Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel

Project Profile

October 2008

Civil Engineering and Development Department

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APPENDIX

1. BASIC INFORMATION

1.1 Project Title

Providing Sufficient Water Depth for Kwai Tsing Container Basin (KTCB) and its Approach Channel.

1.2 Purpose and Nature of the Project

The purpose of the Project is to dredge the seabed of KTCB, as well as portions of Northern Fairway and Western Fairway to provide the necessary manoeuvring basin and approach channel to Kwai Tsing Container Terminals (KTCT) with adequate draught for the new generation of the ultra-large containerships.

1.3 Name of Project Proponent

Civil Engineering Office, Civil Engineering and Development Department (CEDD), the Government of Hong Kong Special Administration Region

1.4 Location and Scale of Project and History of Site

1.4.1 The location of the project sites include the whole KTCB as well as portions of Northern Fairway and Western Fairway which are shown on the drawing no. **2008AUG001** at Appendix**.** The existing seabed levels of the project site are largely in the range between -15.5m C.D. and –16.5m C.D. The project sites are currently used by the user cointainerships of KTCT and other vessels nagavitating in the vicinity.

1.4.2 The KTCT locates in the north-western part of the harbour which have nine container terminals with 24 berths of 7,694 metres of deep sea frontage. The container terminals construction project was undertaken in a number of phases and the phase one works was commenced in 1969. According to the ground investigation (GI) stations carried out in the period 1981 to 1993 under various projects in or near the project sites, the existing seabeds of the project site are on a deep layer of soft grey marine clay. The clay becomes less soft with depth and is underlaid by stiffer or more compact ground consisting of firm brown sandy clay or silt, or in some places compact brown clayey sand with or without gravel content.

1.4.3 The KTCT are operated by five companies, namely Modern Terminals Ltd. (MTL), Hongkong International Terminals Ltd. (HIT), COSCO Information & Technology (H.K.) Ltd. (COSCO), CSX World Terminals Hong Kong Ltd (CSX) and Asia Container Terminals Ltd. (ACT). Under land granted conditions, the terminal operators are required to maintain a strip of seabed of approximately 50m wide along the terminals.

1.4.4 The basic information of the nine container terminals are summarised in Table 1.

Terminal	Operator	Water Depth (m)	Berths	Quay cranes
Terminal 1 (CT1)	MTL	14	1	4
Terminal 2 (CT2)	MTL	14	1	5
Terminal 3 (CT3)	CSX	14	1	6
Terminal 4 (CT4)	HIT	12.5	3	8
Terminal 5 (CT5)	MTL	14	1	4
Terminal 6 (CT6)	HIT	12.5-15.5	3	11
Terminal 7 (CT7)	HIT	15.5	4	15
Terminal 8 East (CT8E)	HIT/COSCO	15.5	2	9
Terminal 8 West (CT8W)	ACT	15.5	2	8
Terminal 9 North (CT9N)	HIT	15.5	2	9
Terminal 9 South (CT9S)	MTL	15.5	4	13

Table 1 – Basic Information of Kwai Tsing Container Terminals

1.4.5 In May 2008, the Permanent Secretary for Transport and Housing (Transport) signed off a Project Definition Statement (PDS) and requested Director of Civil Engineering Development (DCED) to undertake the dredging works of this project. DCED accepted the request. As highlighted in the PDS, the Hong Kong Port Development Council, Hong Kong Logistics Development Council and Hong Kong Maritime Industry Council all supported the project which facilitates the safe navigation of the ultra large containerships to KTCT. Also, in the context of the 2008 Budget, the Secretary for Transport and Housing has put forward the project as one of the budget initiative.

1.5 Number and Types of Designated Projects to be Covered by the Project Profile

The Project will involve dredging about 5.5 million cu.m. sediment, which falls within item C.12 of Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) in that the dredging operation will exceed 500,000 cu.m.. It is therefore considered as a Designated Project requiring an EIA report subject to approval of the Director of Environmental Protection under EIAO.

1.6 Name and Telephone Number of Contact Person

All queries regarding the Project can be addressed to:

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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Implementation Time Table

2.1.1 The objective of the Project is to carry out necessary dredging works in KTCB and portions of Western Fairway and Northern Fairway. The dredging works will be carried out together with series of appropriate mitigation measures so as the environmental impacts generated during the construction stage will be minimised and be controlled at acceptable levels.

2.1.2 It is planned to implement the works as soon as possible so as the ultra-large containerships can use the KTCT in 2012. A round the clock 24-hour dredging operation is assumed in a bid to meet the extremely tight target completion as requested in the PDS. The preliminary yearly dredging output forecast is listed as follows:-

Fiscal Year	In-situ Volume of Type 1 (Open Sea) Sediment Produced (cu.m)	In-situ Volume of Type 2 (Confined Marine) Sediment Produced (cu.m)
2010-11	200,000	800,000
2011-12	550,000	2,200,000
2012-13	350,000	1,400,000
Total	**1,100,000**	**4,400,000**

2.1.3 The dredging works is planned to commence in October 2010 for completion in 2012. It will be conducted in a number of stages to suit the daily operation of the container terminals. About 4.4 million cu.m of sediment will be dredged in the hub project area (i.e. KTCB and part of the Northern Fairway) while 1.1 million cu.m will be dredged in the Western Fairway respectively.

2.1.4 Grab pontoon dredger or trailer suction hopper dredger would be used in the project subject to their environmental impacts have been carefully assessed and accepted by the relevant authorities. There would be two or three dredging locations within the project areas in different phases of the works programme. At each dredging location, one grab pontoon dredger (app. 50m long x 20m wide) moored in conjunction with one hopper barge (app. 50m long x 20m wide for receiving the dredged sediment) or alternatively a small to medium size trailer suction hopper dredger (app. 100m long x 20m wide x 6m draught) will be used. On top of these, laden or empty hopper barges will be travelling to and fro the disposal ground and the dredging area. A marine traffic impact assessment (MTIA) will be carried out in the detailed design stage to assess the marine traffic impacts arisen from the dredging fleet. Appropriate mitigation measures will be proposed to minimise the impacts to the acceptable level.

2.2 Interactions with other Projects

2.2.1 There are likely interactions with the following proposed projects next to or outside the Project Area:

(i) The government is studying the feasibility of construction of Container Terminal No.10 in Southwest Tsing Yi which might involve substantial dredging works. Its implementation programme will be closely checked throughout EIA study to ensure the cumulative impacts, if any, have been properly assessed and catered with in the EIA Study.

(ii) Proposed dredging for marine Sand, South of Tsing Yi

(iii) Proposed laying of submarine cable between Kennedy Town and Outlying Islands, part of which falls inside the submarine utilities area across the Western Fairway.
(iv) Proposed submarine cable from Tong Fuk to Chung Hom Kok, part of which falls inside the submarine utilities area across the Western Fairway.
(v) Operations at the South of Tsing Yi disposal facility.
(vi) The dredging operations and seawalls modification works carried out by the container terminals' operators in associated with this seabed deepening project.

2.2.2 Apart from the above, it is anticipated that there are unlikely interactions with other projects, since the project site is located far away from all land-based sensitive receivers and development areas.

3. POSSIBLE IMPACTS ON THE ENVIRONMENT

3.1 General

3.1.1 An outline of the environmental impacts or issues is given in the following paragraphs. In general, the environmental impacts arising from the dredging works are controllable. Close liaison among CEDD/ Environmental Protection Department (EPD)/ Marine Department (MD) and container terminal operators will be maintained throughout all stages of the project to minimize and abate the environmental impacts arisen.

3.2 Air Quality

Gaseous Emission

3.2.1 A low level of gas emission from the dredging fleet is anticipated. The dredging contract will specify that all constructional plant powered by diesel fuel must use ultra low sulphur diesel which is in line with the Development Bureau's policy for environmental management on construction sites as stipulated in Environment, Transport and Works Bureau Technical Circular (Works) No. 19/2005.

Dust

3.2.2 No dust problem is envisaged as the operation is marine based and disposal will be by barge.

Odour

3.2.3 Site observations during the routine maintenance dredging in Kwai Tsing Container Terminal reveals that there is little or no odour arising from the dredging operation.

3.3 Noise Impacts

3.3.1 Construction noise would be generated by the dredging fleet throughout the works period. The emanated noise will probably blend with the container terminals background operational noise. Pre-project baseline noise monitoring will be conducted to define the baseline noise level. Impact noise monitoring will be carried out regularly during works to ascertain the construction noise level emanated. The data of the noise monitoring will be analysed in accordance with the "Technical Memorandum on Noise from Construction Work other than Percussive Piling" and reported to EPD for scrutiny.

3.3.2 The project site is in large open area. The nearest sensitive receivers would be in Tsing Yi Island and Kwai Chung. The dredging works will be carefully planned to reduce the noise impacts to the nearby residents.

3.3.3 It is likely that night-time operations will be required for optimising the daily dredging output and overall efficiency which can in turn reduce the interference to the public and mitigate the associated environmental impacts by shortening the project time. Appropriate noise mitigation measures (e.g. silencers, silent engines and noise enclosures etc.) will be explored and adopted. In case dredging works in restriction periods (including evening, night-time and holidays) are planned, Construction Noise Permit will be obtained from EPD in accordance with Noise Control Ordinance.

3.4 Marine Traffic

3.4.1 The project sites are on the KTCT turning basin or the fairways leading to KTCT where the marine traffic is always busy over the whole year. A Marine Traffic Impact Assessment (MTIA) would be carried out by marine traffic consultant separately. The MTIA's recommendations/ findings will be considered for works programme planning and dredging plant selection. The preliminary dredging fleet deployment has been detailed in Section 2.1.4 above. In this scale, the marine traffic impacts generated by the dredging fleet should be controllable through close liaison among the container terminal operators/CEDD/MD.

3.5 Water Quality

3.5.1 Dredging will increase the turbidity of water and suspended particles level. Our preliminary search indicates that there is no seawater intake within 100m from the project area. The nearest sensitive receivers are water inlets for flushing water of Tsuen Wan Seawater Pumping Station, Tsing Yi Seawater Pumping Station, Cheung Sha Wan Seawater Pumping Station and cooling water intake for Princess Margaret Hospital. With carefully devised mitigated measures, the risk of the sediment plume generated by the dredging operation to clog the intake or the pumping equipment is low. Notwithstanding the above, hydraulic modelling will be set up to predict the extent of the impact. We would adopt silt curtain or closed dredging grab which are common and effective mitigation measures to prevent sediment plume dispersing to the sensitive receivers.

3.5.2 There are existing outfalls, namely submarine outfalls from Kwai Chung Primary Treatment Works and Tsing Yi Primary Treatment Works fall within the project sites while the outfall from Stonecutters Island Sewerage Treatment Works falls adjacent to the project areas. A Drainage Impact Assessment (DIA) Study will be conducted during the EIA stage to assess the impacts to the above drainage outfalls. The DIA Study report and dredging works proposal will be sent to the Director of Drainage Services for comment and agreement in due course.

3.5.3 The project will be implemented in a coordinated manner with other capital dredging projects and maintenance dredging works to avoid concurrent dredging during the peak period of 2011 and 2012. In any case, cumulative impacts arising from these projects will be jointly assessed.

3.6 Wastes and Contaminated Sediment

3.6.1 Wastes generated by construction works are likely to include site wastes, workforce wastes, chemical wastes, and construction and demolition materials. Chemical wastes, including residual fuel, solvent and lubricating oil may be generated from the dredging plant. These wastes, though small in quantities, should be collected by licensed contractor and disposed off-site at the designated treatment centre(s).

3.6.2 From the maintenance dredging record on KTCB and the approach fairways between 2002 to 2008, it is reasonable to assume that the sediment dredged from the KTCB would be sediment requiring Type 2 – Confined Marine Disposal as determined according to Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002, which is currently disposed of at the East Sha Chau mud pit. While for the sediment dredged in Western Fairway, it would be sediment suitable for Type 1 – Open Sea Disposal that is currently disposed of at the South Cheung Chau/East Ninepin disposal facilities. The preliminary yearly forecast on dredging output is listed in section 2.1.2 of this report. Marine Fill Committee has been informed of this preliminary disposal requirements arising from this project. Further detailed site investigation will soon be carried out so as to verify the correctness of the assumption and estimation.

3.7 Risk of Accidents which would result in Pollution or Hazard

The project area is within the consultation zone of the oil terminals located on Tsing Yi Island which are classified as Potential Hazardous Installations (PHI). The time duration of the dredging works to be carried out within the consultation zone of the oil terminals and the induced population associated with the works will be submitted to the Electrical and Mechanical Services Department for assessment in the detailed design stage when such information becomes available.

The operators of the oil terminals in Tsing Yi Islands will be consulted for any concerns on the project during the course of the EIA Study.

3.8 Disruption of Water Movement

No disruption of water movement in long term is envisaged because the seabed is only deepened for about 1.5 metres from –15.5m C.D. to –17m C.D. The disruption of water movement during dredging is considered insignificant because the works will take place in open sea but not in closed water body. We shall introduce silt curtains to restrain the dispersion of sediment plumes during dredging works; which is a common and effective mitigation measure to reduce impact to water quality.

3.9 Unsightly Visual Appearance

The presence of dredging fleet is no different from that of the routine maintenance dredging within the container basin and fairways. Therefore no significant visual impact is expected, either from dredging or stockpiling.

3.10 Ecological & Fishery Impacts

3.10.1 The project sites in KTCB and the Northern Fairway, with grossly polluted seabed, expected to have low ecological value and dredging will not pose unacceptable impacts to the local benthic communities. The sediment quality report for past maintenance dredging in these project sites can substantiate this point.

3.10.2 The project site in Western Fairway is part of a busy navigation channel where maintenance dredging takes place regularly. Nevertheless, potential impact to marine habitats would be assessed in the EIA Study.

3.10.3 Bearing in mind that the project sites are in container basin or navigation fairways where fishing activities are rare. We do not consider there is any significant impact to the fishing due to this project.

3.10.4 Ma Wan, Lo Tik Wan, Sok Kwa Wan and Cheung Sha Wan Fish Culture Zones are approximately 5km, 6km, 7km and 11km from the nearest dredging boundaries respectively. Impact to them will be assessed in the fisheries study included in EIA Study.

3.10.5 Ecology study will also be included in the EIA Study to confirm whether there is any sensitive and important marine habitats/ species such as coral within the dredging area. Particular attention will be paid to the nearby coral sites such as Green Island, Kau Yi Chau, Peng Chau, and appropriate/ practical mitigation measures will be proposed in EIA report for implantation in the construction stage. Impact due to dredging of KTCB and its approach channel on marine habitats/ species such as marine benthic communities, intertidal, marine mammals and corals, would also be assessed in the EIA study. Ecological field surveys may be needed, depending on the finding of literature review.

3.11 Cultural Heritage

As the subject sites are either on KTCB or navigation fairways, of which both are subject to constant surveillance for the purpose of maintenance dredging, there is little chance of existence of any items of archaeological value at the concerned seabed. Nevertheless, a Marine Archaeological Review would still be conducted for this project. If marine archaeological potential is identified in the review, a Marine Archaeological Investigation (MAI) shall be carried out. Such Marine Archaeological Review and MAI, if required, will be included as part of the EIA Study.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 The project sites are either on KTCB or fairways in open sea. There are no sensitive receivers within the Site. The nearest sensitive receivers would be the residential estates in Tsing Yi Island and Kwai Chung. There are to our knowledge no natural habitats of high ecological value in the surrounding area.

4.2 Project site in KTCB and associated navigation fairways in open sea is not accessible by the general public under normal circumstance and the dredging works should not constitute visual impact and large concern of the general public. Other environmental impacts, which will be properly kept under control by the project team, should not be easily discerned by the public.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

5.1 Measures to Minimize Environmental Impacts

5.1.1 The future EIA for this project will identify, assess and specify methods, measures and standards to be included in the detailed design and dredging works, which are necessary to mitigate the cumulative environmental impacts and to reduce them to acceptable levels.

5.1.2 An initial list of mitigation measures is as follows:

Key Environmental Impacts	**Mitigation Measures to be Considered**
Air Quality	*Emission* • Plant will be carefully chosen and maintained (such as adequately lubricated) to minimize gas emission. • All constructional plant powered by diesel fuel must use ultra low sulphur diesel *Dust* • Not required *Odour* • Not required
Noise	• Plant will be carefully chosen and maintained (such as adequately lubricated) to minimize noise generation. In view of the location of the Project site is not close to sensitive receivers, it is unlikely that noise from the construction works would be a concern. All works carried out during restricted hours will be under the control of Construction Noise Permit.
Marine Traffic Impacts	• To use high efficiency dredging plant in order to limit plant resources to as reasonably low level as possible • To set up good navigational guide systems • To liaise closely with Marine Department and other stakeholders for updating the programme or any special traffic arrangements within and near the project site
Water Quality	• The sediment plume generated will be carefully studied by computer model in the EIA Study and intensively monitored in the construction phase. • Closed type silt curtains will be installed at the dredger. • Pending the results of the prediction of modelling, silt curtain could be installed too at the seawater intakes if found to be adversely affected. • Environmental Monitoring & Audit will be carried out including implementing action plans during the construction stage.

Key Environmental Impacts	**Mitigation Measures to be Considered**
Waste Management & Disposal of Contaminated Sediment	• Waste management in the way of avoiding, minimizing, reusing, and recycling should be adopted to reduce waste generation. In addition, on site sorting of dredged debris will be carried out. Scrap metals or abandoned equipment will be recycled, if possible. • The contaminated sediment will, subject to its detailed classification by a forthcoming site investigation, be properly disposed off to relevant designated dumping ground(s). No significant impact is expected in this regard. • Should special treatment be required to handle the heavily contaminated sediment (i.e. Type 3 – Special Treatment Disposal), which is unlikely to be found, we have the experience and will handle the disposal properly by for example dumping the sediment in proprietary geo-bags.
Risk of Accidents which would result in Pollution or Hazard	• Nil
Disruption of Water Movement	• Nil
Unsightly Visual Appearance	• Nil
Ecological & Fishery	• Environmental monitoring and auditing together with action plan will be implemented, though it is unlikely that unacceptable impact will occur. Preliminary diving inspection at the existing seawall prior to dredging will be carried out to ascertain this point. • Even though fisheries specific mitigation measures may not be considered necessary, mitigation measures for minimizing water quality impacts should be implemented for potential indirect fisheries impact
Cultural Heritage	To exercise precautionary dredging operation and report to Antiquities and Monuments Office immediately in case of any suspected cultural heritage be found on seabed.

5.2 Possible Severity, Distribution and Duration of Environmental Effects

Short Term Effect

5.2.1 Potential environmental impacts described in Section 3 are expected to last for the construction period only. As such, the effects are considered to be temporary and short term.

Beneficial Effects

5.2.2 The existing seabed level of the project sites is around –15.5m C.D. The water depth is insufficient for the next generation of ultra-large containerships to navigate to KTCT to use its facilities. This project will provide a route and turning basin with sufficient water depth for safe navigation of ultra-large containerships. As a result, the competitiveness of Hong Kong as a regional hub port in the world can be maintained and enhanced.

5.3 Implications of the Project

5.3.1 Since this project is to facilitate the new generation of ultra-large containerships to use KTCT's facilities, which will in turn enhance the competitiveness of Hong Kong as a regional hub port in long term, any objection to the implementation of the project is unlikely. Because the projects sites are not prominent to the general public, we foresee that this project will not draw much public attention. The main stakeholder affected by the project would be the KTCT operators and user containership pilots. A Working Group comprises the representatives from CEDD, MD and KTCT operators has been formed and regular meetings will be held to keep the members abreast of latest development of the project. The opinions and inputs from the members can be reflected and obtained promptly.

5.3.2 The dredging works will have impacts on the marine navigation, berthing/unberthing operations and port traffic control. The views of MD and Hong Kong Pilots Association will be solicited and incorporated in the project implementation.

5.3.3 The dredging works may have impacts to the two existing submarine outfalls of Kwai Chung and Tsing Yi Preliminary Treatment Works, the extent of which will be ascertained in the findings of the Drainage Impact Assessment.

6. Use of Previously Approved EIA reports and Subsequent Study Reports

The register of approved EIA Report in the On-line Cyber Help Bench for EIA has been searched. No relevant approved EIA Report can be used.

APPENDIX

Drawing No. 2008AUG001 Site Layout Plan and Location of Sensitive Receivers

荃灣區
TSUEN WAN DISTRICT

荃灣
TSUEN WAN

荃灣海水抽水站
Tsuen Wan Cental Sea Water Pumping Station

葵青區
KWAI TSING DISTRICT

葵涌
KWAI CHUNG

青衣
TSING YI

馬灣航道
MA WAN FAIRWAY

汲水門航道
KAP SHUI MUN FAIRWAY

北航道
NORTHTERN FAIRWAY

荔枝角
LAI CHI KOK

長沙灣
CHEUNG SHA WAN

深水埗區
SHAM SHUI PO DISTRICT

油尖旺區
YAU TSIM MONG DISTRICT

油麻地航道
YAU MA TEI FAIRWAY

青洲北航道
NORTH GREEN ISLAND FAIRWAY

南航道
SOUTHTERN FAIRWAY

中央航道
CENTRAL FAIRWAY

西航道

ADAMASTA CHANNEL 北長洲海峽

WESTERN FAIRWAY

堅尼地城
北環
西環
中環
中西區
CENTRAL & WESTERN DISTRICT

南區
SOUTHERN DISTRICT

香港島
HONG KONG ISLAND

圖例
LEGEND :

挖泥區域,海床面水平高於海圖基準-17.0米
AREA OF WATER DEPTH LESS THAN -17.0m CD WHERE DREDGING WILL BE REQUIRED

區議會分區界線
DISTRICT BOARD BOUNDARY

航道
FAIRWAY

	name/post		initial	date
designed	K.S.TAM	E/M1D	SIGNED	17.10.2008
drawn	H.P.LAI	TO	SIGNED	17.10.2008
traced	H.P.LAI	TO	SIGNED	17.10.2008
checked	K.M.LAU	Ag.SE/M1	SIGNED	17.10.2008

approved

SIGNED
(LAM Sing-kwok)
Chief Engineer/Port Works
date : 17.10.2008

drawing title

工程位置及易受影響地方圖
SITE LOCATION PLAN AND ENVIRONMENTAL SENSITIVE RECEIVERS

drawing no.
2008AUG001

scale
1 : 15 000

office
PORT WORKS DIVISION
CIVIL ENGINEERING OFFICE

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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