

Hang Hau Tsuen Channel at Lau Fau Shan

Project Profile

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**For
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1. BASIC INFORMATION

1.1 Project Title

The title of this Project is:

Hang Hau Tsuen Channel at Lau Fau Shan, hereafter referred to as the “Project”.

1.2 Purpose and Nature of the Project

The squatter area in the vicinity of the existing Hang Hau Tsuen stream was cleared in 1997. The poor hydraulic performance of the Hang Hau Tsuen stream is attributed partly to the siltation of the watercourse by the remains of the former squatter structures, and also to the meandering watercourse and the presence of an under-sized box culvert at Deep Bay Road. A total of about 43 hectares of land is flood prone as a result of the inadequate drainage capacity of the Hang Hau Tsuen stream. The purpose of the channel project is to alleviate flooding occurred in the catchment by converting the existing Hang Hau Tsuen stream between Deep Bay and Deep Bay Road to an engineered channel that will meet the required flood protection standards.

The Project includes the construction of drainage channel, box culvert, footbridges, access road, footpath and associated drainage system.

The Project is a designated project under the Environmental Impact Assessment (EIA) Ordinance (EIAO) (Cap.499). An EIA report is required to be prepared to meet the requirements under the EIAO and for an Environmental Permit to be obtained for the construction and operation of the project.

1.3 Name of the Project Proponent

The Project Proponent is the Project Manager, New Territories North and West Development Office, Civil Engineering and Development Department.

1.4 Location and Scale of Project, and History of Site

The location of the Project within Northwest New Territories and its preliminary layout and sections are shown in *Figures 1, 2 and 3*.

The project comprises the following development:

- (i) Training of Hang Hau Tsuen stream including construction of a 370 m long drainage channel connecting to the downstream ends of Fung Kong Tsuen Channel and San Hing Tsuen Channel to Deep Bay.
- (ii) Construction of a 25 m long triple-cell box culvert 5.5 m (w) x 3 m (H) beneath the Deep Bay Road and 4 nos. of footbridges across the channel.
- (iii) Provision of a 3.5 m wide access road with passing bays along the northern bank of the channel and 2.0 m wide footpath on both sides of the channel and associated drainage system.

Hang Hau Tsuen is situated at the southern part of Lau Fau Shan bordering the Hang Hau Tsuen stream. The area is mostly characterised by wooden sheet-metal clad squatter dwellings that has accumulated on Government Land. Some of the structures lying outside the present watercourse, were built with brick and concrete. A large part of the village is classified by the Government as squatter areas. To the north of the stream there used to be areas covered by paddy fields and fish ponds. Farming and livestock rearing has been abandoned leaving the area and its temporary structures mostly derelict. Some fish ponds remain on both sides of the watercourse. The area is generally low-lying and storm water is discharged to Deep Bay or to the stream through small cross drains under the embankments along the shore and the stream. Serious flooding was recorded in June 2001.

1.5 The Type of Designated Project Covered in the Project Profile

In accordance with Item I.1 (b) (vi) of Part I, Schedule 2 of the EIAO, the Project is a Designated Project because the proposed drainage channel will discharge into an area which is less than 300 m from the nearest boundary of an existing coastal protection area.

1.6 Name and Telephone Numbers of Contact Persons

New Territories North and West Development Office,
Civil Engineering and Development Department,
9/F Sha Tin Government Offices,
1 Sheung Wo Che Road,
Sha Tin, New Territories, Hong Kong.

Attn: Mr. S K Lam
Tel. No.: 2158 5623 Fax. No.: 2693 2918

2. PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Responsibilities of Parties

The Project Proponent, Project Manager / New Territories North & West (PM/NTN&W) of Civil Engineering and Development Department (CEDD), will be responsible for implementing the proposed works, together with all the environmental mitigation measures, the environmental monitoring and audit requirements as specified in the approved EIA Report of this Project.

Specialist Environmental Consultants under Agreement No. CE 3/74 will be responsible for undertaking the EIA according to the Brief to be issued by the Director of Environmental Protection and to respond on behalf of the Project Proponent on issues related to the EIA.

2.2 Project Time Table

The tentative programme for implementing the Project is from mid-2009 to 2012.

2.3 Considerations on Programme Requirements and Interaction with Other Projects

In order to alleviate the flooding risk to Hang Hau Tsuen and the upstream area, the Project had to be implemented as soon as possible after completing the necessary statutory and administrative procedures.

Concurrent public works projects within North West New Territories (from 2009 to 2012) include the Improvement to Ping Ha Road (Ha Tsuen and Hang Mei sections), Tin Ha Road (northern section) and Tan Kwai Tsuen Road, Installation of Salt Water Supply for North West New Territories, Replacement and Rehabilitation of Water Mains Stages 2 and 3, Cycle Tracks connecting North West New Territories with North East New Territories, Yuen Long and Kam Tin Sewerage Stage 3, Yuen Long and Kam Tin Sewerage Treatment Upgrade. The works areas of these projects, however, are all located over 500m from the Project and cumulative environmental impact is unlikely.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Ecology

Channelisation of the Hang Hau Tsuen Stream will remove part of the mud of the watercourse floor and recently established mangrove habitats at the downstream section of the Stream and at the Stream outfall. Most of these mangroves were established after the clearance of the squatter in 1997. Initial observations show these mangrove habitats currently to be quite active ecologically, supporting some crabs and providing feeding opportunities for wading birds.

In order to avoid adverse impact on the watercourse and riparian ecosystem, the “avoidance approach” is taken into consideration according to DSD Practice Note No. 1/2005 for the design of the 150m downstream section of the stream. Several flood alleviation schemes including distant flood banks, two-stage channels, relief or by-pass channels, and flood storage have been considered. As the watercourse is located in the low-lying area and the discharge is governed by tide, the increase in channel width or diversion of water as for two-stage channels and by-pass channels options are considered not feasible. Also flood storage option is not feasible because sea water will still overflow from the existing watercourse causing flooding. However raising the river banks can retain tidal and runoff from upstream within the channel and distant flood banks option is considered feasible. Adopting the distant banks option, the bed of the existing watercourse at the 150m downstream section will be retained resulting in minimal disturbance to the riparian ecosystems in the existing Hang Hau Tsuen Stream. For the upstream at where the stream is heavily polluted, will be improved by straightening and widening to avoid resumption of the existing fishponds and houses to the northern bank of the Stream.

3.2 Contaminated Materials

The Project will include excavation in the areas along the banks of the Hang Hau Tsuen Stream for the foundation of the distant banks and drainage channel. The amount of excavated sediment is expected to be approximately 1,000 m³. The materials can be mechanically excavated in the dry seasons within a system of temporary bunds and will not require dredging. The wet spoil will be side-cast for drying before loading and dispatching to the approved dump site.

The sediment of the Hang Hau Tsuen Stream bed was found to be heavily contaminated in December 1997 with high levels of copper and zinc, and high cadmium contamination was also identified in the upstream sediment, under the then applicable EPD Circular No.1-1-92. The stream bed of the downstream section will not be disturbed and the contaminated sediments in the stream bed will not be excavated. However the stream bed of the upstream section will be disturbed for the formation of the proposed drainage channel, the excavated materials will have to be tested, re-classified and managed according to the procedures given in the Environmental, Transport and Works Bureau (ETWB)

Technical Circular (Works) (TCW) No. 34/2004 on Management of Dredged / Excavated Sediment.

3.3 Contaminated Land

There is no recorded past history of contaminating land use in the Project works area. The stream bed contamination is likely to be a product of hinterland activities rather than along the immediate stream banks.

3.4 Generation of Solid Waste

Small quantity of scrap metal, wood and other building material will result from demolishing of squatter huts during site clearance. These materials are mostly in an advanced stage of decay and considered unsuitable for recycling. Any inert materials which could be separated from the non inert detritus will be sent to public filling area. Such non inert refuse will be sent to landfill.

3.5 Generation of Effluents and Contaminated Runoff

Inadvertent site runoff discharged to Deep Bay during the construction phase is possible though the downstream section of the stream bed will not be disturbed. In order to avoid generation of contaminated runoff, a line of temporary bund will be installed along the sides of the stream during construction phase and implementing water quality control measures for pumped discharge from the works. There is no operational phase water quality issue associated with the Project.

3.6 Dust and Odour

Minimum construction dust impact is expected as there will be very little moving of dry earth during the site formation phase. Construction of confining bunds and channel bed will employ imported suitable material for which regular dust suppression measures will be applied. There is no operational phase air quality impact associated with the Project because the proposed stream bed will be undisturbed. Possible odour issue may also arise during maintenance excavation, although the likelihood depends on the future stream water and sediment quality.

3.7 Noise

Construction noise impact is likely due to the proximity of works from potential noise sensitive receivers including a kindergarten, but the number of receivers is low. Construction is not required during restricted hours to complete the Project. There is no operational phase noise impact associated with this Project.

3.8 Archaeology and Cultural Heritage

PM/NTN&W had commissioned the Hong Kong Institute of Archaeology (HKIOArch) through the Antiquities and Monuments Office of the Leisure and Cultural Services Department to undertake an archaeological survey and assessment for the Project. The HKIOArch issued the *2001 Archaeological Survey & Assessment for the Proposed Channel at Hang Hau Tsuen, Lau Fau Shan* in February 2001. It has concluded that the proposed works will not create any adverse impact on the archaeological or historic remains, as any of these remains will be outside the Project site area.

3.9 Landscape and Visual Impact

The natural mud flats, mangrove habitat and the natural stream course will be retained. Landscape planting will be designed along the distant flood banks along the watercourse creating a landscape and visual beneficial impact to the residents of Hang Hau Tsuen. A positive impact is possible in terms of removing some of the rubbish in the stream.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 Existing and Planned Sensitive Receivers

Figure PP/1 gives the locations of all the existing and planned noise, air and water quality sensitive receivers within 300 m of the Project boundary. Representative sensitive receivers for each issue are identified on this figure.

Potential noise and air quality impacts of this Project are confined to construction phase only. Construction noise and dust sensitive receivers include the squatter housing along the banks of Hang Hau Tsuen Stream. Potential water quality sensitive receivers include Hang Hau Tsuen Stream and Deep Bay during construction phase. There is unlikely to be water quality impact during the operational phase.

Figure PP/2 presents the potential ecological sensitive receivers of this Project. Ecological sensitive receivers include:

- (i) The Hang Hau Tsuen Stream which may be affected in terms of water quality due to site runoff and due to excavation of the materials along the banks of in the Stream.
- (ii) The scattered mangrove species along the tidal portion of the Hang Hau Stream and part of the mud flats and mangrove habitats at the mouth of this Stream will be retained because the stream bed will not be disturbed. Site visits and photographs of the Stream indicate that there are some crabs in these habitats.

4.2 Natural Environment

The topography of the Project works area is flat, with two small knolls lying 150 m to the south of the Stream. The site is 250 m south of Lau Fau Shan. There are abandoned agricultural land interspersed with groves of mature trees and abandoned structures within the Project works area. The site is flanked by the Deep Bay Road to the east and the Deep Bay to the west. Mangrove covered mud flats characterise the mouth of streams entering the Deep Bay and in the case of Hang Hau Tsuen Stream the mud flat is one of the more substantial in size along the Deep Bay coastline.

The Hang Hau Tsuen Stream proposed for improvement under this Project is a natural muddy bottomed stream course with a width of approximately 20 m at its widest and considerably less at other points along its alignment. The deepest invert level is approximately 1.5 m below ground surface although dry weather flow amounts to just 0.1 m deep. The Stream falling within the works area is tidal. Its mouth is flanked by extensive mudflats which have been colonised by mangrove species since some of the squatter huts at the Stream mouth and over the Stream were demolished in 1997.

Water quality and sediment quality data of Hang Hau Tsuen Stream had been obtained by sampling and analysis in December 1997. The data indicated the levels of ammonia, E.coli, suspended solids, and biological oxygen demand in the Stream water are higher than those of the water quality objectives for Deep Bay. The stream bed sediment within and upstream of the works area contained copper and zinc of levels high enough to be classified as Class C under the EPD Technical Circular No.1-1-92 at the time. Sediments obtained upstream of the work area also contained enough cadmium for them to be classified as Class C. This reflects pollution from the container yards runoff upstream and the untreated domestic and livestock sewage discharged into the hinterland of the Stream at that time.

4.3 Existing and Past Land Uses of the Project Site

The Hang Hau Tsuen Stream is a natural stream course covered extensively with squatter huts constructed on stilts. There are only a few legal houses of the original Hang Hau Village among these squatter huts. Some of the huts, along the alignment of the natural stream course and around the mouth of the Hang Hau Tsuen Stream were cleared in 1997 as part of a rural improvement scheme. Marine sediments have been trapped along the tidal portion of the Stream to form mudflats. Mangrove species now colonise the intertidal part of the Stream. The area was traditionally used as farming and fish ponds although agriculture is now entirely abandoned and none of the remaining ponds are managed. Apart from the residences taken up along the stream banks the area is mostly derelict.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE IMPLEMENTED

5.1 Ecology

The floor of the new channel cannot be re-established so as to permit substantial re-growth of the mangrove which will inhibit hydraulic performance. Distant flood banks to widen the channel width can retain the existing mangrove in the downstream section of the stream bed.

5.2 Solid Waste Management Measures

The sediments to be excavated from the banks along the Stream and at the stream bed of the upstream section may be contaminated. The excavated materials if they are found contaminated will be tested and managed according to the requirements under the ETWB TCW No. 34/2002.

5.3 Effluents and Runoff Management

During the construction phase, sediment in wheel wash effluent will be settled and reused as far as practicable. Any remaining sediment will be disposed of appropriately in a public fill. As each fishpond is already bunded, sediment loaded runoff will be contained within the site. Sediment will be settled before runoff is released.

5.4 Dust Mitigation Measures

Wheel washing facilities will be provided for construction vehicles. Sediments in the effluent from wheel wash facilities and site runoff will be settled and removed before discharge to storm water facilities. If stockpiles are required, they will be covered. Exposed earth surfaces will be watered to minimise generation of fugitive dust as far as practicable.

5.5 Noise Mitigation Measures

The number of construction equipment will be minimised and turned off when not in use, and careful choice of work method will be required.

5.6 Archaeological and Cultural Heritage Mitigation Measures

No archaeological mitigation measures are required. Contract clauses will however be included to instruct Contractors on the procedures for conserving and notification should any artifacts be discovered during construction phase.

5.7 Visual and Landscape Mitigation Measures

Gabion will be used for the distinct flood banks of the proposed channel to obviate glare and increase greenery. Visual and landscape considerations will be incorporated into the channel design, such as planting of native species along the channel bunds. Clearing of rubbish from stream may constitute a positive impact.

6 FURTHER ENVIRONMENTAL IMPLICATIONS

6.1 Beneficial Effects

Beneficial effects of the Project include the prevention of flooding within the catchment and the removal of rubbish from the stream.

6.2 Severity of Adverse Effects

Potential transient construction noise, dust, water quality and waste impacts, visual and landscape impacts, contaminated mud, and archaeological and cultural heritage impacts can be prevented and mitigated in each case by including and enforcing the appropriate specification clauses in the construction contract.

Mitigation measures for some potential ecological impacts have been proposed by the use of distinct flood banks so that the stream bed of the downstream section and the mangrove habitats are retained.

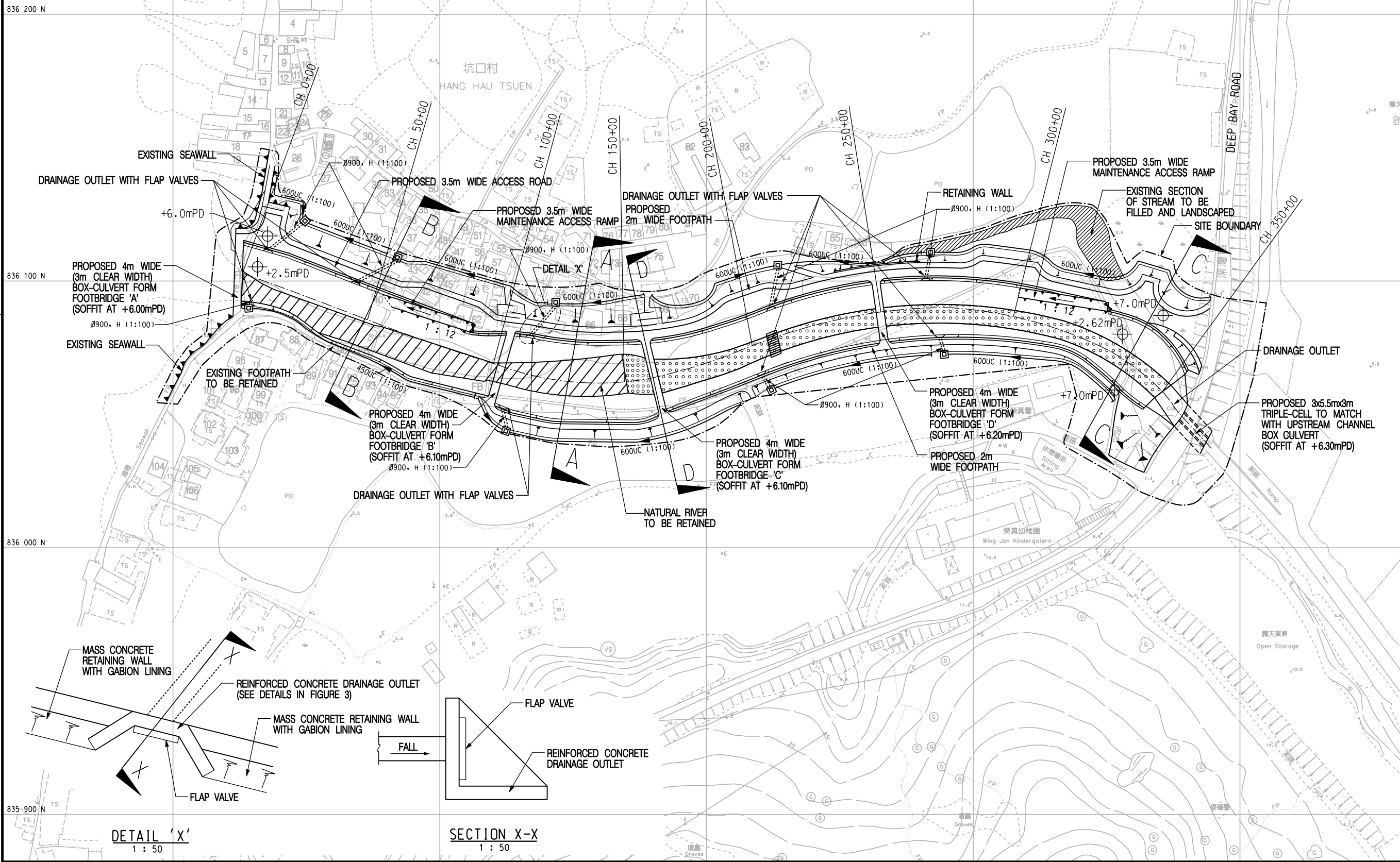
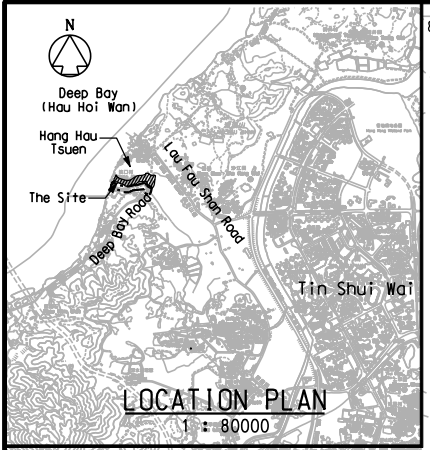
Gabion, an eco-friendly design of the distant flood banks of the channel will be employed to uphold the function and health of the inter-tidal community. The EIA study will define the potential environmental impacts during construction phase of the proposed drainage improvement works.

7 USE OF PREVIOUSLY APPROVED EIA REPORTS

No previous approved EIA reports have been referred to in the preparation of this Project Profile.

END OF TEXT

Figures



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LEGEND

- SITE BOUNDARY
- EXISTING RIVER
- PROPOSED LOW FLOW CHANNEL
- RETAINING WALL
- FILL SLOPE
- PROPOSED GATE
- GABION WALL
- EXISTING SEAWALL
- 600UC (1:100) 600mm COVERED U-CHANNEL AT 1 IN 100 FALL
- Ø900, H (1:100) 900mm PRECAST CONCRETE PIPE (CLASS H) AT 1 IN 100 FALL
- CATCH PIT
- 5m WIDE CROSSING SLAB
- CH 0+00 CHAINAGE OF PROPOSED HANG HAU TSUEN CHANNEL

NOTES:

1. SOFFITS OF FOOTPATHS AND BOX CULVERT AT A MINIMUM OF 500mm ABOVE ESTIMATED 50-YEAR DESIGN WATER LEVEL

Revision	Date	Description	Initial
D	05/07	LD'S COMMENTS	KSC
C	05/07	COMMENTS FROM RC MEETING	KSC
B	05/07	GENERAL REVISED	KSC
A	03/07	GENERAL REVISED	KSC

Revision	Date	Designed	Checked	Drawn	Checked
Initial		KSC	YSY	JT	PKL
Date		11/06	11/06	11/06	11/06

Approved

AGREEMENT NO. CE 3/74

project

PWP ITEM NO. 705 - HANG HAU TSUEN CHANNEL AT LAU FAU SHAN

Drawing Title

GENERAL LAYOUT OF HANG HAU TSUEN CHANNEL

Figure No.	Revision
FIGURE 1	D

Scale

A3 1:1500

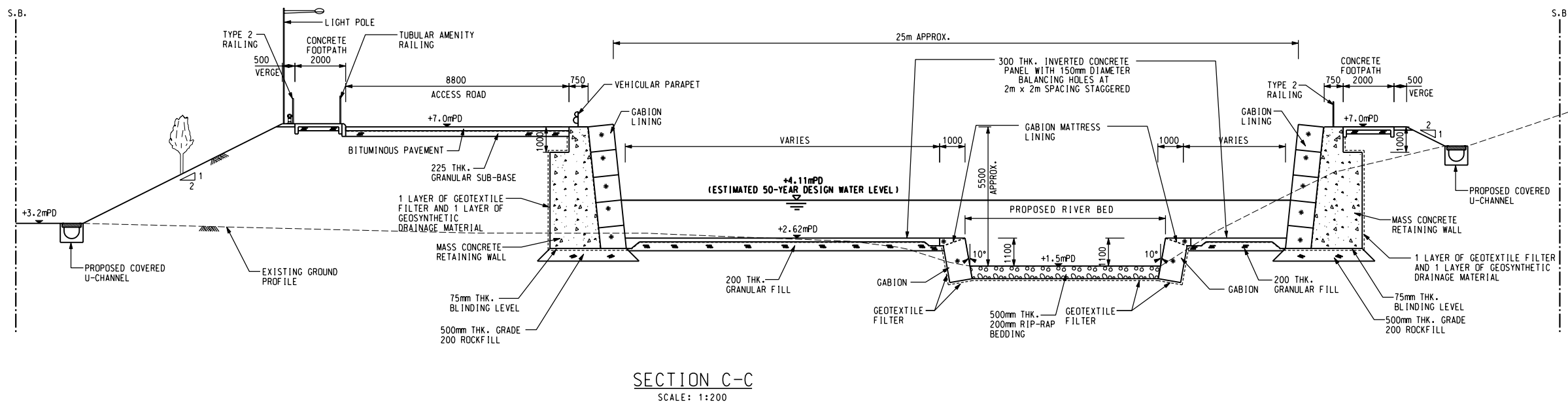
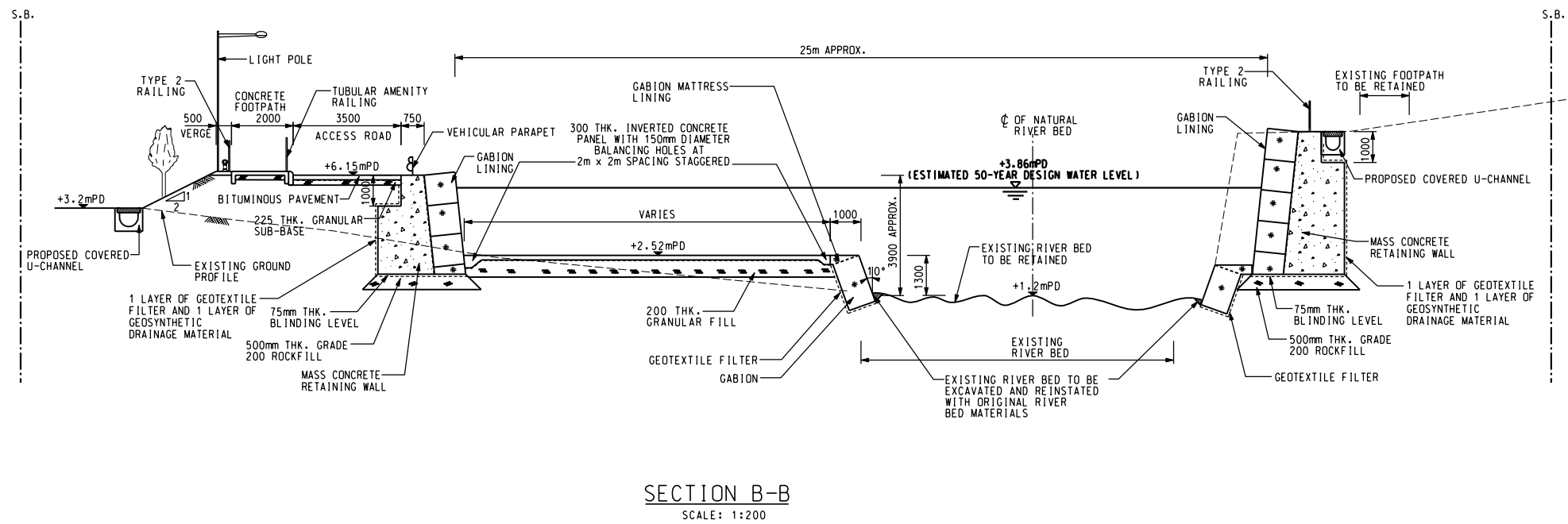
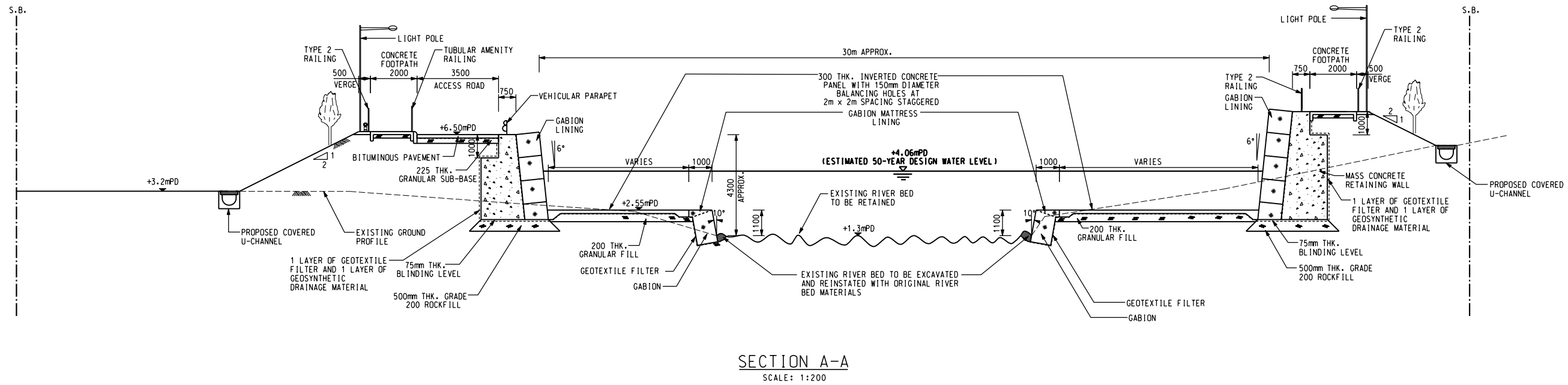
土木工程拓展署
CEDD Civil Engineering and Development Department

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

Plot Date - 6/5/2007

NOTES:

- SOFFITS OF FOOTPATHS AND BOX CULVERT AT A MINIMUM OF 500mm ABOVE ESTIMATED 50-YEAR DESIGN WATER LEVEL



B	05/07	DSD'S COMMENTS		KSC
A	05/07	GENERAL REVISED		KSC
Revision	Date	Description	Initial	Initial
	Designed	Checked	Drawn	Checked
Initial	KSC	YSY	JT	PKL
Date	04/07	04/07	04/07	04/07
Approved				

AGREEMENT NO. CE 3/74

project
PWP ITEM NO. 705 -
HANG HAU TSUEN CHANNEL
AT LAU FAU SHAN

Drawing Title
SECTIONS OF
HANG HAU TSUEN CHANNEL
(SHEET 1 OF 2)

Figure No. **FIGURE 2** Revision **B**

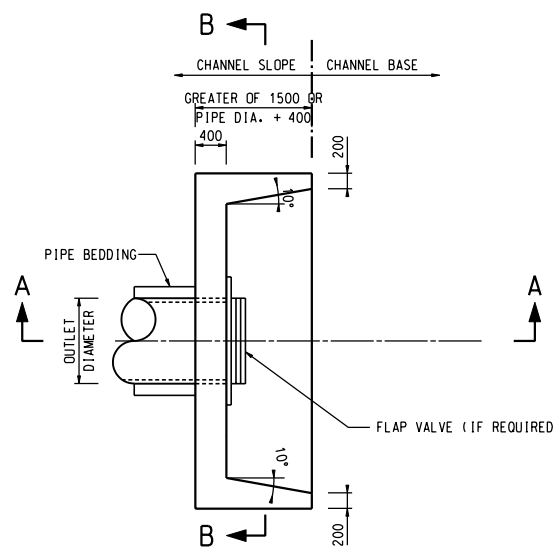
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土木工程拓展署
CEDD Civil Engineering and
Development Department

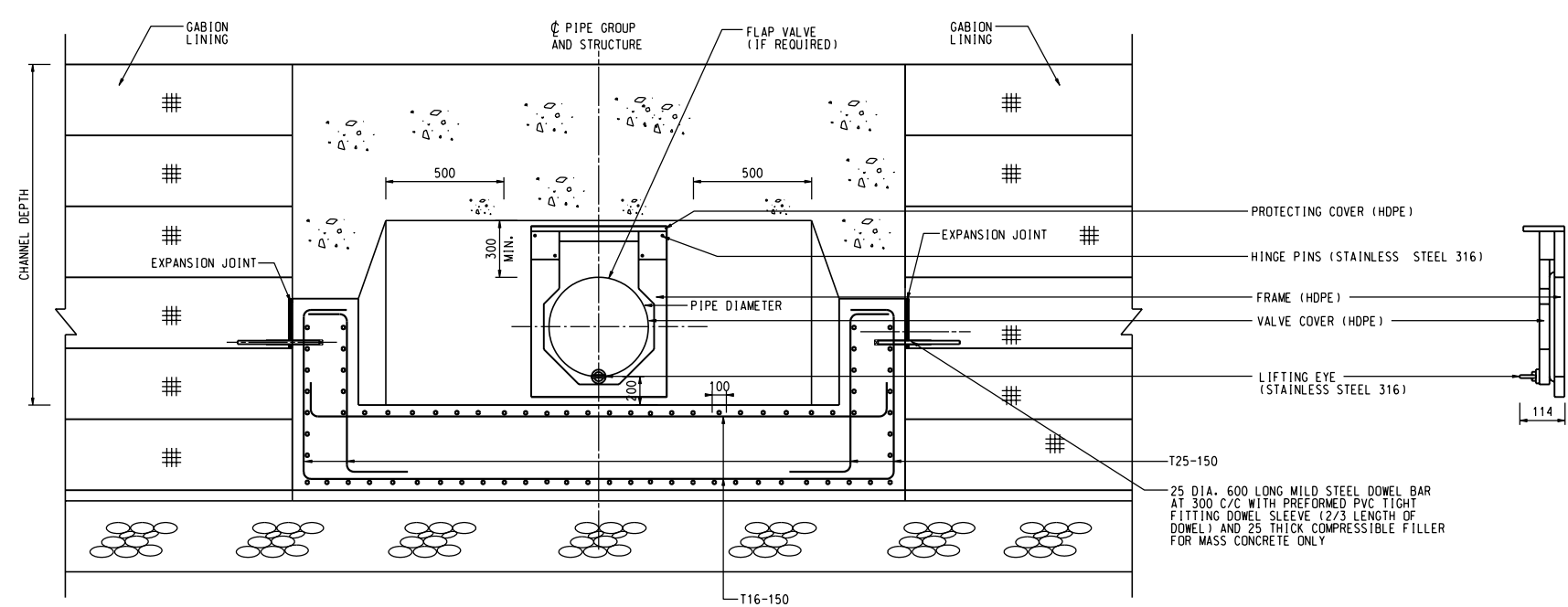
BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

Plot Date - 6/5/2007

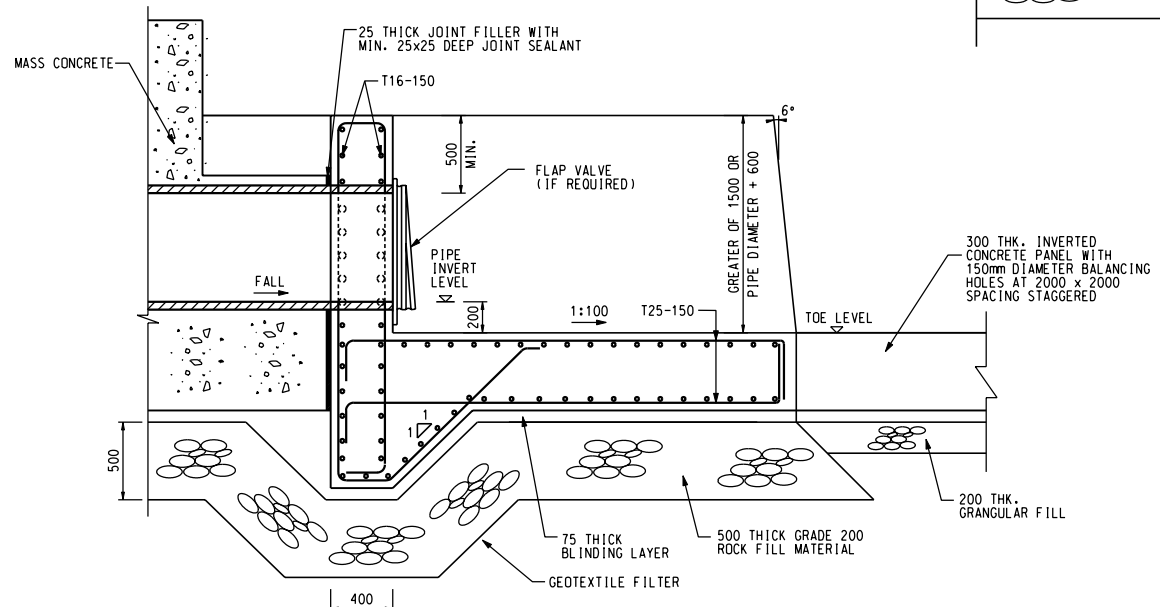
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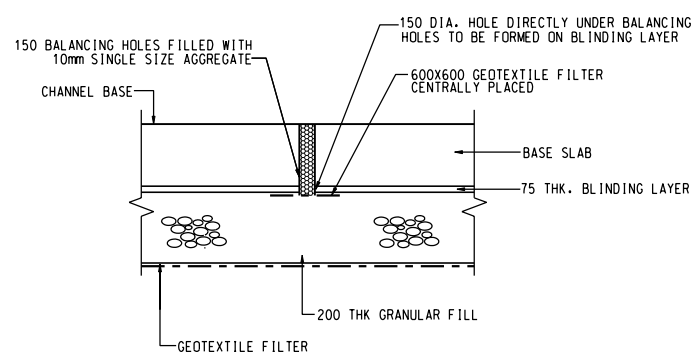
PLAN OF PIPE OUTLET WITH FLAP VALVE
SCALE 1:100 (A3)



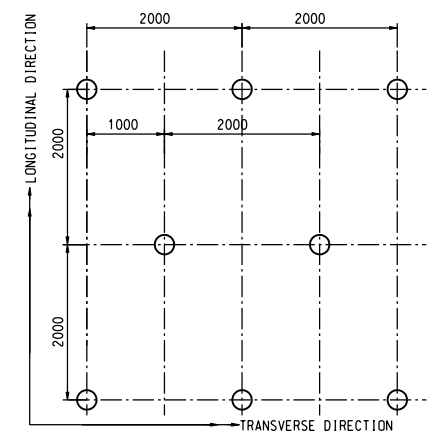
SECTION B-B
N.T.S.



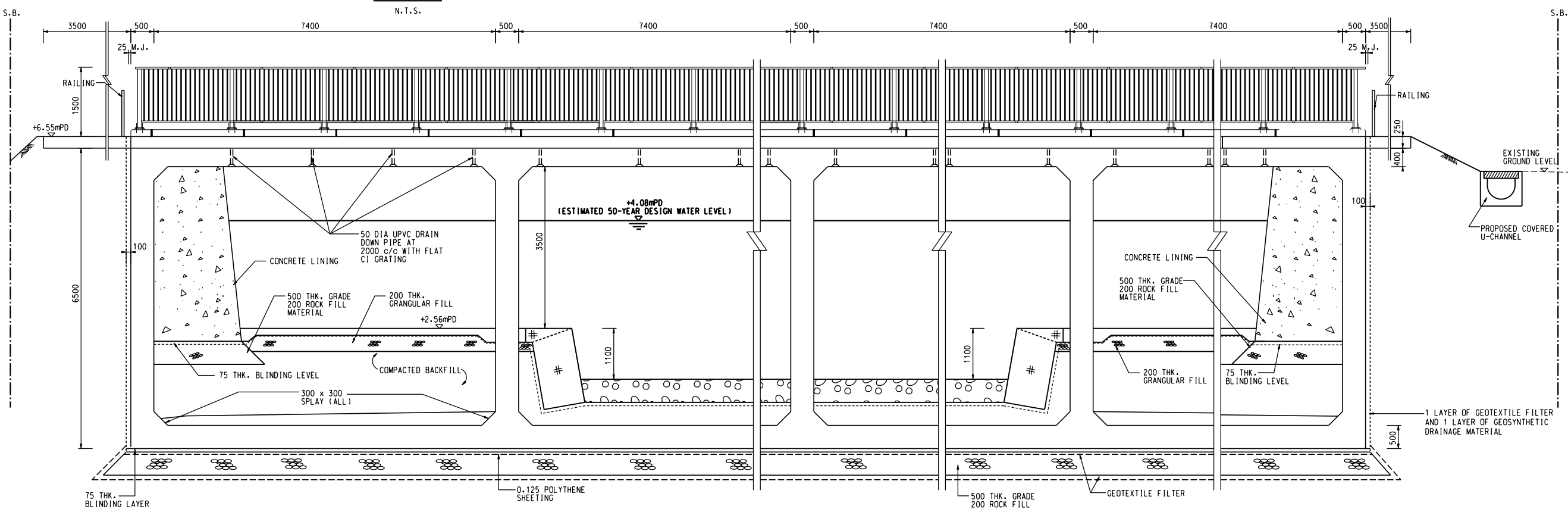
SECTION A-A
N.T.S.



DETAILS OF BALANCING HOLES ON CHANNEL BASE
SCALE A1 1:25
A3 1:50



ARRANGEMENT OF BALANCING HOLES ON CHANNEL BASE
SCALE A1 1:50
A3 1:100



SECTION D - D
SCALE A1 1:50
A3 1:100

Revision	Date	Description	Initial
B	05/07	DSD'S COMMENTS	KSC
A	05/07	GENERAL REVISED	KSC
Designed	Checked	Drawn	Checked
Initial	KSC	YSY	JT PKL
Date	04/07	04/07	04/07

AGREEMENT NO. CE 3/74
project
PWP ITEM NO. 705 -
HANG HAU TSUEN CHANNEL
AT LAU FAU SHAN

Drawing Title
SECTIONS OF
HANG HAU TSUEN CHANNEL
(SHEET 2 OF 2)

Figure No.	Revision
FIGURE 3	B

Scale
A3 1:100



Plot Date = 6/5/2007

NOTES :

1. 所有尺寸單位均以毫米計算。
All dimensions are in millimeters unless otherwise specified.
2. 所有高程以米為單位高於香港水平基準面上。
Levels are in metres above principal datum of Hong Kong.

LEGENDS :

- 工程區界限
Limit of Works Area
- ▨ 潛在的噪音、施工塵埃及視覺敏感受體
Potential noise, construction dust and visual impact sensitive receivers
- ▧ 潛在的水質敏感受體
Potential water quality sensitive receivers
- 考古地點界線
Archaeological site boundary

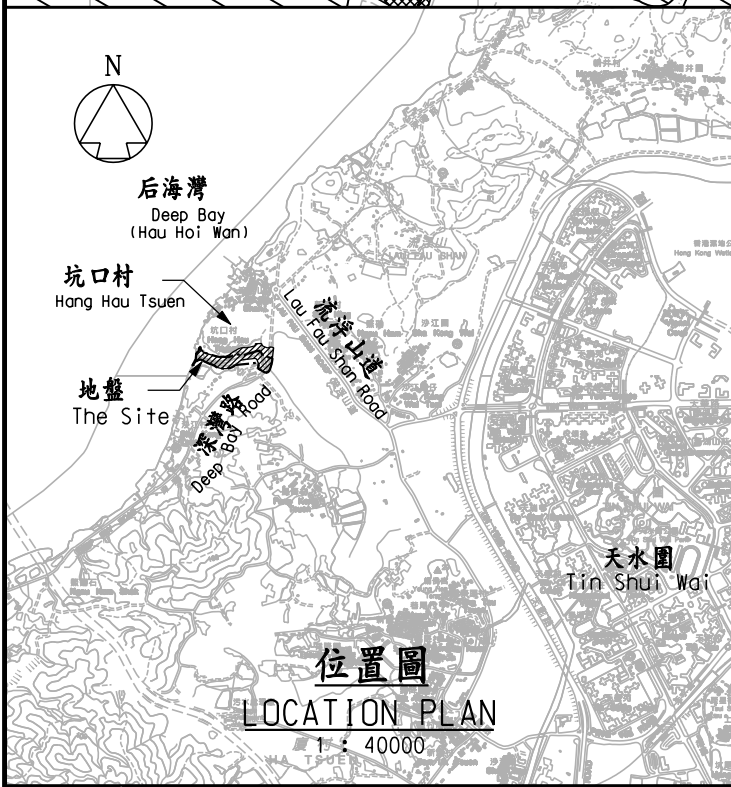
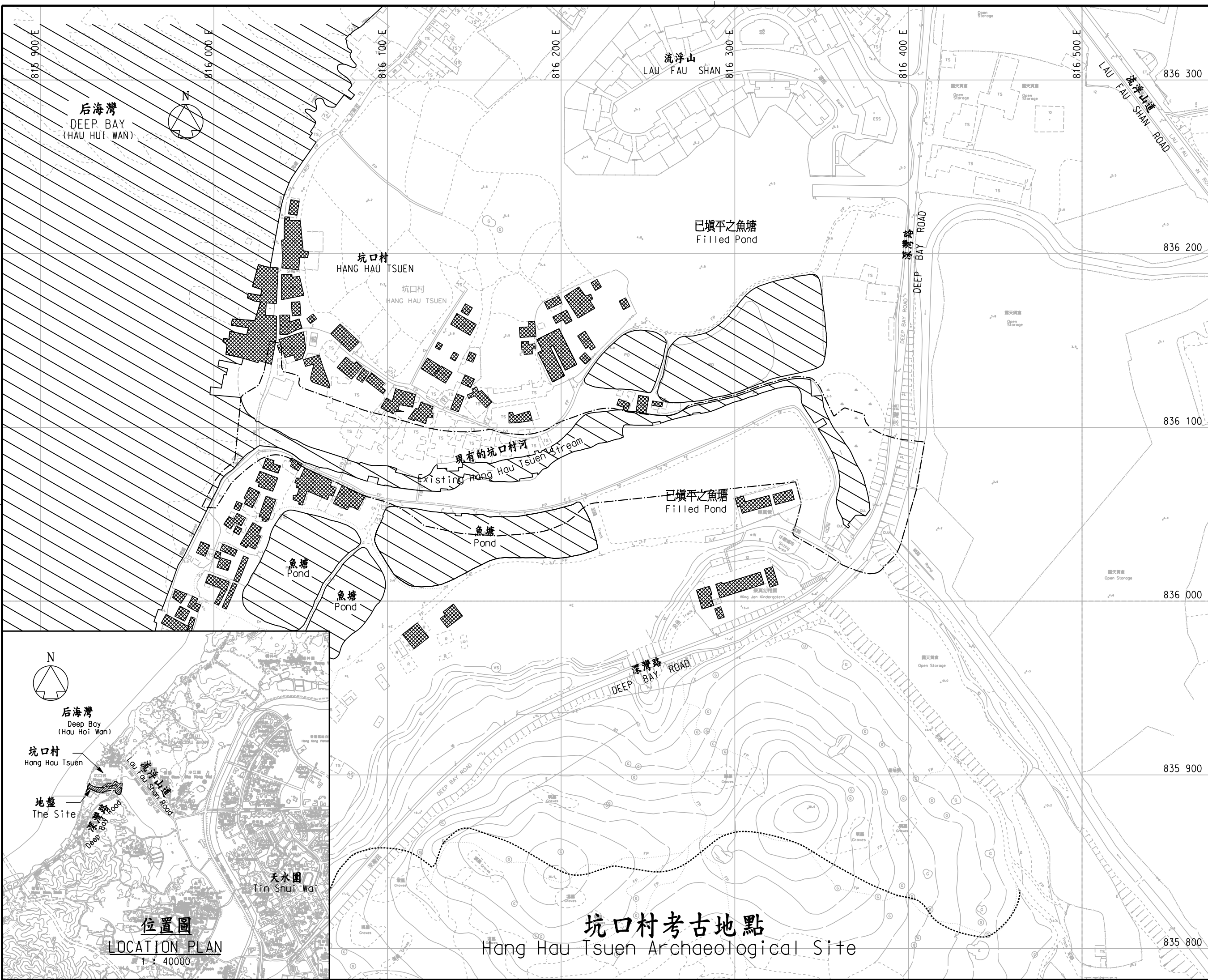
Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial	KSC	YSY	JT
Date	03/07	03/07	03/07
Approved			

AGREEMENT NO. CE 3/74
 project
 PWP ITEM NO. 705 -
 HANG HAU TSUEN CHANNEL
 AT LAU FAU SHAN

Drawing Title
潛在最受影響的噪音, 施工塵埃, 視覺, 水質敏感受體及考古地點
 POTENTIAL WORST AFFECTED NOISE, CONSTRUCTION DUST, VISUAL IMPACT, WATER QUALITY SENSITIVE RECEIVER AND ARCHAEOLOGICAL SITES

Figure No. FIGURE PP/1
 Revision

Scale A3 1:2000












坑口村考古地點
 Hang Hau Tsuen Archaeological Site

NOTES:

- 所有尺寸單位均以毫米計算。
All dimensions are in millimeters unless otherwise specified.
- 所有高程以米為單位高於香港水平基準面上。
Levels are in metres above principal datum of Hong Kong.
- 擬建之行人道寬1600毫米。
The proposed footpath shall be 1600mm wide.
- 擬建之道路寬3500毫米。
The proposed access road shall be 3500mm wide.
- 擬建之行人橋淨寬2000毫米。
The clear width of the proposed footbridges shall be 2000mm.

LEGEND:

-  工程區界限
Limit of Works Area
-  紅樹林品種
Mangrove species
-  現有魚塘
Existing ponds
-  濕草地 (源於魚塘)
Wet grassland (Originated from ponds)
-  草地
Grassland
-  泥灘
Mudflats
-  填高地
Built-up areas
-  樹木
Trees
-  灌木
Shrubs

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial	KSC	YSY	JT
Date	03/07	03/07	03/07
Approved			

AGREEMENT NO. CE 3/74

project

PWP ITEM NO. 705 -
HANG HAU TSUEN CHANNEL
AT LAU FAU SHAN

Drawing Title

潛在的生態環境敏感受體
POTENTIAL ECOLOGICAL
SENSITIVE RECEIVERS

Figure No. FIGURE PP/2

Revision

Scale A3 1:2000

土木工程拓展署
CEDD Civil Engineering and
Development Department

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