 <b>PENTA-OCEAN</b> CONSTRUCTION CO., LTD. 五洋建設	Site Formation for Kai Tak Cruise Terminal Development Contract No. : KL/2009/01	Doc No.	KFCT/907/CSF/134B
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# Waste Management Plan

## for

# Dredged Materials from Seawall Removal

Control Copy No. \_\_\_\_\_

Issue to \_\_\_\_\_

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<b>Prepared by:</b>  <hr/> Perry Yam Environmental Officer Date: 11.05.2010	<b>Approved by:</b>  <hr/> K K Yuen Site Agent Date: 12.05.2010
--	--

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To	Penta Ocean Construction Co. Ltd.	Ref. No.	MCLF2691
Country		Email	perry.yam@pentaocan.com.hk
Attn.	Mr. K. K. Yuen / Mr. Perry Yam	Date	11 May 2010
From	Joseph Poon	No. of Pages	1 (Incl. this page)
C.c. To	Mr. Barry C. S. Wong (Scott Wilson Ltd.)	Fax No.	2428 9922
	Mr. K. Y. Shin (Civil Engineering and Development Department)	Fax No.	2301 1277
	Mr. Stephen Cheng (Scott Wilson Ltd.)	Fax No.	2148 7277
	Mr. Raymond Dai (Lam Environmental Services Ltd.)	Fax No.	2882 3331
Subject	<b>Agreement No. CE 19/2009 (EP) Dredging Works for Proposed Cruise Terminal at Kai Tak – Waste Management Plan for Dredged Materials from Seawall Removal (Doc No. KFCT/907/CSF/134B, Rev 1)</b>		

We refer to the revised Waste Management Plan for Dredged Materials from Seawall Removal (Doc No. KFCT/907/CSF/134B, Rev 1) that we received through email on 7<sup>th</sup> May 2010 and are pleased to confirm we have no further comment.

Should you require further information, please feel free to contact us.

Best regards,

A handwritten signature in black ink, appearing to be "Joseph Poon".

Joseph Poon  
Independent Environmental Checker

JP/CY/by

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## Lam Environmental Services

Our ref.: LES/J2009-09/CS/L028

Date : 11 May 2010

**Penta Ocean Construction Co., Ltd.**

Unit 601, K. Wah Centre,  
191 Java Road,  
North Point,  
Hong Kong

**Attn: Mr. KK Yuen**

**Environmental Permit No. EP-328/2009/A**

**Contract No. KL/2009/01 – Site Formation for Kai Tak Cruise Terminal Development**

**RE: Certification of Waste Management Plan for Dredging Materials from Seawall Removal**

Dear Mr. Yuen,

Referring to your document no. KFCT/907/CSF/134B submitted on 7 May 2010 by email, we hereby certify the captioned Plan in relation to condition 2.10 of the EP/328/2009/A.

Should you have any enquiry, please feel free to contact our Assistant Environmental Engineer, Ms Cherry Mak at 2919 0288 or undersigned at 2839 5666.


Yours truly,

A handwritten signature in blue ink, appearing to read "Raymond Dai".

Raymond Dai  
Senior Environmental Consultant


Encl.

c.c. IEC, Fugro – Mr. Joseph Poon

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### List of Abbreviations

<b>EPD</b>	Environmental Protection Department
<b>PS</b>	Particular Specifications
<b>EP</b>	Environmental Permit No. EP-328/2009/A
<b>ET</b>	Environmental Team
<b>IEC</b>	Independent Environmental Checker
<b>EIA</b>	Environmental Impact Assessment

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## 1 Introduction

### 1.1 Project Description


- 1.1.1 Penta-Ocean Construction Co. Ltd. (hereinafter “The Contractor”) has been awarded the contract of Site Formation for Kai Tak Cruise Terminal Development CEDD Contract No. KL/2009/01 by Civil Engineering and Development Department, HKSAR (CEDD).
- 1.1.2 The Project includes a designated project, dredging operation exceeding 500,000m<sup>3</sup>. The scale and scope of the designated project are:-
- (a) Dredging of marine sediment from seabed in the Harbour area of the southern tip of the former Kai Tak Airport runway (dredging area: approx. 57 hectares and dredging depth: up to -12mCD) to provide the necessary water depth within the manoeuvring area for cruise vessels.
  - (b) Removal and reconstruction of existing seawall of about 1km in length (including 850m berth structure) by dredging at the southern tip of the former Kai Tak Airport runway for cruise berth construction.
- 1.1.3 Figure 1 of the Environmental Permit (EP-328/2009/A) is attached in **Appendix 1** to indicate the staged dredging areas for the Cruise Terminal. The Project is responsible for:
- Stage 1 dredging area within existing seawall for berth construction; and
  - Stage 1 dredging area for manoeuvre basin for phase I berth.

### 1.2 Objectives of the Waste Management Plan

- 1.2.1 According to PS Clause 25.20(6) and (7) and EP Condition 2.10 of the Contract, at least one month prior to the reuse and/or disposal of dredged materials arising from removal of the existing seawall and the seabed (marked red in Figure 1 of the EP) underneath along the southern tip of the former Kai Tak Airport runway, the Contractor shall submit four hard copies and one electronic copy of the Waste Management Plan (WMP) for the dredged materials from seawall removal to EPD. The WMP shall be certified by ET Leader and verified by IEC as conforming to the relevant information and recommendations contained in the approved EIA Report (Register No. AEIAR-115/2007). This WMP indicates:
- (a) the total amount of the dredged materials from seawall removal;
  - (b) the quantity of the dredged materials from seawall removal that will be reused on-site; and
  - (c) the quantity of the dredged materials from seawall removal that will be disposed off-site and the location(s) of the recipient site(s).


### 1.3 Legislations

- 1.3.1 The following legislation relates to the handling, treatment and disposal of wastes in the HKSAR will be strictly followed.
- Waste Disposal Ordinance (Cap.354C)
  - Waste Disposal (Chemical Waste) (General) Regulation (Cap.354C)

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- Land (Miscellaneous Provisions) Ordinance (Cap.28)
- Public Health and Municipal Services Ordinance (Cap.132) – Public Cleansing and Prevention of Nuisances Regulation
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap.354N)
- Dumping at Sea Ordinance (Cap. 466)

- 1.3.2 The Waste Disposal Ordinance (WDO) prohibits the unauthorized disposal of wastes. Construction waste is defined as any substance, matter or thing that is generated from construction work and abandoned, whether or not it has been processed or stockpiled before being abandoned, but does not include any sludge, screenings or matter removed in or generated from any desludging, desilting or dredging works. Under the WDO, wastes can be disposed of only at designated waste disposal facilities.
- 1.3.3 Under the Waste Disposal (Chemical Waste) (General) Regulations, all producers of chemical waste must register with EPD and treat their wastes, either utilizing on-site plant licensed by EPD, or arranging for a licensed collector to transport the wastes to a licensed facility. The regulation also prescribes the storage facilities to be provided on-site, including labeling and warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.
- 1.3.4 The Public Cleansing and Prevention of Nuisances Regulation provides control on illegal tipping of wastes on unauthorized (unlicensed) sites.
- 1.3.5 The current policy related to the disposal of C&D material is documented in the Works Branch Technical Circular No. 2/93, 'Public Dumps'. C&D materials that are wholly inert, namely public fill, should not be disposed of to landfill, but taken to public filling areas, which usually form part of reclamation schemes. The Land (Miscellaneous Provisions) Ordinance requires that dumping licences be obtained by individuals or companies who deliver public fill to public filling areas. All dump trucks must be installed with mechanical covers for transportation of materials off-site.
- 1.3.6 Under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation, enacted in January 2006, construction waste delivered to a landfill for disposal must not contain more than 50% by weight of inert material. Construction waste delivered to a sorting facility for disposal must contain more than 50% by weight of inert material, and construction waste delivered to a public fill reception facility for disposal must consist entirely of inert material. The Environment, Transport and Works Bureau (ETWB) TCW No.31/2004, "Trip Ticket System for Disposal of Construction & Demolition Materials" provides measures to track the disposal of C&D materials. Details of the ETWB TCW No. 31/2004 are given in **Appendix 2**.
- 1.3.7 Measures have been introduced under ETWB TC(W) No. 33/2002, "Management of Construction and Demolition Material Including Rock" to enhance the management of construction and demolition material, and to minimize its generation at source. The new ETWB TC(W) No. 19/2005 "Environmental Management on Construction Sites" includes procedures on waste management requiring construction to reduce the C&D material to be disposed of during the course of construction. Under ETWB TC(W) No. 19/2005, the contractor is required to prepare and implement an Environmental Management Plan (EMP) and the WMP becomes part of the EMP. Waste Management Plan shall be implemented in accordance with the requirements and procedures stipulated in ETWB TC(W) No. 19/2005. Reference should also be made to the ETWB TC(W) No. 31/2004, "Trip Ticket System for Disposal of Construction & Demolition Materials".

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## 2.0 C&D Materials Generation

### 2.1 Inert C&D Materials

2.1.1 Construction and Demolition material would be generated from the removal of a section of the existing seawall by dredging at the southern tip of the former Kai Tak Airport runway for construction of the quay deck structure for the two berths of the cruise terminal. The estimated volume of C&D material to be removed from the existing seawall is approximately 256,100 m<sup>3</sup>. The C&D material comprises rock armour, rockfill and general fill. Figure 2.6 of the EIA Report, attached in **Appendix 3**, indicated the extent of the existing seawall. The following table summarized the estimated volume of each type of C&D materials to be generated from this Project.

Type of C&D Materials	Estimated Volume Generated (m <sup>3</sup> )
Rock Armour	56,900
Rockfill	143,300
General Fill	55,900

### 3.0 C&D Materials Reuse

3.0.1 It is assumed all C&D material generated from the Project would require off-site disposal. Seawall construction relies very heavily on the grading of materials. If the materials are not graded properly then there is the risk that the reclamation will wash out through the seawall and the seawall will collapse. Whilst the as-built drawings of the existing runway seawalls and reclamations have been obtained they do not give any information as to the grading of the existing materials. As such it is not possible with the information available to make any accurate assessment as to which materials may be suitable for reuse. In-situ site investigation will be carried out after the commencement of construction to estimate more accurately the quantity of material suitable for reuse.


3.0.2 However, the Contractor will reuse the C&D materials on-site as much as possible for both permanent and temporary works. Where possible the existing material will be blended with other new material to achieve the required grading for seawall construction. Materials arising from seawall removal will be sorted on-site to recover suitable materials for reuse before disposal to designated grounds.

#### 3.1 On-site Sorting Facility

3.1.1 Excavated inert C&D materials from the existing seawall, mainly rock armor, rock fill and general fill will be sorting by an on-site sorting facility and stored for reuse. Layout of sorting facility and storage area are shown in Drawing No. CD-0002d and CD-0003c in **Appendix 4**.

3.1.2 Excavated inert C&D materials will be transported to the sorting facility by dump truck. The on-site sorting facility (the grizzle) will be located in Portion WA1, it compress of a serious of 200x150 I-beams. The width between each I-beam is 200mm. Materials will be dumped on the grizzle, rock size bigger than 200mmm will be screened out. Soil/rock less then 200mm, not suitable for reconstruction of seawall, will be stored for later use or disposal. Suitable materials will be sorted out by backhoe and transported to storage area. Over size rocks will be further processed, by breaker, re-screened again to obtain specified type of suitable material.



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### 3.2 Reuse of Materials

3.2.1 The Contractor will reuse suitable materials for the Project. The following is an estimation of the quantity of C&D materials to be reused in the Project. Actual quantity will vary depend on the materials quality:

Type of C&D Materials	Estimated Volume Generated (m <sup>3</sup> )	Estimated Volume to be Reused for the New Seawall Construction (m <sup>3</sup> )	Estimated Volume to be Reused in other Projects or Disposed Offsite (m <sup>3</sup> )
Rock Armour	56,900	56,900	0
Rockfill	143,300	100,310	42,990 (see Notes & para. 3.2.3)
General Fill	55,900	11,000	44,900 (see Notes & para. 4.1.1)
Notes: It is anticipated that the majority of the rock armour dredged from the existing runway seawall is of suitable size and condition and can be sorted and re-used in the new seawall. As regards rockfill, the portion of the dredged materials which are suitable for re-use is expected to be generally lesser given the increased difficulty in sorting these finer materials to meet the required size and grading for re-use. See paragraph 3.2.3 for the handling of surplus rockfill. As for general fill, the contract required backfilling volume is less than the material generated. See paragraph 4.1.1 for the handling of surplus general fill.			

3.2.2 Surplus materials for reuse in other projects, either collected by other parties or delivered to other sites will be arranged if possible to reduce disposal at public fill reception facilities.


3.2.3 Surplus rock fill material with defined size will be stockpiled in other locations for reuse. Upon instruction by the Engineer, coordination with the other contractors of the CEDD Contract No. KL/2008/02 – Decommissioning and Decontamination Works at the South Apron of the Former Kai Tak Airport, who are in possession of the Area 1 and Area 2, for the use of Area 1 and Area 2 as shown on Drawing No. 08290/1024 in **Appendix 5** for stockpiling of surplus rock fill material generated from the seawall demolition. The material should be screened, separated and broken down in order to obtain the specified type of suitable material for stockpiling in Area 1 and Area 2. The size of the material for stockpiling should be no greater than 400mm and no less than 150mm (or any other size as instructed by the Engineer).

### 4.0 Disposal of Surplus Materials

#### 4.1 Inert C&D Materials

4.1.1 The inert portion of the C&D materials comprising rock, rubble, boulder, earth, soil, sand, concrete, asphalt, brick, tile, masonry or used bentonite, etc. which cannot be reused on-site or in other projects will be disposed of by marine or land access to the Tuen Mun Area 38 Fill Bank which was designated by the Public Fill Committee of CEDD or other disposal outlets as directed by the Engineer as the public fill reception facility.

4.1.2 With regard to the material to be generated from the removal of the abandoned Kai Tak Runway submarine outfall, much of the material will be removed by grab dredger with no clear view of what is being picked up the grab underwater. As such the material being loaded into the barge will be a mixture of rubble and marine mud. It is not practical to assume that these materials can be separated during the dredging process.

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- 4.1.3 Dredging works for removal of the abandoned Kai Tak Runway submarine outfall will be incorporated into the Stage 1 dredging works and all material generated from the outfall removal would be disposed off-site as marine sediments. The requirements as stipulated in the ETWB TC(W) No. 34/2002 and the Dumping at Sea Ordinance Cap.466 (DASO) will be followed.
- 4.1.4 All sorted and processed surplus materials arising from or in connection with the works not suitable for reuse will be promptly removed off-site to minimize temporary stockpiling on-site to Tuen Mun Area 38 public filling facility by vessel, or a location as notified by the Engineer.
- 4.1.5 Billing account for disposal of materials have been allocated by EPD. The account number is 7009888. The Contractor is applying to CEDD for vessel to be approved for delivering fill material to public fill reception facilities. Disposal via land will be arranged as emergency if necessary.
- 4.1.6 When delivering inert C&D material to public fill reception facilities, the material shall consist entirely of inert construction waste and of size less than 250mm or other size as agreed with the Secretary of the Public Fill Committee. In order to monitor the disposal of the surplus C&D material at the designed public fill reception facility and to control fly tipping, a Trip Ticket System (attached in **Appendix 6**) is developed and will be implemented for off-site disposal.
- 4.1.7 To control overload, the dump truck retrofitted pressure gauge will be checked after loading of material by the dump truck driver and foreman to ensure no overloading.

## 4.2 Reporting

- 4.2.1 The Contractor is responsible to report the cumulative waste disposal figures to the ET by the end of each month during the dredging work period for EM&A reporting

## 5.0 Organization Structure

- 5.0.1 The Contractor recognizes overall responsibility to effectively manage to reduce/minimize C&D generation throughout the construction period. To achieve this objective, the following staff shall be assigned to control, coordinate, monitor and implement the measures throughout the Project. Staff in the team and their responsibilities are listed below:

Contractor Staff	Responsibilities
<i><b>Project Manager</b></i>	<ul style="list-style-type: none"> <li>- have overall responsibilities for all environmental matters on the Project and provision of resources and facilities for the implementation of all proposed measures.</li> <li>- be responsible for ensuring that the measures are regularly reviewed.</li> </ul>
<i><b>Deputy Project Manager</b></i>	<ul style="list-style-type: none"> <li>- have overall responsibilities for all environmental matters on the Project, and provision of all resources and facilities for the implementation of all proposed measures.</li> <li>- be responsible for ensuring that the measures are kept up to date and implemented.</li> </ul>
<i><b>Site Agent</b></i>	<ul style="list-style-type: none"> <li>- be full time on-site and familiar with the proposed measures.</li> <li>- monitor to ensure that the operation under his control are conducted in accordance with the foregoing requirements and take urgent and</li> </ul>



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	<p>appropriate action to prevent improper working practices or other infringements of statutory or waste management plan requirements under the direction of the Project Manager, attend and participate in Site Safety and Environmental Management Committee meeting and Site safety and Environmental Committee meeting.</p> <ul style="list-style-type: none"> <li>- has a power to issue the suspension of work order to all subcontractors or any activity for those work is not comply with the requirements.</li> <li>- responsible for the provision of resources and facilities for the implementation of all measurers.</li> </ul>
<i>Operation Manager and Construction Managers</i>	<ul style="list-style-type: none"> <li>- be full time on-site and be responsible for the overall management of the C&amp;D materials generated from the works.</li> <li>- ensure that all lines management is conversant with the relevant requirements and that all are assigned appropriate duties and responsibilities to assist in its effective implementation.</li> <li>- establish and maintain a direct line of communication between himself and all other team members.</li> <li>- vested the power to issue the suspension order to all sub-contractor and site staff whose works is not complies with the relevant requirements.</li> </ul>
<i>Environmental Officer and Environmental Supervisor</i>	<ul style="list-style-type: none"> <li>- communicate with the construction team and work out possible measures to reduce/minimize generation of C&amp;D materials.</li> <li>- monitor and record the implementation of the measures.</li> <li>- conduct and arrange training to all personnel.</li> <li>- inspect the workspace to identify potential environmental hazards and report the findings with recommendations for correction to the construction team and the Site Agent.</li> </ul>
<i>All Personnel</i>	<ul style="list-style-type: none"> <li>- have a statutory duty to take reasonable care for the environment.</li> <li>- with regard to the statutory duties impose on their employer, cooperate with their employer to enable him to comply with the relevant requirements.</li> <li>- use the appropriate work methods and equipment.</li> <li>- familiarize themselves with the relevant requirements during training.</li> </ul>

## 5.1 Contractor Communication

5.1.1 Effective two-way communications shall be developed to initiate the flow of information among different parties. The communication is mainly through the regular meetings, method statement submissions, site inspections and environmental awareness promotion activities between the Contractor, work force and sub-contractors.

## 6.0 Good Site Practices

6.0.1 The C&D material to be disposed off-site should be transported and handled in a manner that would minimize the disturbance to the environment. The following mitigation measures to minimize



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potential environmental impacts will be implemented.

- Training of site personnel in proper waste management and chemical waste handling procedures.
- Provision of sufficient waste disposal points and regular collection for disposal.
- Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed container.
- A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).

## 6.1 Waste Monitoring Site Inspections

6.1.1 Waste monitoring inspection shall be conducted with the general environmental inspections to provide a direct means to ensure the compliance with specified waste management procedures and protocols. The general site inspections will be undertaken weekly to check all construction activities in compliance with all appropriate environmental protection and pollution control measures, including measures in this proposal.

6.1.2 The aims of the waste monitoring are:

- 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.

6.1.3 Site Agent and Environmental Officer shall attend the weekly inspection. Project Environmental Team Leader is responsible preparing and updating the checklist for use during the weekly site audit and for monitoring the follow-up actions arising from the inspection. Sample of the Weekly Site Audit Checklist is attached in **Appendix 7**.


6.1.4 Where necessary, the Contractor will review the scope of the inspection. In the event of any notice of non-compliance or complaint is received, the Contractor shall initially propose corrective action to the Engineer. This shall be in accordance with the requirements of the relevant environmental complaint procedure.

6.1.5 The following items shall be included in the agenda for discussion at every Site Safety and Environmental Management Committee meeting and Site safety and Environmental Committee meeting for performance monitoring.

- review the proposal including the quantities and types of C&D materials generated, reused and disposed off-site. The amount of fill materials imported to the Site and quantity of timber used in temporary works for each construction process / activity shall also be included;
- monitor the achievement of the measures to assess its effectiveness; and
- monitor the follow-up actions on defects and deficiencies identified.

## 6.2 Provision of Training

6.2.1 Environmental talk or training will be arranged to all site personnel conducted by Environmental Officer or Environmental Supervisor. The training shall cover the waste management policy, requirements, and measures on the Site.

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### 6.3 Waste Flow Table

6.3.1 To record the quantities of C&D materials generated, recycled and disposed each month, a Monthly Summary Waste Flow Table (sample shown in **Appendix 8**) will be submitted to the Engineer's Representative no later than the 15<sup>th</sup> day of each month following the month reported on, or if it is a General Holiday, the day following the General Holiday.

### 6.4 Mitigation Measures to Reduce Environmental Impact During Works

6.4.1 Mitigation Measures include:

- All construction plants / machineries will be checked / serviced on a regular basis during the courses of construction to minimize the emission of noise generation and eliminate dark smoke emission.
- All dump trucks will be equipped with mechanical covers to prevent the dust emission during transportation when necessary.
- To avoid contamination to the sea, silt curtain will be provided around the works area to prevent muddy water being washed away from works area.
- Dust control measures, such as cover and water spraying system, will be provided at sorting facility.
- Fuelling of equipment will be conducted carefully on-site by mobile tanker to avoid storage of fuel and oil spillage.
- All dump trucks should be washed to remove and dusty materials from its body and wheels before leaving a construction site. Two wheel washing bays at both site exits will be provided as indicated on the Drawing No. SK-0053 in **Appendix 9**. The area where vehicle washing takes place and the section of the road between the washing facility and the exit point are paved with concrete.

6.4.2 Mitigation Measures for prevention of potential dust and water pollution impact from temporary stockpiling of C&D materials in accordance with the Air Pollution Control (Construction Dust) Regulation and EPD's Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN1/94) will be provided, in particular:

- Stockpile shall be located away from water front or storm drains as far as possible.
- Stockpile shall be covered with tarpaulin or similar fabric.
- Stockpile height will be limited to control fugitive dust emission.
- All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation.