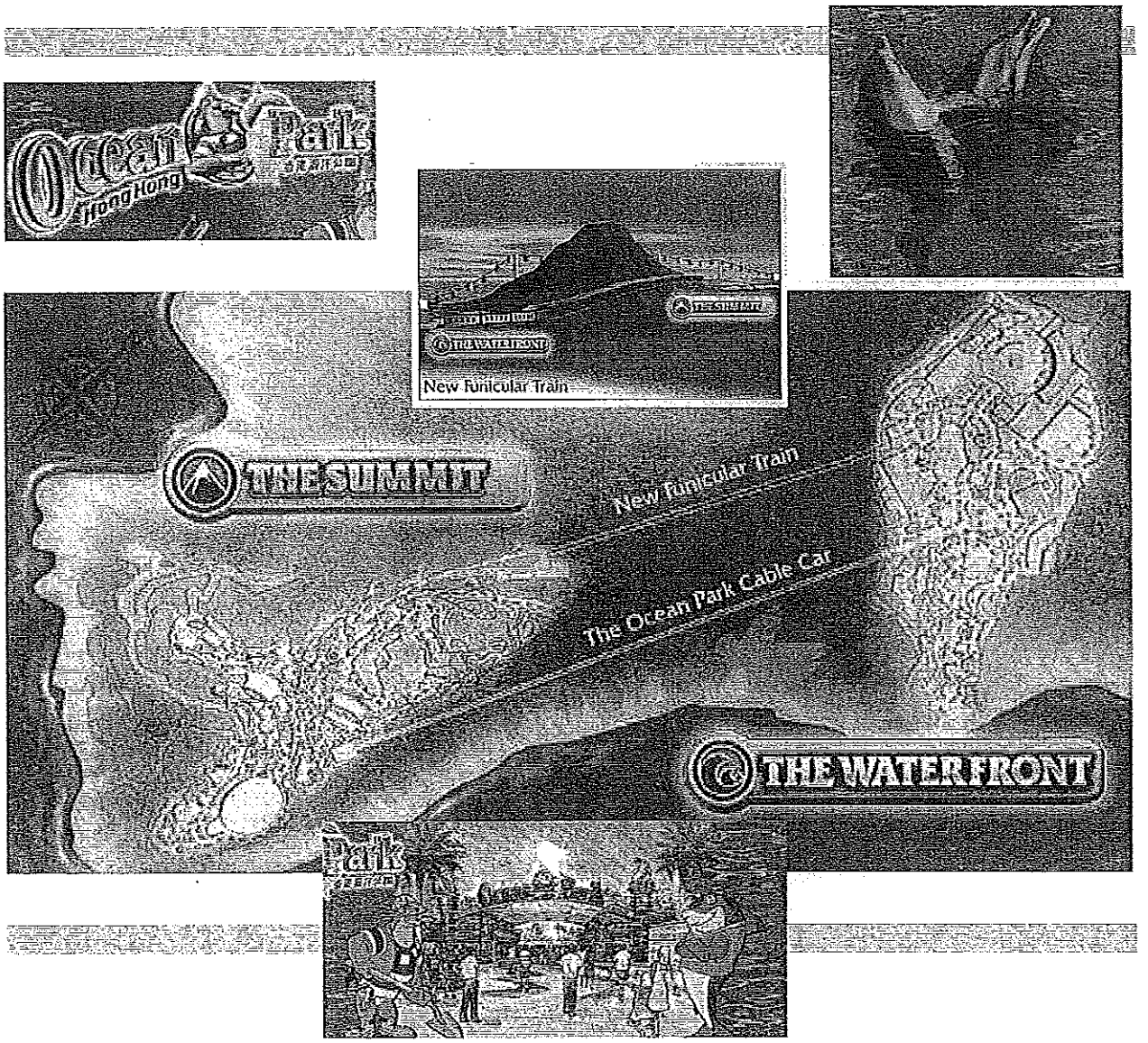
Dragages-Bouygues JV 賽喜–布依格聯營

Ocean Park Master Redevelopment Project
Contract No. CI05



PROJECT WASTE MANAGEMENT PLAN

Rev.	Date	Prepared	Reviewed	Approved	Comments
D	09 Aug 07	STa	YTS/PIp	DAL	DBJV Controlled Copy 03
C	15 Jun 07	STa	YTS/INg/JRi/PIp	DAL	
B	18 Apr 07	STa	YTS/INg/JRi/PIp	DAL	
A	16 Jan 07	STa	YTS/INg/JRi/PIp	DAL	

To be checked by the ICE	~~YES~~ / NO	OPE/DBJV/PROJ/QSE/0070 Rev D
		Doc. number

Ocean Park Master Redevelopment Project

Contract No. CI 05

EP-249/2006/A – Condition 2.21

Waste Management Plan (Rev. D)

Submitted by DBJV on 13-Aug-07

Certified by _____ **on** 14-Aug-07

Terence Kong

Project Environmental Team Leader

Verified by Independent Environmental Checker **on** 14-Aug -07

IEC Certificate attached in the submission? Yes

Submitted to Ocean Park on 24-Aug-07

Ocean Park Master Redevelopment Project

Environmental Permit No. EP-249/2006/A - Condition 2.21

Waste Management Plan (Revision D)

Submitted by Dragages-Bouygues JV on 13-08-2007

This is to verify that

Waste Management Plan (Revision D)

Submitted by Dragages-Bouygues JV

On 13-08-2007

Has been verified by the undersigned.

Signed

Dr Anne F Kerr
Independent Environmental Checker (IEC)
Retained by Ocean Park Corporation
pursuant to Environmental Permit No. EP-249/2006/A

Date 14 August 2007

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PD-DCC#: GOV/OPC-letter-000444

13 July 2007

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Aberdeen, Hong Kong
(Attn. Ms. Helen Leung, Project Manager (Infrastructure)

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Dear Ms. Leung,

Environmental Impact Assessment Ordinance (EIAO), Cap.499
Project Title: Repositioning and Long Term Operation Plan of Ocean Park
Environmental Permit No. : EP-249/2006/A

Permit Condition 2.21: Submission of Waste Management Plan

I refer to your letter (ref.: PD/PW/GOV/151/001489) dated 22.6.07 providing the revised Waste Management Plan (WMP) in response to our comments given on 18.5.07.

We note that your have responded to our comments raised on 18.5.07. In the revised WMP, we understand that you are still exploring potential disposal sites/other options to reuse the materials. Please be reminded to document the subsequent changes to the WMP including the information on exploring alternative options/disposal sites, e.g. exporting to Mainland China/Macau as mentioned in the approved EIA report (re: para. 6.17), with details of quantities and tentative programme once available.

Furthermore, we note that some minor textual rectifications/clarifications to the following parts of the WPM are required for ease of future reference:-

- Table 6.1 – You supplemented that the approximate disposal volume by barge is 4 barge loads (approx. 8,000 tonnes) per day and 150 truck trips per day before crusher and convey belts are in operation. Please clarify whether the disposal volume by barge would be increased when the crusher and conveyor belts are in operation? Please note that 8 barge loads with throughput reaching about 6,000 cum per day was assumed in the approved EIA report (re: paras. 6.22 and 6.23) to reflect the intention to transport the majority of the C&D materials by barge. You should also pay attention to the delivery

arrangement by barge as mentioned in para. 6.18 of the approved EIA report.

- Table 6.1 – The estimated quantity of excavated material to be disposed of at public fill reception facilities (i.e. 136,720 cum) does not tally with the figures stated in the Waste Flow Table in Appendix D (i.e. 100,000 cum + 136,720 cum + 5,000 cum + 2,500 cum = 244,220 cum). Please check the discrepancy.
- Figure 3.1 is missing.

The above comments are on technical details for reference/record rather than concern on the acceptability of the WMP. Grateful if you could take note of the above comments and revise the WMP accordingly and deposit four hard copies and one electronic copy of the finalized version. The finalized version of the WMP will be deposited in the EIAO Register Office available for public information.

Yours faithfully,

(Victor WT YEUNG)
Senior Environmental Protection Officer
for Director of Environmental Protection

Internal
S(RS)3 – f.i.
S(TC)4 – f.i.

Dragages-Bouygues JV 疏浚-布依格聯營	Ocean Park Master Redevelopment Project Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works	Submission Review Record

Contractor's Submission Reference No.	OPE-DBJV-PRPJ-QSE-0070 Rev. C ~ Project Waste Management Plan	For MCAL Use

Item No	Review By	Document / Drawing Reference	Reply Code	PMR's Comments	DBJV's Response	Action	Action Date	Closed Date
1	EPD	General		In the revised WMP, we understand that you are still exploring potential disposal sites/other options to reuse the materials. Please be reminded to document the subsequent changes to the WMP including the information on exploring alternative options/disposal sites, e.g. exporting to Mainland China/Macau as mentioned in the approved EIA report (re: para. 6.17), with details of quantities and tentative programme once available.	Noted. Information on exploring alternative disposal sites with details of quantities and tentative programme would be delivered to relevant parties when available.			
2	EPD	Table 6.1		You supplemented that the approximate disposal volume by barge is 4 barge loads (approx. 8,000 tonnes) per day and 150 truck trips per day before crusher and conveyor belts are in operation. Please clarify whether the disposal volume by barge would be increased when the crusher and conveyor belts are in operation? Please note that 8 barge loads with throughput reaching about 6,000 cum per day was assumed in the approved EIA report (re. paras. 6.22 and 6.23) to reflect the intention to transport the majority of the C&D materials by barge. You should also pay attention to the delivery arrangement by barge as mentioned in para. 6.18 of the approved EIA report.	Noted. The approx. barge load is 4 to 8 per day and the no. of trips by truck is approx. 150 per day before the crusher and conveyor belts are in operation. But the no. of truck trips will be reduced when the crusher and conveyor belts are in operation. The barge will transport the majority of excavated materials to the alternative sites for reuse. However if the excavated materials are to be delivered to the public fills reception facilities, the delivery arrangement as stated in para. 6.18 of the approved EIA report would be fully followed.			
3	EPD	Table 6.1		The estimated quantity of excavated material to be disposed of at public fill reception facilities (i.e. 136,720 cum) does not tally with the figures stated in the Waste Flow Table in Appendix D (i.e. 100,000 cum + 136,720 cum + 5,000 cum + 2,500 cum = 244,220 cum). Please check the discrepancy.	Noted. The estimated quantity of excavated materials to be disposed of at public fill reception facilities as stated in Table 6.1 and the Yearly Waste Flow Table in Appendix D have been checked and the updated tables are attached. It should be noted that this figure does not include the estimated quantity of artificial materials to be disposed of at the public fills.			

Reply Code: A- Comment must be incorporated into a resubmission. B - Comment to be noted and implemented but does not require resubmission. C – PMR preferred solution, to be incorporated if possible. D - For information only. E - New requirement to be incorporated - variation may be required.

Contractor's Submission Reference No.				OPE-DBJV-PRPJ-QSE-0070 Rev. C ~ Project Waste Management Plan		For MCAL Use		
Item No	Review By	Document / Drawing Reference	Reply Code	PMR's Comments	DBJV's Response	Action	Action Date	Closed Date
4	EPD	Figure 3.1		This figure is missing in the submission.	The missing figure will be included in the revision.			

Distribution

Controlled copies of this document are distributed to the holders noted below:

Copy Number	Document Holder	Soft / hard copy	Remarks
Original	Document Control	Master	
1	DBJV Project Director	Hard	
2	DBJV Project QSE Manager	Hard	
3	Project Manager's Representative	Hard	
-	DBJV Project Staff	Soft	Via server

Revision History

Revision	Revisions
A	First Issue
B	Second Issue, incorporate the comments in rev. A
C	Third Issue, incorporate EPD's comments
D	Fourth Issue, incorporate CEDD's comments thro' EPD

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1. INTRODUCTION

1.1 Requirement for Waste Management Plan

Permit Condition 2.21 of Environmental Permit (EP) No. EP-249/2006 and subsequent permits issued with respect to the Ocean Park Master Redevelopment Project requires that the Permit Holder shall submit a Waste Management Plan (WMP) no later than one month after commencement of construction of the Project. This condition was based on a recommendation in the Environmental Impact Assessment (EIA) prepared by Ocean Park Corporation's (OPC's) consultant at the preliminary design stage. This WMP has been prepared and submitted by Dragages Bouygues J.V. (*"the Contractor" or "DBJV"*) on behalf of the Permit Holder with specific reference to Redevelopment of Ocean Park Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works.

The referenced EIA was prepared by OPC with respect to the entire Master Redevelopment Project. Therefore, the objective of this 'contract specific' WMP is to set out procedures for the management of waste generated during the construction of Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works. The major construction areas in the Contract include:

- The hill between 600m from the top of Nam Long Shan Road and the existing cable car terminus (including adit portal & explosive magazine area);
- The conveyor belt system (including the crusher and the access road to Tai Shue Wan);
- The barging point at Tai Shue Wan; and
- The tunneling works for funicular system.

In the following of this WMP, all personnel charged with responsibilities for waste handling and disposal for Contract No. CI05 will be provided with the guidance and procedures necessary to ensure that environmental implications of waste disposal issues are appropriately and adequately addressed.

1.2 Project Background

Ocean Park (*"the Park"*) has been opened in 1977 and has over time developed into a major regional ocean/marine-based theme park serving mostly the Hong Kong and Asia markets. It has received more than 60 million visitors since its opening.

In the past five years, Ocean Park's annual attendance has ranged from approximately 2.8 to 3.7 million and the number of visitors will continue to grow in the coming years. The main reason is the Mainland Chinese tourist market becomes one of the important segment of visitors to Hong Kong and most of them will visit the Park during their stay.

Another reason is this large amount of tourists tends to visit Hong Kong in the three "Golden Weeks", i.e. the Chinese New Year, Labour Day and National Day. Taking the Chinese New Year as an example, both mainland visitors and local residents have been visited the Park in this period and the number of visitors will increase simultaneously. It has result in extreme peaking, which cannot be fully accommodated in the Park due to the current setting.

The highest number of visitors in the record of Ocean Park was 36,300 visitors per day and this capacity has been experienced above 14 days in year 2003/2004. It was far in excess of the Design Day of 15,000 per day in maximum.

In addition, there is insignificant physical connection between the three main areas of Ocean Park and relatively few marquee attractions to the visitors, which will not cope with the existing demand.

In conclusion, there is a clear need to upgrade and expand the existing Ocean Park to meet anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in the themed recreational and educational park experience.

1.3 Description of Contract CI05

Contract CI05 provides for the site formation, construction of funicular tunnel and miscellaneous works. Further details are presented below.

- Site formation at Summit - bulk excavation to the existing mountain to provide a new platform for additional attractions at the Summit. This should include stripping the vegetation. excavation of soft material, blasting and rock excavation for the Summit, disposal of rock/soil. formation of platforms to levels, formation of new slopes. design and construction of temporary overland conveyor systems and temporary barging point;
- Funicular tunnel linking the Waterfront aril the Summit - this should include tunneling in rock and soft material. cut and cover excavation, tunnel portals, tunnel ventilation and associated M&E works, at grace work, tunnel lining, and installation of utilities;
- Construction of Funicular Termini buildings' structure and associated M&E works;
- Fitting out of Funicular Termini buildings and platforms, power supply system. turnstiles and counting system, finishes, and miscellaneous works;
- Facilitating works to enable construction of works in later contracts. such as excavation for future construction of foundations. laying of utilities. track works arid facilitating works for the commissioning of the funicular system;
- Access road at waterfront - road works including slope formation and other geotechnical works to form the access road leading from ocean Park Road to the funicular system's terminus at the waterfront;
- Access road at Summit - slope formation at the rear of the new platforms, and other geotechnical and road works to form the access road leading from Nam Long Shan Road to the new Summit platform;
- Fresh and salt water service reservoirs at the Summit and associated waterworks facilities;
- Filling of the existing lagoon at the Waterfront area;
- Decommissioning of the existing fire services pump and associated pipeworks underneath the lagoon;
- Construction of new underground fire services pump and water tank underneath Go-kart track at Waterfront to replace the fire services system function of the existing lagoon;
- Tree Felling, transplanting and compensatory planting;
- Demolition of existing buildings. foundations, structures, pavements, pools, channels, site appurtenances, site furnishings, etc. including, but not limited to, Waterworld facilities, Dinosaur Discovery Trail. Goldfish Pagoda and Butterfly House;

- Site formation for New Bird House at Waterfront;
- Project Office at the Waterfront and Accommodation for the Project Manager at Nam Long Shan Road;
- Erection of Hoardings;
- Government entrusted sewerage works along Nam Long Shan Road and Wong Chuk Hang Road (Option);
- Coordination with other Contractors, utility companies, Ocean Park operation departments. etc;
- Environmental monitoring and mitigation measures;
- Design and build a facility to house mock-ups and samples;
- Diversion of existing utilities as required to maintain daily operating functions of Ocean Park;
- Establish temporary locations for electrical equipment, CCTV system. PA and messaging system before demolition of entrance facilities; and
- Other works or requirements which are shown on the Drawings or specified in the Specification or which are required by the General Conditions of Contract.

1.4 Objectives of the Waste Management Plan

This WMP provides details of the measures and procedures considered necessary to control and manage the storage, transportation and disposal of all wastes generated during the construction of Contract CI05.

The main objectives of the WMP include to:

- make reference to statutory waste management requirements and obligations;
- clarify duties, authorities and responsibilities within the Project Team and the Contractor's Environmental Team;
- set out waste flow table and handling procedures;
- set out waste transportation and disposal procedures; and
- set out auditing and other checking requirements.

Although all inert excavated material from the Summit and tunnel excavation works will be reused in other construction sites and is not considered as waste, the control and management of the storage, transportation and disposal of such material is still detailed in this plan for ease of reference.

1.5 Structure of the Waste Management Plan

Following this introductory section, the WMP is set out as follows:

- Section 2 – set out the project specific waste management policy of management's approach, commitment and targets/measures;
- Section 3 – provides details on the structure of the contractor production and environmental teams structure and responsibilities with respect to the generation of construction waste;
- Section 4 – sets out the legislative framework in Hong Kong for the control of wastes;

- Section 5 – provides details of the requirements and procedures for the management of generated construction waste;
- Section 6 – sets the procedures of Construction and Demolition (C&D) wastes handling;
- Section 7 – presents the outlines of the Spoil/Crushed Rock Disposal Management;
- Section 8 – shows the details of requirements for handling chemical waste;
- Section 9 – provided the method of general refuse handling;
- Section 10 – provides details of audit/checking procedures to ensure compliance with prescribed waste management practices;
- Section 11 – conclusion and other recommended mitigation measures, if any;
- Appendix A – Project Site Layout Plan; and
- Appendix B – Standard C&D Material Disposal Delivery Form.
- Appendix C – Summary table for work processes or activities requiring timber for temporary works
- Appendix D – Waste Flow Chart and Yearly Waste Flow Table

2. POLICY

2.1 Policy

We, **Dragages - Bouygues JV** (hereafter referred to as the Company) – Project Team of Ocean Park Corporation Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works (hereafter referred to as the Project) is fully aware of our duties and responsibilities towards the minimization of environmental impact, which may due to our construction activities.

It is our intention to maintain highest possible standard of environmental protection on all our construction sites. In fulfilling this objective and responsibility, management has a duty to provide all possible mitigation measures to reduce the impacts to a reasonably practicable level.

- avoiding or minimizing the waste generation through optimising the design approach in the project planning;
- minimizing the waste generation through optimising the construction method or sequence in the construction stage;
- adopting better management practices on site to reduce cross contamination and promote waste segregation;
- reusing or recycling waste materials in other construction activities where possible;
- diverting waste to other construction sites or to public dumps for beneficial use if applicable;
- installing appropriate facilities for segregation of various typed of wastes; and
- arranging and facilitating collection of wastes by the appropriate waste recyclers as far as possible.

Daniel Altier
Project Manager

Date of Issue: 16 January 2007

2.2 Objectives and Targets

The objectives and targets of the project on the waste management are summarized in Table 2.1.

Table 2.1 Objectives and Targets

Objective	Target
• Avoid disposal to public fill	• At least 50% C&D waste disposal to an alternative site.
• Minimize use of water	• Re-use process water as far as possible.

3. ENVIRONMENTAL TEAM STRUCTURE

3.1 Organisation Frame

A team has been set up to manage and control environmental issues for the construction phase of Contract CI05. The overall responsibilities and duties of this team have been provided in the Project QSE Plan and Organisation Chart. The general organisation and lines of communication with respect to environmental works are shown in Figure 3.1.

3.2 Responsibilities and Duties

DBJV team is fully responsible for the compliance with and satisfaction in the implementation of the WMP as shown in Table 3.1.

Table 3.1 Organisation for Waste Management

Position	Reporting to	Duties
Project Manager Representative (PMR)	OPC (Client)	Monitor DBJV's environmental compliance with the contract specifications and statutory requirements. Conducting the inspection and approved the waste management measures. Provision of instruction to DBJV to follow the agreed protocols in the event of waste related incidents and complaints.
Contractor Project Director (C-PD)	JV Board	Overall control of the contract and oversee implementation of the WMP. He is responsible to ensure that adequate resources are provided to enable the environmental mitigation measures to be properly implemented.
Project QSE Manager	C-PM	Develop technical requirements of the WMP, including training. He is also acting the trainer to provide the training on waste management to managerial levels. (EIA ref. S6.31 & EM&A ref. S5.4)
Contractor Environmental Team Leader (C-ETL)	Project QSE Manager	Review and authorize the proper development and implementation of the WMP in accordance with the contract, EP and statutory conditions. Provision of training to the Project Production Engineers and the frontline supervisors and workers. (EIA ref. S6.31 & EM&A ref. S5.4) The C-ETL will undertake weekly inspections to assess the compliance.

Table 3.1 Organisation for Waste Management

Position	Reporting to	Duties
Independent Environmental Checker (IEC)	PMR	Responsible for reviewing and auditing all waste management aspects. Conducting the monthly and ad-hoc waste audits to verify the satisfactory implementation of the waste management measures. Assisting PMR on complaint investigation and recommending and/to instructing mitigation measures as appropriate.
Project Construction Manager	Project QSE Manager	Programming and implementation of site based activities and sub-contractors to ensure the compliance with and maintenance of WMP conditions.
Project Production Engineer	C-PM	Development of engineering details to ensure compliance with and maintenance of WMP conditions.
Site Environmental Representatives [SEngr] (e.g. Site Agents)	C-ETL	Implementation and supervision of site based activities to ensure compliance with and maintenance of WMP conditions. For example, day-to-day based inspection.
Contracts Manager	C-PM	Responsible to ensure that relevant clauses covering the environmental performance of contracts and sub-contractors (including waste generating activities) are included in all sub-contractors performance requirements including disposal waste are carried out in accordance with the procedures set by DBJV.
Sub-contractors	SEngr	Implementation the measures set out in the WMP and followed all environmental related instructions given by the management staff of DBJV. Reporting any non-compliance of the waste management measures and conducting the rectifying actions as required in a timely and efficient manner.

4. FRAMEWORK FOR CONTROL OF WASTES IN HONG KONG

The legislation relates to the handling, treatment and disposal of wastes in Hong Kong, and shall be observed with regard to all wastes generated and requiring disposal due to the construction of Contract CI05, where applicable, have been provided in Project QSE Plan.

The requirements, which extracted in related legislation, are summarized in Table 4.1.

Table 4.1 Summary of Waste Disposal Requirements

Legislation	Relevant Regulation(s) / Requirement(s)	Project Aspects
Land (Miscellaneous Provisions) Ordinance (Cap 28);	Records of particulars of dumping license shall be maintained by waste haulers relating to public filling matters	Inert C&D materials
Public Health and Municipal Services Ordinance (Cap 132)	Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws – It provides prevention, control and collection of litter or waste, including the liability of the owner or occupier of any premises, or the driver, registered owner or hirer of any motor vehicle, in relation to such prevention, control and collection.	Waste transportation; Domestic refuse
Waste Disposal Ordinance (Cap 354)	It is prohibited to dump waste in public places or on Government Land, or on private premises without the consent of the owner or occupier. Waste Disposal (Chemical Waste) General Regulation – Anyone who produces chemical waste or causes it to be produced has to register as a chemical waste producer. The waste must be packaged, labelled and stored properly before disposal. Only a licensed collector can transport the waste to a licensed chemical waste disposal site for disposal. Chemical waste producer also need to keep records of their chemical waste disposal for inspection by PMR, IEC and EPD staff.	Non-inert C&D materials Chemical waste Oil-containing wheel wash waste Asbestos waste and other special waste (if identified) Construction Waste Charging Scheme
Dumping at Sea Ordinance (Cap 466)	Anyone involved in marine dumping and related loading operations, requires a permit from related Government Authority. All dumping vessels have to be equipped with an automatic self-monitoring system, which records their position and loading and dumping operations.	Contaminated excavated materials, if applicable.

The Contractor shall be responsible for obtaining all necessary permits and licences under these ordinances including, but not limited to:

- Chemical waste permits/licences under the Waste Disposal Ordinance (Cap 354);
- Dumping Licence under Land (Miscellaneous Provisions) Ordinance (Cap 28); and
- Marine dumping permit under the Dumping at Sea Ordinance (Cap 466) (if necessary).

The following non-statutory documents and guidelines also relate to waste management and disposal in Hong Kong and are considered of relevance to CI05, but not limited to:

- *Waste Reduction Framework Plan, 1998 to 2007,* Planning, Environment and Lands Bureau, Government Secretariat, 05 November 1998;
- *2001 Review of the Waste Reduction Framework Plan,* Waste Reduction Committee;
- *Site Practice for Waste Reduction in Construction Industry (2001),* Environmental Protection Department;
- *Environmental Guidelines for Planning in Hong Kong (1990),* Hong Kong Planning and Standards Guidelines, Hong Kong Government;
- *New Disposal Arrangements for Construction Waste (1992),* Environmental Protection Department & Civil Engineering Department;
- *A Guide to the Registration of Chemical Waste Producers (2001),* Environmental Protection Department;
- *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992),* Environmental Protection Department;
- *A Guide to the Control on Import and Export of Waste (1999),* Environmental Protection Department;
- *Works Bureau Technical Circular No. 2/93, Public Dumps,* Works Bureau;
- *Works Bureau Technical Circular No. 2/93B, Public Filling Facilities,* Works Bureau;
- *Works Bureau Technical Circular No. 16/96, Wet Soil in Public Dumps,* Works Bureau;
- *Works Bureau Technical Circular No. 25/99, 25/99A and 25/99C, Incorporation of Information on Construction and Demolition Material Management in Public Works Sub-committee Papers,* Works Bureau;
- *Works Bureau Technical Circular No. 12/00, Fill Management,* Works Bureau;
- *Works Bureau Technical Circular No. 19/01, Metallic Site Hoardings and Signboards,* Works Bureau;
- *Works Bureau Technical Circular No. 6/02 and 6/02A, Enhancement Specification for Site Cleanliness and Tidiness,* Works Bureau;
- *Works Bureau Technical Circular No. 21/2002, Trip-ticket System for Disposal of Construction and Demolition Material,* Works Bureau;
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 33/2002, Management of Construction and Demolition Material including Rock,* Environment, Transport and Works Bureau;
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 15/2003, Waste Management on Construction Sites*, Environment, Transport and Works Bureau.
- *Environment, Transport and Works Bureau Technical Circular (Works) No. 19/2005, Environmental Management on Construction Sites,* Environment, Transport and Works Bureau.

5. WASTE MANAGEMENT PROTOCOLS

5.1 Introduction

The purpose of this section is to set out protocols necessary to ensure that all wastes generated during the construction of Contract CI05 are managed on-site, transported and disposed of in a manner that is both environmentally acceptable and in full compliance with statutory and contractual requirements. As stipulated in Condition 2.21(c) of EP-249/2006 and its subsequent permits, specific measures covered by the WDO have not been included in details (although pertinent references have already been provided in Section 3).

5.2 Waste Disposal Sites

The Contractor shall confirm with the Waste Disposal Authority (EPD & CEDD) that different waste types will generally be disposed of in accordance with Table 5.1a. Inert excavated materials will be disposed of in accordance with Table 5.1b.

Table 5.1a Disposal Sites for Different Waste Types

Waste Type	Typical Disposal Site	Control/Mitigation	Anticipated Disposal Site
Steel (including steel mesh, reinforcement bars, window frames, railing, banisters etc.)	Licensed steel mills in Hong Kong or Overseas steel mills.	Segregation and storage at the designated areas on site.	Local steel recycle mills
Inert demolition material (reinforced concrete, asphaltic concrete, dirt/soil, bricks, masonry, mortar, plastic, ceramic tiles etc) that comply with the requirements of the Public Dumping Licence	Construction sites (e.g. other as approved by the Contractor and PMR) that require fill material; Public filling areas; Public filling barging points; and Public sorting facility.	The truck will cover well with mechanical cover or equivalent before leaving the site for disposal.	• Tseung Kwan O Area 137 public sorting facilities • Tuen Mun Area 38 public sorting facilities
Demolition waste (plastics, glass, wood, bamboo scaffolding etc) that consists of less than 20% (by volume) of inert material	Strategic landfill sites operated by EPD	The truck will cover well with mechanical cover or equivalent before leaving the site for disposal.	South East New Territories Landfill (SENT)
Chemical waste as defined under *Schedule 1 of the Waste Disposal (Chemical Waste) Regulations*	Chemical waste treatment facility at Tsing Yi Other facilities approved by EPD	A designated chemical and chemical waste store will be placed on site to keep the chemicals and their wastes.	Enviropac would be employed as the waste collector and disposer
General refuse	Strategic landfill operated by EPD; or Refuse transfer stations	A waste collector / hauler has employed to collect the refuse in regular basis (average two to three days).	South East New Territories Landfill (SENT)
Sewage	Disposal site depends on the nature of sewage and will be determined by relevant Government Department, usually the treated sewage will be collect to public sewer; or Disposal by licensed waste collector	A licensed waste collector has employed to collect the sewage in a regular basis.	The waste will be stored in a self-contained area and a licensed waste collector (Sanki) was employed to collect the waste especially from portable chemical toilets in a regular basis.

Notes: 1. *The recommended waste management mitigation measures as stated in Project Specific EMIS (ref OPE/DBJV/PROJ/QSE/0071 Rev. B) would be fully implemented.*

2. *The recommended waste management mitigation measures as stated in Section D of Appendix B of the Project EM&A Manual would be followed.*

3. *The recommended pollution control/waste reduction measures on waste management in the approved EIA report, including enclosures and water sprays would be followed. (ref. Condition 2.21(c) of EP-249/2006/A)*

Table 5.1b Disposal Sites for Inert Excavated Materials

Waste Type	Typical Disposal Site	Control/Mitigation	Anticipated Disposal Site
Inert excavated materials *	Reuse on site or other projects as approved by the Contractor and PMR; Reuse in landscaping works; Public Fill	The excavated materials are loaded onto the dump trucks directly from the blasting locations. Dump trucks will deliver the excavated materials through a hard paved haul road to the crushing plant. The haul road will be water sprayed by water trucks regularly (approx. once per two hours). Then the excavated materials will go into the crusher for crushing. At the crusher loading point, water sprays are applied and fabric filters have installed for crusher. After the excavated materials have been broken down to less than 300mm in size, they will be dropped to the totally enclosed conveyors and delivered to the stockpile. At the outlet of conveyors, rubber curtain with water sprays are installed and will be in operation during the operation of crusher. Hence, the crushed excavated materials will be transported to the barging point through the totally enclosed conveyors with water sprays. The barging point is supported by profiled steel cladding at two sides and to be placed in a totally enclosed structure incorporating an enclosed chute for material transfer to the barge. Flexible curtain will be hanged on the enclosed chute to avoid dust emission when crushed excavated materials/rocks transported into the barge.	• Alternative construction sites as disposal sites (approval should be granted from PMR and would be updated in the monthly EM&A reports)

*Notes: 1. * denotes reference is made to Section 7.25 to 7.26 of Project EM&A Manual.*

5.3 Waste Management Protocols

All wastes generated through the construction phase of Contract CI05 shall be managed in accordance with the protocols set out in the following tables. Details of the waste reduction measures on waste management are presented in Appendices A and E.

Table 5.2 General Waste Management

Item	Requirement		Control/Mitigation	Responsibility
	Activity	Frequency		
1	All staff involved in the day to day handling and management of waste shall, as a minimum, be instructed in the requirements as set out in this WMP mainly the domestic waste and the importance of waste segregation and minimization	Prior to commencement and as new staff are appointed	Waste segregation on site (the arrangement and location of storage, collection and treatment, please refer to the drawings in Appendix A).	Production Engineer to implement; CET and PMR to check; IEC to provide advice on any particular requirements
2	All works areas shall be cleaned of general litter and refuse	Daily	Provision of rubbish bins on site.	Site Engineer / General Foremen to implement; CET and PMR to check; IEC to audit
3	General refuse and litter should be stored in enclosed bins or compaction units separate from construction or chemical wastes. A reputable waste collector should be used to remove general waste and litter off site for disposal	Daily, or every other day.	The waste collector (Hung Chat) will collect the refuse in regular basis (average two to three days).	Site Engineer / General Foremen to implement; CET and PMR to check; IEC to audit
4	Refuse should not be burned at any construction site	At all times	Training is given to all level of staff, workers to let them aware the requirement.	Site Engineer / General Foremen to implement; CET and PMR to check; IEC to audit
5	General refuse will be generated by food service activities on site, so reusable rather than disposable dishware should be used, if feasible	Throughout the construction phase	The food service provider will collect the food wares for treatment by themselves.	Site Engineer / General Foremen to implement as appropriate following confirmation of on-site canteen facilities, if any.
6	Separately labeled bins should be provided, where practical, to allow segregation of recyclable materials generated by individual site staff (e.g. aluminum cans) such that recycling collectors could be assisted	Throughout the construction phase	Three-color recyclable bins have provided on site.	Site Engineer / General Foremen to implement; CET and PMR to check; IEC to audit

Table 5.2 General Waste Management

Item	Requirement		Control/Mitigation	Responsibility
	Activity	**Frequency**		
7	Office wastes should be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered.	Throughout the construction phase	A local recycler is deployed to collect the paper waste of offices.	Project QSE Manager to implement if paper volumes are large enough to warrant collection and a local collection scheme is available
8	The Contractor shall aim to minimize waste generation through the following hierarchy: Avoidance and minimization (not generating waste through changing or improving practices and design) Reuse of materials, thus avoiding disposal (generally with only limited processing) Recovery and recycling, thus avoiding disposal (although reprocessing may be required) Treatment and disposal according to relevant regulations, guidelines and good practice	Throughout the construction phase	1. Minimize the waste generation by changing design; 2. Reuse or recycle the materials as much as possible; and 3. Disposal in according to relevant regulations.	Site Engineer / General Foremen to implement

Notes: 1. The recommended waste management mitigation measures as stated in Project Specific EMIS (ref OPE/DBJV/PROJ/QSE/0071 Rev. B) would be fully implemented.

2. The recommended waste management mitigation measures as stated in Section D of Appendix B of the Project EM&A Manual would be followed.

Table 5.3a Storage, Collection, Reuse and Transport of Waste

Item	Requirement		Responsibility
	Activity	Frequency	
1	All stockpiled spoil > 50 m^3 should be covered with tarpaulin or other appropriate fabric to prevent runoff during rainstorms, or dust during dry and windy periods	In advance of predicted rainstorms or particularly windy periods	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
2	All vehicles transporting wastes, especially C&D waste should been fitted with covered box type dump bed or securely covered by tarpaulin	All vehicles transporting waste	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
3	Only waste haulers licensed for specific waste categories should be retained	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
4	All wastes should be stored in a manner ensuring that they are held securely without loss or leakage	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
5	All wastes should be removed from site in a timely manner	At the earliest opportunity and in accordance with the Client requirements	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
6	All waste storage areas should be cleaned and maintained regularly	Weekly	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
7	All necessary disposal permits should be obtained from the appropriate authorities for each waste category	Prior to commencement of disposal	Production Engineer to implement, CET and PMR to check and IEC to audit
8	All wastes should only be disposed of to appropriate licensed sites	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
9	The Contractor's Production Engineers should keep records of quantities of chemical wastes generated, recycled and disposed and agree the location of these records with the Engineer	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
10	The handling and disposal of bentonite slurries should follow the *Practice Note for Professional Persons, Construction Site Drainage* (ProPECC PN 1/94)	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit
11	The following properties of wastes should be noted; Waste for landfill disposal should not contain > 20% (by volume) inert material Waste for public dump/filling areas must be 100% inert	Throughout the construction phase	Site Engineer / General Foremen to observe

Notes: The arrangement and location for storage, collection, treatment and disposal of C&D materials are referred to Condition 2.21(d) of EP-249/2006/A.

Table 5.3b Storage, Collection, Reuse and Transport of Inert Excavated Materials

Item	Requirement		Responsibility
	Activity	Frequency	
1	The priority for off site disposal of excavated inert materials should be in accordance with the following hierarchy: • Transport to other construction contracts to satisfy fill requirements elsewhere • Transport to other land formation sites for reuse • Transport to public filling areas *Notes: If fill materials are transported to private lands, the agreement with the relevant third party and authority should be sought*	Throughout the construction phase	Site Engineer / General Foremen to implement

Notes: The arrangement and location for storage, collection, treatment and disposal of C&D materials are referred to Condition 2.21(d) of EP-249/2006/A.

Table 5.4 Management of Chemical Waste

Item	Requirement		Responsibility
	Activity	Frequency	
1	Where practical, processes shall be identified that pre-empt the production of chemical waste	Throughout the construction phase	Site Engineer / General Foremen to implement
2	Chemical waste (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*	Throughout the construction phase	Site Engineer / General Foremen to implement, CET and PMR to check and IEC to audit

6. CONSTRUCTION AND DEMOLITION (C&D) WASTES

C&D wastes generated in the project area include concrete slab, cement grouts, timber, steel formwork or plastic facing, rubble and steel/metal, scrap, excavated spoil, wrappers, etc. The estimated volume of C&D waste for the whole construction period is presented in Table 6.1 (refer to Condition 2.21(e) in EP-249/2006/A). It should be noted that the quantity stated in Table 6.1 is an estimated figure for the whole construction period, however the updated quantity of the waste generation will be reported in the monthly or quarterly EM&A report as appropriate.

6.1 Construction Waste

- Careful design, planning and good site management shall be maintained to minimise over-ordering and waste of materials such as concrete and cement grouts.
- The formwork will be designed to maximise the use of standard timber faced panels so that high reuse levels can be achieved. No tropical hardwoods will be used in the works or otherwise on-Site. Alternatives such as steel formwork or plastic facing will be considered.
- General construction waste shall be separated into reusable items and materials to be disposed of or recycled. This work will be carried out by the general workforce under the supervision of the foremen and charge hands. It will be conducted at the working area immediately to avoid loss or leakage during handling. For example formwork and timber would be cleaned for reuse, off-cuts of reinforcement will be sorted into usable lengths and short off cuts stacked for scrap metal. Where it is no longer reusable, steel and metal items will be sent as scrap for recycling. Appendix C gives the summary table for work processes or activities requiring timber for temporary works.
- Segregated materials shall be temporarily stored at designated areas for reuse on site. Steel will be stored at the reinforcement yards, timber at the formwork yard and rubble in a stockpile (either covered or sprayed to control dust).
- Control of drill and blast activities and optimise the blast pattern in order to reduce the overbreak.
- Any residual materials (Such as containers, wrappers or general waste material, etc) shall be collected and placed in skips. These will be transported to the appropriate tips/dumps by licensed waste hauliers (where appropriate).
- Non-inert construction waste would be disposed in strategic landfills.

6.2 Demolition Waste

- Demolition waste will be generated by the existing roads and structures. The General Foremen will be responsible for the monitoring and management of the demolition waste. All demolition waste will be disposed offsite.
- Useful materials such as steel pipes, reinforcement shall be collected for recycling as scrap metal. Concrete and rubbles shall be segregated for reuse as backfill or for hard standings and site haul roads. This work will be carried out by the general workforce under the supervision of foremen and charge hands. It will conducted at the demolition area immediately to avoid loss or leakage during handling.
- Inert demolition waste such as concrete slab shall be dumped as public fill. Whilst, non-inert demolition waste shall be disposed in landfill.

Table 6.1 Estimated Waste Generation Pattern

Works Area	Processes/Activities	Generation Period	Estimated Waste Quantities					
			Surplus Inert C&D Materials		C&D waste (construction debris, general refuses and others [in m^3])	Chemical waste (in L)	Recyclables	
			Broken concrete (in m^3)	Excavated * Materials (in m^3)			Paper (in m^3)	Metals (in m^3)
Waterfront	Site clearance	Feb 07 – Apr 07	4,500	500	-	-	-	80
	Demolition	Feb 07 – Jul 07	30,000	-	2,500	-	-	100
	Pond filling and enhancement	Apr 07 – Jun 07	-	500	-	-	-	-
	Waterfront Terminus	Apr 07 – Jun 08	-	-	-	-	-	-
Summit	Site Office Installation and operation	Mar 07 – Dec 08	-	-	1,000	-	2,400	-
	Explosive magazine	Apr 07 – Jun 07	-	-	-	-	-	-
	Temporary conveyor system	Mar 07 – Jul 07	-	-	500	-	-	-
	Summit Excavation	Mar 07 – Aug 08	-	-	-	5,000	-	-
	Summit Terminus	Jun 07 – Apr 08	-	-	-	-	-	-
	Reservoir	May 08 – Dec 08	250	-	-	-	-	10
	Pumping station	Oct 07 – Jun 08	-	-	-	-	-	-
Tunnel	Adit portal and tunnel formation	Mar 07 – Jan 08	250	-	500	-	-	-
	Tunnel excavation	May 07 – Jan 08	-	-	-	5,000	-	-
Government Entrust Works	Wong Chuk Hang Road	May 07 – Oct 08	-	-	200	-	-	-
	Nam Long Shan Road	May 07 – Aug 08	-	-	200	-	-	-
Predicted Total Quantity			**35,000**	**1,000**	**4,900**	**10,000**	**2,400**	**190**
Waste Management Strategy			Reused as backfills, surplus to dispose		Land disposal	Collection and treatment	To recycle	
Mode and Route of Disposal			Mainly by road transport on truck	Mainly by road transport on truck	Road transport by truck	Road transport by licensed trucks	Road transport by truck	
Disposal Site, where applicable			TKO137, QBBP	TKO137, QBBP	SENT	CWTC at Tsing Yi	-	-

Notes: * A further 748,538m^3 of inert excavated material to be used will be produced by the summit and tunnel excavation works. Approx. 5,500m^3 to be reused for pond filling; the rest will be delivered to other construction sites mainly by barge (approx. 4 to 8 barge loads per day). Besides, the no. of trips by truck is approx. 150 per day before crusher and conveyor are in operation and the no. of trips by truck will be reduced when the crusher and conveyor belts are in operation.

7. SPOIL/CRUSHED ROCK DISPOSAL

7.1 C&D materials/waste Disposal Management System

The C&D materials/waste Disposal Management System will describe the procedures for controlling the disposal of spoil and crushed rock generated at the site. The System applies to the management of inert construction and demolition (C&D) waste destined for disposal at public fill areas as well as the alternative construction sites (either public or private). It will include:

- procedures for obtaining the necessary disposal licences;
- trip ticket system to records the location of the disposal site; and
- procedure for preparing the records of quantities of disposed soil as required by OPC.

7.2 Disposal of Blasted Materials from Drill and Blast Operation

Materials excavated during the drill and blast operation will generally fall into one of the following categories:

- rock;
- completely decomposed volcanic tuff (CDV); and
- a mixture of the two.

Due to the inherent nature of the contract at the time of writing, it has not been possible to develop the design to a point where final excavated materials management can be confirmed. Therefore, there are several options on handling and disposal of excavated materials. Each option will comply with requirements and is described below in outline:

- The excavated materials could be stored at a designated temporary point/area and disposed of during the period of 0700 to 1900 hours on normal working days;
- If materials are excavated during general holidays, we will manage it in two ways:

  (i) the excavated materials will be disposed to the designated dumpsite with confirmation from CEDD. A Construction Noise Permit (CNP) would be applied from EPD to cover the disposal activity; or

  (ii) the excavated materials will be temporarily stored on Site with the application of proper mitigation measures (including maintaining in a wet condition by water sprays) and disposed on the following normal working day.

- Additional measures, such as covered the trucks with tarpaulin to avoid potential dust nuisance before leaving the site; or
- Reuse material as temporary fill on site for working platforms or temporary access roads.

In conclusion, the general principle will be that all statutory and contractual requirements will be met in this regard.

7.3 Arrangement of Disposal of excavated materials to the alternative sites

The arrangement of disposal of excavated materials (refer to Condition 2.21(a) in EP-249/2006/A) is summarized below:

The raw materials are delivered to the crushing plant by trucks, then the materials will load into the sieve to sieve out the size less than 300mm before go into the crusher. After the material was broken down to the size of not more than 300mm, they will drop onto the stockpile through the conveyor belt.

Then the crushed material will directly transfer into another fully enclosed conveyor belt and transport to the barging point. Details of the arrangement and the layout of conveyor belt and barging point (refer to Condition 2.21(b) in EP-249/2006/A) could be referred to the drawings in Appendix A.

To be environmental friendly, the Contractor/subcontractors can maximize the reuse of excavated materials and minimize the disposal to the public filling facilities. With notification of the requirement, great effort would be paid to find appropriate sites as alternative disposal sites. If an alternative disposal site is available, we will write the proposal to PMR to seek their agreement. Upon receiving the agreement from PMR, we will send the notification to EPD and CEDD for their information, records and better management of their public filling facilities.

Negotiation with other construction sites to be the alternative disposal site would be an on-going process; however the information of the alternative disposal sites would be notified to all relevant parties once the confirmation is granted.

At present, TKOGV (i.e. the Contractor of SENT Landfill) has been one of the alternative disposal sites. They use the C&D materials from CI05 as the topsoil of landfill. Besides, other potential alternative disposal sites include:

- Penny's Bay Reclamation Stage 2;
- NW-SW (i.e. the Contractor of WENT Landfill); and
- Central Reclamation Phase III.

7.4 Implementation of Chit Ticket System to public filling facilities and landfills

The following steps shall be implemented for using the Chit Tickets:

(a) The Contractor will open a billing account at EPD for the disposal of C&D waste. Chit Tickets shall be prepared by EPD and collected by the Contractor. Every vehicular trip which transporting the C&D waste off site, either by the Contractor/subcontractor shall complete the Chit.

(b) Prior to the vehicle leaving the Site, the driver shall present to the completed Chit to the site deployed staff at the entrance/exit. The deployed staff shall sign the Chit and record the information in the log sheet.

(c) For each vehicular trip, the driver shall obtain a receipt from the operator of the public filling facility or the landfill. The driver shall return the completed Chit (i.e. the Chit with receipt and chop) to the Contractor not later than the end of the following working day for checking and recording. Late return or lost without any acceptable reason might be regarded as non-compliance.

The same procedures would be used for the disposal by barge to the public filling facilities.

7.5 Implementation of Trip Ticket System to approved alternative disposal sites

The following requirements in line with the steps defined under ETWB TC No. 31/2004 shall be implemented:

(a) A C&D Material Disposal Delivery Form (DDF) shall be prepared by the Contractor. Every vehicular trip which transporting the C&D materials off site, either by the Contractor/subcontractor shall complete the DDF in duplicate except for the Time of Departure.

(b) Prior to the vehicle leaving the Site, the driver shall present the completed DDF to the site deployed staff at the entrance/exit. The deployed staff shall sign the DDF and record the information in the log sheet.

(c) For each vehicular trip, the driver shall obtain a designated chop from the approved construction site, as dumpsite for confirmation. The driver shall return the completed DDF (i.e. the DDF with the designated chop) to the Contractor not later than 8:00 am in the following working day for checking and recording. Late return or lost without any acceptable reason might be regarded as non-compliance.

The same procedures would be applied for the disposal by barge to the approved alternative disposal sites accordingly.

7.6 Monitoring and Auditing

The monitoring and audit of spoil disposal and the interface with the overall requirements of waste management audit are described in Section 10 of this WMP.

8. CHEMICAL WASTE

8.1 General

The principal source of chemical waste (with the exception of contaminated soil) is anticipated to be waste oil and other lubricants from servicing and maintenance of the construction plant. These wastes contain chemicals, which may cause pollution or constitute a danger to the health of workers or pose a risk of pollution to the environment. The handling, storage and disposal of chemical waste therefore demand careful management.

The Contractor will register as a chemical waste producer with EPD and a Chemical Waste Producer's Licence will be obtained for each works area.

8.2 Storage and Disposal

Requirements for the storage and disposal of chemical wastes are listed below:

- Chemical waste should be stored in containers of suitable design and construction so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport;
- The container materials must not be predisposed to any reaction with the intended contents such that any dangerous product results or the container is weakened;
- Containers for storing chemical waste must be securely closed, have a capacity of <450L (unless otherwise approved by EPD) and have a warning label in English and Chinese displayed on surface;
- Storage areas for chemical wastes must be clearly labelled and used solely for storing chemical waste;
- Storage areas of chemical wastes must be enclosed on at least three sides and have adequate ventilation;
- Storage areas for chemical wastes must be covered to prevent rainfall entering;
- Storage areas of chemical wastes must have an impermeable floor and bunding of sufficient capacity to accommodate 100% of the volume of the largest container or 20% of the total volume of waste stored in that area, whichever is the greatest;
- Storage areas for chemical wastes must be arranged so that incompatible materials are adequately separated;
- Disposal of chemical waste from site must only be via a licensed waste collector in the EPD approved contractors list and to must be a facility licensed to receive the chemical waste.

The Production Engineer will try to minimize the generation of chemical waste by use of suitable method statements. Information on chemical waste minimization would be provided as required. Other recommendations are listed below:

- The Site Engineer and the Safety Officer will inspect the storage area and advise the site storekeeper that try not to keep large quantities of chemical at site as possible; and
- The site storekeeper should maintain and update the inventory of the types and quantities at site to avoid large amount of same chemical stored at site in one time.

8.3 Emergency Procedures

The chemical waste producer should ensure that his employees or agents have received adequate instruction or training for implementing the procedures in the event of emergencies due to spillage, leakage or accidents arising from the handling and storage of chemical wastes. The detailed procedures are summarized as follows:

- Instruct untrained personnel to keep at a safe distance well away from the spillage area and check if anyone is injured to the Site Supervisors;
- Site Supervisors shall ensure any injured persons are treated and assess what has spilled/leaked;
- If necessary, open windows, provide forced ventilation and close the door/doors of the room where the spillage took place;
- If the spillage/leakage involves highly toxic, volatile or hazardous waste, initiate emergency evacuation and call the emergency services;
- Only trained persons equipped with suitable protective clothing and equipment should be allowed to enter and clean up the waste spillage/leakage area;
- Spillage/leakage of liquid waste at storage area – Where the spillage/leakage is contained in the enclosed storage area, the waste can be transferred back into suitable containers by suitable handheld equipment, such as hand operated pumps, scoops or shovels. If the spillage/leakage quantity is small, it can be covered and mixed with suitable absorbing materials such as tissue paper, dry soft sand or vermiculite. The resultant slurry should be treated as chemical waste and transferred to suitable containers for disposal;
- Spillage/leakage at other areas – For spillage/leakage in other areas, immediate action is required to contain the spillage/leakage. Suitable absorbing materials such as tissue paper, dry soft sand or vermiculite should be used to cover the spill. The resultant slurry should be treated as chemical waste and transferred to suitable containers for proper disposal;
- Areas that have been contaminated by chemical waste spillage/leakage should be cleaned. While water is a suitable solvent for aqueous chemical wastes and water soluble organic waste, kerosene or turpentine should be used for organic chemical wastes that are not soluble in water. The waste from the cleanup operation should be treated and disposed of as chemical waste;
- In incidents where spillage/leakage may result in significant contamination of an area or risk of pollution, the EPD should be informed immediately.

The Site Supervisors shall prepare a report on the incident detailing the accident, clean up actions taken, any pollution problems and suggested measures to prevent similar accidents from happening again in the future. The incident report shall then be submitted to the Contractor's QSE Manager. He/She will ensure that all site staff members are aware of the above emergency response procedures. Depending on the nature and extent of the spill, the Contractor shall notify PMR, the IEC and EPD if necessary.

8.4 Safety Equipment for Handling of Chemical Waste

Personal Safety and Protective Equipment

- Safety helmets;
- Safety glasses or goggles;
- Chemical-resistant gloves or gauntlets;
- Steel-toed rubber or plastic boots;
- Protective clothing or overalls;
- Appropriate respirators, gas masks;
- Eye-wash bottle or device;
- Face visor with hood; and
- First aid kits.

Equipment for Handling Emergencies and Spillage

- Fire extinguishers;
- Dustpan and brush;
- Dry soft sand;
- Mop and bucket;
- Paper tissue and towelling;
- Plastic bags, empty containers or drums;
- Absorbing agents e.g. vermiculite, sawdust, etc;
- Scoop
- Tweezers or forceps;
- Hand-operated pumps; and
- Suitable sampling device.

9. GENERAL REFUSE

- General refuse will be generated largely by food service activities for site workers. Bins will be provided for containment prior to disposal of such waste.
- Aluminium cans, glass and plastic bottles are often recovered from the waste stream by individual collectors if they are segregated or easily accessible, so separate labelled bins for their deposit will be provided wherever feasible.
- Office wastes will be reduced through recycling of paper. Currently, we have joined the local collection scheme to collect our office waste regularly and this will continue throughout the whole project period.
- The estimated domestic debris is estimated to be generated on-site throughout the construction period.
- We will encourage environmental awareness and try to reduce waste by:

  (i) Reducing the number of photocopies to a minimum.

  (ii) By copying on both sides of paper for internal documents and external documents where appropriate.

- General refuse generated on-site shall be stored in enclosed bins or compaction units separate from construction and chemical wastes.
- A reputable waste collector will be employed by the contractor to remove general refuse from the site, separately from construction and chemical wastes, on daily or every second day basis to minimise odour, pest and litter impacts. No burning of refuse on site will be permitted.
- The general foreman will inspect and manage the site condition with respect to the general refuse on-site during the daily site walk.

10. WASTE MANAGEMENT AUDIT

10.1 Site Inspections

Site inspections provide a direct means to ensure compliance with specified waste management procedures and protocols. It is considered that such waste management audits should be included within more general environmental site audits. The general site inspections (including waste management aspects) shall be undertaken routinely (in weekly basis by C-ETL with PMR) to check all construction activities for compliance with all appropriate environmental protection and pollution control measures together with the EM&A programme and those set out in this WMP.

10.2 Monthly Audit

The PMR and the Contractor shall update the IEC (via agreed procedures) with all relevant information of the construction waste to facilitate the IEC in carrying out a monthly audit. In conducting the inspections or audits, all relevant parties shall make reference to the following in relation to waste management practices:

- This WMP;
- Provisions of the contract specific implementation schedule for mitigation measures in respect of Contract CI05;
- Works progress and the construction programme;
- Individual works methodology proposals (which shall include proposals on associated waste management measures);
- Contractual requirements for waste management practices;
- Relevant environmental protection and pollution control laws; and
- Previous site inspection results.

The inspection or audit results and associated recommendations on improvements to the environmental protection and pollution control works shall be filed and available for inspection. *Ad hoc* site inspections shall also be carried out by the Contractor where significant waste management problems are identified. The Contractor shall report the result of follow-up action to the PMR for review and information purposes.

In the event that any Notice of Non-compliance is received by the Contractor from the PMR or IEC with respect to any waste management issues, the Contractor shall initially propose corrective action to the PMR. This shall be in accordance with the requirements of the relevant environmental Event Contingency Plan. (Table 10.1)

Table 10.1 Event Contingency Plan

Step	Day	Action	CET	PMR	IEC
1	1	Create a new non-compliance (NC) record in the recording system within 1 working day after making an observation during the site audit. The NC will include the observation and the reason(s).	●		
2	1	Advise PMR	●		
3	2	Propose corrective action within 1 working day after receipt of the NC.		■	
4	2	Review and agree with the proposed corrective actions and make additional recommendation as required.	●		●
5	2	Implement the proposed corrective actions once they have been agreed.			
6	3	Audit the implementation of the corrective actions within 1 working day after the actions have been implemented.	●	■	
7	-	Check the implementation of the corrective actions at the next site audit. Close the NC record in the recording system if the implementation of the corrective actions is satisfactory and reported to PMR.	●		●
8	-	Propose preventive actions within 3 working days after the closure of the NC.	■		

Notes: *CET denotes Contractor's Environmental Team*
CM denotes Project Construction Manager
PMR denotes Project Manager Representative
● *denotes Action Party*
■ denotes *comments/proposals into appropriate compliant record in recording system where applicable*

10.3 Objectives of the Waste Audit

Objectives of the waste audit are to:

- Ensure that the waste arising from works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner;
- Ensure that the handling, storage, collection and disposal of waste arising from any demolition works comply with the relevant statutory requirements; and
- Encourage the reuse and recycling of materials.

In achieving these objectives, the items as require in waste management site audits have been incorporated in the Environmental Checklist. Apart from the above, Table 10.2 below sets out the items that shall, as a minimum, be observed.

10.4 Record keeping

Records of Chit tickets, trip tickets and their log/record will be kept in the site office either by the Production Engineer or the Environmental Team. These records will record the vehicle registration number, type and quantity of wastes, time of departure from the generated source, time in and out the dumpsite and the computer record from the dumpsite, if applicable for each trip of waste disposal. Apart from the above, a summary of quantity of waste generated, audit checklists and the training records will be kept in the site office for easy reference during the audits or enquiries.

11. CONCLUSIONS AND OTHER RECOMMENDED MITIGATION MEASURES

11.1 Conclusions

This WMP has been prepared specifically with respect to Contract CI05. The objectives of this WMP have been to:

- Determine responsibility for the management and audit of waste generated by the contract;
- Set out measures to ensure that waste generation is minimised as far as is practical;
- Ensure that all wastes are managed in an environmentally acceptable manner;
- Ensure that all contractual and statutory requirements are met; and
- Set out guidelines and protocols for site inspections and waste audit.

In order to prove effective, this WMP must be made available to all parties responsible for waste related activities such as:

- Waste generation;
- Waste storage and handling;
- Waste transportation;
- Waste disposal; and
- Site inspection and waste audit.

It is concluded that, in following the prescribed measures and practices set out in this WMP, the control and management of wastes derived from Contract CI05 should be completed in an environmental acceptable manner.

11.2 Recommended Mitigation Measures

Mitigation measures shall be fully implemented through the construction phase of Contract CI05 in accordance with the recommendation stated in the following.

Excavated Materials

- The excavated material will be exported, and disposed of offsite due to programming constraints. In some places, however, the material generated can be used in place of imported fill, hence reducing both the amount of material to be disposed of offsite, and the amount to be imported for works.
- In order to make maximum use of suitable fill materials, it is proposed to use them in other construction projects, rather than go to the public filling areas. This ensures beneficial use of materials.
- All excavated material (generally good quality granular fill comprising reclamation material) will be temporarily stockpiled on site if space is available. Proper control, such as covered with tarpaulin or spray with water if necessary to prevent dust nuisance. The priority for off-site disposal shall be as follows:

  a) Transport to other Ocean Park Master Redevelopment sites for reuse;

  b) Transport to other construction sites in Hong Kong for reuse; or

  c) Transport to public filling area.

We will liaise with other contractors and developers who require fill materials during our construction (excavation) period, which will minimize the amount of inert excavated materials to be delivered to public filling areas.

Site Clearance Waste/Demolition Waste

- All construction wastes should be sorted on site into inert and non-inert components. Non inert materials (wood, glass and plastic) should be recycled and reused wherever possible and disposed of to landfill as a last resort, whilst inert materials (soil, rubble, sand, rock, brick and concrete) should be separated and disposed of at public filling areas operated by CEDD. Steel and other metals should be recovered from demolition waste and recycled as far as practicably possible.
- The identification of final disposal sites for spoil created by the construction works should be considered during the detailed design stage of the Project. Disposal of C&D waste with not more than 30% inert material is likely to be to any of Hong Kong's strategic landfills.
- Concrete is the main material likely to be used in the construction of the tunnel portals, viaduct section, foundations, stations and associated works. Of the volume of wet concrete supplied, it is assumed that approximately 3-5% of the concrete used will be lost to waste. Dry concrete waste will be sorted out from other wastes and recycled for reuse or sorted for disposal at the public filling area. Shotcrete is expected to be used for slope stabilisation works. There may be some surplus or rejected shotcrete. The use of precast concrete segments for the tunnel lining will significantly minimise the expected concrete waste.

General Works Waste

- Reusable steel shutters should be used as a preferred alternative to formwork and falsework where possible.
- Site fencing may be necessary to separate the construction works from the public and to reduce construction nuisance such as noise to nearby sensitive receivers. In this case metal fencing or building panels to provide site fencing should be used. Timber hoarding is prohibited unless required. Building panels are cement structures with a lightweight concrete core. The material provided good sound and thermal insulation, as well as being both waterproof and fire resistant. These panels are easily recycled and reduce wastage of metals.

Chemical Waste

- Lubricants and waste oils are likely to be generated during the maintenance of vehicles and mechanical equipment. Used lubricants should be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place. If possible, such waste should be sent to oil recycling companies, and the empty oil drums collected by appropriate companies for reuse or refill. A Waste Exchange Scheme which operated by The Centre of Environmental Technology could assist in finding receivers or buyers for chemical wastes.

Aqueous Waste

- Requirements designed to protect against surface runoff include the use of sediment traps, settlement ponds, special drainage channels and bunding. Discharges from concrete works will be high in suspended solids and pH. These washings must be settled in a sedimentation pit, and possibly treated to reduce pH before discharge. Oil interceptors should be used where oily wastes are present, and must have a bypass for ease of disposal of oily wastes. Landtake under stockpiles or open working areas must

be minimised wherever practicable and the stockpiles or open working areas must be minimised wherever practicable and the stockpiles should be fenced and bunded to reduce erosion and sediment release. Runoff from the stockpiles should be collected in sediment traps. Solids accumulated in the sand traps, settlement tanks, manholes, and stream beds must be cleared out regularly and disposed of accordingly in order to maintain an effective system.

- All discharged waters, including sewage and site runoff, should comply with the appropriate standards in the Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters, prior to discharge. Advice on the handling and disposal of construction site discharges, including site runoff and contaminated wastewater, is provided in the ProPECC Note No. 1/94 – Construction site Drainage.

Wheel Wash Waste

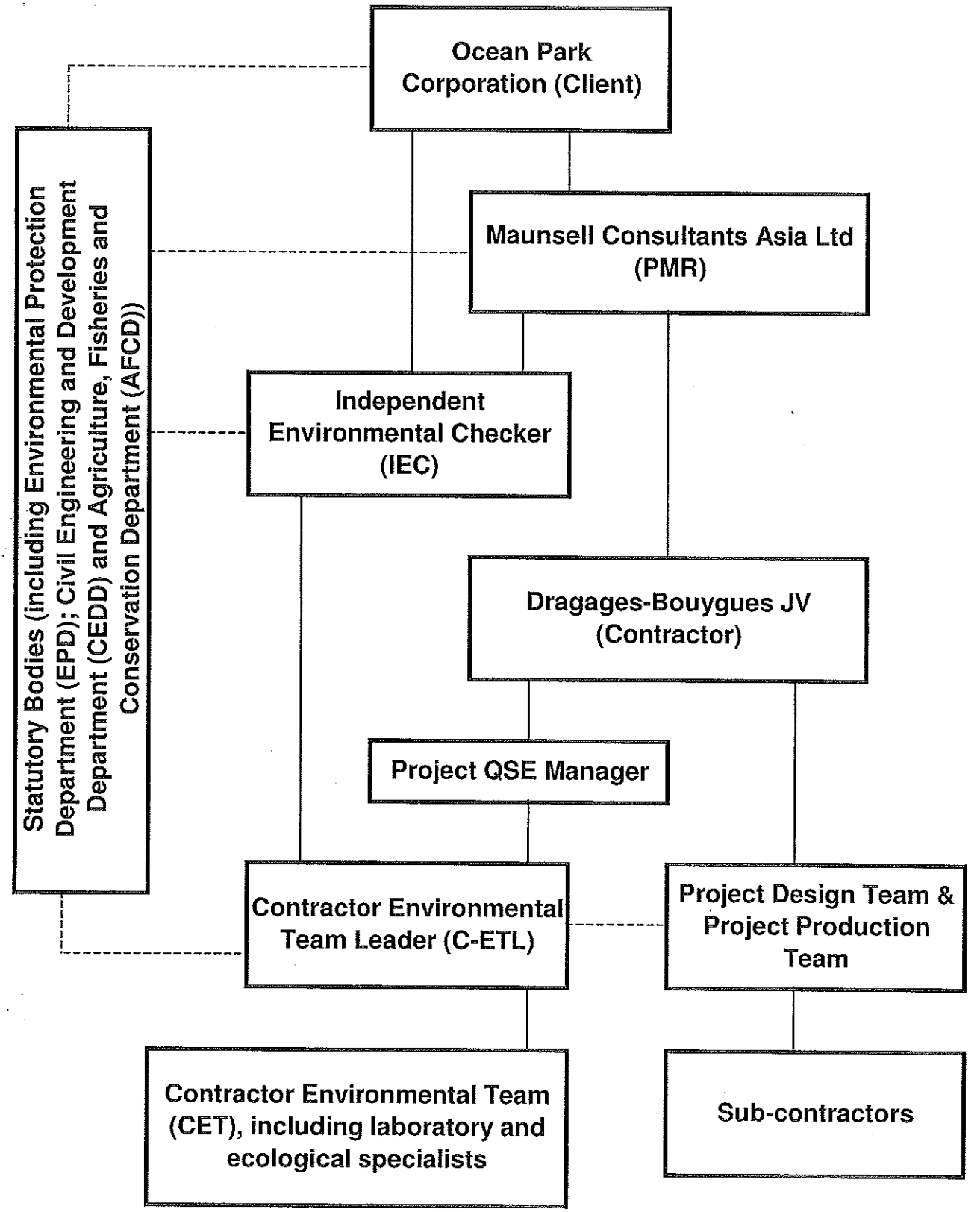
- All vehicles leaving any of the works areas must pass through a wheel wash at the site access/exit. If, at any time, further entry/exit points are created, similar facilities must be provided. The wheel wash must be regularly cleaned to remove sediment, a process which may produce a large volume of wastewater. To prevent excess sedimentation, and minimise possible contamination of locate streams and water courses, these wastewater should be directed into settlement ponds as far as practicable. The wastewater can then be reused on site. The maintenance of the wheel wash will be the responsibility of the Contractor undertaking the site formation works.
- If the waste contains a significant amount of oil and grease from vehicles, areas of sand for absorbing oily wash water should be set up by contractors. Liaison with the Food and Environmental Hygiene Department (FEHD) is essential for correct disposal.

Sewage

- Sewage is characterised by high BOD and suspended solids, is enriched with nutrients and has high bacteriological counts. Domestic sewage generated from any additional site toilets, washing facilities and any temporary canteen provided for construction workers should be collected separately and disposed of or appropriately treated to comply with Government requirements. It is the responsibility of the contractor to ensure that sewage disposal complies with the standards set out in the *Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*.

Municipal Waste

- Solid and liquid wastes will be generated by the construction workers during the construction period. The quantity of municipal waste generated is estimated to be 1.10kg/employee/day (EPD, 1998). A temporary refuse collection point should be set up by the Contractor. Municipal waste should be collected regularly in black refuse bags and delivered to an approved Refuse Transfer Station or a reputable waste collector as required.
- Provision and collection of skips for different types of recyclable waste is the responsibility of the Contractor. Arrangements should be made directly with the recycling companies, for example, the paper merchants, to collect the waste as required.



LEGEND:

——————— Line of Communication

- - - - - - - - - - - - - - - Line of Authority

Dragages-Bouygues JV 寶嘉-布依格聯營

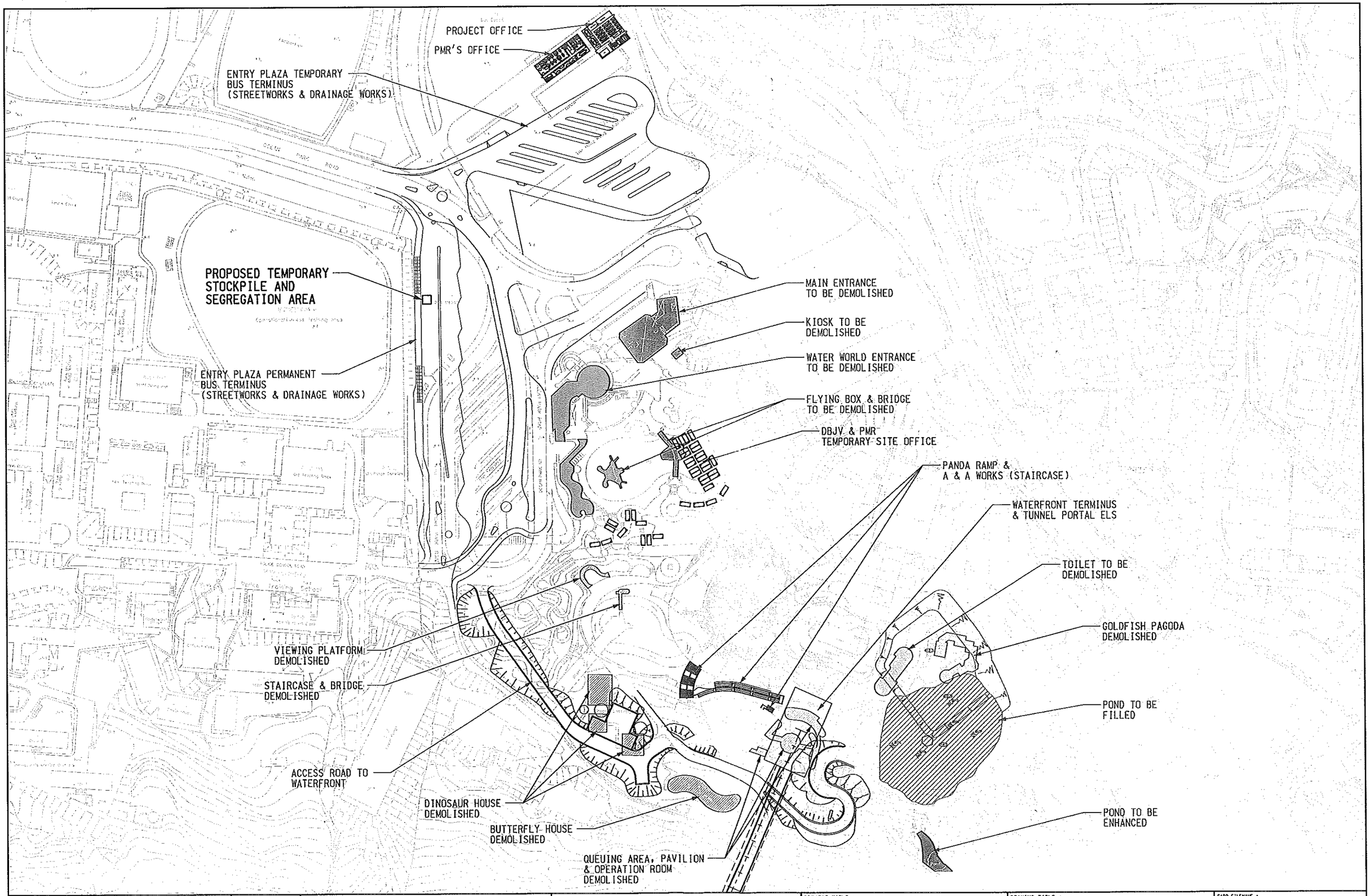
Ocean Park Master Redevelopment Project Contract CI05

Figure 3.1

Project Environmental Organisation Chart

APPENDIX A

Project Site Layout Plan with other relevant facilities



REV.	DATE	BY	DESCRIPTION
B	15AUG2007	STa	GENERAL REVISION
A	11APR2007	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY BLo
CHECKED BY STa
IN CHARGE PIp
DATE 11APR2007

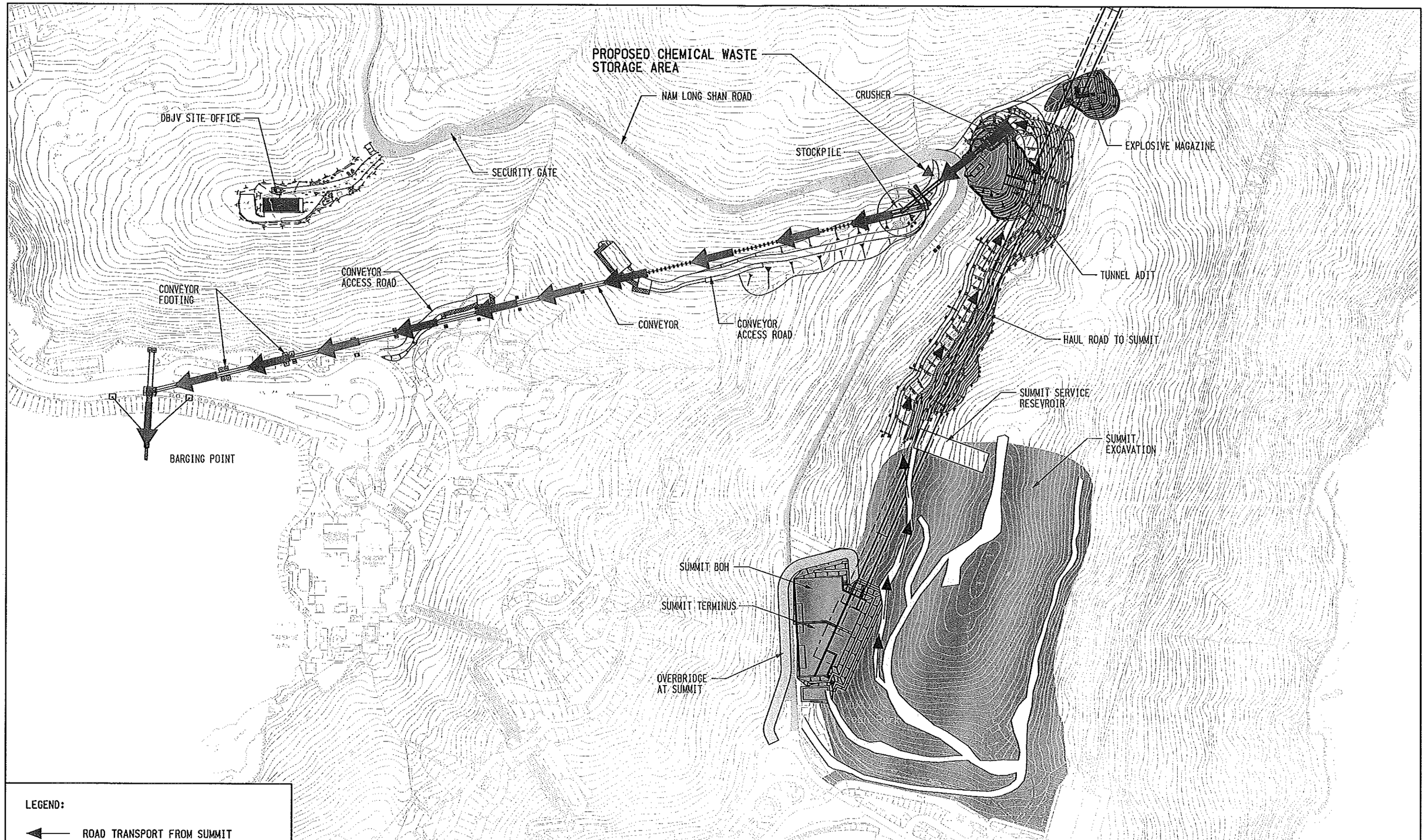
MAIN CONTRACTOR :
Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
SITE LAYOUT AT WATERFRONT AND TEMPORARY STOCKPILE & WASTE SEGREGATION AREA

CADD FILENAME : 01ENV0017B.DGN
DATE : 15AUG2007
SCALE : 1 : 2000 @ A3
DRAWING NUMBER : DBJV/CI05/01/ENV/0017
REV. B



REV.	DATE	BY	DESCRIPTION
B	15AUG2007	STa	GENERAL REVISION
A	11APR2007	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY BLo
CHECKED BY STa
IN CHARGE PIp
DATE 11APR2007

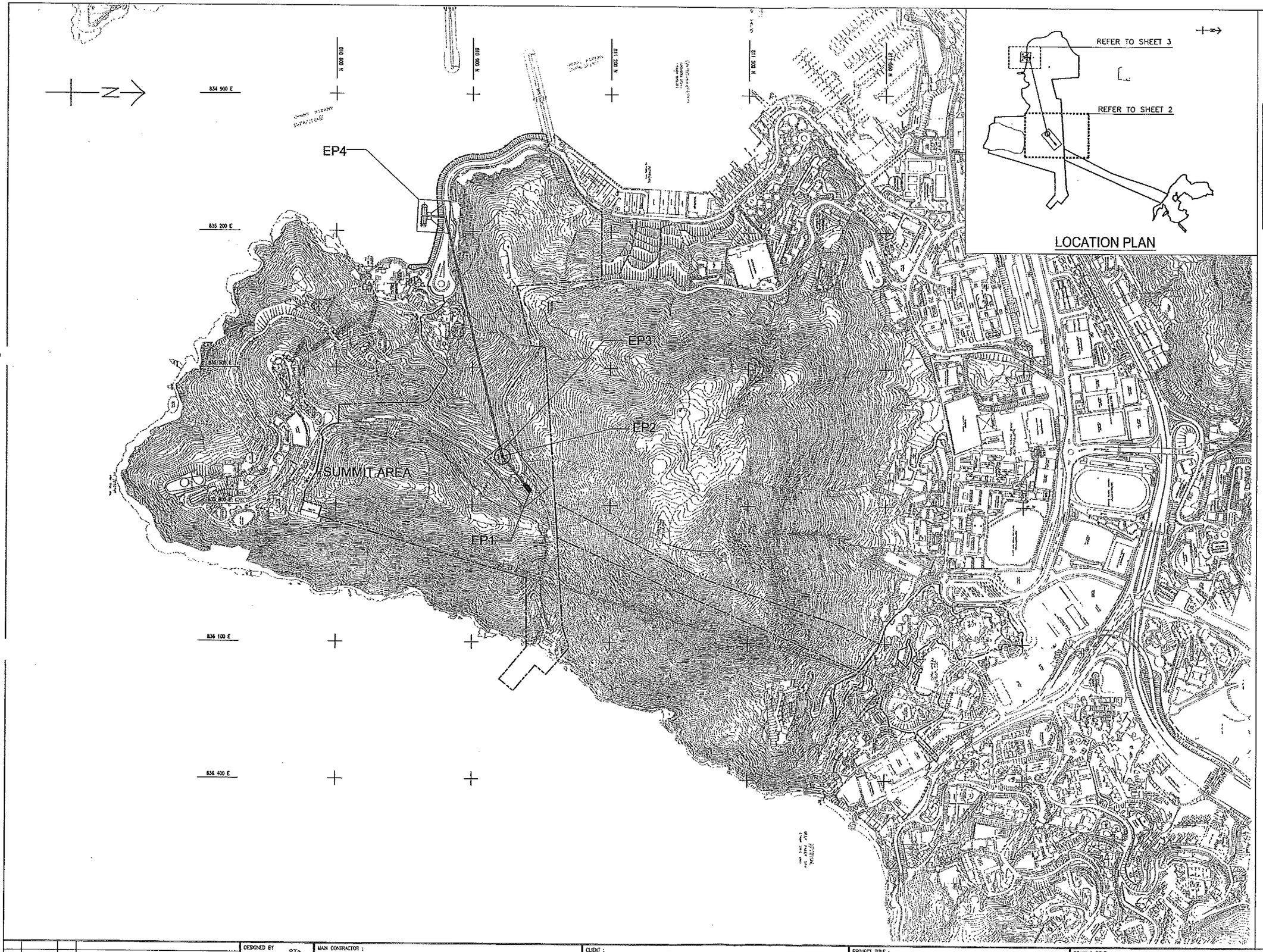
MAIN CONTRACTOR :
Dragages-Bouygues JV 疊嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
SITE LAYOUT AT SUMMIT
ARRANGEMENT OF ROUTING OF C & D MATERIAL TRANSFERING AND CHEMICAL WASTE STORAGE AREA

CADD FILENAME : 01ENV0018B.DGN
DATE : 15AUG2007
SCALE : 1 : 2500 @ A3
DRAWING NUMBER : DBJV/CI05/01/ENV/0018
REV. B



LOCATION PLAN

LEGEND:

SITE BOUNDARY

EMISSION POINT	DESCRIPTION
EP1	CRUSHER LOADING POINT
EP2	TRANSFER POINT
EP3	STOCKPILE
EP4	BARGING POINT

REV.	DATE	BY	DESCRIPTION
C	04-06-07	STa	DRAWING UPDATED
B	26-04-07	STa	DRAWING UPDATED
A	09-03-07	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY Mch
CHECKED BY STa
IN CHARGE YTSO
DATE 09MAR.2007

MAIN CONTRACTOR :
Dragages-Bouygues JV 實嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
BLOCK PLAN

CADD FILENAME : 01ENV0008C.DWG
DATE : 09MAR.2007
SCALE : 1:4000 @A1
DRAWING NUMBER : DBJV/CI05/01/ENV/0008
REV. C

EP2
TRANSFER POINT

TOTALLY ENCLOSED
CONVEYOR T1

MATERIAL DELIVERY TO
CRUSHER LOADING POINT

CONVEYOR RS

CRUSHER

EP3
STOCKPILE

TOTALLY ENCLOSED
CONVEYOR S1

TOTALLY
ENCLOSED

EP1 CRUSHER
LOADING POINT

SUMMIT AREA

LEGEND:

SITE BOUNDARY

PLANT BOUNDARY

EMISSION POINT	DESCRIPTION
EP1	CRUSHER LOADING POINT
EP2	TRANSFER POINT
EP3	STOCKPILE
EP4	BARGING POINT

REV.	DATE	BY	DESCRIPTION
C	04-06-07	STa	DRAWING UPDATED
B	26-04-07	STa	DRAWING UPDATED
A	09-03-07	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY Mch
CHECKED BY STa
IN CHARGE YTSO
DATE 09MAR.2007

MAIN CONTRACTOR :
Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel
and Miscellaneous Works

DRAWING TITLE :
BLOCK PLAN
(SHEET 2)

CADD FILENAME : 01ENV0008C.DWG
DATE : 09MAR.2007
SCALE : 1 : 500 @A1
DRAWING NUMBER : DBJV/CI05/01/ENV/0008
REV. C

TOTALLY ENCLOSED
CONVEYOR T2

EP4
BARGING POINT

TOTALLY ENCLOSED
CONVEYOR T1

BARGE

LEGEND:

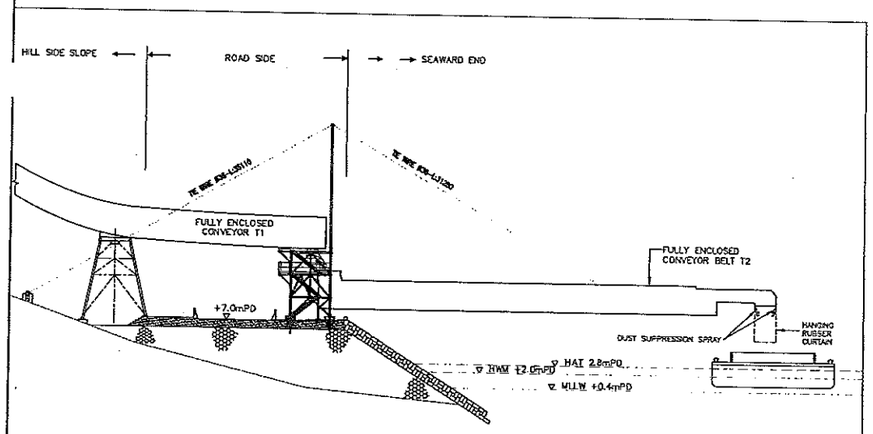
SITE BOUNDARY

PLANT BOUNDARY

EMISSION POINT	DESCRIPTION
EP1	CRUSHER LOADING POINT
EP2	TRANSFER POINT
EP3	STOCKPILE
EP4	BARGING POINT

NOTES:

1. MATERIAL WILL BE DROPPED FROM THE TOTALLY ENCLOSED CONVEYOR T1 THROUGH A HOPPER INSIDE A TOTALLY ENCLOSED STEEL STRUCTURE ONTO TOTALLY ENCLOSED CONVEYOR T2 PROJECTING SEAWARDS FOR DISCHARGE ONTO BARGES VIA FLEXIBLE HANGING RUBBER CURTAIN.
2. THE CONVEYOR T1 IS HOUSED INSIDE A TOTALLY ENCLOSED STEEL TRUSS BEAM STRUCTURE WHICH IS SUPPORTED ON STEEL FRAMES AT BOTH ENDS.
3. THE CONVEYOR T2 IS HOUSED INSIDE A TOTALLY ENCLOSED STEEL TRUSS CANTILEVER BEAM SUPPORTED ON A STEEL FRAME ON THE LAND SIDE AND SUSPENDED BY STEEL WIRES AT THE SEAWARD END.



REV.	DATE	BY	DESCRIPTION
C	04-06-07	STa	DRAWING UPDATED
B	26-04-07	STa	DRAWING UPDATED
A	09-03-07	STa	FIRST ISSUE

DESIGNED BY STa
DRAWN BY Mch
CHECKED BY STa
IN CHARGE YTSO
DATE 09MAR.2007

MAIN CONTRACTOR :
Dragages-Bouygues JV 實嘉-布依格聯營

CLIENT :
香港海洋公園
OCEAN PARK HONG KONG

PROJECT TITLE :
OCEAN PARK REDEVELOPMENT
Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :
BLOCK PLAN
(SHEET 3)

CADD FILENAME : 01ENV0008C.DWG
DATE : 09MAR.2007
SCALE : 1:500 @A3
DRAWING NUMBER : DBJV/CI05/01/ENV/0008
REV. C

APPENDIX B

Standard C&D Material Disposal Delivery Form

Dragages-Bouygues JV 賈基—布依格聯營

Ocean Park Master Redevelopment Project
Contract CI05

No. OPE-00001

Construction and Demolition Material Disposal Delivery Form

Contract No.: CI05 Contractor: _____

Contract Title: Site Formation, Funicular Tunnel and Miscellaneous Works

Location of Site: _____

Location of Public Filling Facility/Landfill * : _____

Date: _____ Time of Departure: _____

Vehicle Registration No.: _____

Approximate Load: Full / three quarter / half / one quarter *

Remark:

_____

_____

_____

_____

_____

Authorised Chop of
Project Manager Representative

*** Delete whichever inappropriate**

Authorised Chop of
Operator of Approved Alternative Dumpsite

APPENDIX C

Summary table for work processes or activities requiring timber for temporary works

Dragages-Bouygues JV 寶霖–柏傲指聯營	**Summary table for work processes or activities requiring timber for temporary works**	**Ocean Park Master Redevelopment Project**
Contract Name and No.	CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works	
Date of Preparation		

Item No.	**Description of Works Processes and Activity** [1]	**Justifications for using timber in temporary construction works** [2]	**Quantities of timber used (m^3)**		**Remarks**
			Estimated	**Actual**	
		Total			

Notes

[1] – Type of Works Processes and Activity

- Access
- Covering/Protecting openings
- Falsework
- Formwork
- Temporary shed/structure
- Trench shoring
- Working platform
- Others (to be specified)

[2] – Justification for using timber

- Cost consideration
- Flexibility for works
- Recycled/Reused/Old materials from other activities
- Safety consideration
- Site/Engineering constraint
- Others (to be specified)

APPENDIX D

Waste Flow Chart and Yearly and Monthly Material/Waste Flow Table

Dragages-Bouygues JV 渣務—布依伯聯營	**Yearly Summary Material/Waste Flow Table**	**Ocean Park Master Redevelopment Project**
Contract Name and No.	CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works	
Date of Preparation	09 Aug 2007	

Year	Quantity of Inert C&D Materials Generated									Quantity of Non-inert C&D Materials (i.e. C&D waste Generated)					
	Natural Materials					Artificial Materials [4]									
	Natural Excavated Materials [1]	Rocks [2]	Total Generation	To re-use	To dispose of at Public Fills	Total Generation	Soft Materials [3]	To re-use	To dispose of at Public Fills	Metals	Paper	Plastic [5]	Chemical Waste	Timber	General refuse
2007	100,000	400,000	500,000	499,000	1,000	20,000		15,000	5,000	190	1,200		5,000		2,000
2008	50,000	199,538	249,538	249,538	0	12,500		10,000	2,500		1,200		5,000		2,400
2009						2,500		2,500							500
TOTAL															

Notes:
1 - Natural Excavated Materials ~ size <200mm include Grade IV & V rocks
2 - Rocks ~ Grade III or above
3 - Soft Materials ~ include spent bentonite and the likes
4 - Artificial Materials include broken bituminous/concrete materials
5 - Plastic refers to plastic bottles/containers, plastic sheets/foam from packaging materials

All figures are in m^3

Dragages-Bouygues JV	**Monthly Summary Material/Waste Flow Table**	**Ocean Park Master Redevelopment Project**
Contract Name and No.	CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works	
Date of Preparation		

Year	Month	Quantity of Inert C&D Materials Generated									Quantity of Non-inert C&D Materials (i.e. C&D waste Generated)					
		Natural Materials					Artificial Materials [4]									
		Natural Excavated Materials [1]	Rocks [2]	Total Generation	To re-use on site	To dispose of at Public Fills	Total Generation	Soft Materials [3]	To re-use on site	To dispose of at Public Fills	Metals	Paper	Plastic [5]	Chemical Waste	Timber	General refuse
2007	Jan															
	Feb															
	Mar															
	Apr															
	May															
	Jun															
	Jul															
	Aug															
	Sep															
	Oct															
	Nov															
	Dec															
SUB-TOTAL																
2008	Jan															
	Feb															
	Mar															

Year	Month	Quantity of Inert C&D Materials Generated									Quantity of Non-inert C&D Materials (i.e. C&D waste Generated)					
		Natural Materials					Artificial Materials [4]									
		Natural Excavated Materials [1]	Rocks [2]	Total Generation	To re-use on site	To dispose of at Public Fills	Total Generation	Soft Materials [3]	To re-use on site	To dispose of at Public Fills	Metals	Paper	Plastic [5]	Chemical Waste	Timber	General refuse
2008	Apr															
	May															
	Jun															
	Jul															
	Aug															
	Sep															
	Oct															
	Nov															
	Dec															
SUB-TOTAL																
TOTAL																

Notes:
1 - Natural Excavated Materials ~ size <200mm include Grade IV & V rocks
2 - Rocks ~ Grade III or above
3 - Soft Materials ~ include spent bentonite and the likes
4 - Artificial Materials include broken bituminous/concrete materials
5 - Plastic refers to plastic bottles/containers, plastic sheets/foam from packaging materials

APPENDIX E

Pollution Control / Waste Reduction Measures (extracted from approved EIA report by MCAL, Project EM&A Manual by MCAL and Project Specific EMIS by DBJV)

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM01	Disposal of waste (general)	PS 26.18	Minimize the generation of waste from Works. Avoidance and minimization of waste generation shall be achieved through changing or improving design and practices, careful planning and good site management.			✓	Note
WM02	Disposal of waste (general)	PS 26.18	Different types of waste are segregated on-site and stored in different containers, skips or stockpiles to facilitate the reuse/recycling of materials, thus avoiding disposal (generally with only limited processing and reprocessing may be required).	✓		✓	EIA ref. S6.32 EM&A ref. S5.5
WM03	Disposal of waste (general)	WMP	A trip ticket system for the disposal of Construction and Demolition (C&D) materials following the guidelines stipulated in the Environment, Transport and Works Bureau Technical Circular (Works) No. 31/2004 shall be used to prevent any illegal dumping.			✓	
WM04	Disposal of waste (general)	PS 26.18	No construction waste of more than 20% inert material by volume shall be disposed of to landfill. Inert materials like rock, sand, concrete debris should be sorted out from construction waste before disposal. Dry concrete waste or the excavated materials should be recycled for reuse or sorted for disposal at public dumps.			✓	
WM05	Generation and disposal of construction and demolition waste	WMP; PS 26.18	All non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material shall be disposed at public dumps.	✓		✓	Note

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM06	Generation and disposal of construction and demolition waste	WMP; PS 26.18	The C&D materials shall be sorted into public fill (inert portion) and C&D waste (non-inert portion). The inert portion which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works as far as possible. Where excavated rock is of the appropriate grade, it shall be crushed and reused as aggregate or for other surfacing uses, wherever possible. The non-inert portion, which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled.	✓	✓	✓	
WM07	Disposal of waste (general)	WMP; PS 26.18	Record of the amount of waste generated, recycled and disposed of shall be kept on site for easy reference and checking.			✓	
WM08	Disposal of waste (general)	WMP; PS 26.18	Authorized/Licensed Waste Hauliers/Collectors should be used to collect and transport different category wastes to the appropriate disposal points.			✓	EIA ref. S6.34 – S6.35 EM&A ref. S5.7 – S5.8
WM09	Disposal of waste (general)	WMP; PS 26.18	Handle and store wastes in a manner, which ensures that they are held securely without loss or leakage, thereby minimizing the potential for pollution.			✓	Note
WM10	Disposal of waste (general)	WMP; PS 26.18	Remove wastes in a timely manner and maintain the waste storage areas clean regularly.			✓	
WM11	Disposal of waste (general)	WMP; PS 26.17(8)	Regular cleaning and maintenance the drainage system, sumps, oil interceptors and grease traps. The waste from these facilities shall be collected and disposed of by a licensed Collector.	✓		✓	

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM12	Disposal of waste (general)	WMP	Obtain the necessary permits and licenses with regards to the waste management from the appropriate authorities wherever necessary, in accordance with • The Waste Disposal Ordinance (Cap 354), • Waste Disposal (Chemical Waste)(General) Regulation (Cap 354), • The Crown Land Ordinance (Cap 28), and • Dumping at Sea Ordinance (Cap 466)			✓	
WM13	Disposal of waste (general)	WMP	Provide training for workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.			✓	
WM14	Generation and disposal of construction and demolition waste	WMP & WBTC 5/99 (Appendix A)	The Contractor shall produce a Construction and Demolition Material Disposal Delivery Form (the Form) for each and every vehicular trip transporting Construction and Demolition (C&D) materials off-site. The Contractor shall complete the Form and maintain records as per procedures.			✓	
WM15	Production of Chemical Waste (general)	Magnitude	For those processes that generate chemical waste, it may be possible to find alternatives that generate reduced quantities or even no chemical wastes, or less dangerous types of chemical waste	✓	✓		
WM16	Production of Chemical Waste (general)	Cap 354 sub. leg. C; PS 26.18 (4)	The Contractor shall be required to register with EPD as a chemical waste producer and to follow the guidelines as stated in the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes.				Register as chemical waste producer EIA ref. S6.36 EM&A ref. S5.9

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM17	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	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, Labeling and Storage of Chemical Wastes as follows:				EIA ref. S6.36 EM&A ref. S5.9
			• A suitable area (special container(s) would be proposed to use) for temporary storage of chemical waste shall be provided. The best location for the storage area shall be located close to the source of chemical waste generation.	✓			
			• The container used for the storage of chemical waste should be used for chemical waste only and kept clean and dry all the times.	✓		✓	
			• The container shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.	✓		✓	
			• The container should have a capacity of less than 450 l unless the specifications have been approved by EPD.	✓			
			• If the container is not used as the storage, the storage area shall be enclosed on at least three sides by a wall, partition or fence with a height of not less than 2m or the total height in stack, whichever is less.	✓		✓	
			• Adequate ventilation shall be allowed by leaving some space between the top of the enclosure walls and ceiling, or provision of louvers on the sides of the enclosure walls.	✓		✓	

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM17 (contd)	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	• The storage area should 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	✓		✓	
			• The storage area should be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary)	✓		✓	
			• Every chemical waste storage area should display a hazard-warning panel, notice or marking at or near the entrance or opening of the storage area in English and Chinese characters "CHEMICAL WASTE" and "化學廢物" clearly and boldly in red on a white background with a letter/character size of not less than 60mm high.	✓		✓	
WM18	Disposal of Chemical Waste	WMP; PS 26.18	Disposal of chemical waste be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility that also offers a chemical waste collection service and can supply the necessary storage containers, or to a re-user of the waste under approval from EPD.			✓	
WM19	Disposal of Chemical Waste	Cap 354, sub. leg. C s21 & 22	Disposal of chemical waste should be via a licensed waste collector.			✓	
WM20	Generation of general refuse	Cap 311, sub leg O S.4 (1)	Law prohibits the burning of refuse on construction sites.			✓	

CONSTRUCTION PHASE – REGISTER OF DIRECT SIGNIFICANT ASPECTS

Rev. C

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Other / Remarks
				Site Installation	Method Statement	Toolbox Talk	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)							
WM21	Generation of general refuse	Magnitude	Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.	✓		✓	
WM22	Generation of general refuse	WMP	General refuse generated on site should be stored in enclosed bins or compaction units separate from construction and chemical wastes. A reputable waste collector should be employed to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts.	✓		✓	
WM23	Generation of general refuse	Magnitude	General refuse will be generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Individual collectors often recover aluminum cans from the waste stream if they are segregated or easily accessible, so separate labeled bins for their deposit should be provided wherever feasible.	✓		✓	

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
S 5.140	S4.7	Trees located within the works areas shall be preserved as far as practicable. A tree survey shall be conducted to identify any mature trees affected by the proposed works. If tree felling is unavoidable, feasibility of tree transplantation shall be explored and compensatory planting shall be provided on at least a 1:1 ratio.	To protect plant species of conservation interest	Contractor and qualified botanist/ horticulturist	Whole site	Construction Phase	
S 5.141	S4.7	The loss of 4.8ha tall shrubland habitat will be compensated by planting native tall shrubs to enhance the ecological value of an existing low shrubland area with relatively low species diversity located to the north of Nam Long Shan Road close to the affected area. The identified area for compensation is approximately 6ha as shown in Figure 5.4.	To mitigate loss of tall shrubland habitat	Contractor and qualified botanist/ horticulturist	Whole site	Construction Phase or Pre-construction Phase	
D		*Waste Management Implications*					
S6.31	S5.4	Good site practices: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site	To reduce waste management impacts	Contractor	Works area	Construction phase	

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		practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▫ Training of site personnel in proper waste management and chemical handling procedures ▫ Provision of sufficient waste disposal points and regular collection of waste ▫ Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ▫ Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.					
S6.32	S5.5	Waste reduction measures: ▫ Sort C&D waste from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals ▫ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or	To achieve waste reduction	Contractor	Works area	Construction phase	

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		recycling of materials and their proper disposal ▫ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force ▫ Proper storage and site practices to minimise the potential for damage or contamination of construction materials ▫ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.					
S6.34 - S6.35	S5.7-5.8	General refuse: ▫ General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the	To minimize environmental impacts during the handling, transportation and disposal of general refuse	Contractor	Works area	Construction phase	ETWB TCW No.19/2005 ETWB TCW No.31/2004

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		occurrence of 'wind blown' light material. ▪ In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials arising from site formation and tunnel construction should be reused on-site as backfilling material and for landscaping works as far as practicable. In addition, volcanic rock generated from the tunnelling works should be subject to beneficial re-use. Other mitigation requirements are listed below: o A Waste Management Plan should be prepared o A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used. o In order to monitor the disposal of C&D and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included.					ETWB TCW No.15/2003.

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
S6.36	S5.9	Chemical waste: Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.* Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive. etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, either to the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation	To minimize environmental impacts during the handling, transportation and disposal of chemical refuse	Contractor	Works area	Construction phase	Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concern to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
E		*Land Contamination*					
S 7.24, S 7.29 S 7.35 - S 7.37	S6.3-6.7	*Land Contamination Assessment* Site investigation works shall be carried out at Hong Kong School of Motoring (HKSM) and City Bus Depot (CBD) in accordance with the approved CAP. A Contamination Assessment Report (CAR) shall be compiled after completing the SI works following the requirements in the CAP. The CAR shall compare the findings with relevant standards and provide interpretation of the laboratory analysis. If land contamination is confirmed, a Remediation Action Plan (RAP) shall be drawn up to formulate necessary remedial measures. The subsequent CAR and RAP shall be endorsed by EPD before implementation of any remedial	To clean up any identified contaminated land where the ground will be disturbed by the proposed works	Existing site user	Hong Kong School of Motoring and City Bus Depot	Prior to the commencement of site clearance and construction works.	"*Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards, and Car Repair/Dismantling Workshops*" published by EPD, HKSAR EPD ProPECC Note No. 3/94 Dutch "B" standard for soil remediation