

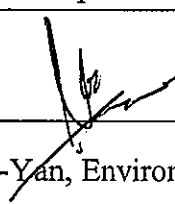

香港電燈有限公司  
The Hongkong Electric Co., Ltd.



**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) ORDINANCE, CAP. 499**

**ENVIRONMENTAL PERMIT NO. EP-071/2000/C**

**LAMMA POWER STATION EXTENSION  
ENVIRONMENTAL MONITORING & AUDIT PROGRAMME  
AT CONSTRUCTION PHASE**

Report Title	Lamma Power Station Extension – Waste Management Plan for Civil Superstructure Works of Unit L12
Date	25 September 2020
Certified by	 (Mr. IP Tat-Yan, Environmental Team Leader)
Verified by	 Mr. Y T Tang (AECOM Asia Company Limited, Independent Environmental Checker)

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**WASTE MANAGEMENT PLAN**

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**Document Title**

Waste Management Plan

**Project Details**

L12 Civil and Superstructure Works at  
Lamma Power Station Extension

**Revision Number**

R0

Prepared by Env. Dept.

Signature:

Date:

Approved by Project Mgr.

Signature:

Date:

**Document Holder**

Controlled Copy No.

Name of Holder

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## WASTE MANAGEMENT PLAN

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## WASTE MANAGEMENT PLAN

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### REVISION HISTORY

Revision No.	Revision Date	Pages	Amendment

### ISSUE

Controlled copies of this Waste Management Plan are to be issued by the Project Manager to the following persons/organisation:

Controlled Copy No.	Issued to
01	Engineer
02	Project Manager/Environmental Officer – Site Office
03	Environmental Department – Head Office

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## WASTE MANAGEMENT PLAN

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### SECTION 1 – GENERAL

#### 1.1 Introduction

This Waste Management Plan (WMP) shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities to be carried out.

#### 1.2 Purpose

This Waste Management Plan provides details of the measures; procedures and initiatives to be employed by the Contractor to control and manage waste related environmental issues that may arise during the construction works of the project.

The main purpose of this Waste Management Plan is to:

- (i) Make reference to statutory and contractual environmental management requirements and obligations;
- (ii) Clarify responsibilities;
- (iii) Describe committed mitigation measures;
- (iv) Provide details of preventive actions to be taken;
- (v) Provide details relating to environmental licensing requirements;
- (vi) Inform Contractor's SHE Team Members and sub-contractors of Contractor's management measures, systems and obligations.

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## WASTE MANAGEMENT PLAN

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### 1.3 Description of Works

The Works to be carried out under the Contract shall include but not necessarily be limited to the following items:

#### Scope of Works for the contract

##### 1)

- (a) L12 Main Station Building (MSB) for the L12 gas turbine, steam turbine-generator and auxiliary equipment;
- (b) Link Bridge between L11 and L12 MSB and at south of L11 MSB and their associated alterations & additions (A&A) Works;
- (c) Foundations and substructures for various plants and equipment including but not limited to Transformers, HRSG, Gas Duct, Tanks, Pumps, Racks etc. for L12;
- (d) L12 HRSG Equipment Room and its associated works;
- (e) C.W. Pump Equipment Room No.5 and its associated works;
- (f) LMX Administration and Control Building including the fulfilment of BEAM Plus specifications in PS45;
- (g) Civil Works for gas facilities at Gas Receiving Station (GRS) including Gas Receiving Station Equipment Room;
- (h) Civil provision for L12 Circulating Water (C.W.) System including inlet and outlet culverts / pipes installation;
- (i) 275kV Cable Trenches;
- (j) L12 gas pipe support foundations and trenches;
- (k) Pipe and Cable Rack and its Extension;
- (l) Shunt Reactor Compound Extension;
- (m) Civil Work for LMX Light Oil Tank Farm;
- (n) No. 5 Chimney with L12 Steel Flue Liner;
- (o) Civil Works for DAX Cable Diversion;
- (p) External Works including roads, pavement, drains, trenches, pits, underground utilities, fire hydrant, etc.

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## WASTE MANAGEMENT PLAN

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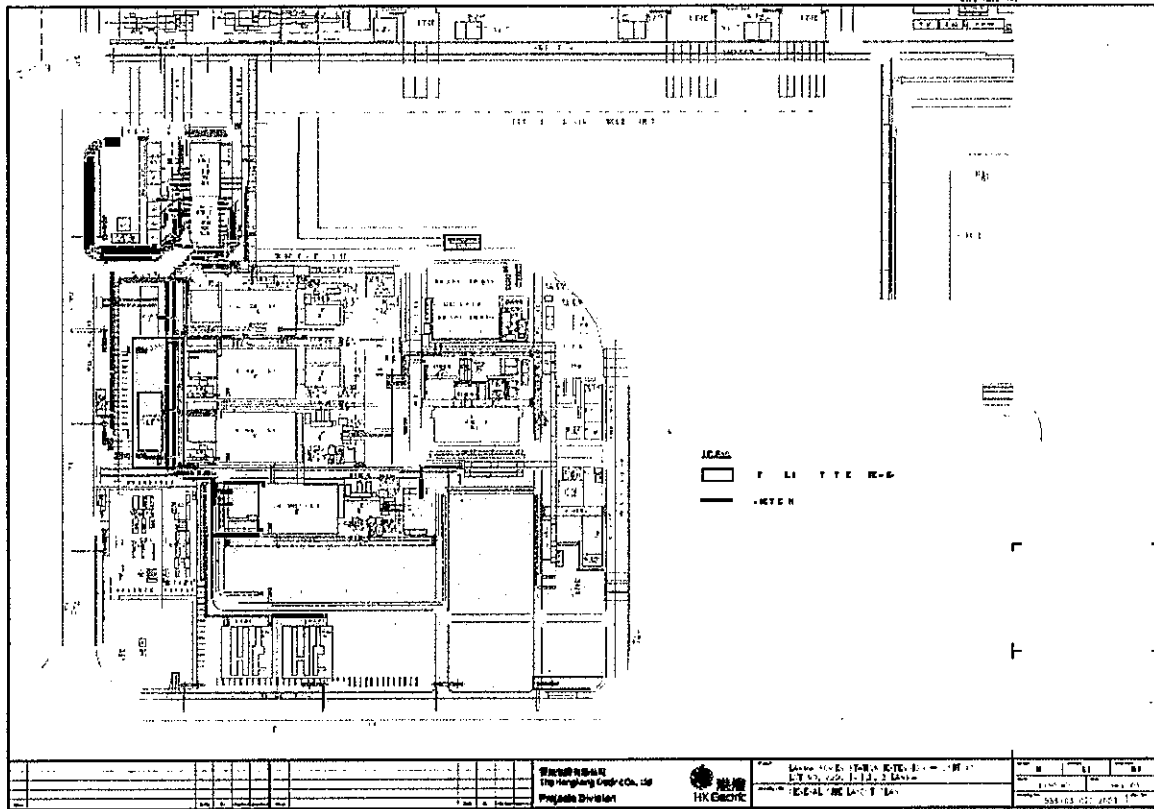
2)

- (a) No. 5 Circulating Water (C.W.) Intake, which lie at the south-west of LMX site;
- 1) Temporary Excavation and Lateral Support works
  - 2) Associated removal and modification of existing seawall and existing RC culverts
  - 3) No. 5 C.W. Intake permanent reinforced concrete works –  
Lower portion of pre-casting chamber by off-site prefabrication and upper portion of chamber by in-situ casting works
  - 4) Pipe and culvert connection, backfill works to ground level and reinstatement works
  - 5) Associated rails & railing foundation, steel hoisting gantry and miscellaneous steelworks
- (b) Cable Bridge, which lie at the north-east of LMX site connecting to the south-east of LPS site;
- 1) Construction of pile caps
  - 2) Construction of bridge structure, abutment and retaining wall;
  - 3) Soil backfill retained by abutment wall & retaining wall
  - 4) Roadworks and drainage system for the bridge;
  - 5) Seawall modification on LMX side;
  - 6) Construction of R.C. trenches;
  - 7) Temporary Excavation and Lateral Support Works for the above works
- (c) Drainage works, which lie at the south-west of LMX site;
- 1) Temporary diversion of existing upstream storm water drains to bypass the construction area;
  - 2) Removal and reconstruction of drain pipes and gullies between manholes;
  - 3) Temporary utilities and traffic diversion and Road reinstatement



# WASTE MANAGEMENT PLAN

Location plan of coloured works area are shown in Figure 1 below:



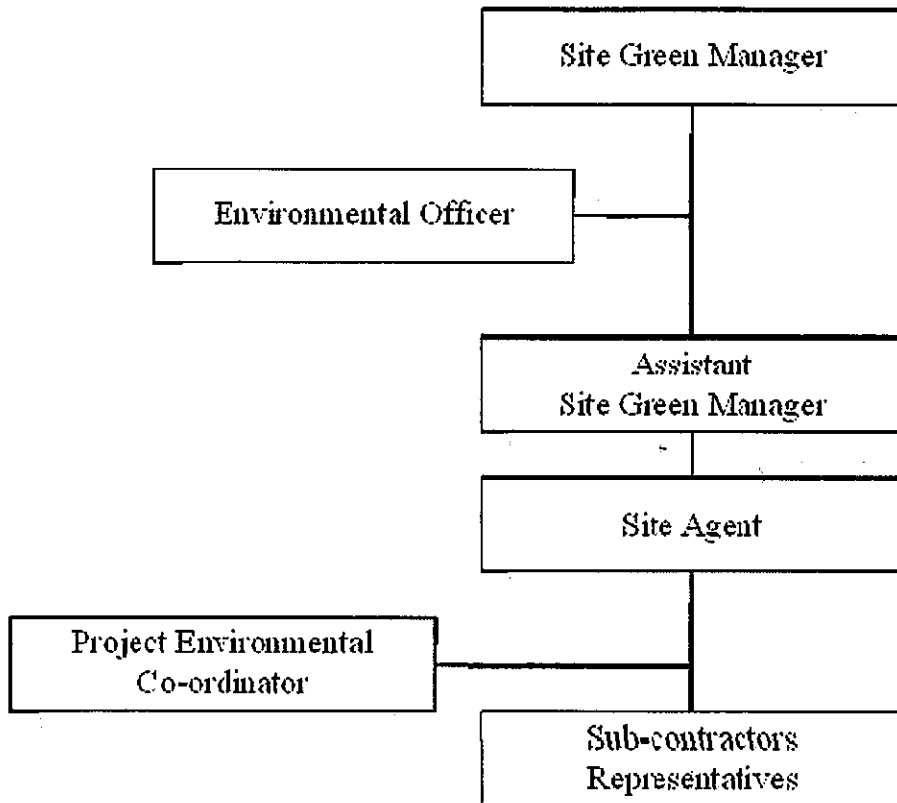
## 1.4 Environmental Policy

Contractor regards the environmental protection as high priority during the course of our construction processes. The Safety, Health, Environment and Quality Policy Statement below sets out our management's approach, commitments, targets and measures for environmental nuisance abatement and waste management in the Contract and the policy statement would keep review and updated regularly. It is our intention to achieve sustainable construction and minimize any adverse impact on the environment resulting from our site activities. We will communicate this Policy Statement to all levels of persons engaged in the Contract and will review our environmental performance for continuous improvement.

[Policy Statement]

- Safety - Internal and external safety audit scores > 80%
- Health - Accident rate < 9 per 1,000 workers per year
- Environment - Minimizing material wastage and reducing generation of construction waste
- Quality - Enhancing business operation efficiency and effectiveness

**1.5 Contractor's Environment Committee Organisation Structure**



**1.6 Function Descriptions and Responsibilities**

Contractor is the main contractor for this project and has the overall responsibility for the construction works including the implementation of this section. The Project Management will assemble relevant personnel to undertake environmental management issues associated with the contract.

1.6.1 The Site Green Manager (SGM) is the Project Manager who is responsible for maintaining overall control of the project and implementation of waste management system. The SGM shall be responsible for ensuring that adequate resources are provided for the implementation and over viewing the site practices related to the awareness of waste control. He shall authorise Assistant Site Green Manager (ASGM) to assist him to enforce the implementation on a day-to-day basis.

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## WASTE MANAGEMENT PLAN

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- 1.6.2 Environmental Officer shall oversee all environmental matters for the project and liaise with the Engineer during the full duration of the contract. He is responsible for ensuring that the Waste Management Plan is properly implemented.
- 1.6.2 The responsibility of ASGM, the Site Agent, is to ensure that the relevant personnel with respect to waste management are carrying out their duties diligently. Due to site activities that the works are proceeded in different locations, he shall assign Sub-Agents to assist him to enforce the waste controls.
- 1.6.3 Each Sub-Agent is responsible for the day-to-day overview of site practices in his assigned location in relation to waste controls. He shall assign a Project Environmental Co-ordinator to assist him in the day-to-day supervision on the Sub-Contractor's daily activities.
- 1.6.4 The Site Engineer as the Project Environmental Co-ordinator (PEC) is responsible for preparing, handling, updating and upkeeping the environmental documentation such as environmental submission, permit administration, test recording, water sample test result, trip tickets and etc. of which shall be readily available for inspection within short notice.
- 1.6.5 The Sub-contractors in different trades shall be responsible for ensuring that their workers are aware of the work activities which might affect the surrounding environment with waste controls. Under Contractor's instructions, the Sub-contractors shall provide waste controls with a full co-operative manner with Engineer Representative. The Sub-contractors are also responsible for preparing their own plans which are consistent with conditions of the contract.

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## WASTE MANAGEMENT PLAN

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### SECTION 2 – LEGISLATIVE REQUIREMENTS

The following legislation either covers or has some bearing upon the handling, treatment and disposal of wastes in the Hong Kong SAR and will also be considered in the Plan:

- (i) Waste Disposal Ordinance (Cap 354)
- (ii) Waste Disposal (Chemical Waste)(General) Regulation (Cap 354C)
- (iii) Land (Miscellaneous Provisions) Ordinance (Cap 28)
- (iv) Public Health and Municipal Services Ordinance (Cap 132) (includes mosquito control)
- (v) Environmental Impact Assessment Ordinance (Cap 499)
- (vi) Waste Disposal (Amendment) Ordinance 2013
- (vii) Waste Disposal (Designated Waste Disposal Facility)(Amendment) Regulation 2013
- (viii) Waste Disposal (Charges for Disposal of Construction Waste) Regulation

Other guideline documents that detail how the construction work should comply with the regulations include:

- (i) Environment (Ch. 9), Hong Kong Planning Standards and Guidelines (2008), Hong Kong Government
- (ii) Code of Practice on the Packing, Labelling and Storage of Chemical Wastes (1992), Environmental Protection Department
- (iii) WBTC No. 12/2000, Fill Management
- (iv) WBTC No. 6/2002 and 6/2002A, Enhanced Specification for Site Cleanliness and Tidiness
- (v) ETWB TCW No. 6/2010, Trip-ticket System for Disposal of Construction and Demolition Material
- (vi) ETWB TCW No. 15/2003, Waste Management on Construction Sites
- (vii) ETWB TCW No. 33/2002, Management of Construction and Demolition Material Including

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## WASTE MANAGEMENT PLAN

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- (viii) A Guide to the Registration of Chemical Waste Producers by EPD
- (ix) A Guide to the Chemical Waste Control Scheme by EPD
- (x) ETWB TCW No. 19/2005, Environmental Management on Construction Sites

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## WASTE MANAGEMENT PLAN

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### SECTION 3 – SITE SPECIFIC WASTE MANAGEMENT

#### 3.1 Waste Policy Principles (Waste Management Hierarchy)

Waste management options can be categorised in terms of preference from an environmental viewpoint, whereby the more preferable options have the least impacts and provide for enhanced sustainability. A Waste Management Hierarchy shall be applied on site as follows:

- (i) Avoidance and minimisation, i.e. not generating waste, achieved by changing or improving practices and design;
- (ii) Reuse/recovery/recycling of materials, thus avoiding disposal; and
- (iii) Treatment and disposal, in accordance with relevant laws, guidelines and good practice.

#### 3.2 Construction Waste Management

Waste material may include any excavation spoil, seawall rubble, sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land, storm drain, and sanitary sewer. Waste material also includes any waste matter or refuse to be deposited anywhere within the site or onto any adjoining land (e.g. Concrete waste or used formwork etc.). Formwork will be reused/recovered/recycled as far as possible before disposal to landfill.

When handling the waste material, the following measures shall be undertaken:

- (i) The strategy for management and disposal of all wastes arising from the project will be based on the principle of segregation and re-use/recover/recycle on site followed by disposal to landfill or designated outlet as appropriate;
- (ii) Disposal of other inert construction wastes is governed by the Environmental Protection Department policy on the disposal of construction waste. The principles established

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## WASTE MANAGEMENT PLAN

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maximise re-use/recovery/recycling of materials on site and segregation of Wastes to ensure that the minimum quantities are disposed of to landfill and that the maximum is directed for disposal to reclamation. All construction waste shall necessarily be sorted on site into inert and non-inert materials whenever practicable;

- (iii) Non-inert materials such as paper, cardboard, plastic waste, those wastes and metals shall be reused/recovered/recycled by waste collector company. Impossible reused/recovered/recycled non-inert materials such as wood shall be disposed of to landfill. Inert materials like soil, sand, rubble, shall be separated from non-inert material and suitably disposed of;
- (iv) In addition, quantities of site fencing, scaffolding and timber for the building work shall be reused/recovered/recycled where possible. Those materials that cannot be reused/recovered/recycled will require disposal at landfill;
- (v) All vehicles carrying waste shall have properly fitting Side and Tail Boards, and the materials being transported shall be securely covered;
- (vi) Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal site);
- (vii) Contractor shall make use of a trip ticket system for the disposal of Construction and Demolition (C&D) Materials to any designated public filling facility and/or landfill.

### 3.3 Excavated Material

Excavated material generated during the contract shall be disposed off site or backfill after appropriate treatment or transferred to the temporary storage areas where possible. It is recommended that the excavated topsoil shall be stored separately from fills and treated accordingly to avoid degradation. Other excavated materials shall be sorted immediately at source to avoid double handling as far as possible for inert C&D materials.

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## WASTE MANAGEMENT PLAN

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### 3.4 Municipal (Non-construction) Waste

The following principles shall be adopted for Municipal (Non Construction) Waste:

- (i) All works areas shall be cleaned of general litter and refuse daily.
- (ii) General refuse and litter shall be collected and stored in enclosed bins or compaction units separate from construction or chemical wastes before disposal off the site. A suitable waste collector shall be used to remove general waste and litter off site for disposal. The refuse will be disposed regularly off site, on frequency of daily or every second day basis to appropriate refuse collection points.
- (iii) Refuse shall not be burned at any Construction Area.
- (iv) Separately labelled bins shall be provided where practicable, to allow segregation of recyclable material generated by individual site staff (e.g. aluminium cans) such that recycling collectors could be assessed.
- (v) Segregation of recyclable material generated by individual site staff (e.g. aluminium cans) such that recycling collectors could be assisted.
- (vi) Office wastes shall be reduced through recycling of paper. If volumes are large enough to warrant collection, participation in a local collection scheme shall be considered, if available.
- (vii) Where connection to the existing foul sewer main is not possible Contractor will employ a licensed contractor to provide sufficient number of portable chemical toilets for handling of sewage from the construction workforce. The licensed contractor will be responsible for collecting the toilet sewage for regular disposal. An adequate number of chemical toilets will be provided in accordance with the number of staff on site.

Contractor will maintain disposal records for the general waste, which will be available for inspection by the Engineer at any time. The disposal records shall contain the basic information



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## WASTE MANAGEMENT PLAN

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such as; date, time, quantity, and location of dumping, name of vehicle, authorised signature, etc. The detailed information of disposed excavated materials shall be included in the latest revision of WMP.

### **3.5 Minimisation of C&D Materials Generation (Measures to Reduce/ Minimize Generation of C&D Materials)**

The generation of C&D materials should be avoided and minimised and this can be achieved through:-

- (i) Balance cut and fill
- (ii) Lean Construction
- (iii) Low waste technology
- (iv) Use of pre-casting and pre-fabrication standardises construction activities
- (v) Use of tailor-made building fixtures and fittings
- (vi) Minimise the amount of material and temporary works kept on site
- (vii) Use more durable material
- (viii) Increase flexibility in design
- (ix) Better site management as well as improved material storage and handling on site
- (x) Research and implement new building materials and technology

If C&D materials generation is unavoidable, reuse and recycle should be maximised. Sorting is a good means to facilitate material reuse and recycle. As far as site conditions permit, a dedicated area will be allocated for waste segregation.

### **3.6 Identification of Temporary Storage Areas**

In the contract commencement stage, Contractor shall identify and provide sufficient space for the temporary storage of C&D materials to facilitate collection and sorting on site. The provided space shall be commensurate with the estimated quantity for each type of C&D materials

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## WASTE MANAGEMENT PLAN

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generated. In order to optimise the storage space, except the recover/ reuse C&D materials, all other C&D materials shall be removed from site as far as practicable. For re-use existing seawall amour or existing RC culverts shall be placed in a temporary storage yard off-site/ on-site, and then resume to original position after site works.

### **3.7 Arrangement of Recyclable Materials**

Contractor shall sort out the recyclable materials from C&D materials during excavation and demolition. With reasonable care of all recyclable materials, Contractor shall arrange any licensed recycling vendors to collect the sorted materials for recycle.

### **3.8 Maximize Quantity of Waste Recycled and Recording**

Contractor shall maximize the quantity and proportion of C&D waste recycled such that at least 50% (by weight or by volume) that generated from construction activities to be recycled or directed from landfill by transference to public filling facilities for future re-use.

Quantity of C&D material that generated from construction activities shall be recorded using the monthly summary "Waste Flow Table" (WFT) (refer to Attachment A) and monthly EM&A report to the Engineer at monthly intervals.

Based on the work method statement, estimation on the total C&D material generation shall be made at the beginning of the project such that assessments shall be made against the actual C&D material generation during the course of work.

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### SECTION 4 – “CHIT” SYSTEM

#### 4.1 The “CHIT” System

Contractor as main contractor of construction work with value of \$1 million or above, will open a billing account solely for this project. This billing account shall be applied within 21 days after the contract is awarded.

Once the application is accepted, “CWCS” of EPD will issue CHITs for using the prescribed disposal facilities. Each CHIT is made up of three parts that Part A will be retained by Main Contractor, while Part B by Waste Hauler and Part C by Prescribed Facility.

#### 4.2 Disposal of C&D Materials

Contractor will complete Part A, B & C of CHIT for each delivery of wastes to the Prescribed Facility. The Waste Hauler will take Part B & C of CHIT to operator of Prescribed Facility when using the disposal service. On the completion of service, waste hauler will retain Part B of CHIT while Prescribed Facility operator will take Part C of CHIT away.

#### 4.3 Prescribed Facilities

There are four prescribed facilities rendering disposal service, e.g. landfills, sorting facilities, public fill reception facilities and outlying islands transfer facilities. Except the outlying islands transfer facilities, the other facilities will be able to receive the construction wastes from this project. Where should the wastes be disposed under the required condition is subjected to the table below:

**WASTE MANAGEMENT PLAN**

<b>Designated Waste Disposal Facility</b>	<b>Type of Construction Waste Accepted</b>	<b>Criteria to be adopted</b>
Landfills	Construction waste containing not more than 50% by weight of inert construction waste	For a load of construction waste delivered by a vehicle, the weight of the waste divided by the permitted gross vehicle weight of the vehicle must not be greater than 0.25 for goods vehicle with demountable skip and 0.2 for other types of vehicle.
Sorting Facilities	Construction waste containing more than 50% by weight of inert construction waste	For a load of construction waste delivered by a vehicle, the weight of the waste divided by the permitted gross vehicle weight of the vehicle must be greater than 0.25 for goods vehicle with demountable skip and 0.2 for other types of vehicle.
Public Fill Reception Facilities	Construction waste consisting entirely of inert construction waste	
Outlying Islands Transfer Facilities	Construction waste containing any percentage of inert construction waste	

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## WASTE MANAGEMENT PLAN

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### 4.4 Inert and Non-inert Waste

By Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Schedule 5), the definition of inert construction waste is any object that make-up with "Rock, rubble, boulder, earth, soil, concrete, asphalt, brick, tile, masonry or used bentonite" wholly or in mixture. Other objects not included in above, can be considered as non-inert construction waste as described in Section 3.2 (iii).

### 4.5 Alternative Disposal Grounds Proposed by Contractor and Approval Procedures

In order to make use of C&D materials generated by the Site, Contractor shall use his best endeavours to identify other construction projects where such materials can be used. Where Contractor has identified such a project which can be used as an alternative disposal ground, he shall obtain the written approval of the Engineer, who will process Contractor's request expeditiously. In support of the request for such approval Contractor shall provide relevant information including:

- (i) A detailed description of the alternative disposal ground, including location, lot number (where appropriate) and location plan;
- (ii) Where the alternative disposal ground is a private construction project, submit a letter from the Authorised Person of the development (as defined under the Buildings Ordinance) to confirm that:
  - (a) The C&D materials for use in the development is acceptable;
  - (b) The use of land so formed by the C&D materials is in conformity with the statutory town plan/ lease conditions;
  - (c) The Engineer's staff are allowed to enter the alternative ground to conduct inspections where necessary; and

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## WASTE MANAGEMENT PLAN

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- (d) 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 Disposal Delivery Form.
- (iii) Where the alternative disposal ground is a private land but not a construction site, submit a letter from the relevant authorities, such as the Lands Department and Planning Department, to confirm 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.
- (iv) Where the alternative disposal ground is a government construction project, 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.
- (v) A system for transmitting disposal records from the alternative disposal ground to the Engineer's Representative.
- (vi) Where the disposal ground is proposed by Contractor and has been approved by the Engineer. Contractor shall also maintain a daily record with details of each disposal trip from the Site to the disposal ground.

### 4.6 Implementation

Contractor shall prepare a site management plan for implementation of the CHIT system (CS):

#### Recording System and Transaction Records

Contractor shall maintain a comprehensive register of the CHIT issued, and make it available for inspection by Engineer's Representative upon requests whenever practicable. With due consideration to the overall surveillance efficiency, the transaction records can be viewed 24

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## WASTE MANAGEMENT PLAN

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hours after using disposal services at EPD's website

【<http://www.epd.gov.hk/epd/misc/cdm/scheme.htm#i>】 .

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## WASTE MANAGEMENT PLAN

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### SECTION 5 –MEASURES FOR GOOD SITE MANAGEMENT

#### 5.1 Training & Communication of this Plan

Contractor shall review relevant statutory regulations and waste management practice and identify training needs for different levels of staff as well as subcontractors. Relevant contractual requirements shall also be discussed during the training.

Contractor shall conduct orientation and specific training for workers about the concepts of waste management and appropriate waste control procedures including waste reduction, handling and sorting, reuse and recycling of C&D materials, as well as site cleanliness and housekeeping, by the Environmental Officer.

At regular intervals, Contractor shall provide tool-box training to all workers or labours at regular intervals to promote environmental awareness and to communicate updated issues regarding waste management practices. All Foremen and subcontractor's representatives shall obtain the information and technique through in-house training organised by Contractor's Environmental Department.

#### 5.2 Avoidance/ Minimisation to use Timber for Temporary Works

Reasonably practicable steps shall be planned for works so as to change or improve design and practices through liaison, planning and site management including but not limited to:

- (i) Standard wooden panels for high reuse level if timber formworks are unavoidable;
- (ii) Purchase materials in a manner that minimises waste and unnecessary costs with consideration such as matching size of materials purchased with the dimensions of structure to avoid excessive cut offs;
- (iii) Check consistency of drawings and specifications to avoid unnecessary hacking-off of



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## WASTE MANAGEMENT PLAN

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- concrete or unwanted work;
- (iv) Avoid use of 'sensitive material' such as use of hardwood for shuttering and strutting;
  - (v) Implement measures to minimise over-ordering and then wastage of materials such as concrete, mortars and cement grouts;
  - (vi) Maximise potentials reuse, namely durable, reusable hoarding to replace timber hoarding and use of metal in place of wood for formwork;
  - (vii) Minimise total quantities required, such as use of gondola in place of bamboo scaffold;
  - (viii) Whenever possible, consider alternative processes that reduce or preferably avoid entirely C&D waste generation.

### 5.3 Raw Material Storage to Avoid Unneeded Wastage

Apart from good intention to avoid and minimise the waste at the stages of design and work execution, however, in the process between two these stages the handling and treatment of raw material storage is another potential area able to reduce the wastage as well by way of site tidiness and cleanliness.

Contractor shall adopt the guidelines to properly handle the raw material storage with suitable protective measures on site as listed in below (Extracted from Ciria, 1997, Waste Minimisation in Construction: Site Guide):

## WASTE MANAGEMENT PLAN

Material	Store under cover	Store in secure area	Store in pallets	Store material bound	Special Requirements
Sand, gravel, rock, crushed concrete					Store on hard standing base to reduce wastage. Store in bays if large quantities
Plaster, cement	✓		✓		Avoid material getting damp
Concrete, paviers				✓	Store material in original packaging until used, and protect from vehicle movements
Bricks			✓	✓	Store material in original packaging until used, and protect from vehicle movements
Clay pipes, concrete pipes			✓	✓	Use stoppers and spacers to prevent rolling, and store in original packaging until used
Wood	✓	✓		✓	Protect all types of wood from rain
Metals	✓	✓			Store in original packaging until used
Any internal fittings	✓	✓			Store in original packing until used
Cladding	✓	✓			Wrap in polythene to prevent scratches
Sheet glass, glazing units		✓	✓		Protect glass from breakage due to bad handling or vehicle movements
Paints		✓			Protect from theft
Bituminous felts	✓	✓			Usually store in rolls and protect with polythene
Insulating material	✓	✓			Store under polythene
Ceramic tiles	✓	✓		✓	Store in original packaging until required
Glass fibre/GFRP	✓			✓	
Iron mongery	✓	✓			

## WASTE MANAGEMENT PLAN

Material	Store under cover	Store in secure area	Store in pallets	Store material bound	Special Requirements
Oils		✓			Store in bowsers, tanks or cans according to quantity - protect container from damage to reduce likelihood of spillage - use a bund
Kerbstones				✓	Protect from vehicle movements & tar spraying to reduce damage
Clay & slate tiles		✓	✓	✓	Keep in original packaging until use
Topsoil, subsoil					Store on hardstanding base to reduce wastage and keep segregated from potential contaminants
Precast concrete units					Store in original packaging, away from vehicular movements

### 5.4 Sorting On-Site

Waste sorting shall be implemented in the following manner:-

- (i) The site shall designate area(s) for temporary waste storage and subsequent segregation for ease of handling.
- (ii) The storage and sorting area(s) for waste and recyclable materials shall be clearly marked and labelled.
- (iii) The checking of C&D waste generation shall be incorporated into the daily inspection programme to ensure that they are not mixed into the general refuse area but are stored in a designated area for collection by subcontractors for recycling as appropriate.

### 5.5 Chemical Waste Control

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## WASTE MANAGEMENT PLAN

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Whenever possible alternative processes shall be considered that reduce or preferably avoid entirely chemical waste generation. Chemical waste shall be identified through following steps:-

- (i) Examine the MSDS (Material Safety Data Sheet) of the chemical(s) to be in the used process/activity,
- (ii) Check the MSDS against Schedule 1 of Waste Disposal Ordinance to determine whether the material(s) in question is/are chemical waste.

A Waste Producer License shall be applied for and the guidelines stated in the “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” shall be followed. Chemical waste storage containers shall be:-

- (i) Suitable for the intended purpose, corrosion resistant, well maintained and securely closed;
- (ii) Maintained with a capacity of < 450L unless received specific approval from Environmental Protection Department is given;
- (iii) Identified with a warning label as specified in Schedule 2 of the Waste Disposal Ordinance.

Chemical waste storage areas shall:-

- (i) Be clearly labelled and any waste properly stored, it must be only used for the storage of chemical waste and be enclosed on at least 3 sides. If the storage area is not within a building, top covering should be provided;
- (ii) Have an impermeable floor and bunking capacity of 110% of either the largest container to be stored or 20% by volume of the chemical waste in that area, whichever is the

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## WASTE MANAGEMENT PLAN

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greater;

- (iii) Have adequate ventilation away from water spillage and wood storing place;
- (iv) Be covered to prevent ingress of rainfall (water collected within the bunk, if checked containing chemical, must be disposed of as chemical waste);
- (v) Be arranged such as to separate incompatible materials;
- (vi) Be arranged not to connect to any surface water drains or foul sewers.

Disposal of chemical waste shall be regulated to involve,

- (i) Communication with Environmental Protection Department prior to waste generation; in case of Part A chemical waste under Section 17 of the Waste Disposal Ordinance, notification to Environmental Protection Department shall be made before at least 10 working days ;
- (ii) Use of a licensed waste collector;
- (iii) Disposal to a facility licensed to receive chemical wastes, such as the Chemical Waste Treatment Centre or other approved facility (which offers both collection service and supply of suitable storage containers);
- (iv) Reuse of chemical waste, under approval of Environmental Protection Department, such as the Business Environment Council of which operates a Waste Exchange Scheme to assist in locating receivers or buyers of chemical waste.

Any non-conformance identified by the Engineer, will follow an additional action reporting procedure if required by the Representative. In case of emergency such as chemical spill, the flowchart procedure is described in Chemical Spillage Handling Method (refer to Attachment B).

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## WASTE MANAGEMENT PLAN

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### 5.6 Site Cleaning and Tidying, Control of Mosquitoes

The Environmental Officer shall ensure that strict cleaning and tidying of the site is carried out on a daily basis. Standing water shall be cleared as soon as practicable, or be treated with approved oil at least once per week. The Environmental Officer shall ensure that the anti-mosquito measures are implemented on site. All the control measures are properly enforced including disposal of any surplus water holding containers, checking that no possible breeding areas for mosquitoes exist. The notice including "Cover any water tanks and remove any stagnant water containers, fill ends of bamboo scaffolding or fill them with holes, drain away accumulated water to rainwater drains after sedimentation" shall be prominently displayed on site and workers are briefed in toolbox talks on the importance of anti-mosquito measures. Effective mosquito control and removal of stagnant water shall be addressed during all Site Environmental Committee Meetings. Spraying of pesticide or larvicidal oil to kill adult mosquitoes and prevent breeding should only be employed as the last resort where removal of stagnant water would be impossible or the drainage cannot be done effectively.

### 5.7 Records and Updating of the WMP

The PEC shall ensure that proper and adequate records are maintained on site in relation to the requirements of this plan. This shall include records such as; delivery tickets, photographs, measurement records, cleaning checklists, truck visit records and etc. These shall be submitted to the Engineer every month.

- (i) Records associated with the Chit System.
- (ii) Quantities of different types of waste generated and their disposal method.

This Waste Management Plan will be reviewed on (as a minimum) a six-month basis for internal reference only and shall take into consideration any audit or other findings. The Project

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## WASTE MANAGEMENT PLAN

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Environmental Co-ordinator is responsible for ensuring that this review is carried out regularly. Any findings will be communicated to the site team in accordance with Training & Communication principles outlined.

### **5.8 Inspection Programme**

The Site Green Manager shall ensure that the ASGM/ Sub-Agents always monitor the generation and disposition of wastes throughout the construction period and the Sub-contractors always properly handle and dispose the wastes in conforming with this WMP. This shall be achieved by routine checking to ensure a satisfactory performance on compliance with this WMP.

### **5.9 Corrective Actions in Response to Non-conformance**

The efficiency of site practices to minimise construction waste associated impacts will be assessed and any deficiencies or areas requiring improvement will be reported to Contractor's Environmental Officer. Contractor's SHE Team will advise on additional waste minimisation and management procedures as necessary.

Any incidents of illegal dumping of construction wastes, emergency such as chemical spill or any major Non-conformance will be reported immediately to the Environmental Officer and Engineer. Further, where called upon, the SGM and Environmental Officer will advise on any required remedial works.

The PEC shall undertake regular site inspections to determine that the requirements of the WMP are met. The Project Environmental Management will also undertake regular six monthly site audits under their Environmental Site Audit programme. In the event that any non-compliance

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## WASTE MANAGEMENT PLAN

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of environmental management procedures is identified by any party, an Environmental Action Note (EAN) shall be completed by any observer and notify the SGM and Environmental Officer immediately.

On receipt of the EAN, the Assistant Site Green Manager shall review the observations and submit to the Site Green Manager who shall:

- (i) Investigate the cause of the non-conformance;
- (ii) Recommend the appropriate corrective action and/or preventative actions;
- (iii) Estimate the time needed to implement the measures; and
- (iv) Complete the EAN and file for record.

On completion of the corrective or preventative action the Environmental Officer shall complete the EAN and record all necessary details in the logbook for corrective and preventative action.



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**WASTE MANAGEMENT PLAN**

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**ATTACHMENT A**

**EXAMPLE OF MONTHLY SUMMARY**

**WASTE FLOW TABLE**

## WASTE MANAGEMENT PLAN

Waste Flow Table (WFT)

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

Month	% of recycling	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
		Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused In the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
		(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in 'tonnes)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in 'tonnes)
Jan												
Feb												
Mar												
Apr												
May												
June												
July												
Aug												
Sept												
Oct												
Nov												
Dec												
<b>Total</b>												

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**WASTE MANAGEMENT PLAN**

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**ATTACHMENT B**

**CHEMICAL SPILLAGE HANDLING METHOD**

# WASTE MANAGEMENT PLAN

