Agreement No. CE 65/2006 (DS)
Port Shelter Sewerage
Stage 2 and Stage 3 –
Design and Construction

Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O Project Profile

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382770/048/Issue 1

Report Authorized For Issue By:	For and on Behalf of Black & Veatch Hong Kong Limited

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Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O Project Profile			Client: DSD	Initials: MC
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All	February 2013	Issue 1	Final report for EIAO submission	MC

*The Registered Recipient is responsible for destroying or marking as 'superseded' all superseded documents.

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	Name	Signature	Date
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Checked	Eddie Yu		8 Feb 2013
Reviewed	Glenn Chan		8 Feb 2013

1. BASIC INFORMATION

1.1 Project Title

1.1.1 Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O (hereinafter referred to as the "Project").

1.2 Purpose and Nature of the Project

1.2.1 In November 1989, Environmental Protection Department (EPD) commissioned a consultancy study entitled "Port Shelter Sewerage Master Plan Study" (SMP) to develop a Sewerage Master Plan for the provision of adequate sewerage and sewage treatment and disposal facilities in Sai Kung Port Shelter areas. The SMP was completed in March 1991. The SMP revealed that sewage generated from the unsewered areas was only partially treated mostly by septic tanks and soakaway systems, and discharged into streams and watercourses, resulting in water pollution to the surrounding waters.

1.2.2 The Project is part of the on-going implementation of the SMP to convey sewage collected from the unsewered villages in Sai Kung to sewage treatment works for treatment and disposal. With the implementation of the Project, water quality in Sai Kung areas will further improved. Maintaining a good water quality is essential in Sai Kung, as it provides various beneficial uses, such as bathing beaches, fish culture zone and secondary contact recreational uses.

1.2.3 The purpose of the Project is to provide sewage collection, treatment and disposal facilities in Po Toi O, Sai Kung.

1.2.4 The key elements of the Project are:

(a) provision of village sewerage to the unsewered areas of Po Toi O. The works involve construction of about 800m of gravity sewers and 400m of rising mains;

(b) construction of a local sewage treatment plant with Average Dry Weather Flow (ADWF) of about 220m^3/day; and

(c) construction of a submarine outfall of about 200m in length.

1.3 Name of the Project Proponent

1.3.1 Sewerage Projects Division, Drainage Services Department (DSD).

1.4 Location and Scale of the Project

1.4.1 The Project is located in Po Toi O, Sai Kung. The extent of the sewerage works is shown in **Figure 1**.

Village Sewerage

1.4.2 Approximately 800m gravity sewers and 400m rising mains will be constructed to serve the unsewered areas of Po Toi O. The size of the proposed village sewers and rising mains are in the range of 150mm to 250mm. Majority of the proposed pipelines will be laid along existing footpaths and constructed by conventional open cut method. A short section of the rising mains near the submarine outfall will be constructed along the shoreline.

Maintenance access may be required for this section of the rising mains. The preliminary layout of the proposed village sewerage is shown in **Figure 1**. The proposed layout is for indication only and will be subject to further review in the subsequent detailed design stage.

Local Sewage Treatment Plant

1.4.3 The use of pumping station to convey the collected sewage to downstream sewerage system was investigated and considered not practical, in view of the remoteness of Po Toi O. A local sewage treatment plant is therefore required. Considering the land availability and the technical constraints in collecting sewage from the village, there are two feasible areas in which the proposed treatment plant can be located, the nearby shoreline and the area adjacent to the existing mini-bus stop at Po Toi O Chuen Road. Since locating the proposed treatment plant at the nearby shoreline (currently zoned Coastal Protection Area) would involve marine works (reclamation / dredging), greater environmental impacts are anticipated. Owing to design limitation, altering the treatment plant layout to fit the elongated shoreline is not possible. Therefore, it is considered more suitable to choose the site adjacent to the existing mini-bus stop at Po Toi O Chuen Road. Although the proposed site is located within a Conservation Area (CA) zone, it is an existing cut slope mainly covered by shrubs, some herbs and a few small trees and is disturbed by the nearby village road (see **Annex A – Photo 1**). The location was also agreed with the village representative during the initial consultation. The proposed local sewage treatment plant with design ADWF of 220 m^3/day would employ membrane bioreactor as the treatment process. The sewage treatment plant compound will occupy a site area of approximately 440 m^2 (about 26m x 17m). The treatment process and the need for disinfection will be determined in the subsequent detailed design stage. The preliminary location of the proposed local sewage treatment plant as shown in **Figure 1** is for indication only and will be subject to further assessment in the subsequent detailed design stage.

Submarine Outfall

1.4.4 In order to minimize impact to the nearby Po Toi O Fish Culture Zone (FCZ) and taking into account the requirement in the technical memorandum of the Water Pollution Control Ordinance, the treated effluent will be discharged at least 200m away from the FCZ. A 200m long pipeline was initially proposed to be laid along the nearby rocky shoreline with discharge pipe at the shore to discharge the treated effluent to the sea. However, the local residents strongly objected to any construction works to be implemented along the natural shoreline during consultation. Furthermore, as there is a large natural slope along the shoreline, substantial slope stabilization works will be required for construction and future maintenance of the proposed pipeline (see **Annex A – Photo 2**). Therefore, it is considered more suitable to adopt a submarine outfall of about 200m in length and 2x150mm in diameter to discharge the treated effluent away from the Po Toi O FCZ (**Figure 1**). The use of horizontal directional drilling instead of dredging for the construction of the outfall to minimize impact to the FCZ will be explored. Nonetheless, to facilitate the construction of the diffuser for the outfall, localised area of dredging of about 5m x 5m will need to be conducted. For dredging related to the outfall diffuser, not more than 75 m^3 of marine sediment will need to be dredged which will be subject to further review with a view to minimize the quantity as far as possible. The exact design, alignment and construction method of the outfall is subject to further review during the detailed design stage.

1.5 Number and Type of Designated Project covered by the Project Profile

1.5.1 Based on the current preliminary design, the following works are classified as designated projects under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap.499):

- construction of a sewage treatment plant and portion of sewer alignments which are within a conservation area (under Part I, Q.1);
- dredging work at the proposed submarine outfall which are dredging operation located less than 500m from the nearest boundary of an existing fish culture zone and coastal protection area (under Part I, C.12(a)(v)(vii)); and
- a submarine sewage outfall (under Part I, F.6).

1.5.2 Various other alternative options on the design, locations, alignments and construction methods of the Project to avoid or minimise environmental impacts will be considered and further investigated in the detailed design and EIA stage.

1.6 Name and Telephone Number of Contact Person

Mr. Tony YEUNG
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Fax: 2827 8700

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

2.1.1 Environmental Protection Department is the client department and DSD is the works agent. An environmental consultant will be appointed by DSD to carry out the Environmental Impact Assessment (EIA) study. Planning and design of the proposed works is being carried out by the consultants for Agreement No. CE 65/2006(DS). Construction is tentatively scheduled to commence in late 2014 for completion in 2018. DSD will be responsible for operating and maintaining the Project.

2.2 Need of the Project

2.2.1 Po Toi O is not served by public sewers. Sewage from these unsewered areas is currently treated and discharged by means of septic tanks and soakaway systems. Improper use and inadequate maintenance of these systems would affect their pollutant removal efficiency and may even lead to an overflow of effluent. Pollution would also result if such systems are located too close to waterbodies. Under the above undesirable operation condition, sewage discharged from these unsewered areas would be a source of water pollution to the nearby marine waters. In addition, environmental hygiene in the vicinity would also be affected.

2.2.2 As a long term measure to address water pollution problems, DSD proposed the provision of a sewage treatment plant and associated sewerage network in Po Toi O. The sewage collected from Po Toi O will be treated by the local sewage treatment plant before discharge, thereby mitigating water pollution in the nearby marine waters as well as improving the living environment.

2.3 Interactions with Other Projects

2.3.1 No major projects have been identified to be carried out concurrently in the vicinity or within the Project site boundary.

2.3.2 It is noted that CEDD will undertake a project "Sediment Removal at Po Toi O Fish Culture Zone" tentatively in late 2013 for 6 months. The project consists of an one-off dredging works during construction with no operational stage activities. Cumulative environmental impact is therefore not expected.

3. POSSIBLE IMPACTS ON THE ENVIRONMENT

3.1 Outline of Processes Involved

3.1.1 The Project will provide sewerage system, including village sewers and rising mains, local sewage treatment plant and submarine outfall for proper collection, treatment and disposal of sewage arising from Po Toi O.

3.1.2 The preliminary design of the local sewage treatment plant would incorporate membrane bioreactor technology as the treatment process. The process would consist of screen, bioreactor, sludge digester, sludge holding tank and dewatering unit. Disinfection, if required, would employ UV disinfection.

3.1.3 The treated effluent will be discharged to sea through the proposed submarine outfall. The dewatered sludge will be disposed of at landfill or other approved facilities.

3.1.4 Major construction activities will include earthworks (excavation and backfilling), pipe laying, dredging, disposal of excavated/dredged materials, building construction, and installation of electrical and mechanical equipment.

3.2 Possible Environmental Impacts during Construction Stage

Noise

3.2.1 Noise would be generated from powered mechanical equipment during construction of the Project.

Air Quality

3.2.2 Dust would be generated during construction activities such as earthworks, excavation, backfilling and building works.

Water Quality

3.2.3 Potential water quality impacts would arise from site runoff of exposed soil, earthworks and stockpiles during rainstorms and sewage generated from construction workforce. Dredging works associated with the diffuser of the submarine outfall may impact the marine water quality due to sediment release from the disturbed seabed, leading to increase of suspended solids.

Waste Management

3.2.4 Construction and demolition (C&D) materials such as excavated rock / soil, unusable concrete and grout, wood, metal scraps and packaging materials would be generated. Chemical waste and general refuse would also be generated. A small amount of marine sediment (not more than 75 m^3) may need to be excavated/dredged for the diffuser of the submarine outfall. A sediment quality investigation would be required.

Ecology

3.2.5 The main ecological impacts are associated with the permanent loss of small area of conservation area, shoreline and the deterioration of water quality, as a result of silty site runoff and dredging, affecting the nearby terrestrial and marine ecological sensitive receivers / habitats, e.g. vegetated slope, FCZ, corals, intertidal habitat and benthic communities, etc.

Fisheries

3.2.6 Construction of the submarine outfall would require marine works. The marine waters of the Project area (Eastern waters) is identified as a spawning ground for commercial fisheries resources. Potential impacts to nearby Po Toi O FCZ, fishing grounds, spawning grounds and fisheries resources may arise due to the works. A Fisheries Impact Assessment will be conducted as part of the EIA.

Landscape and Visual

3.2.7 The proposed sewage treatment plant will be constructed on an existing cut slope partly covered with vegetation (currently zoned as conservation area). The landscape and visual quality of the conservation area will be affected. A short section of rising mains and associated maintenance access near the submarine outfall will be constructed on existing rocky shore (currently zoned as coastal protection area) affecting the landscape and visual quality of the coastline.

Cultural Heritage

3.2.8 There are no known archaeological sites in the Project area. No direct adverse impacts on declared monuments are expected during the construction phase. Indirect impacts to the Grade 3 Hung Shing Temple and other built heritage resources at Po Toi O will need to be investigated in the EIA study. Potential marine deposits of archaeological interest if any will need to be investigated in a Marine Archaeological Investigation.

3.3 Possible Environmental Impacts during Operational Stage

Noise

3.3.1 The pumps, blowers, ventilation systems and other mechanical equipment of the proposed local sewage treatment plant are potential noise sources during operation.

Air Quality

3.3.2 The proposed local sewage treatment plant is the potential odour source during operation.

Water Quality

3.3.3 The Project will convey sewage collected from surrounding unsewered village houses to the proposed local sewage treatment plant for treatment and disposal. Implementation of the Project will enhance the water quality of the surrounding environment, and will not cause any adverse impacts during normal operation. The design of the local sewage treatment plant will include measures such as dual power supply or emergency generator, standby equipment, telemetry warning system and emergency buffer storage of sewage to prevent emergency bypass. Details will be proposed in the EIA. In the unlikely event such

as prolonged power failure or pump failure, sewage bypass into the marine waters of Clear Water Bay may occur, affecting the nearby water sensitive receivers including the FCZ in the semi-enclosed water of Po Toi O.

Waste Management

3.3.4 Screenings, grits and sludge generated by the proposed local sewage treatment plant will need to be handled and disposed.

Ecology

3.3.5 Potential impacts may arise in the unlikely event of emergency sewage bypass leading to impact on marine ecological sensitive receivers, e.g. FCZ, corals, intertidal habitat and benthic communities, etc.

Fisheries

3.3.6 The proposed submarine outfall pipeline will be entirely below seabed level. Only the diffuser of the outfall will form a small permanent structure (not more than 1m x 1m) on the seabed which may result in loss of a very small area of fishing and spawning grounds (less than $1m^2$). Impact to fishing ground and fishery resources is expected to be insignificant. In addition, potential impact to Po Toi O FCZ may arise in the unlikely event of emergency sewage bypass. A Fisheries Impact Assessment will be conducted as part of the EIA.

Landscape and Visual

3.3.7 The above ground structure of the proposed local sewage treatment plant and the maintenance access of the rising mains along the shoreline may induce landscape and visual impacts.

Cultural Heritage

3.3.8 No cultural heritage impact is expected during operation phase.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 Existing and Planned Sensitive Receivers and Sensitive Parts of the Natural Environment

4.1.1 Po Toi O is a small fishing village at Clear Water Bay Peninsula, Sai Kung, New Territories.

4.1.2 The identified representative sensitive receivers in the surrounding areas are summarised in **Table 4.1** and shown in **Figure 2**.

Table 4.1
Representative Sensitive Receivers in the Vicinity of the Project

Description	Type of Sensitive Receiver
Po Toi O	ASR / NSR / VSR
Fairway Vista	ASR / NSR / VSR
Tai Wong Kung	ASR / NSR / VSR
Clear Water Bay Golf and Country Club	ASR / NSR / VSR
Clear Water Bay	ESR / WSR
Shorelines at the Coastal Protection Area zone	ESR
Clear Water Bay Country Park	ESR / VSR
Conservation Area zone	ESR
Po Toi O Fish Culture Zone	ESR / WSR
Coral communities at Clear Water Bay[1] and Po Toi O*	ESR / WSR
Intertidal habitat	ESR / WSR
Marine benthic communities (including amphioxus)[2]	ESR / WSR
Spawning grounds for commercial fisheries resources and fishing grounds at Eastern waters including Po Toi O	FSR

Notes:
* Subject to further ecological survey

ASR:	Air Sensitive Receiver	NSR:	Noise Sensitive Receiver
ESR:	Ecological Sensitive Receiver	FSR:	Fisheries Sensitive Receiver
VSR:	Visual Sensitive Receiver	WSR:	Water Sensitive Receiver

4.1.3 According to AFCD marine mammal distribution data, the Project area is outside the range of Chinese white dolphins and Finless porpoises[3].

[1] Hong Kong Offshore Wind Farm in Southeastern Waters – Environmental Impact Assessment (AEIAR-140/2009). Figure 5.2.
[2] *Ibid*. Figure 5.4.
[3] AFCD website: http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/con_mar_chi_chi.html (Accessed on 22 October 2012).

4.1.4 The following built heritage resources can be found in the surrounding area:

- Hung Shing Temple (Grade 3)
- Tai Wong Kung
- Shrines and graves at Po Toi O

4.2 Major Elements of Surrounding Environment and Land Uses

4.2.1 The proposed village sewerage works will be located in zones annotated as "village", "coastal protection area" and "conservation area" under the Clear Water Bay Peninsula South Outline Zoning Plan – S/SK-CWBS/2. The proposed local sewage treatment plant will be located in a zone annotated as "conservation area".

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

5.1 Mitigation Measures during Construction Stage

Noise

5.1.1 Mitigation measures including temporary noise barriers, quiet equipment and good site practices will be recommended to minimise the construction noise impact.

Air Quality

5.1.2 The extent of dust generation from the construction works is expected to be insignificant with the implementation of dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation.

Water Quality

5.1.3 The design of temporary on-site drainage and silt removal facilities will follow the guidelines stipulated in EPD's ProPECC PN 1/94 – 'Construction Site Drainage' to control site runoff. For dredging activities, closed grab dredger and silt curtain will be used and dredging rate will be carefully controlled to minimise the marine water quality impact.

Waste Management

5.1.4 All C&D materials and waste will be sorted into different categories for reuse on site, recycling and disposal at designated public fill reception facilities or landfills. Disposal of C&D materials will be managed through the trip-ticket system. Dredged marine sediment will be managed in accordance with ETWB TCW No. 34/2002. All chemical waste will be handled, stored and disposed of in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulation.

Landscape and Visual

5.1.5 The following mitigation measures will be implemented to reduce the impact on landscape and visual qualities of the proposed works during construction.

- Retain and protect existing trees near the works site.
- Erect site hoarding compatible with the surrounding environment for the sewage treatment plant works area.
- Maintain site cleanliness and tidiness.
- Properly manage construction waste in the works area.
- Minimise the number and size of temporary works area.
- Control of night-time security lighting to minimise night-time glare to nearby village.

Ecology

5.1.6 Pollution control measures for construction dust and noise will be undertaken to reduce the ecological impact during construction. In addition, mitigation measures such as control of site runoff, use of silt curtain, closed grab dredger and careful control of dredging rate will be implemented in order to reduce the impact on water quality and thereby on the potential impact on marine ecology of the surrounding areas.

Fisheries

5.1.7 Mitigation measures such as control of site runoff, use of silt curtain, closed grab dredger and careful control of dredging rate will be implemented in order to reduce the impact on Po Toi O FCZ, fishing grounds, spawning grounds and fisheries resources.

Cultural Heritage

5.1.8 Mitigation measures to heritage resources if required will be identified in the EIA.

5.2 Mitigation Measures during Operational Phase

Noise

5.2.1 In order to minimise the potential noise impacts during operation, all mechanical equipment will be enclosed within the proposed local sewage treatment plant as far as practicable. All openings for ventilation will be located away from sensitive receivers as far as practicable and if required, fitted with acoustic louvers.

Air Quality

5.2.2 The potential odour sources of the proposed local sewage treatment plant will be fully enclosed / covered. Deodorization unit will be provided for the plant and the associated exhaust will be located away from sensitive receivers as far as practicable.

Water Quality

5.2.3 To minimise potential impacts on water quality, dual power supply or emergency generator, standby equipment, telemetry warning system and emergency buffer storage of sewage will be provided to the local sewage treatment plant as far as practicable to prevent emergency sewage bypass.

Waste Management

5.2.4 The screenings, grits and sludge will be stored in covered containers and transported to landfill (or other approved facilities) for disposal regularly. The handling of these wastes will be conducted inside the local sewage treatment plant structure.

Landscape and Visual

5.2.5 Landscape and visual enhancement measures will be provided to improve the overall landscape and visual quality of the proposed local sewage treatment plant. Such measures will include:

- Green roof design with climbers, shrubs and ground covers will be provided on the roof of the proposed sewage treatment plant.
- Trees and shrubs will be planted within the site.
- Vertical greening will be provided along the site fencing.
- Selection of colours, materials and finishes that complement with the surrounding environment.

Ecology

5.2.6 With the implementation of mitigation measures as discussed in Section 5.2.3 to prevent emergency sewage bypass, no impact to marine ecological sensitive receivers, e.g. FCZ, corals, intertidal habitat and benthic communities, etc, is expected during operation phase.

Fisheries

5.2.7 With the implementation of mitigation measures as discussed in Section 5.2.3 to prevent emergency sewage bypass, no fisheries impact is expected during operation phase.

Cultural Heritage

5.2.8 As no cultural heritage impact is expected during operation phase, no mitigation measure is necessary.

5.3 Further Environmental Implications

Beneficial Effect and Public Interest

5.3.1 At present, sewage generated from Po Toi O is only partially treated mostly by septic tanks and soakaway systems, and discharged into nearby marine waters resulting in water pollution. In the long term, the environmental and hygiene conditions in Po Toi O area will improve as a result of the Project. The public and villagers of Po Toi O can be benefitted from the improved water quality in Po Toi O.

Public Consultation to Date

5.3.2 The village representative of Po Toi O have been consulted on the proposed sewerage scheme and supported the Project. Further consultation with other stakeholders will be conducted in the EIA stage.

6. USE OF PREVIOUS APPROVED EIA REPORTS

6.1 Previous Approved EIA Reports

6.1.1 No previous EIA report has been approved or submitted for the Project.

6.1.2 Reference has been made to the following approved EIA in preparing the project profile:

- Hong Kong Offshore Wind Farm in Southeastern Waters – Environmental Impact Assessment (AEIAR-140/2009).

END OF TEXT

ANNEX A

ANNEX A
PHOTOS

Photo 1 : Existing Site Condition of the Proposed Local Sewage Treatment Plant

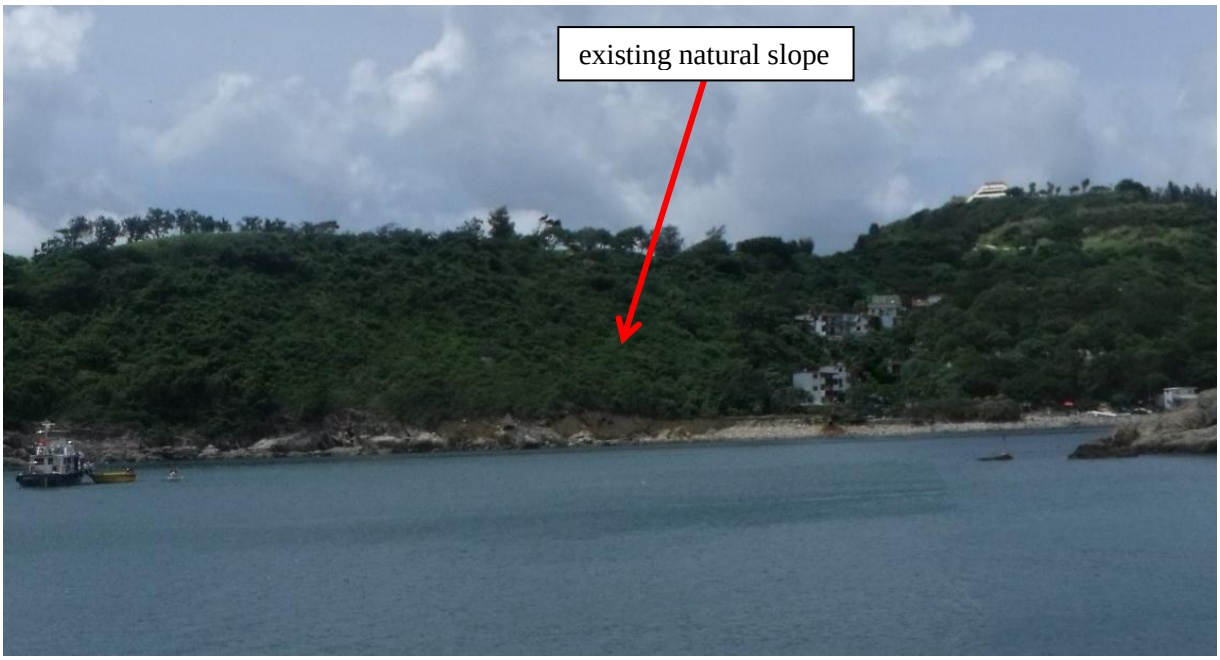
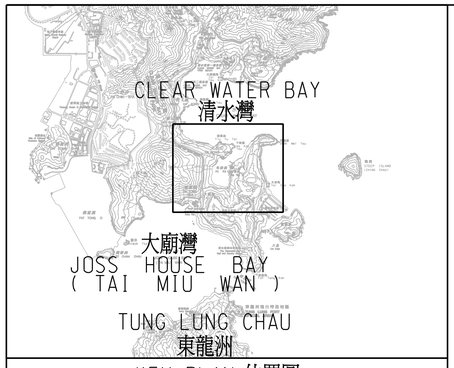


Photo 2 : Existing Natural Slope along the Shoreline

FIGURES



KEY PLAN 位置圖
比例 KEY PLAN 1 : 50000

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LEGEND:
圖例:

- PROPOSED SEWER 擬建污水管
- PROPOSED RISING MAIN 擬建壓力管
- PROPOSED SEWAGE TREATMENT PLANT 擬建污水處理廠
- PROPOSED DREDGING AREA 擬挖泥區域

LANDUSE ZONINGS UNDER THE APPROVED CLEARWATER BAY PENINSULA SOUTH OUTLINE ZONING PLAN NO. S/SK-CWBS/2 (DATED 9 JUNE 2006)
清水灣半島南分區計劃大綱核准圖編號 S/SK-CWBS/2的土地用途地帶(2006年6月9日)

- V VILLAGE 鄉村式發展
- O OPEN SPACE 休憩用地
- CPA COASTAL PROTECTION AREA 海岸保護區
- CA CONSERVATION AREA 自然保護區
- OU OTHER SPECIFIED USES 其它指定用途
- CLEAR WATER BAY COUNTRY PARK 清水灣郊野公園

848 500 E
849 000 E
815 500 N
815 000 N
N
CLEAR WATER BAY 清水灣
CLEAR WATER BAY
DETAIL 'A' 詳圖 "A"
PROPOSED SUBMARINE OUTFALL (TENTATIVE ALIGNMENT) 擬建海底排放管 (初步走線位置)
TAI WONG KUNG 大王公
PO TOI O 布袋澳
FAIRWAY VISTA 翡翠別墅
PROPOSED LOCAL SEWAGE TREATMENT PLANT 擬建小型污水處理廠
DETAIL 'B' 詳圖 "B"
PO TOI O CHUEN ROAD 布袋澳村路
CLEAR WATER BAY GOLF AND COUNTRY CLUB 清水灣鄉村俱樂部
CPA
CA
OU
V
O
TIU YU TOI 釣魚台
HA KOK TAU 下角頭
SHEK NEI TAU 石尾頭
TAI MIU AU 大廟坳
Golf Course

PROPOSED SUBMARINE OUTFALL (TENTATIVE ALIGNMENT) 擬建海底排放管
PROPOSED DIFFUSER 擬建擴散器

DETAIL 'A' 詳圖 "A"
比例 SCALE A1 1 : 250 A3 1 : 500

PO TOI O CHUEN ROAD
CA
CPA
PROPOSED LOCAL SEWAGE TREATMENT PLANT 擬建小型污水處理廠

DETAIL 'B' 詳圖 "B"
比例 SCALE A1 1 : 250 A3 1 : 500

Revision	Date	Description		Initial
	Designed	Checked	Drawn	Checked
Initial	MC	GC	SZ	GC
Date	10/12	10/12	10/12	10/12

Approved

PRELIMINARY

Contract no.
CE 65/2006 (DS)

Contract title
PORT SHELTER SEWERAGE, STAGE 3 - SEWERAGE WORKS AT PO TOI O
牛尾海污水收集系統 第三階段工程 - 布袋澳污水收集系統

Drawing title
KEY SEWERAGE WORKS - LAYOUT PLAN (PO TOI O)
主要渠務工程 -位置圖 (布袋澳)

Drawing no. FIGURE 1 圖一
Revision -

Scale
A1 1 : 2000
A3 1 : 4000

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

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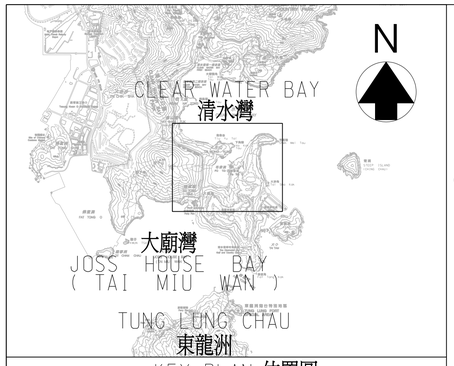

KEY PLAN 位置圖

比例 KEY PLAN 1 : 50000

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LEGEND:
圖例:

- PROPOSED SEWER 擬建污水管
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- VILLAGE 鄉村式發展
- OPEN SPACE 休憩用地
- COASTAL PROTECTION AREA (CPA) 海岸保護區
- CONSERVATION AREA (CA) 自然保護區
- 1 PO TOI O 布袋澳
- 2 FAIRWAY VISTA 翡翠別墅
- 3 TAI WONG KUNG 大王公
- 4 CLEAR WATER BAY GOLF AND COUNTRY CLUB 清水灣鄉村俱樂部
- 5 CLEAR WATER BAY 清水灣
- 6 COASTAL PROTECTION AREA 海岸保護區
- 7 CLEAR WATER BAY COUNTRY PARK 清水灣郊野公園
- 8 PO TOI O FISH CULTURE ZONE 布袋澳魚類養殖區
- 9 HUNG SHING TEMPLE 洪聖宮
- 10 CORALS 珊瑚
- 11 INTERTIDAL HABITAT 潮間帶生境
- 12 MARINE BENTHIC COMMUNITIES 海洋底棲生物群落

Revision	Date	Description			Initial
	Designed	Checked	Drawn	Checked	
Initial	MC	GC	SZ	GC	
Date	10/12	10/12	10/12	10/12	

Approved

PRELIMINARY

Contract no.

CE 65/2006 (DS)

Contract title

PORT SHELTER SEWERAGE, STAGE 3
- SEWERAGE WORKS AT PO TOI O
牛尾海污水收集系統
第三階段工程 -
布袋澳污水收集系統

Drawing title

LOCATION OF KEY ENVIRONMENTAL SENSITIVE RECEIVERS
主要環境
敏感受體位置

Drawing no.: FIGURE 2 圖二

Revision: -

Scale: A1 1 : 2000
A3 1 : 4000

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

Plot Date = $DATE$

CAD Filename = $FILE$