MOTT MACDONALD

Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities - The Road Connection Between HKBCF and the Airport, Chek Lap Kok

Waste Management Plan

February 2022

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Waste Management Plan

February 2022

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

This Waste Management Plan has been

reviewed and certified by the Environmental Team Leader (ETL)

in accordance with Condition 2.5 of

Further Environmental Permit No. FEP-01/353/2009/K.

Certified by:

Heidi Yu
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 8 March 2022

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By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
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Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Principal Manager, Environmental Compliance

8 March 2022

Dear Sir,

Contract No. 3102
Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilitiies – The Road Connection Between HKBCF and the Airport, Chek Lap Kok - Independent Environmental Checker Consultancy Services

Waste Management Plan

We refer to the Waste Management Plan submitted and certified by the ET Leader on 8 March 2022.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 2.5 of Further Environmental Permit No. FEP-01/353/2009/K.

Should you have any query, please feel free to contact the undersigned at 3922 9141.

Yours faithfully,
AECOM Asia Co. Ltd.

Roy Man
Independent Environmental Checker

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1 Introduction

1.1 Background

To connect the Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Boundary Crossing Facilities (HKBCF) with the Hong Kong International Airport (HKIA), roads including an elevated bridge structure (hereinafter referred to as "the HKBCF Viaduct/Roads") were proposed as part of the HKBCF project, as described in Section 4.5 of the approved Environmental Impact Assessment (EIA) report of the HKBCF project. The HKBCF Viaduct/Roads are located partly within the boundary of the Airport Island near Terminal 2 (T2) and partly within the boundary of the land corridor between HKBCF and the Airport Island, i.e., partly within the HKBCF boundary.

Under the HKBCF project, the arrangements for the planning of the construction of the HKBCF Viaduct/Roads were formulated based on the scenario with the existing two-runway system (2RS) at the HKIA. The portion of the HKBCF Viaduct/Roads falling within the boundary of the land corridor between HKBCF and HKIA were originally planned to be constructed by Highways Department (HyD) of the Government of the Hong Kong Special Administrative Region (HKSARG) as part of the HKBCF project.

With the planned expansion of HKIA into a three-runway system (3RS), a revised layout of the HKBCF Viaduct/Roads (the revised layout is hereinafter referred to as the proposed "HKIA-HKBCF Road Connection") was formulated as part of the P282 Terminal 2 Expansion Design Consultancy of Airport Authority Hong Kong (AAHK). The proposed HKIA-HKBCF Road Connection has taken the design of the 3RS road network designed around the expanded T2 building into account. In addition to preparing the detailed design, it was also considered that the proposed HKIA-HKBCF Road Connection within the HKBCF boundary would be constructed by AAHK instead of HyD along with the 3RS road network planned within the Airport Island. Upon completion of the construction works, the new HKIA-HKBCF Road Connection outside the Airport Island would be handed over to HyD for future operation and maintenance.

The EIA for the HKBCF project, which covered the HKBCF Viaduct/Roads as a Designated Project (DP) based on the requirements set out in Item A.8. (i.e., a road bridge more than 100 m in length between abutments) in Part 1 of Schedule 2 to the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), was completed and approved (EIA Register No.: AEIAR-145/2009) and an Environmental Permit (EP) (EP No.: EP-353/2009) was granted under the EIAO to HyD.

On the other hand, the 3RS EIA had subsequently commenced and completed (EIA Register No.: AEIAR-185/2014) by AAHK, and it has already taken the layout of the proposed HKIA-HKBCF Road Connection into account and has assessed the relevant cumulative environmental impacts. The planned change in implementation agent from HyD to AAHK for the construction of the proposed HKIA-HKBCF Road Connection outside the Airport Island would, involves a transfer of corresponding responsibilities under the HKBCF EP from HyD to AAHK. To this end, an Environmental Review Report (ERR) was prepared and submitted to EPD in November 2018 which concluded that the change of implementation agent from HyD to AAHK for the construction of HKIA-HKBCF Road Connection would not result in any exceedance or violation of the environmental performance requirements set out in the approved HKBCF and 3RS EIAs and the mitigation measures identified in these EIAs remained relevant and valid. A Further Environmental Permit (EP No. FEP-01/353/2009/K) for the construction of the HKIA-HKBCF Road Connection (hereinafter referred to as "the Project") was granted to AAHK in December 2018 in accordance with Section 12 of EIAO.

Pursuant to Condition 2.5 of the FEP, AAHK should prepare a Waste Management Plan (WMP) for waste generated from construction activities of the Project. Mott MacDonald Hong Kong

Limited (MMHK) was appointed by AAHK to provide environmental consultancy services to establish a WMP to be implemented for construction phase of the Project.

1.2 Project Description

The Project will consist of the construction of a road bridge more than 100 m in length between abutments connecting between HKBCF and the HKIA which is part of the work for HZMB-HKBCF.

1.3 Purpose and Scope of the Plan

This WMP describes 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 of the Project. This WMP is prepared in accordance with Condition 2.5 of the FEP.

This WMP provides an overarching framework for waste management of the Project, as assessed in the approved EIA Report of Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Investigation (hereinafter referred to as “the EIA Report”) and the ERR, stated in the Project’s Environmental Monitoring and Audit Manual (hereinafter referred to as “the EM&A Manual”), and stipulated in the FEP.

The Contractor should adopt this WMP as a basis and proforma to develop their own contract specific WMPs. The contract specific WMPs should be updated from time to time and submitted to the Environmental Team (ET) and Independent Environmental Checker (IEC) for their verification and AAHK for agreement. The general structure for preparing a contract specific WMP is shown in **Appendix A**.

The key objectives of this WMP are to:

- Set out the organisational structure, roles, and responsibilities of key personnel responsible for the waste management and appropriate mitigation measures,
- Describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment, and disposal of different categories of waste,
- Include the recommended mitigation measures on waste management in the EIA Report,
- Indicate the disposal location(s) of all surplus excavated spoil and other waste, and
- Include details of the Trip Ticket System (TTS) to be implemented.

Nevertheless, the Permit Holder and any person working on the Project will strictly comply with all the waste management mitigation measures recommended in the EIA Report, ERR, EM&A Manual, FEP, this WMP, and contract specific WMPs.

In this updated submission, Section 4 incorporates the revised quantity of marine sediment estimated to be excavated, and the requirements to tally with the updated EM&A Manual.

1.4 Waste Management Legislation, Guidance, and Standards

1.4.1 Statutory Requirements

There are a number of 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), and
- 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 waste disposal authority.

According to the **Waste Disposal (Chemical Waste) (General) Regulation**, all producers of chemical waste must register with EPD and treat their wastes, either utilising on-site plant licensed by EPD, or arranging for a licensed collector to transport 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.

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 (PFRF) 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 PFRF need prior approval from Civil Engineering and Development Department (CEDD). 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 **Dumping at Sea Ordinance** (DASO) requires dumping permits from EPD for any marine disposal of dredged materials.

The **Public Cleansing and Prevention of Nuisances Regulation** provides control on illegal tipping of waste on unauthorised (unlicensed) sites.

The **Summary Offences Ordinance** includes provisions related to littering in the marine environment.

1.4.2 Non-statutory Guidelines and Standards

The following guidelines and standards of practice related to waste management and disposal will be adopted during construction of the Project:

- Waste Disposal Plan for Hong Kong (1989), Planning, Environmental and Lands Branch Government Secretariat,
- Works Branch Technical Circular No. 02/1993, Public Dumps, Works Branch, HKSAR Government,
- Works Branch 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, HKSAR 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,

- Works Branch Technical Circular No. 19/2005, Environmental Management on Construction Site, Works 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,
- Works Branch Technical Circular No. 12/2000, Fill Management, Works Bureau, HKSAR Government,
- Development Bureau Technical Circular (Works) No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness. Works Branch, Development 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 ADV-21 – Management Framework for Disposal of Dredged/ Excavated Sediment (April 2007).

1.4.3 Application for Licenses, Permits, and Approvals

The Contractor should apply for, where appropriate, and maintain permits and licences required under the legislation for the handling and disposal of waste arising from the Project, 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),
- Dumping permit under the Dumping at Sea Ordinance (Cap. 466), and
- Public Dumping License under the Land (Miscellaneous Provisions) Ordinance (Cap 28).

2 Waste Management Hierarchy and Approach

2.1 Key Source of Waste Generation from the Project

The key types of waste arising during construction phase of the Project identified in the EIA Report and the ERR include inert and non-inert C&D materials, marine sediment, chemical waste, and general refuse. A summary is presented in **Table 2.1**. Details of the different types of waste are presented in subsequent sections.

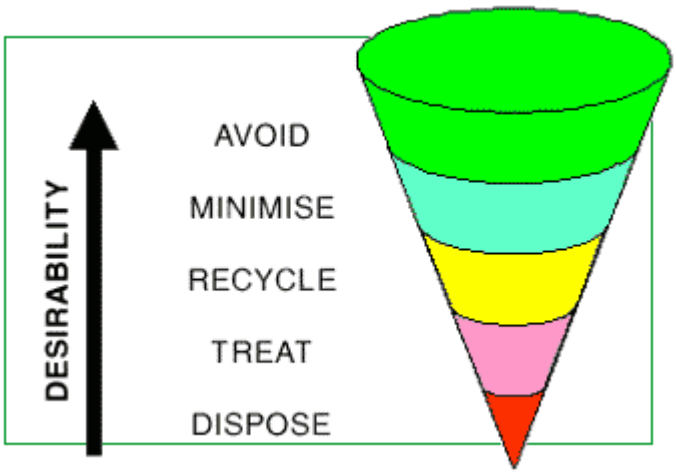
Table 2.1: Summary of Waste Arising During Construction Phase

Waste Type	Key Sources of Waste Generation
Inert C&D material	• Excavated materials generated from bulk excavation for substructure construction and foundation for viaducts and roadworks
Non-inert C&D material	• Waste generated from site clearance and demolition
Dredged/ Excavated marine sediment	• Marine sediment generated during excavation and foundation works
Chemical waste	• Used cleansing fluids, solvents, lubricating oil, waste fuel, etc. from maintenance and servicing of construction plant and equipment
General refuse	• Food scraps, wastepaper, empty containers, etc. generated from construction workforce

2.2 Hierarchy of Waste Management

The various waste management options should 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 construction waste management strategy is illustrated as an inverted cone in **Figure 2.1** which is to avoid, minimise, reuse, recycle, and finally dispose of waste with desirability in descending order.

Figure 2.1: Inverted Cone of Construction Waste Management Strategy



Source: Management Strategy for Construction Waste, EPD.
http://www.epd.gov.hk/epd/misc/cdm/management_intro.htm.

This hierarchy of waste management as shown in **Table 2.2** should be used to evaluate waste management options, thus allowing maximum waste reduction. Waste reduction measures should be introduced at the planning and detailed design stage and carried through the construction activities, whenever possible, by careful purchasing control, reuse/ recycling of materials and good site management. Examples of waste management measures to be incorporated into the Project are also presented in **Table 2.2**.

Table 2.2: Hierarchy of Waste Management

Hierarchy	Waste Management Measure
Avoidance and minimisation	Avoid and minimize generation of C&D materials and dredged/ excavated marine sediment through careful planning and design of works.
Reuse	Reuse inert portion of the C&D materials generated. Where appropriate and practicable, construction materials such as timber formwork, metal etc. should be re-used onsite.
Recovery and recycle	Undertake on-site and off-site waste recycling. Recover and store metals, plastics, cardboard, and paper packaging for subsequent collection by recycling contractors and recycling at approved disposal facilities.
Treatment and disposal	Properly treat and dispose of waste in accordance with legislative requirements, guidelines, and good practices. All chemical waste that is generated on-site will be stored for collection and disposal at approved disposal facilities.

3 Construction and Demolition (C&D) Material

3.1 Inert C&D Material

3.1.1 Estimated Quantities and Timing for Generation

The key sources of inert C&D material generated from the Project are excavated materials from works including bulk excavation for substructure construction and foundation for viaduct and roadworks. The approach used for inert C&D material management in the Project is to optimise the balance of earthworks, thereby minimising the volumes of fill required to be imported to and exported from the site. Every effort would be made to minimise the extent of excavation and to ensure that as much of the inert C&D materials generated by the project as practicable will be reused on-site. For this, the relevant construction activities and construction programme have been carefully planned and developed.

The estimated quantity of inert C&D material to be generated from the Project is 34,324 m^3. The estimated timing of generation is from Q3 2021 to Q2 2024 during the construction of the Project.

3.1.2 Requirements for On-site Handling and Storage

According to above estimated time for generation, temporary stockpiling of inert C&D materials will be required to facilitate the subsequent reuse of such materials during the period of Q3 2021 to Q2 2024.

3.1.3 Disposal Arrangement

Surplus inert C&D materials that cannot be reused on site will be recycled into aggregates, recovered, and delivered to Tuen Mun Area 38 or other PFRFs designated by the Public Fill Committee (PFC). A TTS should be implemented for disposal of such C&D materials. Details of the TTS are presented in **Section 3.3**.

3.1.4 Recommended Mitigation Measures

The following mitigation measures are recommended in the EIA during construction phase:

- 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 TTS for each works contract to ensure that the disposal of C&D materials is properly documented and verified;
- 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; and

- 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 AAHK and get its approval before implementation.

3.2 Non-inert C&D Material

3.2.1 Estimated Quantities and Timing for Generation

The key sources of non-inert C&D material generated from the Project include waste generated from site clearance and demolition works. The estimated quantity of non-inert C&D material to be generated from the Project is 6,090 m^3. The estimated timing of generation is from Q3 2021 to Q2 2022.

3.2.2 Requirements for On-site Handling and Storage

Non-inert C&D materials should be sorted on site into recyclable (e.g., metals, paper, packaging, and timber) and non-recyclable (e.g., vegetation, organic material, and soil) components. The recyclable component should be made available for collection by recycling contractors. Different areas of the work site should be designated for such segregation and storage.

3.2.3 Disposal Arrangement

Non-recyclable components of the non-inert C&D materials will be delivered to the West New Territories (WENT) landfill. A TTS should be implemented for disposal of such C&D materials. Details of the TTS are presented in **Section 3.3**.

3.2.4 Recommended Mitigation Measures

The following mitigation measures are recommended in the EIA during construction phase:

- 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; and
- 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.

HKSAR has developed and implemented a charging policy for the disposal of waste to landfill. It will provide additional incentive to reduce the volume of waste generated and to ensure proper segregation to allow disposal of inert material to public filling areas.

3.3 Trip Ticket System (TTS)

In accordance with DEVB TC(W) No. 6/2010, a TTS should be implemented to track the off-site delivery or disposal of C&D materials from the site to the disposal grounds. The contactors should prepare a Site Management Plan for implementation of the TTS. 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/ Disposal Delivery Form (DDF), and that the relevant waste management records have been completed and signed properly before its departure from site.

The CHIT should be used for off-site delivery of C&D material to a prescribed facility as defined under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). The DDF should be used for disposal of C&D materials at other disposal grounds as designated in the project or recycling facilities/ construction sites proposed by the Contractor and approved by AAHK/ Project Manager (PM). Samples of the CHIT and DDF are shown in **Appendix B**. General site procedures of the TTS are provided below:

- Prior to the truck leaving the site, the Contractor should provide a duly completed, signed, and stamped CHIT/ DDF to dump truck driver/ barge operator.
- The truck driver should proceed to the disposal facilities as stipulated in the CHIT/ DDF. The truck driver/ barge operator 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/ DDF.
- For disposal at a prescribed facility, the Contractor should check the information recorded in the Daily Record Summary (DRS) against the disposal records from EPD's website (http:www.epd.gov.hk/epd/misc/cdm/scheme.htm#j). The Contractor should complete Part 1 and Part 2 of the DRS form for submission to the AAHK/ PM within 1 working day after the records are posted at the EPD website.
- For disposal ground other than a prescribed facility, the Contractor should ensure that the DDF is signed off by a competent person as agreed by the AAHK/ PM at the disposal ground to confirm completion of each trip. The Contractor should maintain a daily record with details of each disposal trip from the project site to the disposal ground. The Contractor should complete Part 1 and Part 2 of the DRS form for submission to the AAHK/ PM within 3 working days after the date of disposal.
- Where an irregularity is observed or where requested by AAHK/ PM under special circumstances (e.g. a CHIT/ DDF has been issued but there is no disposal record at the designated disposal facilities), the Contractor should submit to AAHK/ PM 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 AAHK/ PM 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 AAHK/ PM.
- The copies of the CHIT/ DDF and the receipt should 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.

The Contractor should maintain a comprehensive register filing system of the DDF/ CHIT tickets issued. The Contractor should make the DDF register record available for inspection by AAHK/ PM upon request.

Other than C&D materials, the Contractor should also establish a record system for recyclable materials, such as time record and delivery note number, as well as a TTS for chemical waste.

4 Marine Sediment

4.1 Estimated Quantities and Timing of Generation

The key sources of marine sediment generated from the Project are from excavation and foundation works. According to the latest information provided by the Contractor, the estimated quantities of marine sediment to be excavated from the excavation and foundation works for the Project is 4,500 m^3. The estimated timing of generation is from Q4 2021 to Q4 2022.

4.2 Requirements for On-site Treatment and Reuse

As recommended in the ERR, marine sediment excavated may be treated using cement/ solidification/ stabilization techniques and reused onsite or offsite for backfilling and/or landscaping so that the need for offsite disposal is avoided as far as practicable.

The treated marine sediments using cement/ solidification/ stabilization techniques should be tested against the Toxicity Characteristics Leaching Procedure (TCLP) (as shown in **Table 4.1**) which were recommended in EPD's *Practice Guide for Investigation and Remediation of Contaminated Land.* The treated sediment should also be tested against relevant engineering requirements to confirm their suitability as backfilling material for respective areas of different future uses. Unconfined Compressive Strength (UCS) will be tested and defined based on respective engineering requirements.

Table 4.1: Universal Treatment Standards (UTS) for Reuse of Sediment Treated by Cement Mixing and Stabilization

Parameters	TCLP Limit (mg/L)
Arsenic	5
Cadmium	0.11
Total Chromium	0.6
Lead	0.75
Mercury	0.025
Nickel	11
Zinc	4.3

Note:
1) Universal Treatment Standard – US 40 CFR 268.48
2) Antimony and Barium are excluded from the above table as they are not considered as a contaminant of concern for the sediment quality in the EIA study.
3) For Copper, it must be reduced by at least 90% in mobility for copper through cement stabilization/solidification remedial treatment. The reduction of mobility of copper (leachable metals contaminant) should be confirmed through TCLP tests (i.e., to carry out TCLP test for the untreated sediment and for the sediment after treatment and to compare the concentrations of copper in the leachates). By taking account into the scenario where the Copper concentration of the sample is below the limit of the reporting (LOR) of the laboratory analysis (Copper: 0.1 mg/L), the treatment target is considered to be achieved in case the Copper concentration of the sample taken after treatment is smaller than the LOR.

The testing frequency for TCLP is one sample per 50 m^3 of the broken up solidified mixture of the treated marine sediment mix for the first 1,000 m^3 of the treated marine sediment. Provided that the samples meet the UTS for the tested parameters shown in Table 4.1 and the UCS test, the subsequent testing frequency will be reduced to be at least two samples per 10,000 m^3. In the event that the treated marine sediment mix does not meet the specified treatment target, the concerned whole batch should be crushed, and the material would be further handled and treated as necessary. The testing frequency should be revised to one sample per 50 m^3 (with two further

samples kept for contingency) and treated samples should be taken for laboratory testing. Once the UTS and UCS for the relevant tested parameters are attained, the previous sampling frequency should be resumed.

In the worst-case scenario where cement/ solidification/ stabilization techniques cannot achieve the specified treatment target of the excavated marine sediment, the Contractor shall propose alternative method(s) to treat the marine sediment. The Contractor shall seek review without objection from the ET and IEC, and acceptance by EPD on the proposed alternative method(s).

4.3 Disposal Arrangement

In the case where off-site disposal is required, the excavated marine 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. The procedures for seeking disposal shall comply with requirements provided in ETWB TCW No. 34/2002.

5 Chemical Waste

5.1 Estimated Quantities and Timing for Generation

Chemical wastes likely to be generated from the construction activities and associated facilities will include:

- Scrap batteries or spent acid/ alkali from their maintenance;
- Used paint, engine oils, hydraulic fluids and waste fuel;
- Spent mineral oils/ cleansing fluids from mechanical machinery; and
- Spent solvents/ solutions, some of which may be halogenated, from equipment cleansing activities.

The estimated quantity of chemical waste to be generated from the Project is 9,000 L of waste oil. The estimated timing of generation is from Q3 2021 to Q2 2024 and will be dependent on the contractor's on-site maintenance practice and utilisation of vehicles, plant, and equipment.

5.2 Requirements for On-site Handling and Storage

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:

- 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 specification has been approved by EPD; and
- 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:

- Be clearly labelled and used solely for the storage of chemical waste;
- Be enclosed on at least three sides;
- Have and impermeable floor and bund, 110% capacity of the largest container or 20% of the storage capacity, whichever is the greatest;
- Have adequate ventilation;
- Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste if necessary); and
- Be arranged so that incompatible materials are adequately separated.

5.3 Disposal Arrangement

Materials classified as chemical wastes will require special handling and storage arrangements before off-site disposal at the Chemical Waste Treatment Centre in Tsing Yi or other licensed waste recycling/ treatment facilities. The chemical wastes will be delivered to the off-site licensed facilities by a licensed waste collector, by trucks through North Lantau Highway and Tsing Sha Highway.

5.4 Recommended Mitigation Measures

The Contractor will be required to register with the EPD as chemical waste producers. For those processes which generate chemical waste, the Contractor shall identify any alternatives that

generate reduced quantities or even no chemical waste, or less dangerous types of 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, Handling and Storage of Chemical Waste*.

A TTS should be established by the Contractor to track the delivery or disposal of chemical waste from the site to the disposal grounds.

Preventive measures should be implemented for leakage and spillage of fuel and lubricating oil to avoid contamination of the construction site. All on-site equipment maintenance 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. All plant and equipment should require regular maintenance. The maintenance records should be kept in site office for future reference.

Good housekeeping practices should be adopted to deal with chemical waste, which include:

- Generate less chemical waste through:
    - Delivering appropriate quantity of chemicals to the construction site;
    - Avoiding unnecessary wastage of chemicals by using the chemicals more sensibly and in accordance with the manufacturer's instructions;
    - Finishing one bottle/ container of chemicals before opening the next one for use;
    - Collecting the remaining chemicals in suitable containers; and
    - Removing the unused chemicals out of the construction site after completion of the project.
- Prevent illegal discharge of chemicals or chemical wastes; and
- Minimise the volume of unused chemicals to be disposed of through:
    - Using the chemicals before the expiry date; and
    - Ordering appropriate quantity of chemicals and avoiding unnecessary storage of excess chemicals.

6 General Refuse

6.1 Estimated Quantities and Timing for Generation

The key sources of general refuse generated from the Project are from activities by construction workers, which include food scraps, wastepaper, and empty containers, etc. The estimated quantity of general refuse to be generated from the Project is 470 tonnes. The estimated timing of generation is Q3 2021 to Q2 2024.

6.2 Requirements for On-site Handling and Storage

The general refuse should be temporarily stored in enclosed bin to avoid adverse impact to the surroundings. Recycling bins should be provided to maximise waste reuse and recycle volume. Waste storage areas should be well maintained and cleaned regularly to avoid attracting pests and vermin.

6.3 Disposal Arrangement

General refuse will be disposed of at WENT landfill. A reputable waste collector should be employed by the Contractor to remove general refuse, separately from C&D material and chemical wastes. General waste will be collected regularly to minimise odour, pest and litter impacts. The burning of refuse on construction sites (which is prohibited by law) or disposal at sites other than the approved waste transfer or disposal facilities should be prohibited.

6.4 Recommended Mitigation Measures

The following mitigation measures are recommended in the EIA during construction phase:

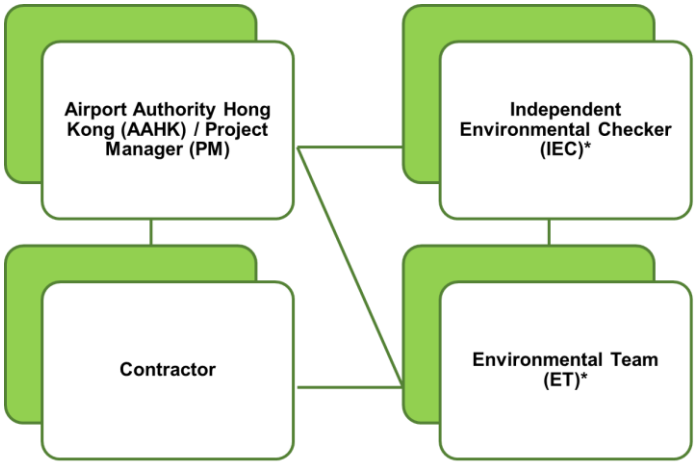
- General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes;
- A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a 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, aluminium cans, plastic bottles etc., should be provided; and
- Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.

7 Organisation Structure for Waste Management

7.1 Overall Organisation Structure

AAHK or its appointed Project Manager (PM), together with the Environmental Team (ET) and the Independent Environmental Checker (IEC) will be responsible for overseeing and ensuring the WMP is effectively implemented by the Contractor during their relevant construction works. Details of the roles and responsibilities of key personnel are presented below. The organisation structure is shown in **Figure 7.1**.

Figure 7.1: Overall Waste Management Organisation Structure



Note: * The ET and IEC are responsible for maintaining overall monitoring and checking of implementation of WMP by the contractor.

7.1.1 Airport Authority Hong Kong (AAHK) / Project Manager (PM)

AAHK is the implementation agent for the construction phase of the Project. The main responsibility of the AAHK/ PM is to oversee and manage the contractor's implementation of the WMP.

7.1.2 Environmental Team (ET)

The ET will be employed by AAHK and should not be in any way an associated body of the Contractor and IEC of the Project. The ET is responsible to:

- Maintain overall control of the monitoring and professional services required under the conditions of the FEP, EIA Report, and the EM&A Manual;
- Prepare and update this WMP with assistance from the contractor;
- Investigate and inspect the contractors' equipment and work methodologies with respect to waste management and associated mitigation measures;
- Review the programme of works to anticipate any potential waste management implications;
- Liaise with the IEC on the waste management matters;
- Audit and report the implementation status of waste management mitigation measures from site inspections;

- Provide advice to the Contractor on waste management improvement, awareness and enhancement matters on-site;
- Investigate any environmental complaints, including those on waste management matters; and
- Carry out weekly waste management audits.

7.1.3 Independent Environmental Checker (IEC)

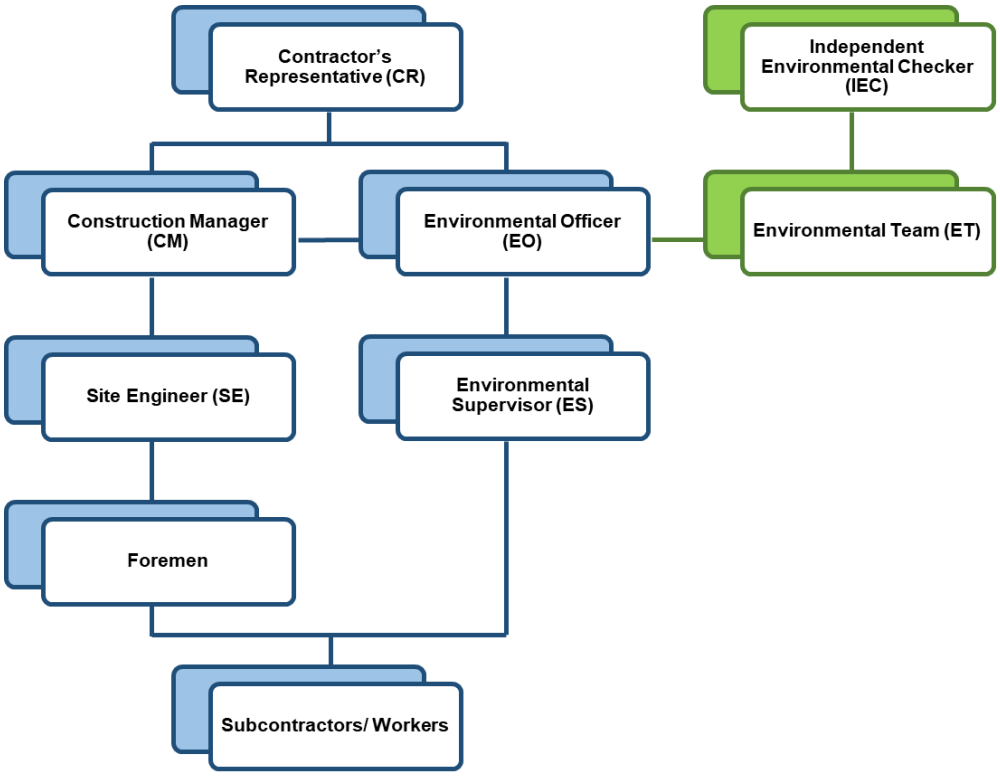
The IEC will be employed by AAHK and should not be in any way an associated body of the Contractor and ET of the Project. The IEC is responsible to:

- Undertake the duties defined in the EM&A Manual and the FEP;
- Audit the overall EM&A programme described in the EIA Report and the FEP, including the implementation of all environmental mitigation measures and submissions required in the EM&A Manual and the FEP;
- Verify the WMP and any subsequent updates on WMP;
- Verify the environmental acceptability of contractor's works with respect to waste management and environmental mitigation measures;
- Liaise with the ET on all the waste management matters;
- Verify the investigation result of any environmental complaints, including those on waste management matters; and
- Carry out at least monthly waste management audits and recommend any changes as appropriate.

7.2 Organisational Structure of Contractor

The Contractor is responsible for the implementation of the WMP within the scope of their relevant construction works. An organisation structure of Contractor is shown in **Figure 7.2**. The Contractor is also responsible for ensuring commitment and sufficient resources to provide an effective environmental management program, which includes waste management, for all the construction works.

Figure 7.2: Overall Waste Management Organisation Structure of Contractor



The details of the roles and responsibilities of key site personnel of the Contractor are described below. Upon appointment, the Contractor may refine the roles in accordance with the company's management structure and assign suitable members of staff.

7.2.1 Contractor's Design Engineers

The design engineer is responsible for setting requirements on waste minimisation during planning process, including setting up procedures and commitments for reducing waste on-site. Waste minimisation decisions should be recorded within the contract specific WMPs. Decisions may be related to the nature of the project, design, construction method or material selection.

7.2.2 Contractor's Representative (CR)

The Contractor's Representative (CR) is responsible for ensuring the implementation of WMP and assigning the necessary resources to ensure its effective implementation. The responsibilities of the CR include, but are not limited to:

- Overview of day-to-day site practices in relation to waste management;
- Direct Construction Manager (CM), Site Engineer (SE) and Foremen as appropriate in supervising and enforcing the on-site mitigation measures; and
- Ensure compliance of all relevant waste management legislations during construction.

7.2.3 Construction Manager (CM)

The Construction Manager (CM) reports to the CR, 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 registration of a Waste Producer and Chemical Waste Producer under corresponding regulations;
- 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).

7.2.4 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 CR. 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 on a weekly basis to identify potential hazards to the environment, reporting findings with recommendations for corrective actions;
- Keep records of quantities of waste generated, reused, recycled, and disposed of on a weekly basis. Number of loads each day shall be recorded for construction and demolition material/ waste;
- 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.

7.2.5 Site Engineer (SE)

The responsibilities of the SE include, but are not limited to:

- 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.

7.2.6 Environmental Supervisor (ES)

The ES is responsible for the implementation of the WMP with the assistance of the Foremen. The ES is also responsible for:

- Cooperate 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.

7.2.7 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 is 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.

7.2.8 Subcontractors/ Construction Workers

Subcontractors and their employees have a duty to carry out agreed waste management practices as instructed by the CR. Every employee should report promptly to management on any non-compliance related to waste management and the TTS. All subcontractors and construction workers must comply with the waste policy of the Contractor and the TTS. They should attend waste management training organised by the EO.

8 Waste Management Records and Training

8.1 On-site Record of Waste

8.1.1 Waste Flow Table (WFT)

The Contractor should establish a mechanism to record all the waste generated each month, using the Monthly Summary WFT. A sample of Monthly Summary WFT is provided in **Appendix C**. The Contractor should record actual quantities of wastes generated in each month in the Monthly Summary WFT and submit it to AAHK/ PM.

The estimated and actual quantities of wastes that will be generated each year from the project will be reported, using the Yearly Summary WFT, which is attached in **Appendix C**.

8.1.2 Waste Management Records

In addition to the CHIT and DDF records required to be retained by the Contractor, a system should be in place to record the quantities of surplus materials and wastes generated each month. These records would include, but not limited to, the following:

- Relevant licences and permits, including dumping permits and registration as chemical waste producer;
- Records of quantities of waste generated, recycled and disposed (including the disposal sites);
- Trip tickets for C&D material and chemical waste disposal; and
- Any waste management training record

The above records of each calendar month should be submitted to the SE and AAHK/ PM within the first week of the following calendar month.

In addition, where it is necessary to use timber for temporary works construction, the Contractor should provide a summary table, as attached in **Appendix D**, containing the description, justification and the estimated quantity for every work process/ activity requiring the use of timbers for temporary works irrespective of the quantity of timber used. The summary table should be submitted to AAHK/ PM with the WFT.

8.2 Site Staff Training

The Contractor will ensure that all site staff members attend an environmental management training course. The training will cover the surplus material management policy, targets, 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, and
- Emergency Response Procedure and mitigation measures.

Furthermore, the CR will assign a member of staff, such as the EO or ES, to provide additional on-site training regarding site cleanliness and waste management procedures on a monthly basis to review relevant statutory regulations and waste management practice and to discuss relevant contract requirements. This training should be provided to all levels of staff as well as subcontractors.

All foremen and subcontractors' representatives should be trained regarding the presentation of the tool-box talks by the EO. Training material for tool-box talks should be prepared by the EO and disseminated to all workers by foremen and subcontractor's representatives at regular intervals to promote environmental awareness and provide updated issues regarding waste management practices.

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

9 Waste Monitoring and Audit

The Contractor is responsible for all waste management activities under their works contracts 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. Relevant mitigation measures are summarised in the Environmental Mitigation Implementation Schedule (EMIS) in **Appendix E**.

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, reuse, recycling and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes are not disposed of into the nearby waters. The Contractor should 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 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 the contract specific WMPs and will report them accordingly. The results of the waste management audits would be reported in the monthly EM&A reports.

Appendix A. General Structure of Contract Specific Waste Management Plan

A.1 General Structure

A general structure of contract specific WMP is shown below and should be used by the Contractor as a guide when preparing their own contract specific WMP.

A.1.1 Purpose and Scope of Contract Specific WMP

- Scope and description of the contract with layout plans
- Duration of the contract
- Purpose of the contract specific WMP
- Environmental legislation, guidelines, and standards
- Licence or permit requirements

A.1.2 Waste Management Hierarchy and Approach

- Key source of waste generation from the contract
- Waste management hierarchy
- Waste management approach to be incorporated in the contract

A.1.3 Organisation Structure for Waste Management

- Duties and responsibilities of key personnel in waste management
- Contact information of the key personnel

A.1.4 Waste Generation and Management Approach

- Classification and estimation of different types of waste generators including the generation timing
- Proposed arrangements for avoidance, reuse, recycling, collection, storage, treatment, and disposal of the relevant categories of waste anticipated to arise from the contract

A.1.5 Waste Reduction and Management Procedures

- Recommended mitigation measures related to construction waste management
- Proposed designation of areas for segregation and temporary storage of re-usable and recyclable materials
- The route to be taken for designated disposal facilities

A.1.6 Waste Management Records and Training

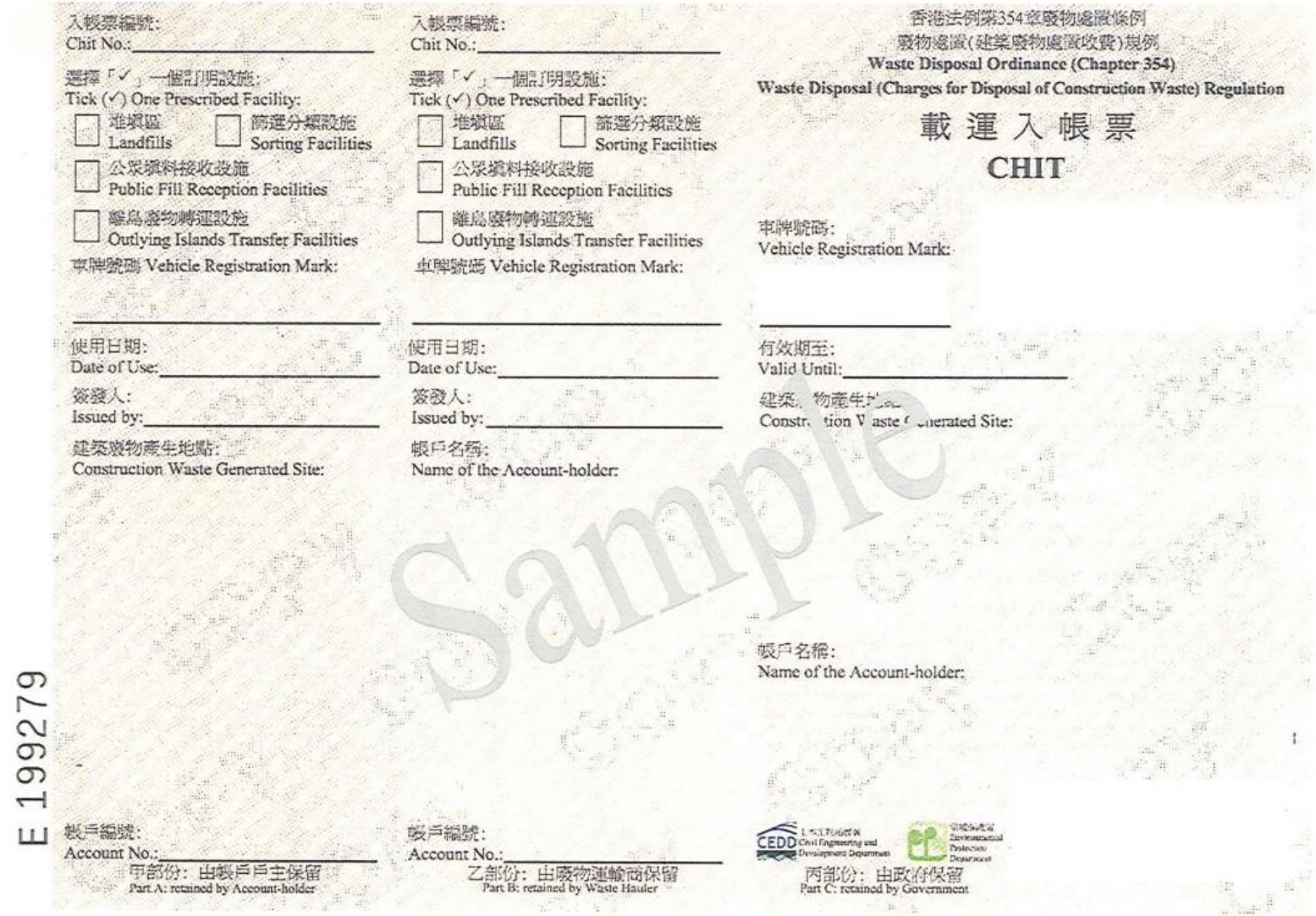
- Adequate and proper records in relation to the implementation of contract specific WMP, such as TTS and measurement record, to be kept on-site
- Record of waste flow table
- Proposed designation of areas for disposal handling and facilities locations
- Raise environmental awareness/ environmental training
- Waste management guidelines to be issued to advise all on-site staff on waste reduction and proper disposal of waste materials, etc.

A.1.7 Waste Monitoring and Audit

- Relevant environmental reporting and auditing requirements
- Inspection programme

Appendix B. Samples of CHIT, DDF, and DRS

Annex 1a to Appendix C



入帳票編號:
Chit No.:

選擇「✓」一個訂明設施:
Tick (✓) One Prescribed Facility:

☐ 堆填區 Landfills ☐ 篩選分類設施 Sorting Facilities
☐ 公眾填料接收設施 Public Fill Reception Facilities
☐ 離島廢物轉運設施 Outlying Islands Transfer Facilities

車牌號碼 Vehicle Registration Mark:

使用日期:
Date of Use:

簽發人:
Issued by:

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

甲部份：由帳戶戶主保留
Part A: retained by Account-holder

入帳票編號:
Chit No.:

選擇「✓」一個訂明設施:
Tick (✓) One Prescribed Facility:

☐ 堆填區 Landfills ☐ 篩選分類設施 Sorting Facilities
☐ 公眾填料接收設施 Public Fill Reception Facilities
☐ 離島廢物轉運設施 Outlying Islands Transfer Facilities

車牌號碼 Vehicle Registration Mark:

使用日期:
Date of Use:

簽發人:
Issued by:

帳戶名稱:
Name of the Account-holder:

帳戶編號:
Account No.:

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

香港法例第354章廢物處置條例
廢物處置(建築廢物處置收費)規例
Waste Disposal Ordinance (Chapter 354)
Waste Disposal (Charges for Disposal of Construction Waste) Regulation

載運入帳票
CHIT

車牌號碼:
Vehicle Registration Mark:

有效期至:
Valid Until:

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

帳戶名稱:
Name of the Account-holder:

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

E 199279

Annex 1b to Appendix C

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

Date of Use:
使用日期:_____

Disposal Ground :
接收設施:

_____

Vehicle Registration Mark. :
車牌號碼:

_____

Issued By:
簽發:

_____

(This part retained by Disposal Ground)
(此部分由接收設施保留)

_____
Chop of Disposal Ground 接收設施蓋印

Serial No. 0012345678

Construction and Demolition Materials
Disposal Delivery Form
拆建物料運載記錄票

Contract No: _____ Contract Title: _____

合約編號: _____ 合約名稱: _____

Date of Use: 使用日期: _____ Time of departure from site: 離開地盤時間 : _____ Vehicle Registration Mark: 車牌號碼: _____

Disposal Ground:
接收設施: _____

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 Representative
接收設施蓋印

_____
Chop of Engineer's/Architect's
工程師 / 建築師代表蓋印

Annex 2 to Appendix C

"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 ;_____

(2) Date of disposal 傾卸日期: _____

(3) Disposal ground (s) designated in the Contract or directed by the Architect/Engineer 合約指定或建築師/工程師指示接收設施: (a)

(b) Others 其它

(4) Approved alternative disposal grounds 另可接受的接收設施_____

CHIT/ DDF no. 戥運入帳票/ 拆建物料運戥記錄票編號	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: _____

Received by 接收 : _____ *[Name and signature of the Architect/Engineer's staff] 建築師/工程師監管人員姓名及簽名*

Post 職位 : _____

Date & Time 日期及時間 : _____

[1] For term 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 甲部- 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 乙部- 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 C. Sample of Summary Waste Flow Tables

Monthly Summary Waste Flow Table for _____ (Year)

Month	Quantities of Inert C&D Materials (in tonnes)								Quantities of C&D Wastes (in tonnes)					
	Total Quantity Generated	Stockpiled for Reuse or Recycle	Reused in the Contract	Reused in other Projects	Disposed as Public Fill Banks or Sorting Facilities	Imported Public Fill	Imported Sand Fill	Imported Rock Fill	Metals Recycled	Paper/ Cardboard Packaging Recycled	Plastics Recycled	Timber	Chemical Waste	Others e.g., General Refuse
JAN														
FEB														
MAR														
APR														
MAY														
JUN														
JUL														
AUG														
SEP														
OCT														
NOV														
DEC														
Grand Total														

Note:

i. Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging material.
ii. 1 tonne = 1000 kg

Yearly Summary Waste Flow Table

Year	Quantities of Inert C&D Materials (in tonnes)																Quantities of C&D Wastes (in tonnes)											
	Total Quantity Generated		Stockpiled for Reuse or Recycle		Reused in the Contract		Reused in other Projects		Disposed as Public Fill Banks or Sorting Facilities		Imported Public Fill		Imported Sand Fill		Imported Rock Fill		Metals Recycled		Paper/ Cardboard Packaging Recycled		Plastics Recycled		Timber		Chemical Waste		Others e.g., General Refuse	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
2021																												
2022																												
2023																												
2024																												
Grand Total																												

Note:

i. Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging material.
ii. 1 tonne = 1000 kg
iii. Est. – Estimated, Act. – Actual

Appendix D. Sample of Summary Table for Work Processes or Activities Requiring Timber in Temporary Works

Work Processes or Activities Requiring Timber for Temporary Works

Item	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Estimated Quantities (m^3)	Actual Quantities Used (m^3)	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
Total Estimated Quantity of Timber Used (m^3)					

Notes:

a) Works items requiring timber for use in temporary construction works. Several minor work items can be combined for ease of updating.
b) The summary table shall be submitted monthly to the Contractor's Representative for review and monitoring.

Appendix E. Environmental Mitigation Implementation Schedule

EIA Ref. (Register No. AEIAR-145/2009)	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Agent to Implement	Location	Time to Implement	Requirements or Standards for the Measures to Achieve
Sediment							
--	--	Marine sediments excavated are to be treated using cement/solidification/stabilization techniques and tested against TCLP which were recommended in the EPD's Practice Guide for Investigation and Remediation of Contaminated Land. Properly treated marine sediment is to be reused onsite or offsite for backfilling and/or landscaping such that the need for offsite disposal is avoided as far as practicable.	Develop marine sediment treatment and reuse arrangement	Contractor	All construction sites	Construction stage	Universal Treatment Standards for On-site Reuse of Cement Stabilisation/Solidification Treated Soil as shown in the Practice Guide for Investigation and Remediation of Contamination Land issued by EPD

EIA Ref. (Register No. AEIAR-145/2009)	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Agent to Implement	Location	Time to Implement	Requirements or Standards for the Measures to Achieve
Waste Management (Construction Waste)							
S8.3.8	WM1	<u>*Construction and Demolition (C&D) Material*</u> 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 is properly documented and verified; • 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; and • 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 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. (Register No. AEIAR-145/2009)	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Agent to Implement	Location	Time to Implement	Requirements or Standards for the Measures to Achieve
S8.3.9 - S8.3.11	WM2	<u>*C&D Waste*</u> • 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; and • 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 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	<u>*Chemical Waste*</u> • 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	Control 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. (Register No. AEIAR-145/2009)	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Agent to Implement	Location	Time to Implement	Requirements or Standards for the Measures to Achieve
		prevent rainfall entering; and arranged so that incompatible materials are adequately separated; and					
S8.2.12 - S8.3.15	WM3	• 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.	Control 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
S8.3.16	WM4	<u>*Sewage*</u> • 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	<u>*General Refuse*</u> • 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	Minimise production of general refuse and avoid odour, pest, and litter impacts	Contractor	All construction sites	Construction stage	Waste Disposal Ordinance

EIA Ref. (Register No. AEIAR-145/2009)	EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Agent to Implement	Location	Time to Implement	Requirements or Standards for the Measures to Achieve
		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, aluminium cans, plastic bottles etc., should be provided; and • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.					