RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_4797L.16

23 November 2016

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. Ringo Tso

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/2013/02 – HZMB HKBCF – Infrastructure Works Stage I (Western Portion)
Waste Management Plan (Revision 4)

Reference is made to the Environmental Team's submission of Waste Management Plan certified by the ET Leader (ET's ref.: "OC/60582/CLL" dated 16 November 2016) and provided to us via e-mail on 16 November 2016.

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

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. Vico Cheung	(By Fax: 3188 6614)
	HyD	Mr. Chee-Kuen Yu	(By Fax: 3188 6614)
	ETS	Mr. C. L. Lau	(By Fax: 2695 3944)
	CHEC	Mr. Kenny Yu	(By Fax: 3915 0300)

Internal: DY, YH, ENPO Site

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Your Ref. : ---
Our Ref. : OC/60582/CLL

16 November 2016

China Harbour Engineering Co., Ltd
19/F, China Harbour Building,
370-374 King's Road,
North Point,
Hong Kong

By Hand and E-mail

Attn: Mr. Lawrence So (Deputy General Manager)

Dear Mr. So,

Contract No. HY/2013/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion)
Waste Management Plan

In accordance with the requirement specified in Condition 2.10 of the Environmental Permit No. EP-353/2009/K, we are pleased to certify the Waste Management Plan dated 08 November 2016 for your onward submission to ENPO/IEC for verification.

Yours faithfully,
ETS-TESTCONSULT LIMITED

Mr. C. L. Lau
Environmental Team Leader

CLL/cw

This company is accredited by HKAS under HOKLAS for laboratories and HKIAS for inspection bodies for a specified range of tests/services listed in the HOKLAS/HKIAS Directories of Accredited Laboratories/Inspection Bodies.

CHINA HARBOUR ENGINEERING CO., LTD.

Waste Management Plan

for

Contract No. HY/2013/02

Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities
– Infrastructure Works Stage I (Western Portion)

Highways Department
The Government of the Hong Kong Special Administrative Region

Revision No. : **4**

Date : **8th Nov, 2016**

Prepared by :_____
Environmental Officer

Endorsed by :_____
Project Manager/ ~~Site Agent~~

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H Layout Plan of Proposed Temporary Storage and Sorting Area for C&D Materials

I Location of CMP2, CMP Vd & Marine Mud barging point.

REVISION HISTORY

Revision No.	Revision Date	Pages	Amendment
1	20/11/2014	All	First Submission
2	29/2/2016	All	Deleted DDF (not in use) and revised related content
2	29/2/2016	Page 5	Update the version of EP
2	29/2/2016	Page 7-8	Update Section 1.3 Environmental policy and Environmental Objective and Target
2	29/2/2016	Page 17-18	Update contract person in Figure. 1 and Table 1.
2	29/2/2016	Page 20	Replaced Section 3.3 Treatment (Cement Solidification/ Stabilization of Marine Mud) by Marine Dumping of Marine Mud
2	29/2/2016	30	Revised Section 4.6.3
2	26/4/2016	Page 5	Update the version of EP
2	26/4/2016	Page 21	By IEC comment, Revised Section 3.3
2	26/4/2016	Page 32	Revised Section 4.6.4, adding the disposal outlet of marine mud.
2	26/4/2016	Appendix I	Adding Appendix I: Location of CMP2, Marine Mud barging point and Internal Marine Mud Delivery Form
2	9/7/2016	Page 7-8	Update 1.3 Environmental policy and Environmental Objective and Target
2	9/7/2016	Page 17-18	Update contract person in Figure. 1 and Table 1.
2	9/7/2016	Page 20	By IEC comment, retrieved section 3.3 Treatment (Cement Solidification/ Stabilization of Marine Mud) by Marine Dumping of Marine Mud. Renumbering 3.3 to 3.4
2	9/7/2016	Appendix I	By IEC comment, revised Appendix I and added Location of mud pit CMP Vd.
2	22/7/2016	Appendix I	By IEC comment, revised Appendix I
3	2/9/2016	Page 19-21	By EPD comment. Revised Section 3.3 & 3.4
3	2/9/2016	P.31	By EPD comment. Revised Section 4.6.4 & table 4
4	8/11/2016	P.21	By EPD comment, Revised Section 3.4
4	8/11/2016	Page 31, Appendix G	For progress update, revised table 4 and deleted Appendix G: Layout of Cement SS Process Area

Abbreviations List

C&D	Construction & Demolition
CEDD	Civil Engineering and Development Department
CM	Construction Manager
DRS	Daily Record Summary
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring & Audit
EO	Environmental Officer
EPD	Environmental Protection Department
EP	Environmental Permit
ER	Engineer Representative
ES	Environmental Supervisor
ET	Environmental Team
ETL	Environmental Team Leader
Hyd	Highways Department
IEC	Independent Environmental Checker
MTRC	Mass Transit Railway Corporation
PFRF	Public Fill Reception Facility
TCA	Tung Chung Area 51, 53 and 54
TKO 137	Tseung Kwan O Area 137 Fill Bank
TM38	Tuen Mun Area 38 Fill Bank
TTS	Trip Ticket System
WAC	Waste Acceptance Criteria
WENT	West New Territories Landfill
WFT	Waste Flow Table
WMP	Waste Management Plan

1 INTRODUCTION

The Waste Management Plan (WMP) has been developed in accordance with clause 2.10 of Environmental Permit EP-353/2009/K for the Highways Department Contract namely Contract No. HY/2013/02 Hong Kong-Zhuhai-Macao Bridge, Hong Kong Boundary Crossing Facilities – Infrastructure Works Stage I (Western Portion) (hereinafter the Contract).

1.1 Project Description

The works to be executed under the Contract comprise the following major items of Works:-

(a) Construction of the viaducts and roads at the western portion of Hong Kong Boundary Crossing Facilities (HKBCF) mainly for connection with the Hong Kong – Zhuhai – Macao Bridge (HZMB), Hong Kong Link Road (HKLR), Hong Kong International Airport (HKIA) and the Tuen Mun-Chek Lap Kok Link (TM-CLKL);
(b) Construction of the road modification at the SkyCity Interchange at Airport Island;
(c) Construction of associated street lighting, street furniture, road marking, road signage, drainage, sewerage, fresh water and flushing water supply, irrigation, landscape, electrical and mechanical (E&M), utilities and services works;
(d) Provisioning of civil engineering works and power supply installation for the Traffic Control and Surveillance System (TCSS); and
(e) Other works in accordance with the Contracts.

1.2 Purpose of the Plan

This Waste Management Plan (WMP) aims to describe the arrangements for avoidance, minimization, handling, reuse, recovery and recycling, storage, transportation, collection, treatment and disposal of different categories of waste to be generated from the construction activities of this project. This WMP includes the recommended mitigations measures on waste management as contained as stipulated in EIA report and EM&A Manual.

The main objectives of the WMP include:

(a) Providing reference to the waste management requirements, both statutory and non-statutory;
(b) Clarifying the responsibilities of each party on waste management and the personnel within the Contractor's management;
(c)Establishing the waste management procedures for avoidance, minimization, material reuse/recovery/recycling, collection, transportation, storage and disposal of wastes generated from

the activities.

1.3 Environmental Management Policy

An Environmental Management Policy is established to demonstrate the Company's commitment in improving environmental performance. It aims to communicate China Harbour Engineering Company's mission, vision and beliefs towards the environment to the staff and provides a framework for guiding China Harbour Engineering Company's ongoing environmental improvement efforts.

The policy will be reviewed by relevant parties periodically and will be displayed on notice boards in languages suitable for the nationality for the workforce.

The Environmental Policy Statement, together with the Environmental Objectives and Targets, are listed below:

Environmental Policy Statement

The core business of China Harbour Engineering Company Limited / Zhen Hua Engineering Company Limited is design, construction and maintenance of civil, marine, environmental, building and foundation engineering works. It is the policy of the Company to ensure that all its activities are carried out in a manner that causes minimum adverse impact on the environment through the establishment and implementation of an environmental management system. We committed to: -

- Comply with all environmental legal, contractual and other requirements.
- Prevent pollution by providing sufficient resources for implementation of environmental nuisance control and waste management.
- Maintain a proper and good communication channel with the neighbourhood so as to minimize the environmental nuisance on them.
- Reduce the production of construction waste and to minimize the consumption of natural resources by careful planning and implementation.
- Provide appropriate training to all staff including subcontractors' staff.
- Strive to achieve continual improvement and maintain the effectiveness through periodic review of the environmental management system, the environmental objectives and targets and management reviews.

Mr. So Sze Lung Lawrence (Deputy General Manager of Quality, Safety and Environmental Compliance Department) is appointed as Management Representative, responsible for the overall co-ordination and implementation of this policy. However, environmental protection is one of the prime responsibilities of every employee, all staff shall ensure that this policy is understood, implemented and maintained. This policy will be reviewed annually and whenever necessary.

Approved by:

Managing Director
1 April 2016

Environmental Objectives and Targets

環境目標及指標

Item No.	Objective	Target
1	To comply with legal requirements	•Zero Conviction •Zero Pink/ yellow notice
2	To satisfy client's environmental requirements	Obtain a "satisfactory" or above ratings on the quarterly performance report
3	To prevent serious environmental incident	Zero Serious Environmental Incident
4	To maintain an effective Environmental Management System	Audit the Environmental Management System not less than twice a year
5	Enhance environmental awareness of workers	All workers to receive environmental induction training

環境目標及指標

項目.	目標	指標
1	奉公守法	•零檢控 •零 粉紅/ 黃 環境改善通知書
2	滿足業主要求	於季度表現報告(環保項目)中取得『滿意』或以上之級別
3	防止嚴重環境事故	零嚴重環境事故
4	確保環境管理系統有效執行	每年審核環境管理系統不少於兩次
5	加強工人環保意識	所有工人接受環保入職培訓

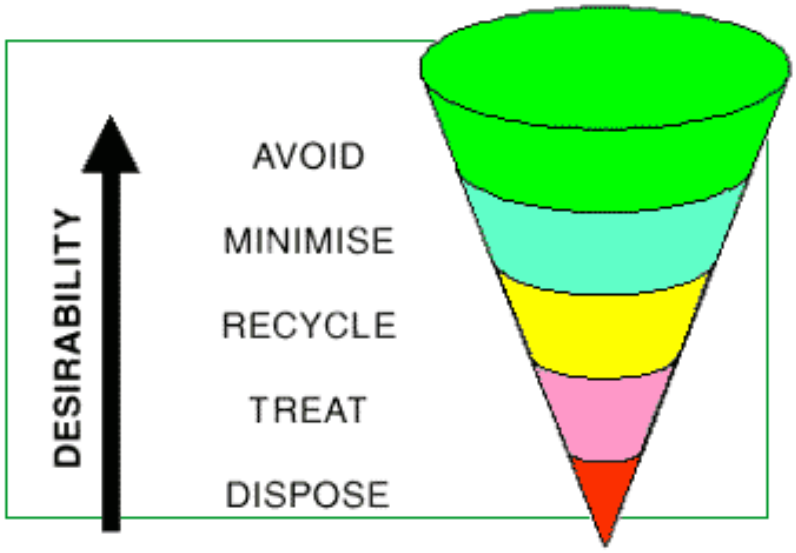
Approved by:

王 岩 Wang Yan
董事總經理 Managing Director
1 April 2016

1.4 The Waste Management Policy

To demonstrate the Project Team's commitment on the continual improvement of our waste management performance, an Environmental Management Policy includes the waste management has been established. It aims to communicate China Harbour Engineering Company's waste management mission, vision and beliefs to the staff and public, it also provides a framework in guiding the project team the basic requirements to be achieved in waste management.

The hierarchy is illustrated below. It attempts to evaluate waste management practices and selects the best practical option since conceptually it makes sense to avoid producing a waste rather than developing extensive treatment schemes. Good planning and site management practices also help minimizing over ordering or misuse of construction materials. The overall objective is to reduce and minimize the amount of wastes generated, hence reducing the costs of waste handling and disposal.



http://www.epd.gov.hk/epd/misc/cdm/management_intro.htm

1.5 Regulations and Guidelines

1.5.1 General

Various types of wastes would be generated during the course of the Project and each waste types requires different approach for management and disposal as stipulated in the waste legislation and guidelines. The relevant statutory and non-statutory requirements regarding waste management are summarized in the sections below.

1.5.2 Statutory Requirements

The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong, and would be observed with regard to all wastes generated and requiring disposal, where applicable:

- The Waste Disposal Ordinance (Cap 354)
- The Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)
- The Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap 354)
- The Land (Miscellaneous Provisions) Ordinance (Cap 28)
- The Dumping at Sea Ordinance (Cap 466)
- The Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws
- Summary Offences Ordinance (Cap 228)
- Other relevant regulations

1.5.2.1 The Waste Disposal Ordinance (WDO)

The Waste Disposal Ordinance (WDO) prohibits the unauthorized disposal of waste. Construction waste is not directly defined in the WDO, but is considered to fall within the category of "trade waste." Under the WDO, wastes can only be disposed of at sites licensed by EPD.

1.5.2.2 The Waste Disposal (Chemical Waste) (General) Regulation

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

1.5.2.3 The Waste Disposal (Charges for Disposal of Construction Waste) Regulation

The current policy related to the dumping of C&D material is documented in the Works Branch Technical Circular No. 2/93, 'Public Dumps'. Construction and demolition materials that are wholly inert, namely public fill, should not be disposed of to landfill, but taken to public filling areas, which usually form part of reclamation schemes.

Under the WDO and the Charging Regulation, wastes can only be disposed of at designated waste disposal facilities licensed by EPD. For construction work 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 facility would need prior approval from EPD. Breach of these regulations can lead to a fine and/or imprisonment.

1.5.2.4 The Land (Miscellaneous Provisions) Ordinance

The Land (Miscellaneous Provisions) Ordinance requires that dumping licences be obtained by individuals or companies who deliver public fill to public filling areas. The Civil Engineering & Development Department (CEDD) issues the licences under delegated powers from the Director of Lands.

1.5.2.5 The Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws

The Public Cleansing and Prevention of Nuisances By-Laws provide further controls on the illegal tipping of wastes on unauthorized (unlicensed) sites.

1.5.2.6 Related Licence and permits

The Contractor would obtain all necessary permits and licenses under these ordinances including, but not limited to:

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

1.5.3 Non-statutory Regulations

The following guidelines related to waste management and disposal would be adhered to during construction of the Project:

- Waste Disposal Plan for Hong Kong (1989), Planning, Environmental and Lands Branch Government Secretariat;
- Environmental Guidelines for Planning in Hong Kong. Hong Kong Planning Standards and Guidelines (1990);
- New Disposal Arrangements for Construction Waste, EPD and CEDD (1992);
- Code of Practice on the Packaging, Labelling and storage of Chemical Wastes EPD (1992);
- Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste, EPD;
- Works Branch Technical Circular No. 12/2000, Fill Management, Works Bureau, HKSAR Government;
- Works Branch Technical Circular No. 29/2000, Waste Management Plan, Works 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;
- Works Branch Technical Circular, 32/92, the Use of Tropical Hard Wood on Construction Site, Works Branch, Hong Kong Government;
- Works Branch Technical Circular No. 2/93, Public Dumps, Works Branch, Hong Kong Government;
- Works Branch Technical Circular No. 16/96, Wet Soil in Public Dumps, Works Branch, Hong Kong Government;
- Works Bureau Technical Circular NO. 4/98 and No.4/98A, Use of Public Fill in Reclamation and Earth Filling Projects, Works Bureau, HKSAR Government;
- Works Bureau Technical Circular No. 5/98, On-site sorting of Construction Waste on Demolition Site, Works Bureau, HKSAR Government;
- Environment, Transport and Works Bureau Technical Circular (Works) No. 33/2002, Management of Construction and Demolition Material including Rock, Environment, Transport and Works Bureau, HKSAR Government;
- Waste Reduction Framework Plan, 1998 to 2007, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
- Works Bureau Technical Circular No. 6/2002 and 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness, Works Bureau, HKSAR Government;
- 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 Burea7, HKSAR Government;

- A Guide to the Registration of Chemical Waste Producers; and
- A Guide to the Chemical Waste Control Scheme.

2 SITE ORGANIZATION AND STAFF DUTIES

2.1 Organization Structure

The organization structure for waste management is outlined in **Figure 1**. This chart outlines the overall site management in relation to waste management and environmental issues. Details on the roles and responsibilities of staffs responsible for implementation of the waste management plan are outlined below.

2.2 Roles and Responsibilities

CHEC has appointed the Environmental Officer as the senior staff member fully responsible for implementing and overseeing the operation of the WMP. And the Construction Manager, Senior Foremen and Foremen are appointed a worker at each exit from the Site for the purpose of ensuring that every truck carrying C&D materials leaving the Site bears a duly completed and signed CHIT.

2.2.1 Deputy General Manager (Quality, Safety & Environmental) (Head Office)

The Deputy General Manager (QSE) is a representative of head office responsible for ensuring commitment to environmental performance is fulfilled and assigning adequate resources and facilities to provide an effective environmental management programme on site.

2.2.2 Project Director (PD)

The Project Director has responsibility for coordinating all environmental matters and reporting on these to the China Harbour Engineering Co., Ltd. Supervisory Board is responsible for all aspects of environmental issues within the project.

2.2.3 Site Agent (SA)

The Site Agent is also responsible for ensuring commitment and assigning resources to provide an effective environmental management program in the workplace. The Site Agent will also attend the Site Safety and Environmental Management Committee Meeting and the Site Safety and Environmental Committee Meeting if required.

2.2.4 Construction Manager (CM)

The Construction Manager (CM) is a senior staff on site report to the Project Director has the responsibility to coordinate all instruct environmental matters on site with all relative authorities. CM is also responsible for all site operations, management of environmental issues, staff supervision, control, coordination & planning, external liaison as well as implementing and monitoring necessary corrective actions. CM is working full-time on the site.

The Construction Manager will also carry out immediate action to rectify any non-compliance of environmental requirements as well as handle any complaints received from the public.

Construction Manager has the responsibility to coordinate all environmental matters on site areas and to report these to the Site Safety and Environmental Committee, HyD, EPD and Engineer's Representatives. The Construction Manager is also responsible for ensuring commitment to environmental performance is fulfilled and assigning adequate resources and facilities. With the assistance of the Environmental Officer, he would also oversee the implementation and performance of the WMP. The Construction Manager reports to the Site Agent. He would assume environmental duties on site and ensure that works are executed in accordance with the WMP. He will arrange regular site inspections with the Environmental Officer.

2.2.5 Environmental Officer (EO)

The Environmental Officer (EO) will be appointed on site for the overall coordination, monitoring and overseeing the performance and implementation of the WMP for the Contract. The Environmental Officer directly reports to the Construction Manager.

The responsibilities of the Environmental Officer are also included as follows:

- Review the Site Management Plan for Implementation of TTS and ensure works to be executed in accordance with the plan;
- Monitor and control the works including those of subcontractors to ensure compliance with specified requirements;
- Assist in handling any complaints received; and
- Ensure regular environmental monitoring is carried out, and that all environmental monitoring results are recorded.

2.2.6 Environmental Supervisor (ES)

Environmental Supervisor (ES) is responsible for the implementation of this WMP with the assistance of the foreman. They are also responsible for:

- Co-operate with the Environmental Officer to rectify any Non-conformances being identified;
- Attend environmental meetings whenever necessary;
- Carry out ad hoc environmental site inspections when deficiencies are being found; and
- Assist with Environmental Officer on any environmental accidents like chemical spillage.

2.2.7 Senior Foremen/ Foremen

The Senior Foremen/ Foremen are responsible for site supervision and coordination of the works as well as implementation of any remedial actions or environmental protection measures as directed by the CM/ EO.

The Senior Foremen/ Foremen are also responsible for:

- Assist in the daily implementation of the WMP including to ensure all waste is sorted, segregated, recycled or reused when applicable;
- Ensure the trip-ticket system is followed and all appropriate paperwork to be collected and signed off; and
- Ensure waste is avoided and/ or minimised as much as practically possible.

2.2.8 Workers

The workers are responsible to carry out the waste management practice. They are obligated to carry out the works like:

- Sorting of different types of wastes;
- Collection of wastes from each working sites to the temporary storage area/ designated fill banks/ landfills;
- General site cleaning; and
- Attend waste management training organized by the Environmental Officer following this site management plan.

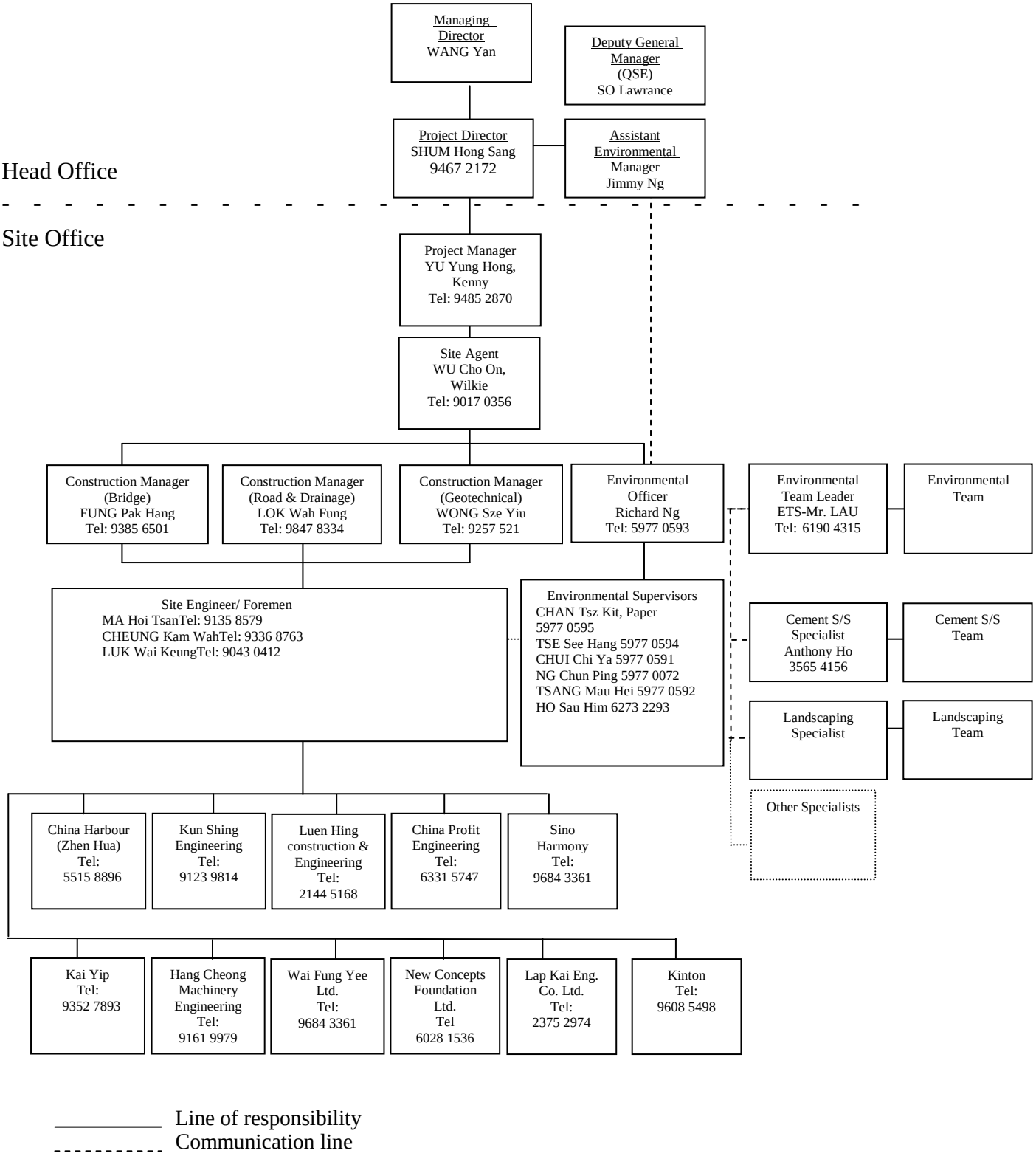


Figure 1: The Organizational Structure for Environmental Management

Name	Post	Telephone No.
Yu Yung Hong, Kenny	Project Manager	9485 2870
Wu Cho On, Wilkie	Site Agent	9017 0356
Wong Sze Yiu	Construction Manager (Geotechnical)	9257 8521
Fung Pak Hang	Construction Manager (Bridge)	9385 6501
Lok Wah Fung	Construction Manager (Roads & Drainage)	9847 8334
Lau Chi Wing, John	Safety Manager	6446 1661
Ng Tao, Richard	Environmental Officer	5977 0593
Chan Tsz Kit, Paper	Environmental Supervisor	5977 0595
Tse See Hang	Environmental Supervisor	5977 0594
Chui Chi Ya	Environmental Supervisor	59770591
Ng Chun Ping	Environmental Supervisor	59770072
Tsang Mau Hei	Environmental Supervisor	59770592
Ho Sau Him	Environmental Supervisor	62732293
Ma Hoi Tsan	Senior Foreman	9135 8579
Cheung Kam Wah	Senior Foreman	9336 8763

Table 1: Contact List of Designated Persons for Implementation of the Trip Ticket System in site level.

3 SITE SPECIFIC WASTE MANAGEMENT

3.1 Waste Policy Principles

Refer to hierarchy abovementioned in Section 1, a further explanation of the hierarchy of waste management on site is detailed below.

3.1.1 Hierarchy of Waste Management

Key to waste management is to reduce the amount of waste generated from the work site. Waste management options would be exercised in accordance with the hierarchy stipulated in the following table:

Avoidance and Minimization	Avoid and minimize waste through careful planning and design works.
Reuse	Reuse construction waste such as excavated material, used wooden plants and ferric materials.
Recovery and Recycle	Undertake on-site or off-site waste recycling.
Treatment and Disposal	Properly treat and dispose of waste in accordance with legislative requirements, guidelines and good practices.

Table 2: Hierarchy of Waste Management

In the context of waste reduction, environmentally responsible purchasing would involve the introduction of practices that discourage unnecessary purchases and encourage the purchase of products with reduced packaging, increased durability and materials with high recycled content, such as, recycled paper, steel and other raw construction materials.

Waste minimization is best achieved through careful planning, design and supervision. Good management practices would reduce and prevent large amount of waste generated. Raw materials would be managed from the first instance before they are ordered and delivered to the site. Good estimation and planning would minimize the amount of raw materials wasted. The generation of waste would be controlled at source.

3. 2 Waste Reduction

Specific measures will be implemented to reduce the generation of waste materials, and thus

minimize the amount of waste disposal to landfills. The measures will include:

- Sorting on site to recover the inert portion of C&D materials;
- Recover all metallic waste for recycling;
- Recover all cardboard and paper packaging, and properly stockpile them in dry and covered condition to prevent cross contamination;
- Use of the materials (such as formworks and hoardings) in the construction would be calculated before purchasing in order to minimize waste generation.
- Use of metal formworks and hoardings, and they would be recycled after demolition on site as far as it can before disposal.

3.3 Treatment (Cement Solidification/ Stabilization of Marine Mud)

(This operation was suspended and replaced by Marine Dumping as described in Section 3.4, no marine mud has been treated in this operation before the suspension)

Construction & Demolition (C&D) materials will be generated from excavation and construction of bored pile foundation and substructures. Most of the C&D materials will be sorted and reused; however, the marine mud, estimated at about 15,000m3 has very limited usage on site. In order to recycle and reuse of the marine mud, a Cement Solidification/ Stabilization of Marine Mud technique will be applied.

For conserving transportation costs and environmental concerns, the cement S/ S process will be taking place on site in a specified contamination zone. Special safety and environmental control measures will be implementing in the stockpiling and treatment area of marine mud.

At the early stage, pilot trial will be carried out to determine an optimum mix proportion with considerations of actual field operations, workmanship, compliance with quality control test, maximization of the use of marine mud and the mechanical property. To maximize cost effectiveness and environmental conservation, the optimum mix should contain minimum content of Portland cement, maximum content of marine mud and adequate content of granular material. Furthermore, it should be workable by conventional mechanical compaction method while backfilling.

In the operation stage, initial screening of the excavated marine mud should be taken place at the anticipated generation area. Corresponding arrangement of supervision, handling and transportation should be also in place. For the sake of minimizing the contaminated zone, only 2 metal tanks and a conventional backhoe will be used to achieve an approximate daily production

of 300m3 cement S/ S marine mud : in a mixing ratio of 5% cement, 15% granular fill and 80% marine mud. In case of the marine mud generation rate > the treatment rate, this production rate could be increased by a mass production approach.

Post production stage, for the quality control purpose, one sample per 100m3 of materials will be taken for making test cubes for analysis of at least 7-day UCS. Besides, for the quality control of workmanship of compaction, test for relative density in a sampling rate of 3 nos. per 100m2 should be carried out as normal backfilling practice. The compacted material will be tested for 7-day SPT. One drill hole per 100m3 of backfilled materials will be sunk and tests were conducted at 1.5m deep interval inside the backfilled material.

Refer to our past experience, all test results were "Passed". It demonstrated the CSMM treatment and the application were practical in fulfilling both of the environmental and works related requirements.

3.4 Marine Dumping of Marine Mud (Type 2 – confined marine disposal)

Construction & Demolition (C&D) materials will be generated from excavation and construction of bored pile foundation and substructures. Most of the C&D materials will be sorted and reused; however, the marine mud, estimated at about 15,000m^3 has very limited usage on site. After the acceptance of the review of the approved Sediment Quality Report (SQR) for this Project under EPD letter dated 19 August 2015, an approval to dispose the marine sediment extracted from bored piling for this Project was then approved under memo from Secretary, Marine Fill Committee of CEDD dated 20 August 2015 for the disposal of marine sediment extracted from bored piling works. Therefore the Cement Solidification/ Stabilization process which was designed to treat the marine mud and reuse on site is temporary suspended and replaced by Marine disposal. The disposal sites allocated to this Project are the Mud Pit CMP2 of the Confined Marine Sediment Disposal Facility to the South of The Brothers (or at the East of Sha Chau). As advised by CEDD in the memo dated 19 February 2016, from 00:00 on 22 March 2016 onward, the disposal space at CMP2 of the South of The Brothers is closed and all disposal of contaminated sediment is to be carried out at CMP Vd to the East of Sha Chau (ESC).

As a practical means, the disposal operation is managed by one contractor who is also responsible for applying dumping permit and its subsequent extension applications from EPD. Contract No. HY/2013/03 has been assigned to coordinate and arrange for disposal of extracted marine sediment from Contract No. HY/2013/02, HY/2013/03 and HY/2013/04.

3.4.1 Procedure of transportation of Marine mud from temporary stockpiling site to the dumping barge

From the dumping arrangement, the barge for disposal of marine sediment will moor at the temporary loading and unloading at the east shore of the HKBCF Island, which has been being

used by contractor Contract No. HY/2010/02 for reclamation activities. In terms of safety consideration and to avoid mixing of sediment between contracts, each dumping date will be allocated to one Contract. The quantity of marine sediment disposed on each date is from one Contract. Besides, there is no uncontaminated sediment arising and need to be disposed off the site.

During dumping, HY/2013/02 is responsible for transporting the marine sediment from his site area to the barge by Land transportation. The estimated quantity of marine sediment in each truck is confirmed by Resident Site Staff of each Contract. The trip tickets for transportation and disposal of marine sediment are collected and checked. Contract No. HY/2013/03 as the dumping permit holder is responsible for reporting to EPD the quantity disposed of as the condition stipulated in the dumping permit.

The Location of CMP2, CMP Vd, Marine Mud barging point are attached in **Appendix I.**

4 WASTE MANAGEMENT PROCEDURE

The quantities of disposal C&D materials will be recorded under the barcode trip ticket system by using the "C&D Material Disposal Delivery Form". In addition, the filled "CHIT" will also be presented to the landfill site as part of the system for the disposal charging scheme which had already been officially effective in January 2006. Waste transaction records could be obtained either in the waste disposal facilities right after the transaction or retrieved from the EPD bill statement each month.

4.1 Acceptance Criteria for the Government Disposal Facilities

According to the Highways Department's Memo ref.: (2NQ9) in Highways Department 7/10/1 dated 15 July 2010, the new WAC (as Tabulated below) became effective from 29 December 2010.

Vehicle Type	Waste Depth	Weight Ratio (note)	Designated Facility
Non-demountable Vehicle	Over 1.5m	No restriction	Landfill
	1.5m or below	0.20 or below	
		Over 0.20	Sorting Facility
Demountable Vehicle	Over 1m	No restriction	Landfill
	1m or below	0.25 or below	
		Over 0.25	Sorting Facility

Table 3: New Waste Acceptance Criteria

CHEC will comply with the acceptance criteria laid down by the operators of the corresponding fill bank(s) and landfill(s), as outlined below:

4.1.1 Acceptance Criteria for Fill Banks (Tuen Mun Area 38 Fill Bank or Tseng Kwan O Area 137 Fill Bank)

- The Truck Driver should bear a duly completed and signed CHIT;
- The dump truck should also have a valid Dumping Licence issued by CEDD, dump trucks without Dumping Licences will be rejected;
- The inert C&D materials to be delivered to the fill bank(s) should be in accordance with the conditions stipulated in the Dumping Licence;
- Any over-sized inert C&D materials should be broken down to less than 250mm in size so as

to facilitate its reuse by other reclamation or earth-filling projects;

- The C&D materials to be disposed should consist entirely of inert construction waste (i.e. 100% inert construction waste); and
- According to the Highways Department's Memo ref.: (32FV) in Highways Department 7/8/13 dated 25 June 2010, the bituminous material is required to be separated from other inert construction and demolition (C&D) materials for disposal prior to delivery to the PFRF.

4.1.2 Acceptance Criteria for NENT Landfill (Northeast New Territories Landfill)

- The Truck Driver should bear a duly completed and CHIT;
- The dump truck should also have a valid Dumping License issued by CEDD, dump trucks without Dumping Licenses will be rejected;
- The non-inert C&D waste to be delivered to the landfills should be in accordance with the conditions stipulated in the Dumping License;
- Construction waste containing not more than 50% by weight of inert C&D waste (Gazette Notice G.N. 4272 published on 27 June 2008);
- For a load of C&D waste not consisting entirely of bamboo, plywood or timber delivered by a vehicle, the weight of the waste divided by the permitted gross vehicle weight of the vehicle must not greater than 0.25 for goods vehicle with demountable skip and 0.2 for other types of vehicle (Gazette Notice G.N. 4272 published on 27 June 2008);
- Mixed C&D materials should be sorted at source to reduce the inert content as far as practicable to meet the above criteria before they are delivered to landfills;
- C&D waste delivered for landfill disposal should contain no free water and the liquid content will not exceed 70% by weight; and
- At least one week's notice, including contractors name and contact details etc, will be submitted to the EPD before starting to deliver the C&D waste to the landfills. EPD will be informed of any subsequent change to the disposal programme.

4.2 Procedures of the Trip Ticket System (Land Based)

China Harbour Engineering Co., Ltd. (CHEC) will implement a Trip Ticket System (TTS) to track the disposal of C&D materials. Under the TTS, each truck carrying C&D materials leaving the Site for a disposal ground will bear a duly completed and signed CHIT. The C&D materials must be disposed of at the disposal grounds as stipulated in CHIT.

The Trip Ticket System will be executed according to the following procedures:

- The Senior Foremen/ Foremen will arrange the C&D waste to be sorted on site. He will also check the total actual amount of cumulated C&D waste after the completion of the particular works in the working area;
- If the sorted C&D waste is less than 1/3 of truckload, then the C&D waste will be transferred to the temporary holding area in CHEC's Works Area for temporary stockpiling. The C&D waste will be sorted and stored separately into different storage areas;
- Non-inert C&D waste will be stored in storage tanks properly covered with tarpaulin sheeting in the temporary holding area. Inert C&D materials will be stored on the ground properly covered with tarpaulin sheeting in the temporary holding area. Larvicidal oil or larvicide will be applied onto the stored C&D waste, if necessary;
- For every 7 days or one truckload collected, the stored non-inert C&D waste in the temporary holding area will be transferred to the designated landfills;
- For every 14 days or one truckload collected, the stored inert C&D waste in the temporary holding area will be transferred to the designated fill banks;
- For each truckload of C&D materials leaving the working area/ temporary holding area to the designated fill banks/ landfills, the truck driver must bear a duly completed and signed CHIT;
- The truck will proceed to the disposal ground as stipulated in the CHIT. The truck driver will present the CHIT to the reception facility operator. If the C&D waste accords with the acceptance criteria, disposal of the C&D waste will be permitted and the facility operator will give the truck driver a transaction receipt and stamp the CHIT;
- The truck driver will present the CHIT at the in-weighbridge officially. If the vehicle load is accepted, the CHIT is deemed to be used and the in-weight would be recorded on the "Transaction Record Slip";
- If the truck driver was instructed by the reception facility operator to go to the sorting facility. The driver will need return back to the site and report to the Senior Foreman/ Foremen. No driver is allowed to go to sorting facility without Senior Foreman/ Foremen permission or

instruction;

- The truck driver will then return the transaction receipt to CHEC as soon as possible. All transaction receipt are to be return to the Environmental Officer;
- CHEC will maintain a daily record disposal of C&D materials from the Site including details of the C&D waste, the truck number, departure time, etc, and should check against the Engineer's Representative records as soon as possible and notify the Engineer's Representative in case any discrepancy is noted;
- A daily record of disposal of C&D materials from the Site will be maintained, the record includes the details of the C&D materials, the truck number, departure time, etc., using the Daily Record Summary (DRS);
- The duly completed Part 1 of the DRS would be submitted promptly to the Engineer's Representative;
- For disposal at government disposal facilities, CHEC will check the information recorded in the DRS against the disposal records in CEDD's website (http:www.cedd.gov.hk/eng/services/trip ticket/index.html) or EPD's website (http://www.epd.gov.hk/epd/misc/cdm/trip.htm) and complete Part 2 of the DRS for submission to the Engineer's Representative within 3 working days after the day of disposal, or a later day if the information in CEDD's/ EPD's website is not yet available within 3 working days; and
- Where an irregularity is observed or where requested by the Engineer's Representative under special circumstances (e.g. a CHIT has been issued but there is no disposal record at the designated disposal facilities), CHEC will submit to the Engineer's Representative within 5 working days after the recorded date of disposal the supporting evidence such as duly stamped CHIT and/or the transaction receipt (where relevant) to confirm proper completion of the delivery trips in question, or within 2 working days after the Engineer's Representative has requested for such evidence, whichever is later. A fax copy of the CHIT and transaction receipt is acceptable, unless otherwise directed by the Engineer. CHEC will maintain all records on the CHIT for at least one year or other period as may be directed by the Engineer's Representative.

4.3 Measures to be implemented during transportation of wastes to avoid leakage of wastes on public areas

- All of the dump trucks used would be equipped with mechanical covers in which maintained in a good condition.
- In order to minimize the leaking of material from the dump trucks, no material should be stored higher than the trail board.
- Deposited silt and wastes on all dump trucks' wheels and bodies should be properly washed off by wheel washing facilities before leaving the constructions sites.
- CHEC will provide wheel washing facilities on site at the site entrance.

4.4 Disposal of C&D Materials to Alternative Disposal Ground(s)

Where CHEC has identified a project that can be an alternative disposal ground, CHEC will provide a detailed description of the alternative disposal ground, including location, lot number (where appropriate) and location plan(s) to the Engineer to request for his written approval.

Where the alternative disposal ground is a private construction project, CHEC will submit a letter from the Authorized Person of the development (as defined under the Building Ordinance) to confirm that:

- The C&D materials for use in the development is acceptable;
- The use of land so formed by the C&D materials is in conformity with the statutory town plan/ lease conditions;
- The Engineer's Representative are allowed to enter the alternative ground to conduct inspection where necessary; and
- The estimated quantity and type of C&D materials to be used in the construction works and the approximate delivery programme, together with the name, post and specimen signature of the competent person to sign the CHIT/ internal trip ticket stipulated in G.S. Clause 25.25(6)(a)(ii).

Where the alternative disposal ground is a private land but not a construction site, CHEC will submit a letter from the relevant authorities, such as the Lands Department and the Planning Department, to confirm that the suitability of the alternative disposal ground in receiving the proposed amount of C&D materials for use, and a written consent from the landowner.

Where the alternative disposal ground is a government project, CHEC will submit written consent from the project office of the alternative disposal ground to use the C&D materials generated from the Site, and to confirm the estimated quantity and type of C&D materials required and the approximate delivery programme.

A system for transmitting disposal records from the alternative disposal ground will be submitted to the Engineer's Representative for approval before disposal to the alternative ground starts.

4.5 Chemical Waste/ Hazardous Waste Handling and Disposal

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 Wastes as follows:

Packaging

Chemical waste will be packed and held in containers of suitable design and construction so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport.

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.

Labelling

Every container of chemical waste will bear an appropriate label which will contain the particulars details. The waste producer will ensure that the information contained on the label is accurate and sufficient so as to enable proper and safe handling, storage and transport of the chemical waste.

Storage

The storage area will be specially constructed and bunded, and located close to the source of waste generation.

The storage area for chemical wastes will:

- Be clearly labelled 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 with the bund must be tested and disposed of as chemical waste); and
- Be arranged so that incompatible materials are adequately separated.

Before reaching 80% capacity of the storage container, licensed waste collectors will be employed to remove the chemical waste.

Transportation and Disposal

After the chemical wastes have been packed, labelled, and stored, the chemical wastes will be transported by licensed waste collectors and disposed of at Chemical Waste Treatment Facility in Tsing Yi or other approved facilities.

4.6 Handling the General Refuse

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

- Reducing the number of photos 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;
- Deploying sufficient recycle bins in site offices to facilitate collection of recyclables including wasted aluminum cans, plastics bottles and papers;
- Deploying sufficient collection bins with cover at convenient locations at site to facilitate collection of non-recyclable for disposal at landfills; and
- General refuse generated from working vessels and barges can dispose the waste into temporary waste collection point.

4.7 Handling of Sewage

For sewage collection will be by holding tank to be pumped out at regular interval and ensuring no adverse water impacts by contracting with licensed contractors to collect sewage and maintain the facilities.

Handling of sewage in terms sewage generated by human, adequate chemical toilets would be provided for collection.

Sufficient numbers of chemical toilets for workers and frontier workforces were placed on works area other than site offices such as WA2 and WA3.

4.8 Handling of Marine Mud

In order to recycle and reuse of the marine mud, a Cement Solidification/ Stabilization of Marine Mud technique will be applied and the treated materials will be re-used on-site as wither backfill or landscaping (i.e. berm materials). **(This operation is suspended and replaced by Marine Dumping as described in Section 3.3)**

For handling the marine mud, follow measures will be implemented:

(a) Location and size of any temporary stockpiles of materials, including excavated material, within the Site shall be as agreed by the Engineer. Stockpiles shall be maintained in a stable condition.
(b) Temporary stockpiling site(s) of any untreated marine mud or other potentially contaminated materials (e.g. solidified mix that have not complied with the Treatment Targets) shall be lined with impermeable sheeting, bunded and with proper leachate control measures implemented;
(c)Watering shall be avoided on temporary stockpiles of untreated marine mud or other potentially contaminated materials to minimize potential contaminated runoff. Such temporary stockpiles shall be properly covered by impermeable sheeting;
(d) Vehicles containing any untreated/ treated marine mud shall be suitably covered to limit potential dust emissions or potential contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any discharge during transport or during wet conditions;

(e) Temporary stockpiling of untreated marine mud or other potential contaminated materials shall be carried out during dry season or with suitable shelters/covers to minimize generation of potential contaminated runoff;

(f) The mixing unit and any unloading/ loading areas of excavated marine mud shall be enclosed to minimize dust emissions;

(g) Handling and mixing of cement shall follow Air Pollution Control (Construction Dust) Regulation to avoid fugitive dust emissions.

(h) Impermeable materials (e.g. concrete paved ground) shall be placed at the bottom of mixing unit/ curing area for the duration of the Cement S/S treatment process;

(i) Any in-ground pit, if used for the Cement S/S process, shall be shallower than the water table to minimize the potential leaching of the excavated marine mud into underlying soils and groundwater; and

(j) Concrete bund shall be constructed as appropriate, along the perimeter of the Cement S/ S treatment facility(s) to prevent leachate from escaping out of the facility(s).

4.9 Estimate Quantities of C&D Material/ Waste

The following types of waste would be generated from the works areas of WA2, WA3 and the workforce on site.

- General refuse
- C&D materials / waste;
- Excavated sediments;
- Chemical waste;
- Sewage
- Slurry/Bentonite

Material	Generated from Project (m^3)	Re-used onsite, or on other Projects, or recycled (m^3)	Disposal (m^3)	Proposed Disposal Outlet
General Waste	1000	500 (Paper cardboard, banner, uniform, office furniture and utilities)	500	North East New Territories Landfill
Inert C&D materials / waste	1,600	600 (backfilling)	1000	Tuen Mun Area 38 Fill Bank
C&D Waste	4,000	2000 (Plastic railing & barrier, waste metal, site container offices)	2,000	North East New Territories Landfill
Excavated sediment	15,000	0	15,000	CMP2 of the South of The Brothers & CMP Vd to the East of Sha Chau (ESC)
Chemical waste	5	0	5	Chemical Waste Treatment Centre at Tsing Yi
Sewage	1,000	0	1,000	Licensed Contractor
Slurry/bentonite	5,000	2000	3000	Tseng Kwan O Area 137 Fill Bank

Table 4: Types of waste and estimated quantity would be generated from the contact.

4.10 Use of Timber

CHEC aims to avoid, reduce or minimize the use of timber in temporary construction activities.

Where the use of timber is unavoidable for temporary works construction processes or activities with an estimated quantity of greater than $5m^3$, CHEC will submit a method statement to the ER for agreement before starting the relevant temporary works. The method statement will include the justifications for the use and the measures taken to minimize the use of timber.

The summary table of timber usage will be updated and submitted to the ER for monitoring and review by not later than the 15th day of each month or, if it is a general holiday, the day following the general holiday, or a day agreed upon with the ER.

4.11 Handling of Recyclables

Before starting the transportation of recyclable materials off site to recycling facilities,
CHEC will meet with recycling contractors to establish a suitable system for collecting recyclable materials with care.

5 DISPOSAL PROGRAMME

The relevant licensing legislation and licensing/ control requirement is listed in **Section 1** above.

There will be inert C&D materials (comprising soil, broken rock and concrete, etc), non-inert C&D materials and slurry and bentonite generated under Contract No.: HY/2013/02. With reference to the clause 25.25(1) of PS, the designated disposal grounds for mentioned are listed as follows:-

- Inert C&D Materials:
  Tuen Mun Area 38 Fill Bank or other disposal grounds as directed by the Engineer

- Slurry and Bentonite
  Tseung Kwan O Area 137 Fill Bank

- Non-inert C&D Materials:

North East New Territories Landfill (NENT)

Monthly Summary for C&D material disposal off the Site will be provided to indicate the estimate quantities, types of C&D materials and corresponding disposal ground in Waste Flow Table (WFT).

Disposal locations for inert C&D materials would be Tuen Mun Area 38. The non-inert C&D materials would be disposed to NENT landfill. Tseung Kwan O Area 137 Fill Bank is designated for slurry and bentonite disposal.

Generated marine mud will be re-used on-site as wither backfill or landscaping after treating with Cement Solidification/ Stabilization. **(This operation is suspended and replaced by Marine Dumping as described in Section 3.3)**

Wheel washing facilities would be installed at works areas WA2 and WA3. These facilities would be cleaned at least twice daily.

6 NOTIFICATION TO TRUCK DRIVERS

CHEC will write to all truck drivers whom he or his sub-contractor(s) has 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 signed CHIT, irrespective of the location and nature of the disposal ground;
- The C&D materials must be disposed of at the disposal ground as stipulated in the CHIT;
- What constitute and improper disposal and that the Public Fill Committee (PFC) will consider revoking the Dumping Licence from the holder of the offending trucks; and
- Truck drivers must bear a valid Dumping Licence that he can apply from the Civil Engineering and Development Department (CEDD).

The Flow Chart of the Trip Ticket System and the notification to truck drivers and the receipt form is attached in **Appendix B and C** respectively.

7 WASTE MANAGEMENT RECORDS

The CHIT will be used for each and every vehicular trip transporting construction and demolition (C&D) material off site.

Prior to the vehicle leaving the site, the Engineer's Representative will record the date, time of departure, vehicle licence plate number, designated public filling facility/ landfill, and other information as required. The CHEC will then retain the first strip of the CHIT and pass the rest to driver. The CHIT will be carried on board the vehicle at all times throughout the vehicular trip.

A comprehensive register of the CHIT issued will be maintained and available for inspection by the Engineer's Representative upon request. The following records will be kept for monitoring of the CHIT issued:-

Daily Record Summary (DRS) and the Waste Flow Table (WFT) should be completed and submitted to the Engineer's Representative for record. A sample of DRS and WFT, please refer to **Appendix C** and **D** respectively.

Waste Flow Table – Monthly

Record of the quantities of C&D materials generated each month will be maintained using the monthly summary Waste flow Table (WFT). CHEC will complete and submit the monthly summary WFT to the Engineer by not later than the 15th day of each month follows the reporting month, or if it is a General Holiday, the day following the General Holiday, or a later date as agreed by the Engineer.

Waste Flow Table – Yearly

The estimated quantities of C&D materials to be generated each year from the site will be summarised using the yearly summary WFT. The WFT will be updated on a half-yearly basis and submit to the Project Proponent by not later than 1st 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.

These summaries shall also be made available to ETL and IEC/ENPO

Specific trip ticket and records for internal transfer of C&D materials and imported fill materials

will also be kept for monitoring whatever necessary.

For recyclable materials, CHEC's Representative will record the quantities of all the recyclable materials before removal off the Site by the recycling contractors, and include the details in the WFT for submission to the Engineer's Representative.

In order to ensure proper disposal of C&D materials, enhancement measures to further improve the TTS recording system, a video recording system shall be installed and disposal shall be checked against survey record. Such video recording system used to monitor the vehicular exit/ entrance of the site.

8 WASTE MONITORING AND AUDIT

The aims and objectives of waste management audit 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 this WMP; and
- To encourage the reuse and recycling of materials.

The ET, with assistance from the Project Manager, would audit the waste management practices 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. The results of the waste management audits would be reported in the monthly Environmental Monitoring and Audit reports.

In the event of any non-compliance or complaint against the provisions of this WMP, actions would be taken according to the event and Action Plan for non-compliance and complaints as shown in the following tables.

Step	Day	Action	Contractor /ET	ER	IEC/ ENPO
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 (NC) to the Contractor, ER and IEC/ENPO. The NC would include the observations and the reasons for non-compliance.	■		
2	2	Propose corrective actions within 1 working day after the receipt for the NC.	■	□	
3	3	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.	■	□	

Table 7: Event Action Plan for Non-compliance

■ action party

□ comments on the non-compliance record where applicable

Step	Day	Action	Contractor/ET	ER	IEC/ENPO
1	1	Investigate validity of complaint and to assess whether the source of problem is due to site activity. If complaint is valid and due to site activity, log complaint into Complaint Record Form.	■		
2	2	Propose mitigation measures	■	□	
3	3	Review and agree with the proposed mitigation measures and propose further mitigation measures if required.		■ □	■ □
4	2	Implement the proposed mitigation measures once they have been agreed.	■		
5	-	Check the implementation of the mitigation measures at the next site audit. Close out the complaint case if the implementation of the mitigation measures is satisfactory.	■ □	■ □	■ □
6	-	Propose prevention measures within 3 working days after closure of the complaint case.	■	□	

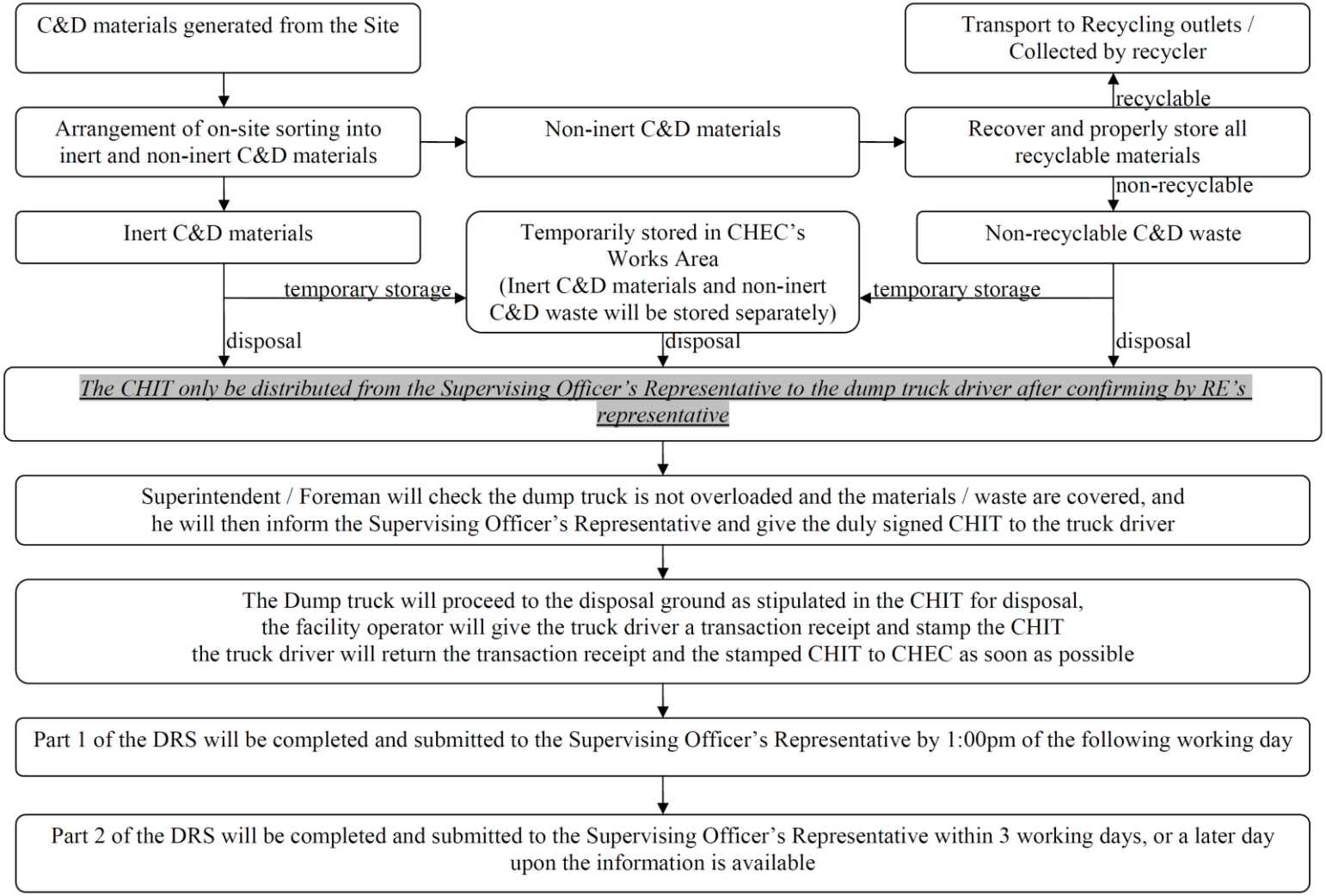
Table 8: Event Action Plan for Complaint

■ action party

□ comments on the non-compliance record where applicable

Appendix A

Flow Chart of the Trip Ticket System


C&D materials generated from the Site
Transport to Recycling outlets / Collected by recycler
recyclable
Arrangement of on-site sorting into inert and non-inert C&D materials
Non-inert C&D materials
Recover and properly store all recyclable materials
non-recyclable
Inert C&D materials
Temporarily stored in CHEC's Works Area (Inert C&D materials and non-inert C&D waste will be stored separately)
Non-recyclable C&D waste
temporary storage
temporary storage
disposal
disposal
disposal
The CHIT only be distributed from the Supervising Officer's Representative to the dump truck driver after confirming by RE's representative
Superintendent / Foreman will check the dump truck is not overloaded and the materials / waste are covered, and he will then inform the Supervising Officer's Representative and give the duly signed CHIT to the truck driver
The Dump truck will proceed to the disposal ground as stipulated in the CHIT for disposal, the facility operator will give the truck driver a transaction receipt and stamp the CHIT the truck driver will return the transaction receipt and the stamped CHIT to CHEC as soon as possible
Part 1 of the DRS will be completed and submitted to the Supervising Officer's Representative by 1:00pm of the following working day
Part 2 of the DRS will be completed and submitted to the Supervising Officer's Representative within 3 working days, or a later day upon the information is available

Appendix B

Notification to Truck Drivers

合約 HY/2013/02
運載物料及傾倒時需注意及檢查事項

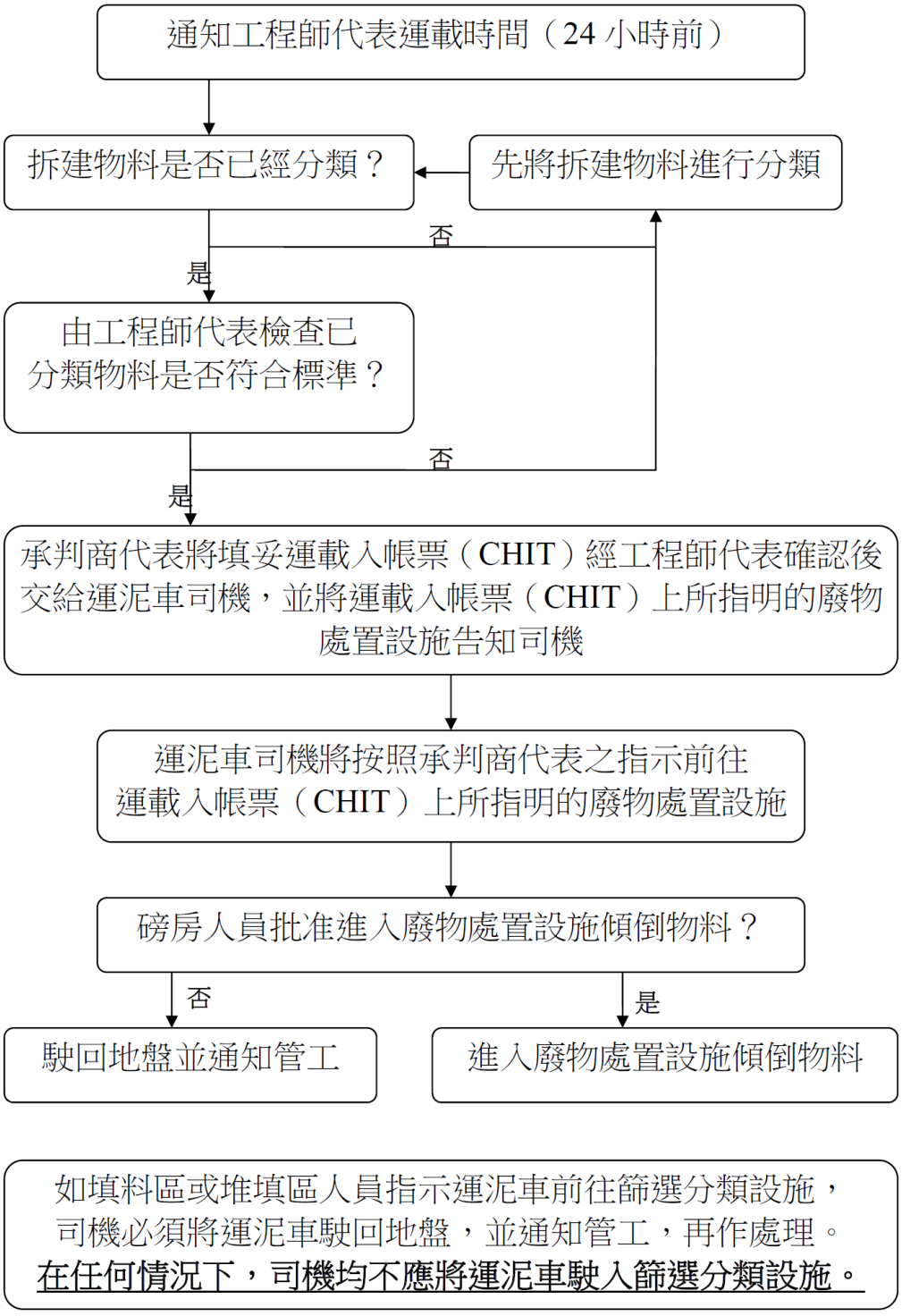
運泥車司機於運載物料及離開地盤前，司機必須注意並檢查以下事項：

1. 運泥車上的物料已經篩選分類為：
   a. 惰性（如泥土、石屎頭、石頭、碎石等）；
   b. 非惰性（如樹枝、鐵枝、一般垃圾等）。
2. 運泥車沒有超載。
3. 車軚及車身已經徹底清洗及泥斗上物料已經完全蓋好。
4. 運載入帳票（綠色）上的第一截已交給承判商代表人員。
5. 司機已持有有效的傾倒執照。
6. 司機已持有運載入帳票（綠色）並票上的所有資料已經填妥。
7. 必須依照運載入帳票（綠色）所指明的地點進行傾倒。
8. 如司機沒有持有已填妥資料的運載入帳票（綠色）而離開地盤進行傾倒；或運泥車駛往非運載入帳票（綠色）所指明的地點進行傾倒；或司機於傾倒後未能提供已蓋印的運載入帳票（綠色）及傾倒記錄，則會構成不當傾倒。
9. 如運泥車駛往非指明的地點進行傾倒，並該地點為私人土地；或運泥車非法傾倒，則會構成嚴重不當傾倒。

※ 運泥車不當傾倒或嚴重不當傾倒可被吊銷傾倒執照。

中國港灣示

合約 HY/2013/02
運載物料及傾倒流程表



如填料區或堆填區人員指示運泥車前往篩選分類設施，
司機必須將運泥車駛回地盤，並通知管工，再作處理。
在任何情況下，司機均不應將運泥車駛入篩選分類設施。

Appendix C

A Sample of Daily Record Summary

中國港灣工程有限責任公司
China Harbour Engineering Company Limited

"Daily Record Summary" to record daily disposal of construction & demolition (C&D) materials from the *Site
"每日運載記錄撮要" 記錄每日由 *地盤所傾卸的拆建物料
(1) Contract no. & title 合約編號及名稱 : Contract no.: HY/2013/02 HZMB, HKBCF - Infrastructure Works Stage I (Western Portion)
(2) Date of disposal 傾卸日期 :
(3) Designated disposal ground(s) 指定接收設施 : (a) NENT
(b) TM 38 FB
Others 其它 TKO 137 FB
(4) Approved alternative disposal grounds 另可接受的接收設施 :

CHIT / DDF no. 載運入帳票／拆建物料運載記錄票編號	Vehicle registration mark 車輛登記號碼	Approx. vol (e.g. Full/Three Quarter/Half/One Quarter) 大約承載量 (例如全、3/4、半、1/4)	C&D materials type (e.g. inert or non-inert) 建築廢料種類 (例如惰性或非惰性)	Disposal ground 接收設施	Signature & Name of the Contractor's Designated person before departure 於離開地盤前，承建商的指定人仕姓名及簽名	Departure time from *Site 離開*地盤時間	Signature & name of the Architect/ Engineer's supervisory staff before departure or other time as agreed between the Architect/ Engineer's Representative and the Contractor[1] 於離開地盤前或其它經承建商與建築師/工程師代表同意的時間，建築師/工程師監管人員姓名及簽名	Actual Disposal Ground 真正接收設施	Arrival Time at Disposal Ground 抵達接收設施時間	Remarks 備註

Part 1[2] 甲部 — Part 2[3] 乙部

Submitted by 呈交 : _____ *[Name of Contractor's Designated Person]* *承建商的指定人仕姓名*
Signature 簽名 : _____
Date 日期 : _____
[Name & signature of the Architect/Engineer's Staff] *建築師/工程師監管人員姓名及簽名*
Received by 接收 : _____
Post 職位 :
Date & Time 日期及時間 : _____

[1]For tern contract, if there are no full time site supervisory staff, the Architect/Engineer's supervisory staff should spot check and then sign as appropriate in accordance with paragraph 25 of DEVB TC(W) 6/2010 定期合約，如沒有全職地盤監管人員，應根據DEVB TC(W) 6/2010的第25段進行定點檢查及簽署
[2]Part 1 The Contractor shall complete Part 1 in duplicate and a copy should be kept by the Architect's/Engineer's Representative. 承建商填寫甲部兩份，副本由建築師/工程師代表持有
[3]Part 2 The Contractor shall complete Part 2 and submit the whole Summary to the Architect/Engineer's Representative within 1 working day after the records are posted at the EPD web-site. 承建商填寫乙部及將整份運載記錄撮要於記錄上載在環境保護署網頁後1個工作天內呈交給建築師/工程師代表
* Delete "Site" and substitute "Sites" for term contracts. 定期合約將 "Site" 刪去及以 "Sites" 代替

Appendix D

A Sample of Waste Flow Table

Monthly Summary of Waste Flow Table for __/ 2014__ (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of Non-inert 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	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 '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000m^3)
Jan-12	0	0	0	0	0	0	0	0	0	0
Feb-12										
Mar-12										
Apr-12										
May-12										
Jun-12										
Sub-total	0	0	0	0	0	0	0	0	0	0
Jul-12										
Aug-12										
Sep-12										
Oct-12										
Nov-12										
Dec-12										
Total	0	0	0	0	0	0	0	0	0	0

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*									
Total Quantity Generated	Hard Rock and Large Broken Concrete	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
(in'000m^3)	(in'000m^3)	(in'000m^3)	(in'000m^3)	(in'000m^3)	(in'000 Kg)	(in'000 Kg)	(in'000 Kg)	(in'000 Kg)	(in'000m^3)
0	0	0	0	0	50	3	4	10	4

Notes:

(1) The performance targets are given in PS Clause 6(14).

(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) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works together with a breakdowm of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m3. (PS Clause 5(4)(b) refers).

Appendix E

Environmental Mitigation Implementation Schedule (EMIS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Waste Management (Construction Waste)							
S8.3.8	WM1	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TC 19/2005

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
S8.3.9-S8.3.11	WM2	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TC 19/2005
S8.2.12-S8.3.15	WM3	*Chemical Waste* • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should 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 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; 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; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	• Waste Disposal (Chemical Waste) General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		• Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.					
S8.3.16	WM4	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	Proper handling of sewage from worker to avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance
S8.3.17	WM5	*General Refuse* • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance

Appendix F

Site Location Plan (Drawing No. 60191048/C2/000/ C00/ 1000)


TAP SHEK KOK
CASTLE PEAK BAY
TAI LAM CHUNG
THE BROTHERS
CHEK LAP KOK
TUNG CHUNG
LANTAU ISLAND
WORKS AREA 'WA3'
SEE DRAWING NO.
60191048/C2/000/C00/1041
THE SITE SEE DRAWING NO.
60191048/C2/000/C00/1010
825000 N
820000 N
815000 N
NOTES:
LEGEND:
SITE BOUNDARY
WORKS AREA
TENDER DRAWING
HIGHWAYS DEPARTMENT
SITE LOCATION PLAN
AECOM
Aedas
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS AOI
DRG.NO. 60191048/C2/000/C00/1000
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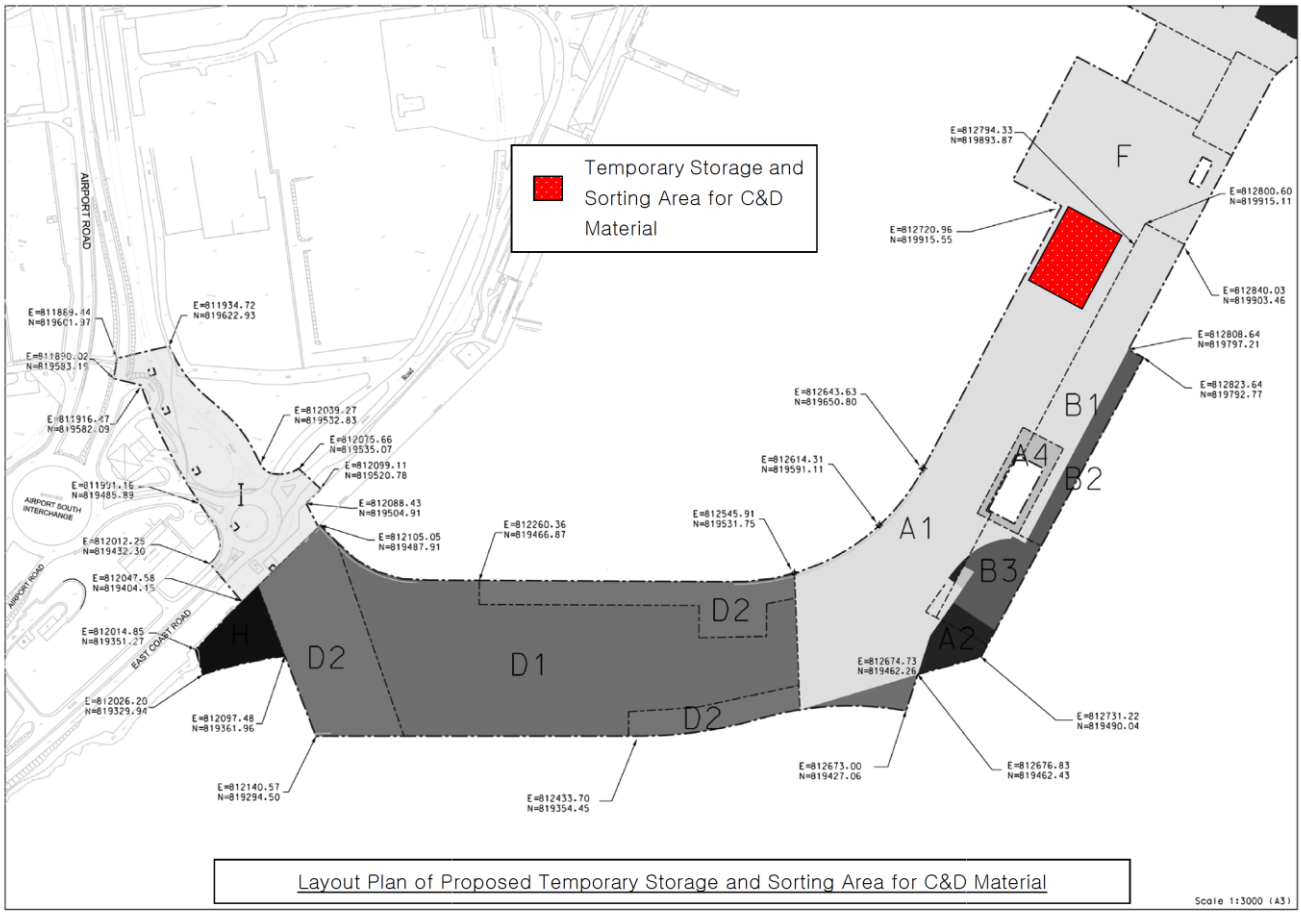
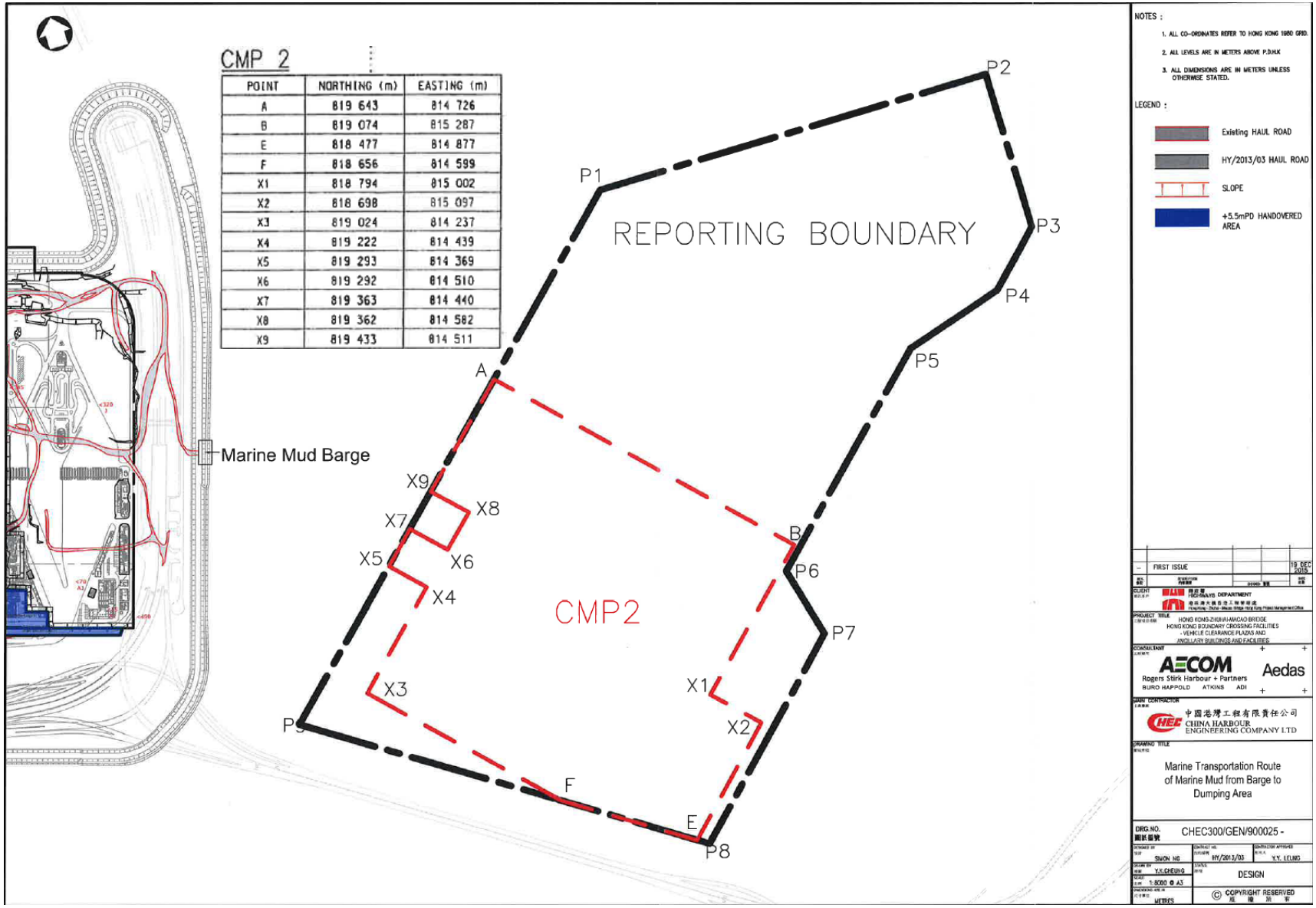
Appendix H

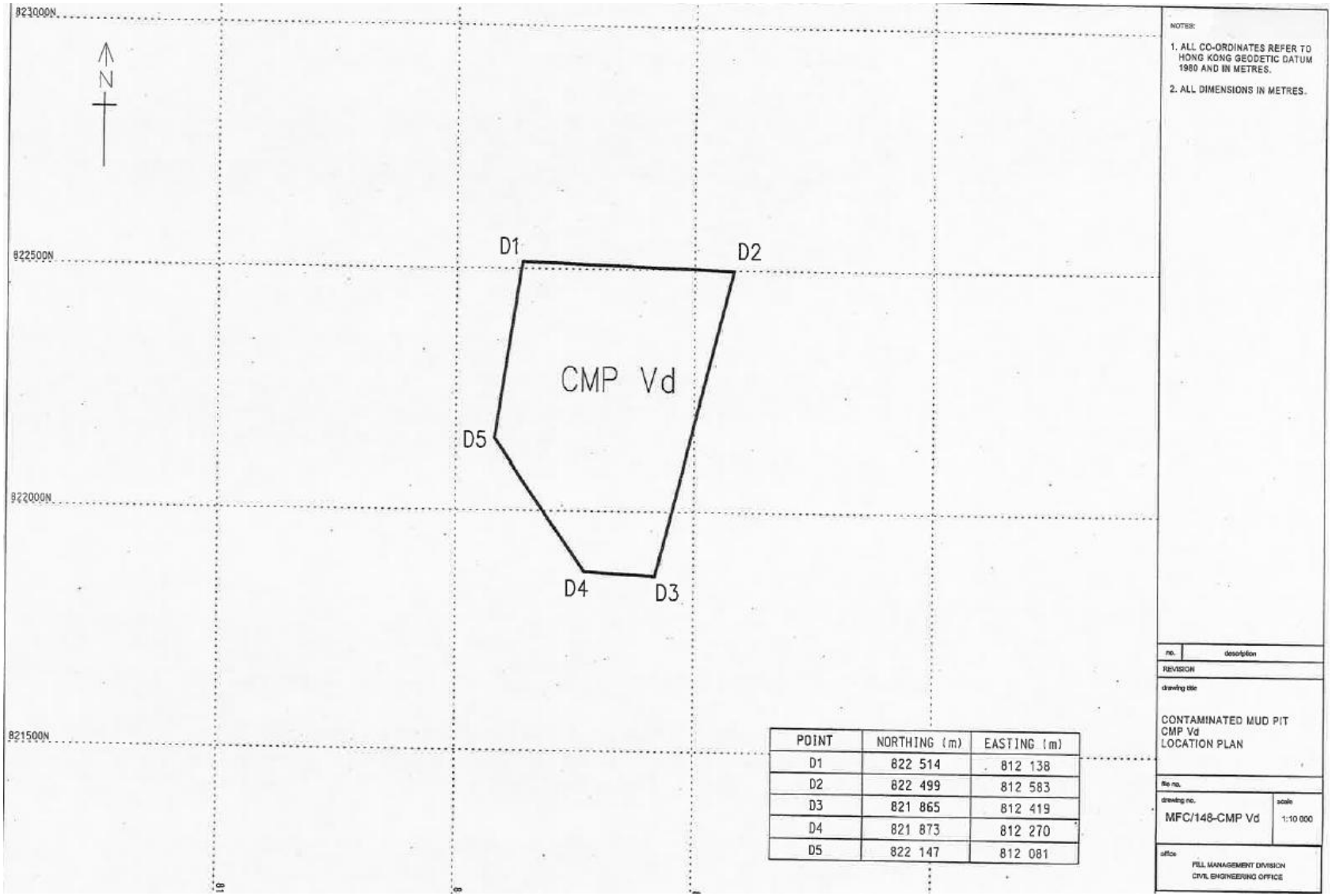
Layout Plan of Proposed Temporary Storage and Sorting Area for C&D Materials


Temporary Storage and Sorting Area for C&D Material
AIRPORT ROAD
AIRPORT SOUTH INTERCHANGE
EAST COAST ROAD
F
B1
B2
B3
A1
A2
A4
H
D1
D2
D2
D2
E=812794.33 N=819893.87
E=812800.60 N=819915.11
E=812720.96 N=819915.55
E=812840.03 N=819903.46
E=812808.64 N=819797.21
E=812823.64 N=819792.77
E=812643.63 N=819650.80
E=812614.31 N=819591.11
E=812545.91 N=819531.75
E=812260.36 N=819466.87
E=812674.73 N=819462.26
E=812731.22 N=819490.04
E=812673.00 N=819427.06
E=812676.83 N=819462.43
E=812433.70 N=819354.45
E=812140.57 N=819294.50
E=812097.48 N=819361.96
E=812026.20 N=819329.94
E=812014.85 N=819351.27
E=812047.58 N=819404.15
E=812012.25 N=819432.30
E=812105.05 N=819487.91
E=812088.43 N=819504.91
E=811991.16 N=819485.89
E=811916.47 N=819582.09
E=811890.02 N=819583.19
E=811869.44 N=819601.97
E=811934.72 N=819622.93
E=812039.27 N=819532.83
E=812075.66 N=819535.07
E=812099.11 N=819520.78
Layout Plan of Proposed Temporary Storage and Sorting Area for C&D Material
Scale 1:3000 (A3)

Appendix I

Location of CMP2, CMP Vd & Marine Mud barging point


CMP 2
POINT | NORTHING (m) | EASTING (m)
A | 819 643 | 814 726
B | 819 074 | 815 287
E | 818 477 | 814 877
F | 818 656 | 814 599
X1 | 818 794 | 815 002
X2 | 818 698 | 815 097
X3 | 819 024 | 814 237
X4 | 819 222 | 814 439
X5 | 819 293 | 814 369
X6 | 819 292 | 814 510
X7 | 819 363 | 814 440
X8 | 819 362 | 814 582
X9 | 819 433 | 814 511
REPORTING BOUNDARY
CMP2
P1
P2
P3
P4
P5
P6
P7
P8
P9
A
B
E
F
X1
X2
X3
X4
X5
X6
X7
X8
X9
Marine Mud Barge
NOTES :
1. ALL CO-ORDINATES REFER TO HONG KONG 1980 GRID.
2. ALL LEVELS ARE IN METERS ABOVE P.D.H.K
3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
LEGEND :
Existing HAUL ROAD
HY/2013/03 HAUL ROAD
SLOPE
+5.5mPD HANDOVERED AREA
FIRST ISSUE
19 DEC 2015
HIGHWAYS DEPARTMENT
HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- VEHICLE CLEARANCE PLAZAS AND ANCILLARY BUILDINGS AND FACILITIES
AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas
CHEC
中國港灣工程有限責任公司
CHINA HARBOUR ENGINEERING COMPANY LTD
Marine Transportation Route of Marine Mud from Barge to Dumping Area
DRG.NO. CHEC300/GEN/900025 -
CONTRACT NO. HY/2013/03
DESIGN
1:8000 @ A3
METRES
© COPYRIGHT RESERVED


823000N
822500N
822000N
821500N
N
D1
D2
D3
D4
D5
CMP Vd
NOTES:
1. ALL CO-ORDINATES REFER TO HONG KONG GEODETIC DATUM 1980 AND IN METRES.
2. ALL DIMENSIONS IN METRES.
POINT | NORTHING (m) | EASTING (m)
D1 | 822 514 | 812 138
D2 | 822 499 | 812 583
D3 | 821 865 | 812 419
D4 | 821 873 | 812 270
D5 | 822 147 | 812 081
no. | description
REVISION
drawing title
CONTAMINATED MUD PIT
CMP Vd
LOCATION PLAN
file no.
drawing no.
MFC/148-CMP Vd
scale
1:10 000
office
FILL MANAGEMENT DIVISION
CIVIL ENGINEERING OFFICE