facilities, licensed by the Environmental Protection Department (EPD). Construction waste is not directly defined in the WDO, but is considered to fall within the category of "trade waste". This ordinance provides for the licensing of collection services and disposal facilities for all types of waste, the control scheme on chemical waste, the control on illegal dumping of waste, the control on import and export of waste and for the establishment of a system whereby specified wastes must be notified to the relevant authority who may give directions as to the method of disposal. It also requires the production of a comprehensive plan for the collection and disposal of wastes.

Under the ***Waste Disposal (Chemical Waste) (General) Regulation***, all procedures of chemical wastes (including asbestos) must register with the EPD and treat the wastes, either by utilising an on-site treatment plant licensed by the EPD, or by arranging a licensed collector to take the wastes to a licensed facility. The regulation also prescribes the storage facilities to be provided on site, including labelling and

warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

The non-inert portion of the Construction and Demolition (C&D) materials should be reused or recycled as far as possible and as the last resort, disposed of at public filling areas or landfills. The inert portion of C&D materials, i.e. public fill, should be reused in earth filling, reclamation or site formation works. Public dumps usually form part of land reclamation schemes operated by the Civil Engineering and Development Department (CEDD). Dumping licences should be obtained by every dump truck owners and the Trip-ticket System should be followed.

Under the ***Waste Disposal (Charges for Disposal of Construction Waste) Regulation***, construction waste delivered to a landfill for disposal must not contain more than 50% by weight of inert material. Construction waste delivered to a sorting facility for disposal must contain more than 50% by weight of inert material, whereas construction waste delivered to a public fill reception facility for disposal must consist entirely of inert material. Furthermore, for contracts with a value of more than HK$1M, the main Contractor is required to establish a billing account at EPD before transporting the construction waste to the designated waste disposal facilities (e.g. landfill, public fill etc.). The vessels for delivering construction waste to public fill reception facilities need prior approval from EPD. Breach of these regulations can lead to a fine and/or imprisonment.

The ***Land (Miscellaneous Provisions) Ordinance*** requires that dumping licenses be obtained by individuals or companies who deliver public fill to public filling areas. The CEDD issues the licences under delegated powers from the Director of Lands. The current policy related to dumping of C&D material is documented in the Works Branch Technical Circular No. 2/93 – Public Dumps. C&D materials that are wholly inert, namely public fill, should not be disposed of to landfill, but taken to fill banks or public filling areas.

The Public Cleansing and Prevention of Nuisances Regulation provides for prevention and control of litter and waste as well as the illegal tipping of wastes on unauthorised (unlicensed) sites. It also provides for removal of litter or waste from any places.

The Contractor is required to obtain and work within the bounds of all necessary permits and licenses required under these ordinances, including but not limited to the following:

- Registration as a Waste Producer under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354);
- Registration as a Chemical Waste Producer under the Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C);
- Public Dumping License under the Land (Miscellaneous Provisions) Ordinance (Cap. 28).

1.4.2 Non-statutory Guidelines and standards

The following guidelines and standards of practice will be adopted during construction:

- Waste Disposal Plan for Hong Kong (1989), Planning, Environmental and Lands Branch Government Secretariat;
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, EPD (1992);
- Works Bureau Technical Circular No. 12/2000, Fill Management, Works Bureau, HKSAR Government;
- Environment, Transport and Works Bureau Technical Circular (Works) No. 19/2005, Environmental Management on Construction Sites, Environment, Transport and Works Bureau, HKSAR Government;
- Works Branch Technical Circular No. 02/1993, Public Dumps, Works Branch, Hong Kong Government;
- Works Bureau Technical Circular No. 02/1993B, Public Filling Facilities; Works Branch, HKSAR Government;
- Works Branch Technical Circular No. 16/1996, Wet Soil in Public Dumps, Works Branch, Hong Kong Government;
- Works Bureau Technical Circular No. 04/1998 and No. 04/1998A, Use of Public Fill in Reclamation and Earth Filling Projects, Works Bureau, HKSAR Government;
- Project Administration Handbook for Civil Engineering Works (Chapter 4, Section 4.1.3), 2014 Edition. Civil Engineering and Development Department, HKSAR Government;
- Waste Reduction Framework Plan, 1998 to 2007, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
- Development Bureau Technical Circular (Works) No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness. Works Branch, Development Bureau, HKSAR Government;
- Development Bureau Technical Circular (Works) No. 6/2010, Trip-ticket System for Disposal of Construction and Demolition Material. Works Branch, Development Bureau, HKSAR Government;
- Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002, Management of Dredged/Excavated Sediment. Environment, Transport and Works Bureau, HKSAR Government;
- A Guide to the Registration of Chemical Waste Producers and Guide to the Chemical Waste Control Scheme; and
- The Practice Notes for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers, PNAP No. ADV-21 – Management Framework for Disposal of Dredged/ Excavated Sediment (April 2007).

Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes provides guidance for complying with the requirements of the ***Waste Disposal (Chemical Waste) (General) Regulation*** on the packaging, labelling and storage of chemical waste. Due to the inherent hazardous nature of chemical waste, it is important to pay special care in the handling and storage of these wastes so as to minimise any danger to health or risk of pollution to the environment.

DBTC(W) No. 6/2010, Trip-ticket System for Disposal of Construction and Demolition Material mentions the auditing requirements for the implementation of the trip-ticket system in construction projects for proper disposal of construction and demolition (C&D) material at public filling facilities or landfills.

ETWBTC(W) No. 19/2005, Environmental Management on Construction Sites and ***PNAP No. ADV-19, Construction and Demolition Waste*** set out the policy and procedures requiring contractors to prepare and implement an enhanced Waste Management Plan to encourage on-site sorting of construction and demolition (C & D) material and to minimize their generation during the course of construction.

2 Waste Management Policy

2.1 General Principles

The principles of waste management to be adopted in this project shall be in line with the latest government policy on environmental management and the China State Construction Engineering (Hong Kong) Limited's (CSHK) environmental management system. A policy statement is shown is **Appendix B**.

2.2 Hierarchy of Waste Management

The various waste management options shall be categorised in terms of preference from an environmental viewpoint. The options considered to be more preferable have the least impacts and are more sustainable in the longer term. Hence, the hierarchy of waste management is as shown in **Table 2.1** in descending order:

Table 2.1: Hierarchy of Waste Management

Hierarchy	Description
Avoidance and Minimisation	Avoid and minimize generation of C&D materials through careful planning and design of works
Reuse	Reuse inert portion of the C&D materials generated.
Recovery and Recycle	Undertake on-site and off-site waste recycling
Treatment and Disposal	Properly treat and dispose of waste in accordance with legislative requirements, guidelines and good practices.

This hierarchy shall be used to evaluate waste management options, thus allowing maximum waste reduction. Waste reduction measures shall be introduced at the planning and detailed design stage and carried through the construction activities, whenever possible, by careful purchasing control, reuse of formworks and good site management.

This plan would attempt to promote waste management practices to the higher options, since conceptually it makes more sense to avoid producing a waste rather than to develop extensive treatment schemes.

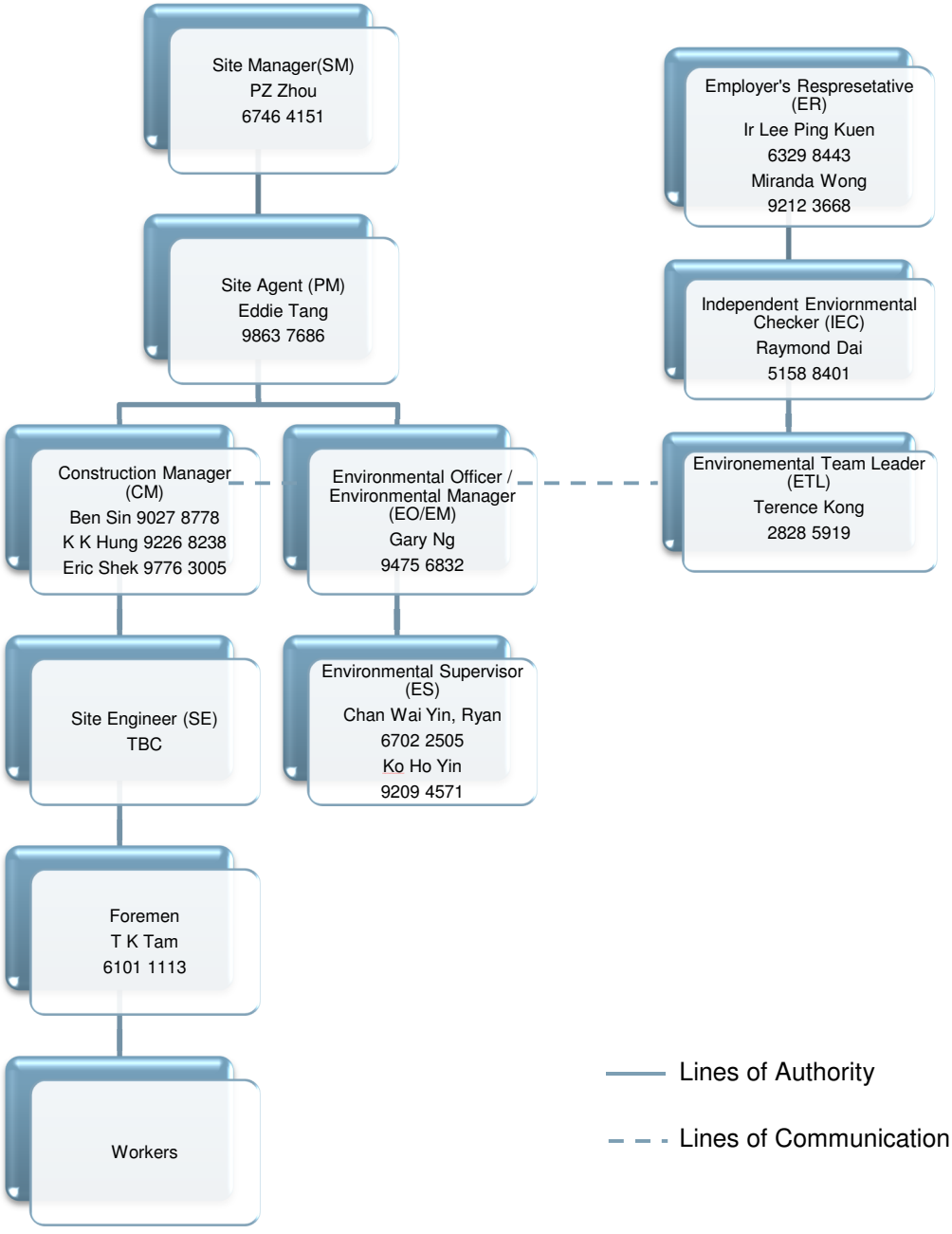
Training and instruction (in the Tool Box Talks) of construction workers and staff will be given at the site to increase awareness and draw attention to waste management and other environmental issues and the need to minimise waste generation for both environmental and commercial reasons.

3 Organisation Structure for Waste Management

3.1 Overall Organisation Structure

The organization structure for waste management onsite is presented in **Figure 3.1**. This structure outlines the overall site management in relation to waste management and the associated environmental issues. Details on the roles and responsibilities of staff members responsible for the implementation of the WMP are outlined in the CSHK organizational chart for waste management below:

Figure 3.1: Organisation Structure for Waste Management



3.2 Roles and Responsibilities

3.2.1 Site Manager (SM)

The SM is responsible for coordinating all environmental matters on site and reporting on these matters to the CSHK Environmental Management Team (EMT). Approve (internally) the WMP and ensure adequate resources for the implementation of the WMP.

3.2.2 Site Agent (SA)

The SA is responsible for ensuring commitment and sufficient resources to provide an effective environmental management program, which includes waste management, for all the construction works.

3.2.3 Construction Manager (CM)

The Construction Manager (CM) reports to the SA, the responsibilities of the CM include, but are not limited to:

- Coordinate all environmental matters related to the WMP;
- Be responsible for all site operations, management of environmental issues, staff supervision, control, coordination and planning, external liaison as well as implementing and monitoring corrective actions related to the WMP;
- Ensure all required licences and permits required for the construction phase are applied for and are valid throughout the duration of the period for which they are required, such as the Dumping at Sea Ordinance (DASO) permit and Public Dumping Licence;
- Carry out immediate corrective action to rectify any non-compliance of environmental requirements of the WMP. when necessary, as well as handle any complaints that are received from the public regarding the WMP;
- Oversee the implementation and performance of the WMP; and
- Assist with environmental duties on-site and ensure that works are executed in accordance with the WMP, as well as arranging regular site inspections with the Environmental Office (EO).

3.2.4 Environmental Officer (EO)

The EO will be appointed on-site for the overall coordination, monitoring, oversight and implementation of the WMP. The EO directly reports to the SA and assists the SA in assigning adequate resources for the implementation and operation of the WMP. The responsibilities of the EO include, but are not limited to:

- Review of the WMP for implementation of the TTS and ensure works are executed in accordance with the plan;
- Monitor on-site work to ensure compliance with the environmental requirements for the site;
- Carry out inspections of the site to identify potential hazards to the environment, reporting findings with recommendations for corrective actions;
- Complete and submit the Monthly Summary Waste Flow Table (WFT) and Yearly Summary WFT;
- Assist the CM in handling any complaints that are received;

- Ensure that the required environmental monitoring is carried out, and that all environmental monitoring results are recorded; and
- Carry out waste management training/ tool-box talks for all site staff and subcontractors.

3.2.5 Site Engineer (SE)

The Site Engineer (SE) shall:

- Coordinate with the EO regarding the implementation of all appropriate environmental mitigation measures; and
- Coordinate with the EO to ensure that all the applicable environmental licenses and permits are identified and allowed for in the programme of work.

3.2.6 Environmental Supervisor (ES)

The Environmental Supervisor (ES) is responsible for the implementation of the WMP with the assistance of the Foremen. The ES is also responsible for:

- Co-operate with the EO to rectify any non-conformities with the environmental requirements of this WMP that are identified on-site;
- Attend environmental meetings related to waste management when necessary;
- Carry out environmental site inspections with the EO when deficiencies in waste management are identified;
- Assist the EO with any environmental accidents, such as the release of chemicals; and
- Assist the EO with waste management training/ tool-box talks for all site staff and subcontractors

3.2.7 Foremen

The foremen are responsible for on-site supervision, the coordination of the works as well as the implementation of any corrective actions as directed by the CM/ EO. The foremen are also responsible for:

- Assist in the daily implementation of the WMP including the sorting and segregation of construction waste into separate stockpiles and where possible recycling (via recycling containers) or reusing materials;
- Ensure the TTS is followed and that all appropriate paperwork are signed, completed and collected;
- Supervise and monitor the works of subcontractors/ construction workers in relation to waste management;
- Ensure waste is avoided and/or minimised as much as practically possible; and
- Report non-compliance of environmental protection, including waste management issues

3.2.8 Workers

The onsite workers are expected to follow the practices that are outlined in the WMP. They are obligated to complete certain specific tasks, such as:

- The sorting of different types of wastes that are generated during construction;

- The collection of sorted wastes from work areas to the temporary storage area / designated fill banks / landfills; and
- General site clean-up.

4 Waste Generation and Management Approach

4.1 General

This section describes the approach adopted in the project scheme design to avoid, minimise and manage construction waste generated by the project. Furthermore, it also identifies the estimated volumes of waste generated by the project and measures to further minimise these volumes.

During the construction phase of the Project, the main activities that will potentially generate waste include:

- Site clearance;
- Road breaking;
- Excavation;
- Road maintenance;
- Scrap metals from of-cuts, rebar, steel pipes and packaging;
- Plastic and paper from pre-formed products and packaging; and
- Unusable / surplus concrete/ grout.

4.2 Estimation of Waste Generation

The key types of waste generated during construction phase of this project identified in the scheme design and the EIA Report include C&D material (inert and non-inert), chemical waste, Excavated marine sediment and general refuse, which are summarised in **Table 4.1**. Details of the different types of waste materials are presented in the following sections.

Table 4.1: Estimation of Waste Generation

Waste Type	Key Sources of Waste Generation	Estimated Total Quantity of Waste (in-situ volume)	Volume to be Reused/ Recycled	Volume to be Disposed	Proposed Disposal Outlet
Inert C&D Material	Excavated soil	31,200 m^3	3,000 m^3	28,200 m^3	Tuen Mun Area 38 Fill Bank
Non-inert C&D Material	Superstructure construction works for various buildings/ facilities	20,000 m^3	2,000 m^3	18,000 m^3	NENT Landfill
Chemical Waste	Used cleansing fluids, solvents, lubricating oil, waste fuel, etc., from maintenance and servicing of construction plant and equipment	Anticipated as a small quantity, to be quantified by the Contractors upon appointment	To be quantified by the licensed waste collector	To be quantified by the licensed waste collector	Licensed waste collector
Marine sediment	Excavated marine sediment	Approximate 15,000m^3	15,000 m^3	0 m^3	N/A
General Refuse	Food scraps, waste paper, empty containers, etc. generated from the construction workforce.	General refuse: maximum daily arising of up to 50 kg	0 kg	50 kg	NENT Landfill

4.3 Construction & Demolition (C&D) Materials

C&D materials comprise unwanted materials generated during construction, including rejected structures and materials, materials which have been over ordered or are surplus to requirements, and materials used and discarded.

C&D material could be divided into two categories according to whether they are inert or non-inert. Inert C&D material are known as rock, rubble, boulder, earth, soil, sand, concrete, asphalt, brick and tile. Non-inert C&D materials are such as metal, timber, vegetation, packaging waste, organic material and all recyclables and non-recyclables are called “C&D Waste”.

Recyclables are mainly metals, paper/cardboard packaging and plastics. Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material. Recyclables would be collected by relevant recyclers. Non-recyclable materials are treated as general refuse.

4.3.1 Management

The following general low waste construction designs and principles shall be adopted to avoid or minimise C&D material generation:

- Management of construction materials such that over-ordering, poor storage and maintenance, mishandling as well as improper operation procedures should be avoided. Any ordering of materials should be approved by Site Agent or Project Manager;
- In order to avoid over-order of concrete, accurate calculation should be made prior to concrete pouring. Close supervision should be arranged during concrete pouring to avoid over-cast;
- Surplus concrete should be, as far as practicable, used for paving of temporary road or cast of concrete blocks for bund etc.;
- Useful materials such as timber, rubble and steel/metal should be segregated for reuse. For example, formwork and timber should be cleaned for reuse, off-cuts of reinforcement should be sorted into usable lengths and short off cuts stacked for scrap metal. Where it is no longer reusable, steel and metal items will be sold as scrap for recycling;
- Packaging waste including foam board and cardboard should be, as far as practicable, returned to material suppliers for reuse;
- Environmental Induction Training and Toolbox Talk will be arranged to disseminate the requirements on waste management and avoidance of mishandling of materials;
- The EO / ES / Foreman will carry out Daily Inspection, Weekly Tidying Inspection, Weekly Environmental Inspection and Audit to monitor the performance on the implementation of the waste management measures.

4.3.2 On Site Handling

CSHK will arrange to reuse or recycle as much as possible the general construction waste with recyclable values such as steel mesh, reinforcement bars as described above, railings, banisters, wooden planks, tires, etc. Where practicable, these wastes would be segregated on site. Different areas should be

designated for such segregation and storage. These wastes, which are described below, would either be reused on site or collected by outside licensed waste recycling agents.

- inert (e.g. rock, concrete, sand, rubble) - for reuse, recycle, or disposal at designated outlet;
- non-inert (e.g. wood, plastics)- for disposal at designated landfills.

All C&D materials will be properly sorted into inert C&D materials, metals, timber and other non-inert C&D materials in the workplace to prevent cross-contamination. Sorting will be carried out at source to avoid double handling. In any case to minimize transport distance, the stockpiling area of C&D materials will be set up in close proximity to the sorting ground.

Concrete and rubble will be segregated at source. Those inert C&D materials will be disposed to designated outlet.

All non-inert demolition C&D materials such as unwanted timber will be temporarily stored in designated storage areas on site and to be disposed of at licensed landfill sites. To prevent illegal dumping, a trip-ticket system will be adopted to ensure C&D waste is disposed of at landfill properly.

Useful materials such as steel pipes, reinforcement, will be collected for recycling as scrap metals. Sorted steel reinforcing bars will be collected and sold to scrap steel mills for recycling. Concrete and rubble will be segregated. Those inert C&D materials will be transported to the designated public filling areas.

Complete records of quantities of material reuse, recovery and recycled at the site or transported off-site for further reuse should be maintained and should be readily available on site.

All C&D materials shall be transported by land off-site to relevant disposal sites and reception facilities. CSHK shall dispose the inert C&D materials to Tuen Mun Area 38 Fill Bank (or other disposal grounds as directed by ER) and the non-inert portion of C&D materials that are not recyclable to NENT Landfill, and where possible shall identify recycling facilities or other construction sites where such materials can be used.

The designated areas for C&D waste segregation and storage is shown in **Appendix G**.

4.4 Marine Sediment

According to EP Condition 3.27, should off-site disposal of marine sediment be required, the excavated sediment shall be disposed of at the designated disposal sites within Hong Kong as allocated by the Marine Fill Committee or other locations as agreed by EPD.

For this Contract, no off-site disposal of marine sediments arising from the construction works is proposed. All the excavated marine mud and similar unsuitable materials generated from the Works shall be treated using cement solidification/stabilization (Cement S/S) techniques to meet the contaminant leachability levels and engineering properties specified in this section of the PS.

The treated materials shall be re-used on-site as either backfill or landscaping (i.e. berm materials) at areas proposed by CSHK and agreed with the Engineer. CSHK shall be fully responsible for the proper storage, prevention of pollution, treatment and on-site re-use of all the Marine Mud as excavated from the Works.

The designated area for Cement S/S techniques is shown in **Appendix H**.

4.5 Chemical Waste

The chemical wastes generated from the general site operation will primarily arise from the maintenance of plant and equipment. These may typically include oils, lubricants, paints and solvents. For chemical waste produced from a process, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, registration should be made with EPD as a Chemical Waste Producer.

4.5.1 Management

CSHK will register with EPD as a Chemical Waste Producer. Chemical wastes expected from the Contract include engine oils, hydraulic fluids, waste fuel, spent solvent, spent cleaning fluids, spent lubricating oil, contaminated sawdust/sandbags, paint residual, and used oil filters.

Repair and maintenance of plant and vehicles on site are not encouraged but minimized as far as practicable to reduce generation of chemical waste on site. Plant in poor condition will not be deployed on site.

All chemical waste generated by the construction works should be properly labelled, packaged, and temporarily stored at designated chemical waste storage areas within the construction site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes issued by EPD, with subsequent collection by a licensed waste collector.

4.5.2 On-site Handling

Preventive measures should be implemented for leakage and spillage of fuel and lubricating oil to avoid contamination of the construction site. All workshops should be located on impermeable areas with provision of drainage channels and interceptors to allow separation of oils from water and release of treated water.

Good housekeeping practices should be adopted to deal with chemical waste and the practices include:

- Generating less chemical waste through:
  - i) Delivering appropriate quantity of chemicals to the construction site;
  - ii) Avoiding unnecessary wastage of chemicals by using the chemicals more sensibly and in accordance with the manufacturer's instructions;
  - iii) Finishing one bottle/container of chemicals before opening the next one for use;

iv) Collecting the remaining chemicals in suitable containers; and
v) Removing the unused chemicals out of the construction site after completion of the Contract.

- Preventing illegal discharge of chemicals or chemical wastes;
- Minimizing the volume of unused chemicals through:
  i) Using the chemicals before the expiry date; and
  ii) Ordering appropriate quantity of chemicals and avoiding unnecessary storage of excess chemicals.

Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Waste. The details are described as follows:

- Containers used for the storage of chemical waste should:
  i) Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed;
  ii) Display a label in English and Chinese in accordance with instruction prescribed in Schedule 2 of the Regulations.
- The storage area for chemical waste should:
  i) Be clearly labelled and used solely for the storage of chemical waste;
  ii) Be enclosed on at least three sides;
  iii) Have an impermeable floor and bund, 110% capacity of the largest container or 20% of the storage capacity, whichever is the greatest;
  iv) Have adequate ventilation;
  v) Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and
  vi) Be arranged so that incompatible materials are adequately separated.
- Chemical waste should be disposed of:
  i) Via a licensed waste collector;
  ii) To a facility licensed to receive chemical waste, i.e. Chemical Waste Treatment Facility in Tsing Yi; or
  iii) To an end-user of the waste, under the approval from the EPD.

Chemical waste, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be disposed of at the Chemical Waste Treatment Facility located at Tsing Yi. Moreover, the disposal facilities for chemical waste shall be designated by EPD. EPD should be informed by the EO on the final disposal location of the chemical waste. Trip tickets issued for every chemical waste collection made by the licensed waste collector should be copied to the ER and the original tickets should be maintained by the EO for future reference.

4.6 Timber

4.6.1 Management

CSHK should avoid, reduce or minimize the use of timber in Temporary Works construction as far as possible, such as follows:

- Restriction on use of hardwood such that softwood, metal props and/or proprietary steel system should be considered for falsework and shoring of trenches and pits;
- The formwork should be designed to maximize the use of standard wooden panels so that high reuse levels can be achieved. More durable alternatives such as steel formwork or plastic facing should be considered for repetitive areas to increase the potential for reuse;
- Design structural or concrete members (such as bridge segments, reinforced earth wall panels, crash barriers, channels, kerbs etc.) to be constructed by pre-cast method as far as practicable that optimizes the repeated use of metal formwork;
- Use metal system or panel formwork for cast-in-situ members as far as practicable;
- Corrugated sheets and structural steel members or steel angle sections should be used to construct site hoardings;
- Steel tubular scaffolds, props or I-beams should be used as falsework with steel I-beams or channels as horizontal runner beams to support formwork; and
- Steel planking or sheet-piles with horizontal steel beams and struts will be proposed as support to excavation when necessary.

Where CSHK has to use timber for Temporary Works construction process/activities with an estimated quantity exceeding ($5m^3$) , a method statement should be prepared and submitted to the ER for agreement prior to commencement of the relevant Temporary Works.

The method statement should include the justification for and the measures taken to minimize the use of timber in the said Temporary Works. In addition, a summary table will be prepared containing the description, justification and the estimated quantity for every work process/activity requiring the use of timber for Temporary Works construction irrespective of the quantity of timber used. A proforma of the summary table is shown in **Appendix C**.

In addition, the updated summary table on the use of timber for Temporary Works construction should be submitted to the ER together with the monthly summary Waste Flow Table (WFT) including the monthly and yearly forecast for monitoring and review. The samples of the monthly and yearly Waste Flow Table are shown in **Appendix D**.

4.7 Recyclable Materials

The strategy for management and disposal of all C&D materials arising from the Contract will be based on the principle of avoidance, minimizing, segregation, salvage for reuse or recycle on or off-site wherever practicable followed by the last resort of disposal to landfill as appropriate.

Throughout the Contract duration, there will be different categories of reusable and recyclable materials generated from every construction process in connection with either temporary or permanent works. The major material generation will include:

- Inert C&D materials – broken concrete from road features;
- Metals – site hoarding and reinforcement offcuts;
- Paper/cardboard – packaging, printed papers and cartons;
- Plastics – foam/plastic material packaging and plastic bottles/containers;
- Chemical waste – engine oils, hydraulic fluids, cleaning fluids, used oil filters and car batteries, etc; and
- General refuse – generated from on-site work force.

4.7.1 Management

CSHK will implement different control measures for this Contract. C&D materials or wastes will be sorted at source. All scrap metals, cardboard and paper will be collected by nominated recycling contractor.

CSHK will carefully design and properly plan the temporary and permanent works to be carried out in such a way to avoid, reduce or minimize the generation of C&D materials in particular metallic waste, timber, paper/ cardboard packaging and chemical waste. CSHK will employ measures to ensure proper planning of works, good site management such as minimizing over-ordering, avoiding cross contamination of reusable and/ or recyclable materials collected, optimizing the use of metal formwork or other process to reduce or minimize the use of timber in temporary works construction and maximizing the reuse of excavated inert C&D materials within the sites (e.g. backfilling).

CSHK will practice necessary design, proper planning and good site management to minimize wastage of materials such as concrete debris, mortars, cement grouts and reinforcing bars as follows:

- Broken concrete from road reconstruction or improvement that is identified as suitable for recycling into aggregates will be sorted at source and disposed of at the designated outlet.
- Reinforcement bars from reconstruction works will be sorted on site and recovered for collection by recycling contractors.
- The design of formwork should maximize the use of standard metal I wooden panels so that high reuse levels can be achieved. Metal panels will be given the first priority except for small quantity of timber which is to be used for some activities.
- CSHK will as far as possible detail the rebar in such a way as to minimize and standardize offcuts which in tum to maximize the planned reuse thereof. Bar benders will be required to label both the bundles of bent bars and the bundles of reinforcement offcuts which will be logged for use in other parts of the works in accordance with the bar bending schedules. Sorting area will be located at source to minimize transport distance. Sorted steel reinforcing bars will be collected and sold to scrap steel mills for recycling.

All C&D materials arising from/or in connection with the construction and demolition work should be, as much as possible and practicable, sorted on-site and be separated into different categories for recycling, re-use or disposal at landfill as appropriate. The sorting area should be at the immediate working area to

avoid loss or leakage during handling and should be revised from time to time in order to suit the construction activities. Foreman should deploy sufficient storage bins to collect reusable and recyclable materials. Segregated materials should be temporarily stored at source for delivery off-site.

4.7.2 On-site Handling

On-site sorting of C&D materials will be adopted so that inert materials can be reused or recycled on or off-site as far as practicable before disposed of at the designated outlet and the remaining C&D waste disposed of at designated landfills.

Such sorting would ensure the quality of the inert C&D materials for backfilling and compliance with the general condition of dumping licences for public filling areas that the materials to be disposed thereof must comprise only soil, building debris, broken rock and concrete. Such materials should be free from marine mud, general refuse, plastic, metal, industrial and chemical waste, animal and vegetable matter and other matter considered unsuitable by the public fills operator. Whereas the material unsuitably disposed of at the public filling areas has to go to a designated landfill.

CSHK will arrange to reuse or recycle as much as possible the general construction waste with recyclable values such as steel mesh, reinforcement bars as described above, railings, banisters, wooden planks, tires, etc. Where practicable, these wastes would be segregated on site. Different areas should be designated for such segregation and storage. These wastes would either be reused on site or collected by outside licensed waste recycling agents. If feasible, an inert and a non-inert construction waste storage skips would be set up on site as below:

- Inert (e.g. sand, rubble) - for reuse, recycle, or disposal at public filling facilities;
- Non-inert (e.g. wood, plastics) -for disposal at licensed landfills.

The storage, collection and transport of construction waste should follow the key measures below as far as practicable:

- A trip-ticket system should be adopted for the disposal of construction and demolition wastes to the designated public fill reception facilities and landfill with due documentation and verification;
- Only permitted waste hauliers should be used to collect and transport wastes to licensed disposal points. A list of licensed waste collectors will be obtained from the EPD;
- Wastes should be stored and handled properly in designated storage points; and
- Wastes should be removed off-site in a timely manner.

CSHK will remove off site as soon as practicable all C&D materials not reusable on site and arrange recycling contractors to promptly collect all sorted and/or processed recyclable materials from the site on a regular basis. The quantities of all the recyclable materials will be recorded before removal off-site by the recycling contractors and the details will be included in the WFT for submission to the ER.

4.8 General Refuse

4.8.1 Management

General refuse refers to the domestic waste generated from daily human activities. General refuse may include food wastes and packaging, waste paper, plastic bottles, aluminium cans and other debris. Enclosed bins for general refuse other than construction and chemical wastes should be provided at convenient locations within the site for the collection of general refuse from the work force. The bins and their storage areas should be cleaned regularly. Refuse should be removed from site by a reputable waste haulier regularly. Three-coloured recycling bins will be provided to collect and segregate aluminium cans, plastic bottles and paper waste on site for subsequent collection by outside waste recycling companies if volumes are large enough to warrant such collection. Burning of refuse on site is strictly prohibited. The following general principles shall be adopted to avoid or minimise general refuse generation:

- 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 etc.;
- Providing drinking facility and encouraging employees to bring their own cups;
- Discouraging take-away food;
- Deploying sufficient recycle bins in site offices to facilitate collection of recyclables including waste aluminium cans, plastic bottles and papers;
- Deploying sufficient refuse collection bins with cover at convenient locations to facilitate collection of non-recyclables for disposal at landfills;
- Participating in local collection scheme (e.g. scheme launched by District Board) if available.

4.8.2 On-site Handling

General refuse from the site should be stored in waste skips and garbage bins with proper covers at designated locations around the areas of site offices, workshops and work areas and separated from construction and chemical wastes for regular removal. Refuse burning on site should not be practiced.

Site staff should be encouraged to use reusable rather than disposable dishware by displaying notice/poster on site. Office waste will be reduced through recycling of paper if volumes are large enough to warrant waste paper collection. This will be achieved by reducing the number of photocopies to a minimum and by allowing double side photocopying for internal documents and external document, where appropriate.

Aluminium cans and plastic bottles should be segregated for collection by waste recycling firms if the volumes are large enough to warrant such collection.

A reputable waste collector should be employed to remove general refuse from the site to the designated landfill. The general refuse should be separated from construction/demolition materials and chemical wastes.

4.9 Packaging Materials

Construction materials will be ordered as far as practicable in bulk quantity or in container that requires the least packaging or wrapping. For materials delivered to site, reusable and recyclable cardboard, packaging materials and pallets will be re-used, recycled or returned to the supplier. Suppliers who accept the return of pallets and reusable and recyclable cardboard and packaging materials should be identified and given priority for business.

Sufficient space will be provided for proper stockpile of such recovered materials in dry condition and with cover to prevent cross contamination by other C&D materials. The recovered materials will be arranged to be collected by or delivered to recycling contractors on a regular basis.

4.10 Toilet Waste

During construction works, chemical toilets will be provided for use by site workers. These will be provided by a licensed contractor, who will be responsible for appropriate disposal of sewage and maintenance of the chemical toilet.

5 Waste Reduction Target

In order to determine whether the waste management procedures used by CSHK are effective, the following specific targets will be implemented onsite in an effort to reduce the generation of waste materials, and thus minimize the amount of waste requiring disposal at landfill:

- All excavated materials are to be sorted to recover the inert portion of C&D materials, e.g. Hard rock, soil and broken concrete, for reuse on the site or disposal to designated outlets. The target is 10,000m^3 of excavated material to be sorted on sited per year;
- All scrap metals are to be recovered for collection by recycling contractors. The target is 2 tonnes of scrap metals to be recycled on site per year;
- All cardboard and paper packaging (for plant, equipment and materials) is to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination. The target is 0.1 ton of cardboard and paper packaging to be recycled on site per year;
- All chemical wastes are to be collected and properly disposed of by specialist contractors. The target is 300L chemical waste to be collected on site per year;
- All demolition debris is to be sorted to recover broken concrete, reinforcement bars, mechanical and electrical fittings. Hardware as well as other fittings / materials for recycling at established recycling outlets. The target is 0.3 ton of waste to be recycled on site per year; and
- The use of new timbers is to be reduced and the Temporary Works controlled. The target is less than 20% of new timber of formwork to be purchased and used on site. The target will be varied according to on-site situation.
- Obtainment of Wastewi$e Label.

6 Waste Management Procedures

6.1 General

This section describes the main waste management procedures to be implemented during construction phase of the project to avoid, minimise, recover, recycle, reuse, store, collect, treat and dispose of waste generated.

The waste that is generated during the construction process will be disposed of at designated disposal facilities. Monthly summaries of the amount of waste material disposed of offsite will be provided to the ER in the form of a Waste Flow Table (WFT). The summaries will indicate the estimated quantities of waste removed the types of materials removed and the corresponding disposal ground in the WFT.

The quantities of C&D material disposed of will be recorded under the barcode TTS by using the CHIT / DDF (for disposal of C&D Materials at Disposal Grounds (Other than Prescribed Facilities) as designated in the Contract or as Directed by the ER, or Alternative Disposal Grounds Proposed by the Contractor and Approved by the ER). In addition, a completed "CHIT" will also be presented to the receiving facility as part of the system for the disposal charging scheme which became officially effective in January 2006. Waste transaction records could be obtained either from the waste disposal facilities directly, or retrieved from the EPD bill statement each month.

6.2 Trip Ticket System (TTS)

In accordance with TCW No. 6/2010, a TTS is implemented to track the disposal of C&D materials from the site to the disposal grounds. A site procedure will be developed to ensure that each truck/ barge load of C&D materials leaving the site will bear a duly completed and stamped CHIT / DDF, and that the relevant waste management records have been completed and signed properly before its departure from site.

The CHIT shall be used for disposal of C&D material at a prescribed facility as defined under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N).

To prevent illegal dumping, a trip-ticket system (TTS) will be adopted to ensure that the inert portion of the C&D materials should be disposed of at the Public Filling Facility at Tuen Mun Area 38 Fill Bank or other disposal outlets as directed by ER. The non-inert portion of the C&D materials that is not recyclable should be disposed of at NENT Landfill. For each and every trip transporting C&D materials off-site to the designated public filling area or landfill, a Construction and Demolition Material Disposal Delivery Form (DDF) and CHIT should be produced and completed in duplicate and should be prepared on site for checking by the ER. A sample of the CHIT and DDF is shown in **Appendix E** and a flow chart of operation for disposal of C&D materials is shown in **Appendix F**.

General site procedures of the TTS are provided below:

- Prior to the truck leaving the site, CSHK should provide a duly completed, signed and stamped CHIT / DDF to dump truck driver.
- CSHK will maintain a daily record summary (DRS) of disposal of C&D material from the Site including details of the C&D materials, the truck number, departure time, etc. CSHK shall complete Part 1 of the

DRS in duplicate and inform the ER's staff of the departure of such truck. ER's staff shall sign Part 1 of the DRS before departure of such truck, or to suit site operations at other times to be agreed between ER and CSHK.

- The truck driver should proceed to the disposal facilities as stipulated in the CHIT / DDF or as directed / approved by ER. The truck driver should present the CHIT / DDF to the reception facility operator.
- If the C&D materials accords with the acceptance criteria, disposal of the C&D materials will be permitted and the facility operator will give the truck driver a transaction record slip and stamp the CHIT.
- The truck driver will then return the transaction receipt and the stamped CHIT / DDF to CSHK as soon as possible. All CHIT / DDFs are to be return to the EO.
- For disposal at a prescribed facility, the Contractor shall check the information recorded in the DRS against the disposal records from EPD's website (http://www.epd.gov.hk/epd/misc/cdm/scheme.htm#j). CSHK should complete Part 2 of the DRS form for submission to the ER (within 1 working day or agreed timeframe) after the records are posted at the EPD website.
- For disposal facility other than prescribed facility, CSHK should ensure that the DDF is signed off by a competent person as agreed by the Engineer at the disposal facility to confirm completion of each trip.
- Where an irregularity is observed or where requested by ER under special circumstances (e.g. a CHIT / DDF has been issued but there is no disposal record at the designated disposal facilities), CSHK should submit to ER within 5 working days after the recorded date of disposal the supporting evidence such as duly stamped CHIT / DDF and/or the transaction record slip (where relevant) to confirm proper completion of the delivery trips in question, or within 2 working days after ER has requested for such evidence, whichever is later. A fax copy of the CHIT / DDF or transaction record slip is acceptable, unless otherwise directed by ER.
- The copies of the CHIT / DDF and the receipt shall be maintained on site for future references.

Daily site inspection should be carried out by foreman, to avoid any non-compliance for TTS. No unauthorized disposal of C&D materials without the stamped DDF/ CHIT tickets will be permitted to exit and re-enter the project works area for delivery of any C&D material generated under any conditions.

CSHK should maintain a comprehensive register filing system of the DDF/ CHIT tickets issued.

CSHK should make the DDF register record available for inspection by ER upon request. The Contractor should establish the record system for the recyclable materials, such as time record and delivery note number.

6.3 Construction Waste

- Careful design, planning and good site management shall be maintained to minimise over-ordering and waste of materials such as concrete, bentonite and cement grouts.
- The formwork will be designed to maximise the use of standard timber faced panels so that high reuse levels can be achieved. Alternatives such as steel formwork or plastic facing will be considered for repetitive areas to increase the potential for reuse.
- General construction waste shall be separated into reusable items and materials to be disposed of or recycled. This work will be carried out by the general workforce under the supervision of the foremen. It

will be conducted at the immediate working area to avoid loss or leakage during handling. For example formwork and timber shall be cleaned for reuse, off-cuts of reinforcement will be sorted into usable lengths and short off-cuts stacked for scrap metal.

- Useful materials such as timber, rubble and steel/metal shall be segregated for reuse. Where it is no longer reusable, steel and metal items will be sent as scrap for recycling.
- Segregated materials shall be temporarily stored at designated areas for reuse on site. Steel will be stored at the reinforcement yards, timber at the formwork yard and rubble in a stockpile (either covered or sprayed to control dust).
- Any residual materials (such as containers, wrappers or general waste material, etc) shall be collected and placed in skips. These will be transported to the appropriate tips /dumps by licensed waste haulers (where appropriate).

6.4 Marine Sediment

Full scale marine mud treatment will be commenced after the Cement S/S mixing proportion and curing time are determined and approved by the Engineer following submission of a pilot scale trial report.

The untreated marine sediment will be delivered to the designated storage areas by dump truck and covered with impermeable sheeting such as canvas sheet once placed at the storage yard. Prior to proceeding with the required cement mixing, screening off of debris, rock fragment and oversize material from the untreated marine mud by backhoe shall be arranged at the storage area.

Untreated marine sediment will be delivered from the storage areas to the Cement S/S mixing tank by dump truck.

After each set of marine sediment is treated and found to be acceptable by verification test, it will be allowed to be used as backfilling materials on site at locations where marine sediment will not be excavated again and will be deposited above the groundwater table. The deposit location will be determined and confirmed by the Engineer. The treated marine sediment will be delivered to the backfilling area by tipping lorry and compacted by vibratory roller or vibratory plate subject to site conditions.

According to EP Condition 3.27, should off-site disposal of marine sediment be required, the excavated sediment shall be disposed of at the designated disposal sites within Hong Kong as allocated by the Marine Fill Committee or other locations as agreed by EPD. For this Contract, no off-site disposal of marine sediments arising from the construction works is proposed.

Owing to the nature of the Cement S/S mixing process, the treated marine sediment will become hardened in time. It is thus desirable that the mixing process will only be carried out when the designated area is available for backfilling.

During the decommissioning of the Cement S/S treatment plant, the components/parts will be cleaned up entirely before demobilisation in order not to cause any contamination on site.

6.5 Chemical Waste

Measures to be implemented to encourage chemical waste avoidance / minimization include:

- For those processes, which generate chemical waste, alternatives would be sought to reduce quantities or even eliminate chemical waste, or which produce less dangerous types of chemical waste.
- Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, will be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste. The foreman shall be responsible for notifying the Environmental Officer when any potentially hazardous materials are store on site. He will draw the attention of users to the disposal requirements on packaging.
- Chemical wastes will arise principally as a result of maintenance activities. Such wastes (mainly spent lubricants, fuel and grease), will be generated throughout the construction period.
- The project shall register with the Environmental Protection Department (EPD) as a chemical waste producer before the generation of chemical wastes.
- The Environmental Officer shall inspect the storage area and its access to ensure it is free from obstruction and is kept dry and clean during the regular daily site walk.
- Foreman, (reporting to the Environmental Officer) shall keep and weekly update the inventory of the types and quantities, if any, of chemical waste being stored at site.
- Tool Box Talk shall be included chemical hazards, provided by the Safety Officer to ensure that all workers understand the hazard symbols and safety precautions in relation to materials being used and chemical wastes generated, if any.

CSHK has been registered as Chemical Waste Producer. Chemical waste that is generated, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, will be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes as follows:

6.5.1 Packaging

- Chemical waste should be packed and held in containers so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport;
- The containers for chemical wastes shall be resistant to the contents and be in good physical condition;
- The containers for chemical waste shall be securely closed or sealed, correctly stored and kept clean;
- Separate containers shall be used to hold different types or different sources of chemical wastes;
- About 100mm air space shall be allowed between the top of the container and the level of any liquid contents;
- Drums and jerry cans shall be used as chemical waste containers. The use of any container with a capacity exceeding 450 litres is subject to the approval of the EPD; and
- Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations.

6.5.2 Labelling

- Appropriate labels shall be affixed on the sides of each of the containers of chemical waste;

- The information contained on the label shall be accurate and sufficient so as to enable proper and safe handling, storage and transportation of the chemical waste.

6.5.3 Storage

- A storage area located close to the source of waste generation shall be designated for temporary storage of chemical waste;
- The main storage area shall be covered and rigidly enclosed on at least three sides by a wall, partition or fence with a height of not less than two metres or the total height of containers in the stack;
- Adequate ventilation should be allowed and adequate space shall be allowed within the storage area for container handling;
- The storage shall be ensured to retain potential leakage of the capacity to 110% of the largest container or 20% of the storage capacity;
- The storage area shall be kept clean and dry and secured with an appropriate door /gate and locked at all time; and
- A small quantity of chemical waste, not exceeding 50 litres, may be stored at the working area with sufficient capacity to accommodate 110% of the volume of the container.

6.5.4 Disposal

- Disposal of chemical waste shall be regular and via a licensed waste collector;
- The chemical waste shall be transported to a facility licensed to receive chemical waste; and
- A log will be maintained for the removal of chemical wastes from site. Trip tickets shall be issued for the disposal of materials. The Licensed waste collector shall properly keep disposal records and pass them to the Contractor for record purposes.

6.6 Timber Waste

Timber used for temporary works will be collected after the end of their use in this project and transported to other project sites for re-use.

6.7 General Refuse

- General refuse will be generated mainly by food service activities for site workers. Bins will be provided for containment prior to disposal of such waste.
- Aluminium cans and plastic bottles are collected by individual collectors if they are segregated or easily accessible, so separate labelled bins for their deposit will be provided.
- Office wastes will be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme would be considered if one is available.
- We will encourage environmental awareness and try to reduce waste by:
  - Reducing the number of photo copies to a minimum.
  - Copying on both sides of paper for internal documents and external documents where appropriate.
- General refuse generated on-site shall be stored in enclosed bins or compaction units separate from construction and chemical wastes.

- A reputable waste collector will be employed by the contractor to remove general refuse from the site, separately from construction and chemical wastes, when necessary to minimise odour, pest and litter impacts. No burning of refuse on site will be permitted.
- Foreman will inspect and manage the site condition with respect to be general refuse on-site during the daily site walk.

6.8 Demolition Waste

- Useful materials such as steel pipes, reinforcement, shall be collected for recycling as scrap metal. Concrete and rubble shall be segregated for reuse as backfill or for hard standings and site haul roads. This work will be carried out in general workforce under the supervision by Foremen. It will be conducted at the immediate demolition area to avoid loss or leakage during handling.
- Steel scrap materials including steel bars and pipes will be used as far as possible.

6.9 Recyclable Materials

Recyclable materials shall be segregated, collected and temporarily stored in separately labelled bins, skips or designated locations. All workers shall be notified and encouraged to store these materials at these facilities, and their use will be monitored by the Environmental Officer. Recyclable materials will be collected by licensed collectors at regular intervals for recycling.

6.10 Packaging Material

Packaging material will be sorted, collected and recycled by licensed collectors at regular intervals.

6.11 Toilet Waste

Portable chemical toilets will be stored in a self-contained area. Toilet wastes shall be collected by a licensed waste collector at a regular interval for onward treatment and disposal.

6.12 Waste Flow Table (WFT)

Besides the aforesaid Trip-ticket system, the receipts for the collection of all scrap metals, cardboard and paper by nominated recycling contractors should be kept on site for recording. The quantities of C&D materials reused, recycled and/or removed from the site will be included in the Monthly Summary of 'Waste Flow Table' (WFT). The monthly summary WFT should be submitted to the Supervisor Officer together with the updated sections of the EMP (if any) by not later than the 15th day of each month following the month reported on, or if it is a General Holiday, the day following the General Holiday.

7 Site Staff Training

The Contractor will ensure that all site staff attend an environmental management training course. The training will cover the measures for waste reduction, reuse & recycling, on-site sorting of C&D materials and performance measurement on the site.

The content of the training will include the following:

- Concepts of Site cleanliness.
- The steps / requirements of the WMP stipulated in the project.
- Classification of different waste types in accordance with the WMP.
- Proper segregation, handling and storage of different types of waste in accordance with the WMP.
- Procedures and measures for waste minimisation, reuse and recycling.
- Locations of designated storage areas for different waste types in accordance with the WMP.
- Handling of contaminated material, including the appropriate Personal Protective Equipment (PPE) requirements.
- Procedures for handling contaminated material.
- Emergency Response Procedure and mitigation measures.

Furthermore the EO or ES, to provide additional training regarding site cleanliness and waste management procedures would be held on-site on a monthly basis to review relevant statutory regulations and waste management practice and to discuss relevant contract requirements. This training shall be provided to all levels of staff.

Tool-box talks would be given to all workers by foremen at regular intervals as a means to promote environmental awareness and provide updated issues regarding waste management practices. All foremen and subcontractors' representations would be trained regarding the presentation of the tool-box talks by the EO.

An auditable record will be maintained for all environmental training undertaken.

8 Surveillance System

From 20 January 2006, charging for disposal of construction waste was started, any person before using waste disposal facilities for disposal of construction waste needed to provide a CHIT ticket issued by EPD at the entrance of the facilities.

The environmental team shall establish a surveillance system within the Site and at any alternative disposal grounds to check that the disposal activities comply with the requirements as set out in the Particular Specification. Disposal activities that require checking are:

8.1 Information for Truck Drivers

The environmental team will write to all truck drivers whom have engaged for removal of C&D materials from the Site and draw their attention to the following particular points:

- Each truck carrying C&D materials leaving the Site for a disposal ground must bear a duly completed and stamped DDF and CHIT, irrespective of the location and nature of the disposal ground;
- The C&D materials must be disposed of at the disposal grounds as stipulated in the DDF and CHIT;
- Any loaded dump truck, which is rejected by the disposal grounds as stipulated in the DDF and CHIT (i.e. either Public Fill Reception Facility or Landfill), the truck drivers should deliver the unacceptable mixed waste back to the site for further sorting;
- What constitutes an improper disposal and that the Public Fill Committee will consider revoking the Dumping Licence from the holder of the offending trucks; and
- Truck drivers must bear a valid Dumping Licence which he can apply from the CEDD.

8.2 Control Measure for Prevention of Overloading

In view of the enhanced controls on truck overloading, all trucks shall be checked by CSHK's supervising staff when leaving the site area to make sure that each truck has total weight not exceeding its Permitted Gross Vehicle Weight which would comply with the relevant provisions under the Road Traffic (Traffic Control) Regulation (Cap. 374G) regarding loading conditions.

8.3 Enhanced Measures to Prevent Waste Disposal at Sorting Facility and Illegal Dumping

The following measures will be implemented continuously to prevent disposal of C&D materials to the sorting facilities and illegal dumping.

8.3.1 Training

Ongoing training sessions on waste handling, sorting and disposal, in the form of induction trainings and tool box talks, are to be provided to the frontline workers, project team members, workers and dump truck hauler's representative to enhance their awareness.

8.3.2 Waste Facilities

Waste facilities to facilitate on-site sorting, collection and temporary storage of waste materials will be provided on site. The waste facilities including the following:

- Designated area for temporary storage of Inert C&D Material;
- Designated waste skip for temporary storage of non-inert C&D Material;
- Recycling cages for collection of waste metal, plastic and paper;
- Recycling bins for collection of waste papers, cans and plastic bottles; and
- Designated storage area for chemical waste.

8.3.3 Administrative Control

To ensure no waste is to be disposed of at the sorting facility and no illegal dumping on private lands or areas other than the designated disposal ground, the environmental team shall mandate any loaded dump trucks, which are rejected either by Public Filling Facility or Landfill, to deliver the unacceptable mixed waste back to the site for further sorting. The environmental team shall closely monitor the efficiency and effectiveness of on- site sorting and ensure that no waste is allowed to be disposed of at the sorting facility.

8.4 Video Recording System

A video recording system should be provided, operated and maintained by CSHK for recording all trucks leaving the Site (e.g. registration mark, loading conditions, etc). The system should securely protect the video cameras from being damaged or blocked. The videos captured shall be recorded continuously without break except as agreed with ER or where there is no disposal of C&D materials during the entire month, and should be kept for at least 60 days.

9 Waste Management Records

9.1 General

The DDF will be used for each and every vehicle that transports C&D material off site to a disposal facility.

Prior to the vehicle leaving the site, the ER will input the date, time of departure, vehicle licence plate number, designated public filling facility / landfill, and any other information as required onto the DDF, then stamp the DDF. The ER will retain the first strip of the form and pass the rest of the DDF to CSHK's representative. The DDF will be carried on board the vehicle by the driver at all times, for the duration of the trip.

A comprehensive register of the DDF issued will be maintained by CSHK in the project environmental filing system, and available for inspection by the ER upon request. The DRS and the WFT records will be completed and kept to enable monitoring of the DDF's that have been issued. These two records will be also submitted to the ER for their record.

9.2 Monthly Waste Flow Table

CSHK will maintain a record of the quantities of C&D materials that are generated each month using the monthly summary WFT. The CSHK EO will complete and submit the monthly summary WFT to the ER by no later than the 15th day of the following month, or if this day is a general holiday, the day following the General Holiday, or a later date as agreed to by the ER.

9.3 Yearly Waste Flow Table

The estimated quantities of C&D materials that are generated each year from the site will be summarised using the yearly summary WFT. The yearly summary WFT will be updated on a half-yearly basis and will be submitted to the ER by not later than 1st of June and 1st of December of each calendar year, or if these days are general holidays, the day following the general holiday, or a later date as agreed to by the ER. These summaries shall also be made available to the ETL and the IEC/ENPO.

Specific trip tickets and records for the internal transfer of C&D materials and imported fill materials will also be kept for monitoring and shall be made available to the SO upon request.

CSHK will record the quantities of before removal off the Site via recycling contractors, and submit the details of recyclable materials in the WFT to the ER.

10 Waste Monitoring and Audit

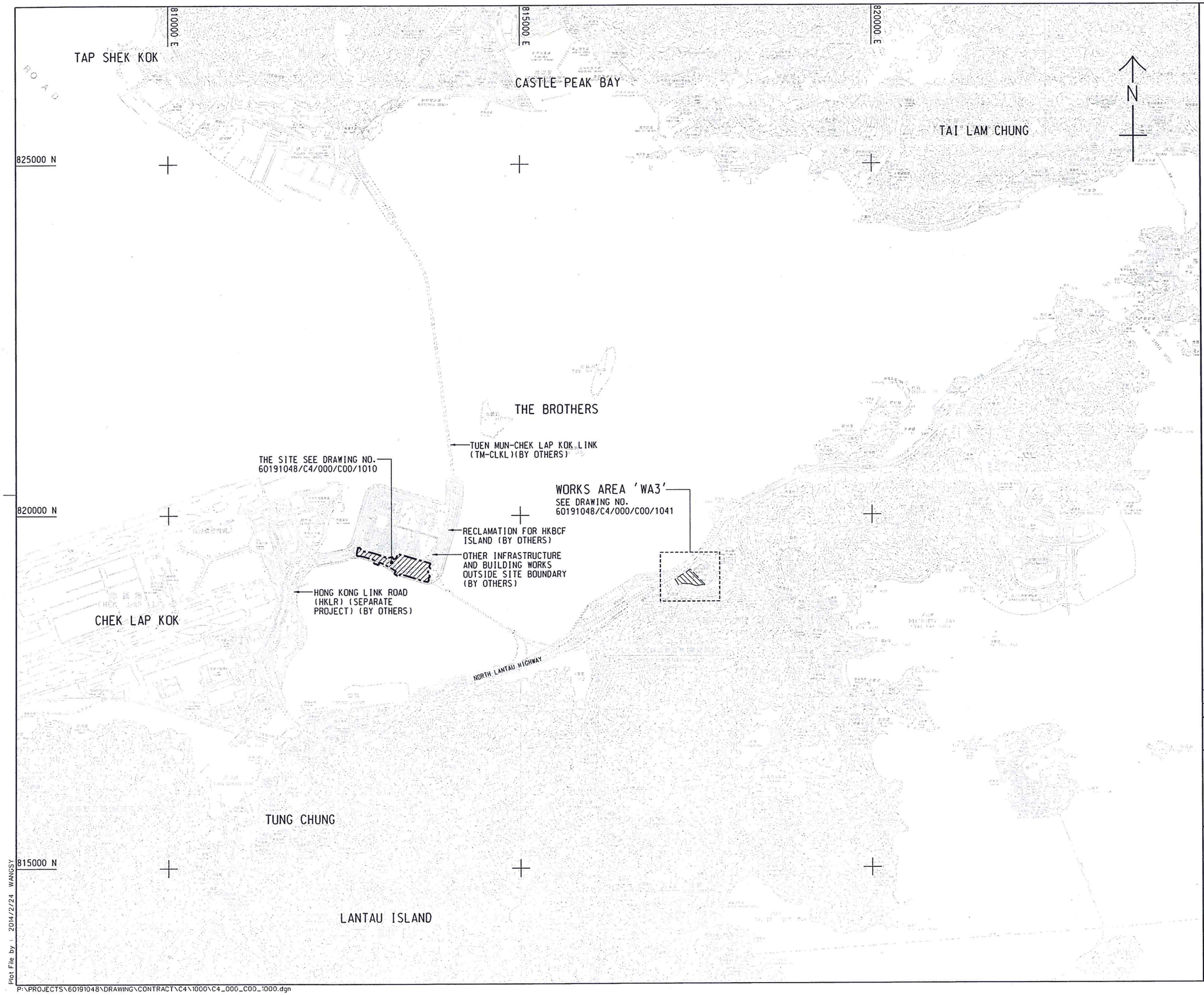
The Contractor is responsible for all waste management activities under its works contract during the construction phase. The Contractor must ensure that all wastes produced during the construction phase are handled, stored and disposed of in accordance with EPD's regulations and requirements and in line with good waste management practices.

The Contractor should perform regular site inspection (at least once per week) to determine if wastes are being managed in accordance with approved procedures. Waste materials generated during the construction works, such as inert C&D material, general refuse and chemical wastes, are recommended to be monitored on a weekly basis to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes are not disposed into the nearby harbour waters. The Contractor would be responsible for the implementation of any mitigation measures to minimise waste or redress problems arising from the waste materials.

In addition, the ET will carry out statutory weekly site inspections in accordance with the EM&A Manual approved under the EIA Ordinance. The ET will identify any non-compliance with the EM&A Manual and will report them accordingly. The results of the waste management audits would be reported in the monthly EM&A reports.

Appendices

Appendix A. Site Layout Plan



NOTES:

1. COORDINATES ARE RELATED TO HONG KONG METRIC GRID (1980).
2. DIMENSIONS ARE IN MILLIMETER AND CHAINAGE ARE IN METRES UNLESS OTHERWISE SHOWN.

LEGEND:

SITE BOUNDARY

WORKS AREA

REV. 修訂	DESCRIPTION 內容摘要	BY CHECKED	DATE 日期
-	TENDER DRAWING	BNCW SCI	FEB.14

HIGHWAYS DEPARTMENT
路政署
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

SITE LOCATION PLAN

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1000

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. Dir. APPROVED 核准人
BNCW	HY/2013/04	TKH
DRAWN BY 繪圖 WSY	STATUS 階段	
SCALE 比例 A1 1 : 25000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版權所有	

Plot File by : 2014/2/24 WANGSY

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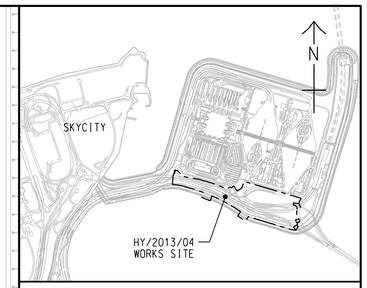
812800 E
813200 E
813600 E
820000 N
819600 N
819400 N

BRIDGE D1
BRIDGE D8
BOX CULVERT C
DEPRESSED ROAD DRAINAGE
PUMP HOUSE CUM SWITCH ROOM
BRIDGE D9a
BRIDGE D14a
BRIDGE D10
BRIDGE D14b
BRIDGE D9b
BRIDGE D11
BRIDGE D9c
BRIDGE D16N
BRIDGE D16S
BRIDGE D15
BRIDGE D13
BRIDGE D12a
BRIDGE D12b
BOX CULVERT D
M.J.

A



LOCATION PLAN
SCALE 1 : 25000

LEGEND:

- SITE BOUNDARY
- AT-GRADE WORKS LIMIT
- M.J. — MOVEMENT JOINT
- BRIDGE
- BUILDING/FACILITIES
- AT-GRADE ROAD
- BOX CULVERT

REV. 修訂	DESCRIPTION 內容摘要	CHECKED 複核	DATE 日期
B	WORKING DRAWING	BWCW SCI	APR.15
A	TENDER ADDENDUM NO. 3	BWCW SCI	MAY.14
–	TENDER DRAWING	BWCW SCI	FEB.14

D.C. P.D.

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HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

GENERAL ARRANGEMENT

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1002B

DESIGNED BY 設計	BWCW	CONTRACT NO. 合約編號	HY/2013/04
DRAWN BY 繪圖	WSY	P. Dir. APPROVED 批准人	TKH
SCALE 比例	A1 1 : 2000	STATUS 階段	WORKING DRAWING
DIMENSIONS ARE IN 尺寸單位	METRES		

Plot File by : 2014/5/7 WANGSY

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SETTING OUT POINT

POINT	EASTING	NORTHING
301	817467.265	819162.683
302	817314.741	819069.828
303	817327.338	819049.295
304	817440.865	819117.811
305	817340.825	819027.314
306	817387.350	819023.403
307	817387.861	819043.396
308	817466.133	819091.047
309	817469.783	819087.181
310	817513.449	819113.764
311	817347.717	819016.082
312	817620.269	819000.620
313	817445.362	819013.131
314	817450.595	819032.307
315	817495.828	819059.595
316	817522.110	819075.388
317	817566.404	819028.472
318	817568.506	819008.526
319	817531.155	819001.066
320	817533.346	818991.306

A

817200 E

817400 E

817600 E

819200 N

819000 N

NORTH LANTAU HIGHWAY

CHEUNG TUNG ROAD

小濛灣污水處理廠
Siu Ho Wan Sewage Treatment Works

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/03

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/09

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/02

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/01

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/03

10m WIDE COMMON ACCESS TO BE MAINTAINED BY CONTRACT NO. HY/2010/02

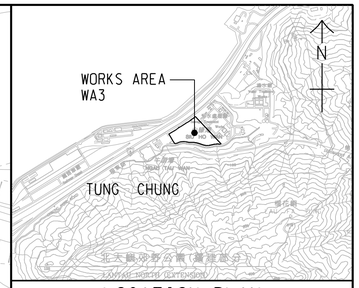
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2010/02

10m WIDE COMMON ACCESS TO BE CONSTRUCTED AND INITIALLY MAINTAINED BY CONTRACT NO. HY/2013/01. UPON COMMENCEMENT OF CONTRACT NO. HY/2013/03. THE MAINTENANCE RESPONSIBILITY SHALL BE TRANSFERRED FROM CONTRACT NO. HY/2013/01 TO CONTRACT NO. HY/2013/03.

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/04

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2014/05



LOCATION PLAN
SCALE 1 : 25000

NOTES:

1. COORDINATES ARE RELATED TO HONG KONG METRIC GRID (1980).
2. DIMENSIONS ARE IN MILLIMETER AND CHAINAGE ARE IN METRES UNLESS OTHERWISE SHOWN.

LEGEND:

- WORKS AREA BOUNDARY
- PORTION 3.1
- PORTION 3.2
- PORTION 3.3
- PORTION 3.4
- PORTION 3.5
- PORTION 3.6
- PORTION 3.7
- PORTION 3.8
- PORTION 3.9
- PORTION 3.10 (A)

REV. 修訂	DESCRIPTION 內容摘要	D.E. P.E. CHECKED 查核	DATE 日期
B	WORKING DRAWING	BWCW SCI	APR.15
A	TENDER ADDENDUM NO. 2	BWCW SCI	APR.14
-	TENDER DRAWING	BWCW SCI	FEB.14

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港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

WORKS AREA WA3

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1041B

DESIGNED BY 設計 BWCW	CONTRACT NO. 合約編號 HY/2013/04	P. Dir. APPROVED 負責人 TKH
DRAWN BY 繪圖 WSY	STATUS 階段 **WORKING DRAWING**	
SCALE 比例 A1 1 : 1000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版 權 所 有	

Plot File by : 2014/4/11 WANGSY

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Appendix B. China State Construction Engineering (Hong Kong) Limited Environmental Policy

China State Construction Engineering (Hong Kong) Limited
ENVIRONMENTAL POLICY

The core business of China State Construction Engineering (Hong Kong) Limited (hereinafter referred to as "the Company") is the design and construction of multi-disciplinary projects, including building, civil, foundation, mechanical & electrical projects, and construction products. It is the Company's policy to protect the environment likely to be affected by its operations.

The Company is committed to:

- complying with statutory, contractual and other requirements in all respects
- preventing environmental pollution
- reducing construction wastes
- minimizing the consumption of natural resources; and
- improving its overall performance

The Company has set up its environmental management system and formulated environmental objectives and targets. The Company shall continuously review and improve the environmental management system in an attempt to improve its overall performance.

It is mandatory that all employees shall fully conform to the policy and carry out their assigned duties and responsibilities.

PAN Shu Jie
Executive Director & President
30th January, 2015

中國建築工程(香港)有限公司
環保政策

中國建築工程(香港)有限公司主要從事房屋工程、土木工程、基礎工程、機電工程和建築製品工程等有關的設計與施工業務。保護環境是公司的基本政策之一。

本公司承諾：

- 遵守環保法例、合約條款及相關要求
- 避免造成污染
- 減少建築廢料
- 減少天然資源消耗
- 達致持續改善

本公司建立環境管理體系，制定環保目標和指標，並不斷檢討和完善，持續改善公司的環保表現。

本公司所有員工必須遵照執行《環保政策》，並對整體環保成效負責。

潘樹杰
執行董事兼總經理
二〇一五年一月三十日

Appendix C. Summary Table for Use of Timber for Temporary Works

SUMMARY TABLE FOR WORK PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Summary Table for Work Processes or Activities Requiring Timber for Temporary Works

Contract No. : _____

Contract Title : _____

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m^3)	Actual Quantities used (m^3)	Remarks
1.					
2.					
3.					
4.					
5.					
6.					
7.					
		Total Estimated Quantity of Timber Used			

Notes: (a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.

(b) The summary table shall be submitted to the Supervising Officer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with **ER Clause 8.8.5(e)**.

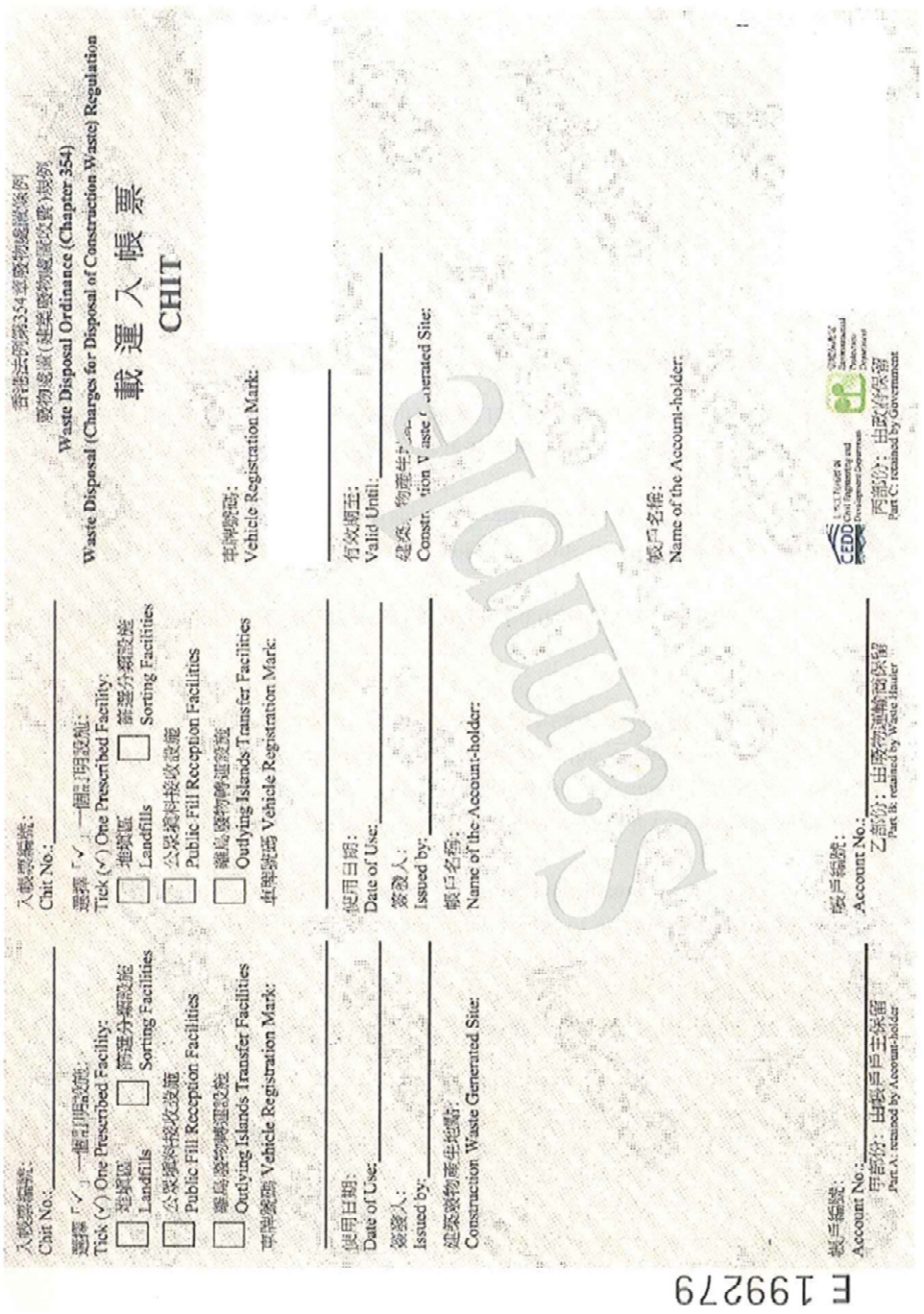
Appendix D. Waste Flow Table

Name of Department: HyDContract No.: _____HY/2013/04_____

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	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan											
Feb											
Mar											
Apr											
May											
June											
Sub-total											
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											

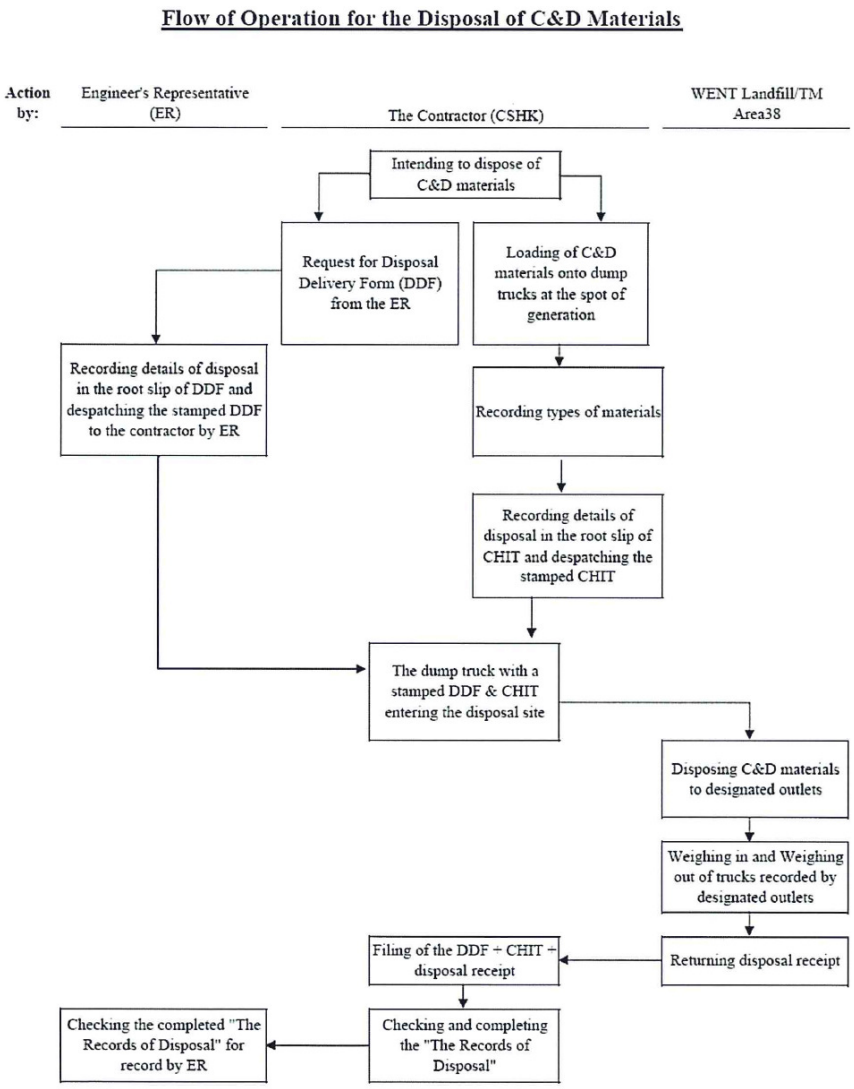
Appendix E. Sample of CHIT & DDF



Sample of the Disposal Delivery Form (DDF) for Disposal of C&D Materials at Disposal Grounds (Other than Prescribed Facilities) as Designated in the Contract or as Directed by the Architect/Engineer, or Alternative Disposal Grounds Proposed by the Contractor and Approved by the Architect/Engineer

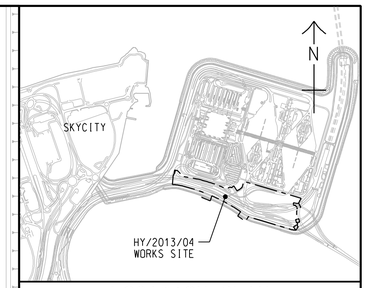
Serial No. 0012345678	**Serial No. 0012345678**
Date of Use: 使用日期:_____	**Construction and Demolition Materials** **Disposal Delivery Form** **拆建物料運載記錄票**
Disposal Ground : 接收設施: _____	Contract No: _____ Contract Title: _____ 合約編號: _____ 合約名稱: _____
Vehicle Registration Mark. : 車牌號碼: _____	Date of Use: Time of departure from site: Vehicle Registration Mark: 使用日期: _____ 離開地盤時間 : _____ 車牌號碼: _____
Issued By: 簽發: _____	Disposal Ground: 接收設施: _____
(This part retained by Disposal Ground) *(此部分由接收設施保留)*	Arrival Time/Date: 抵達日期/時間: _____ *(This part retained by Contract/Driver)* *(此部分由承建商/司機保留)*
Chop of Disposal Ground 接收設施蓋印	Chop of Disposal Ground Representative 接收設施蓋印 / Chop of Engineer's/Architect's 工程師 / 建築師代表蓋印

Appendix F. Flow Chart of Operation for Disposal of C&D Material



Appendix G. Designated Area for C&D Waste Segregation & Storage

812800 E
813200 E
813600 E
820000 N
819600 N
819400 N
N
BRIDGE D1
BRIDGE D8
BOX CULVERT C
DEPRESSED ROAD DRAINAGE
PUMP HOUSE CUM SWITCH ROOM
BRIDGE D9a
BRIDGE D14a
BRIDGE D10
BRIDGE D14b
BRIDGE D9b
BRIDGE D11
BRIDGE D16N
BRIDGE D16S
BRIDGE D15
BRIDGE D13
BRIDGE D12a
BRIDGE D12b
BOX CULVERT D
M.J.
Non-inert C&D Segregation and Storage Area
Inert C&D Segregation and Storage Area
A



LOCATION PLAN
SCALE 1 : 25000

LEGEND:

- SITE BOUNDARY
- AT-GRADE WORKS LIMIT
- M.J. — MOVEMENT JOINT
- BRIDGE
- BUILDING/FACILITIES
- AT-GRADE ROAD
- BOX CULVERT

REV. 修訂	DESCRIPTION 內容摘要	DRAWN 繪圖	CHECKED 複核	DATE 日期
B	WORKING DRAWING	BWCW	SCI	APR.15
A	TENDER ADDENDUM NO. 3	BWCW	SCI	MAY.14
-	TENDER DRAWING	BWCW	SCI	FEB.14

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HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

GENERAL ARRANGEMENT

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1002B

DESIGNED BY 設計	BWCW	CONTRACT NO. 合約編號	HY/2013/04
DRAWN BY 繪圖	WSY	P. Dir. APPROVED 批准人	TKH
SCALE 比例	A1 1 : 2000	STATUS 階段	WORKING DRAWING
DIMENSIONS ARE IN 尺寸單位	METRES		

Plot File by : 2014/5/7 WANGSY
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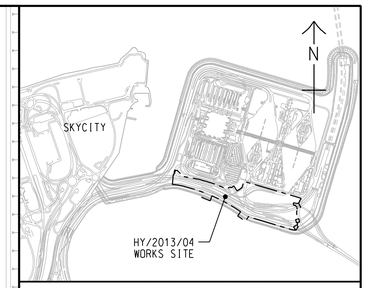
Appendix H. Designated Area for Cement Solidification/Stabilization Works

812800 E
813200 E
813600 E
820000 N
819600 N
819400 N

BRIDGE D1
BRIDGE D8
BOX CULVERT C
DEPRESSED ROAD DRAINAGE
PUMP HOUSE CUM SWITCH ROOM
BRIDGE D9a
BRIDGE D10
BRIDGE D13
BRIDGE D14b
BRIDGE D12a
BRIDGE D12b
BRIDGE D9c
BRIDGE D9b
BRIDGE D11
BRIDGE D15
BRIDGE D16N
BRIDGE D16S
BOX CULVERT D
Untreated Mud Storage Yard
Mixing Tanks
Treated Mud Storage Yard
M.J.
A



LOCATION PLAN
SCALE 1 : 25000

LEGEND:

- SITE BOUNDARY
- AT-GRADE WORKS LIMIT
- M.J. — MOVEMENT JOINT
- BRIDGE
- BUILDING/FACILITIES
- AT-GRADE ROAD
- BOX CULVERT

REV. 修訂	DESCRIPTION 內容摘要	DRAWN 繪圖	CHECKED 複核	DATE 日期
B	WORKING DRAWING	BWCW	SCI	APR.15
A	TENDER ADDENDUM NO. 3	BWCW	SCI	MAY.14
-	TENDER DRAWING	BWCW	SCI	FEB.14

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港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- INFRASTRUCTURE WORKS STAGE II (SOUTHERN PORTION)

GENERAL ARRANGEMENT

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1002B

DESIGNED BY 設計	BWCW	CONTRACT NO. 合約編號	HY/2013/04
DRAWN BY 繪圖	WSY	P. Dir. APPROVED 批准人	TKH
SCALE 比例	A1 1 : 2000	STATUS 階段	WORKING DRAWING
DIMENSIONS ARE IN 尺寸單位	METRES		

Plot File by : 2014/5/7 WANGSY
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