

**DRAINAGE IMPROVEMENTS IN SOUTHERN LANTAU**

**PROJECT PROFILE**

**March 2002**

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## **1. BASIC INFORMATION**

### **1.1 Project Title**

*Drainage Improvements in Southern Lantau.*

### **1.2 Purpose of the Project**

1.2.1 Southern Lantau is served by its existing drainage systems. Most of these drainage systems remain natural at their upper reach and are channelised at the downstream ends. Village expansions around the rural townships in Mui Wo and South Lantau Coast have resulted in higher runoff and some of the existing drainage system that have been designed with lower flood protection standards were no longer adequate to provide the flood protection standards required for the developed areas. The Drainage Master Plan Study (DMP) identified sections of rural rivers (within Mui Wo, Pui O, and Cheung Sha) which require upgrading to increase the flood protection level, and to remove the risk of flooding in known trouble spots. The Study Area for the drainage improvements includes the Mui Wo, Pui O and Cheung Sha catchments, and works are planned for construction in the period 2006 to 2009.

### **1.3 Nature of the Project**

1.3.1 The Project includes the following major items of works which are identified as Designated Projects (DP) under the *Environmental Impact Assessment Ordinance* (EIAO):

*Mui Wo:*

(i) Pak Ngan Heung River

- a. construct a flood bypass for the hairpin meander leading downstream of the access road bridge. A four-cell culvert (approx. 170 m length) will direct flood waters under the emergency vehicle access road;
- b. construct approximately 130 m of channel using grasscrete and masonry lined banks with natural bed both at the upstream and downstream of the flood bypass culvert. The re-provision of the EVA and the 3.5 m wide access road are included under this works item; and
- c. reroute the runoff from Butterfly Hill around the low lying area of Ling Tsui Tau Tsuen into the Pak Ngan Heung River by the proposed extension and enlarging of the existing U-channel (approx. 120 m length).

- (ii) Tai Tei Tong River – Construct 350 m of channel using grasscrete and masonry lined banks with natural bed from Mui Wo Primary School to the rivers confluence.
- (iii) Luk Tei Tong 2 River – Construct 400 m of channel using grasscrete and masonry lined banks with natural bed.
- (iv) Luk Tei Tong River – Extend existing gabion channelisation downstream to River Silver confluence using a grasscrete and masonry lined channel with natural bed.

#### 1.4 **Name of Project Proponent:**

1.4.1 Project Management Division, Drainage Services Department.

#### 1.5 **Location and Scale of Project (Including Plans)**

1.5.1 South Lantau, South West New Territories:

- i. Maps Series 1:1000 scale number 10-SW-12C, 10-SW-12D, 10-SW-17A, 10-SW-17B, 10-SW-17C, 10-SW-17D
- ii. Site Plan Figures 1.1 to 1.6.

#### 1.6 **History of Site:**

- i. *Pak Ngan Heung River:* This existing river is semi-natural, with a sand and pebble bottom. Its southern bank and riverbed at the upper portion of the river is lined with gabions. An U-channel is proposed under this project to re-route surface runoff from Butterfly Hill to Pak Ngan Heung River.
- ii. *Tai Tei Tong River:* An existing natural river course in a rural setting discharging to the three-river confluence at the head of the Silver River. Its bed is mainly composed of gravel and boulders.
- iii. *Luk Tei Tong 2 River and iv. Luk Tei Tong River:* The Luk Tei Tong River flows through a rural catchment of abandoned agricultural land reverted into fresh water marsh. The lower channel is tidally influenced by River Silver during high tide. The stream bed is natural, part muddy and part rocky. The bank of the channel has been straightened and provided with gabions.

**1.7 Number and Types of Designated Projects to be covered by the Project Profile:**

1.7.1 The Project covers four Designated Projects (DP) (Pak Ngan Heung River, Tai Tei Tong River, Luk Tei Tong 2 River and Luk Tei Tong River). The Pak Ngan Heung, Tai Tei Tong, Luk Tei Tong 2 and Luk Tei Tong Rivers all discharge into an area within 300m of the "Butterfly Hill" Conservation Area in the Mui Wo catchment and are therefore DPs, as specified under Item I1(b), Schedule 2 of the *Environmental Impact Assessment Ordinance* (EIAO).

**1.8 Name and Telephone Number of Contact Person:**

**2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

**2.1 Project Implementation**

2.1.1 The project will be planned, designed and implemented by consultants. Construction is scheduled to commence in February 2006, for completion in February 2009.

**2.2 Interactions with Other Projects**

2.2.1 Currently no interactions with any public works projects are envisaged.

**3. POSSIBLE IMPACT ON THE ENVIRONMENT**

**3.1 Processes involved (including process flow diagrams, site plans, storage requirements, and information on emission and discharges)**

See site plans.

### 3.2 Environmental impacts or issues (during construction or operation of the project)

<b>Impact</b>	<b>Pak Ngan Heung River</b>	<b>Tai Tei Tong River</b>	<b>Luk Tei Tong 2 River</b>	<b>Luk Tei Tong River</b>
<i>Gaseous emissions</i>	c) construction vehicle exhausts o) NA	c) construction vehicle exhausts o) NA	c) construction vehicle exhausts o) NA	c) construction vehicle exhausts o) NA
<i>Dust</i>	c) excavation, spoil stock-piles, movement of excess unsuitable waste off-site o) NA	c) excavation, spoil stock-piles, movement of excess unsuitable waste off-site o) NA	c) excavation, spoil stock-piles, movement of excess unsuitable waste off-site o) NA	c) excavation, spoil stock-piles, movement of excess unsuitable waste off-site o) NA
<i>Odour</i>	c) NA o) NA	c) NA o) NA	c) NA o) NA	c) NA o) NA
<i>Noisy operations</i>	c) construction noise, haulage traffic noise o) NA	c) construction noise, haulage traffic noise o) NA	c) construction noise, haulage traffic noise o) NA	c) construction noise, haulage traffic noise o) NA
<i>Liquid effluents, discharges, or contaminated run-off</i>	c) site run-off (including that potentially contaminated by plant or vehicles) o) NA	c) site run-off (including that potentially contaminated by plant or vehicles) o) NA	c) site run-off (including that potentially contaminated by plant or vehicles) o) NA	c) site run-off (including that potentially contaminated by plant or vehicles) o) NA
<i>Generation of waste or by-products</i>	c) C&D material o) NA	c) C&D material o) NA	c) C&D material o) NA	c) C&D material o) NA
<i>Disposal of spoil material, including potentially contaminated material</i>	c) all material to be re-used in landscaping on-site o) NA	c) all material to be re-used in landscaping on-site o) NA	c) all material to be re-used in landscaping on-site o) NA	c) all material to be re-used in landscaping on-site o) NA
<i>Disruption of water movement or bottom sediment</i>	c) timing works to the dry season will minimise water movement disruption. Bottom sediments will be disturbed during the works  o) the purpose of the works is to prevent flooding – therefore water movement will be enhanced	c) timing works to the dry season will minimise water movement disruption. Bottom sediments will be disturbed during the works  o) the purpose of the works is to prevent flooding – therefore water movement will be enhanced	c) timing works to the dry season will minimise water movement disruption. Bottom sediments will be disturbed during the works  o) the purpose of the works is to prevent flooding – therefore water movement will be enhanced	c) timing works to the dry season will minimise water movement disruption. Bottom sediments will be disturbed during the works  o) the purpose of the works is to prevent flooding – therefore water movement will be enhanced

<b>Impact</b>	<b>Pak Ngan Heung River</b>	<b>Tai Tei Tong River</b>	<b>Luk Tei Tong 2 River</b>	<b>Luk Tei Tong River</b>
<i>Unsightly visual appearance</i>	c) the banks will be disturbed for the duration of the works  o) the designs seek to enhance the channels appearance during the operational period	c) the banks will be disturbed for the duration of the works  o) the designs seek to enhance the channels appearance during the operational period	c) the banks will be disturbed for the duration of the works  o) the designs seek to enhance the channels appearance during the operational period	c) the banks will be disturbed for the duration of the works  o) the designs seek to enhance the channels appearance during the operational period
<i>Cultural heritage impacts</i>	c) potential damage or physical disturbance to any listed or unlisted archaeological and cultural resources  o) NA	c) potential damage or physical disturbance to any listed or unlisted archaeological and cultural resources  o) NA	c) potential damage or physical disturbance to any listed or unlisted archaeological and cultural resources  o) NA	c) potential damage or physical disturbance to any listed or unlisted archaeological and cultural resources  o) NA
<i>Ecological impacts</i>	c) further channelization of semi-natural river and riparian habitat.  o) maturation of the landscaping should restore the habitat	c) channelization of natural river and riparian habitat. Wide variety of wetland and woodland habitats, highest diversity bird breeding site on Lantau near works. Mouth of river interfaces with CPA.  o) maturation of the landscaping should restore the habitat	c) channelization of natural river and riparian habitat. Wide variety of wetland and woodland habitats, highest diversity bird breeding site on Lantau near works. Mouth of river interfaces with CPA.  o) maturation of the landscaping should enhance the habitat	c) channelization of largely natural river and riparian habitat. Wide variety of wetland and woodland habitats, highest diversity bird breeding site on Lantau near works. Mouth of river interfaces with CPA.  o) maturation of the landscaping should enhance the habitat

c) construction phase

o) operation phase

NA Not Applicable

CPA Coastal Protection Area

#### 4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

##### 4.1 Existing and planned sensitive receivers and sensitive parts of the natural environment which might be affected by the proposed project include:

<b>Sensitive Receiver</b>	<b>Pak Ngan Heung River</b>	<b>Tai Tei Tong River</b>	<b>Luk Tei Tong 2 River</b>	<b>Luk Tei Tong River</b>
<i>Residential developments</i>	<u>Existing</u> Pak Ngan Heung Village and Tai Tei Tong Tsuen  <u>Planned</u> Village Houses at Chung Hau	<u>Existing</u> Village house of Mui Wo Kau Tseun, Tseng Tau San Tsuen, Nam Pin Wai and Kan Leng Lodge  <u>Planned</u> NA	<u>Existing</u> Luk Tei Tong Village and Ma Po Tsuen  <u>Planned</u> NA	<u>Existing</u> Luk Tei Tong Village and Ma Po Tsuen  <u>Planned</u> NA
<i>Temporary housing areas</i>	NA	NA	NA	NA
<i>Educational institutions</i>	Kindergarten 10 m south-west of up stream alignment, A planned 'E' site for school development in Chung Hau	Mui Wo Primary School	NA	NA
<i>Health care facilities</i>	NA	NA	NA	NA
<i>Places of worship</i>	NA	NA	NA	NA
<i>Agricultural areas</i>	Agricultural area along whole alignment	NA	Agricultural area along whole alignment, reverted back to fresh water marsh	Agricultural area along whole alignment, reverted back to fresh water marsh
<i>Water bodies</i>	Works on river channel	Works on the river channel, Silver River	Works on river channel, Silver River	Works on river channel, Silver River
<i>Beaches</i>	Silver Mine Beach	Silver Mine Beach	Silver Mine Beach	Silver Mine Beach
<i>Water catchments and gathering grounds</i>	NA	NA	NA	NA
<i>Groundwater resources</i>	NA	NA	NA	NA
<i>Marine water resources (industrial and mariculture)</i>	There are no commercially exploited marine water resources at the mouth of the river	There are no commercially exploited marine water resources at the mouth of the river	There are no commercially exploited marine water resources at the mouth of the river	There are no commercially exploited marine water resources at the mouth of the river
<i>Sensitive industries</i>	NA	NA	NA	NA



<b>Sensitive Receiver</b>	<b>Pak Ngan Heung River</b>	<b>Tai Tei Tong River</b>	<b>Luk Tei Tong 2 River</b>	<b>Luk Tei Tong River</b>
<i>Confined airsheds</i>	NA	NA	NA	NA
<i>Areas of conservation value</i>	Butterfly Hill Conservation Area	Butterfly Hill Conservation Area	Butterfly Hill Conservation Area, Wetland at Luk Tei Tong	Butterfly Hill Conservation Area, Wetland at Luk Tei Tong
<i>Places of high visual value</i>	Within Hong Kong SAR, it is generally considered to have high scenic value	Within Hong Kong SAR, it is generally considered to have high scenic value	Within Hong Kong SAR, it is generally considered to have high scenic value	Within Hong Kong SAR, it is generally considered to have high scenic value
<i>Sites of cultural heritage</i>	Potential archaeological sites	Potential archaeological sites	Potential archaeological sites, Some historic village houses in Luk Tei Tong Village, Two historical watch Towers marking former trail	Potential archaeological sites, Some historic village houses in Luk Tei Tong Village, Two historical watch Towers marking former trail

NA Not Applicable

**4.2 The following outline the major elements of the surrounding environment and existing and relevant past land use(s) on site which might affect the area in which the project is proposed to be located:**

<b>Land Use</b>	<b>Pak Ngan Heung River</b>	<b>Tai Tei Tong River</b>	<b>Luk Tei Tong 2 River</b>	<b>Luk Tei Tong River</b>
<i>Roads</i>	NA	NA	NA	NA
<i>Village</i>	Possible expedient waste water and refuse disposal from local villages	Possible expedient waste water and refuse disposal from local villages	Possible expedient waste water and refuse disposal from local villages	Possible expedient waste water and refuse disposal from local villages
<i>Agricultural</i>	Pesticide/herbicide run-off	NA	NA	NA
<i>Industrial</i>	NA	NA	NA	NA

NA Not Applicable

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

### 5.1 Measures identified to minimise environmental impacts or enhance the environment include:

Project Phase	Potential Impact	Proposed Mitigation Measures
<i>Construction</i>	<i>Noise</i>	<p>The works contractor will have to comply with the provisions of the Noise Control Ordinance.</p> <p>Use of silenced plant and noise barriers near sensitive receivers; careful scheduling of activities; use of temporary acoustic barriers and acoustic machinery enclosures.</p> <p>Construction traffic should be scheduled to avoid night time, public holidays and Sundays. Where possible, traffic shall be directed away from NSRs.</p>
	<i>Dust</i>	<p>The contractor will be required to follow the good construction practices for dust minimisation to reduce nuisance to a minimum.</p> <p>Any haul roads and stockpiles will be regularly watered. Vehicles leaving the construction site will pass through a wheel wash. Stockpiles will be shielded. Relevant clauses will be included into the contract documents.</p>
	<i>Water quality</i>	<p>Excavated material should be sampled for contamination prior to disposal to ensure that there is no potential for pollution from spoil tips.</p> <p>Provision of silt traps to contain contaminated sediments carried by runoff from exposed soil; if fuel is stored on site, a bunded storage area should be provided; sewage generated on-site should be disposed of using portable or other facilities. With regard site runoff, good practices (as given in ProPECC PN 1/94 Construction Site Drainage) should be followed as far as practicable, in order to minimise erosion, and to retain and reduce suspended solids in the run-off before discharge.</p> <p>Silt curtains will be deployed to prevent suspended solids from impacting downstream sensitive receivers. Requirements will be included in the contract documents.</p>
	<i>Ecology</i>	<p>Where possible, healthy trees shall not be felled if they can be avoided. Retention of natural riverbed; grasscrete banks; and, tree planting along bank-tops will mitigate and restore the ecological function of the rivers.</p> <p>Works will be scheduled to avoid disturbing the breeding season and roosting of birds near Tai Tei Tong and Luk Tei Tong areas.</p> <p>Works will be scheduled to avoid disturbing the dragonflies and other wildlife at Butterfly Hill Conservation Area.</p> <p>Water quality impact mitigation (see above) will prevent pollution of the Coastal Protection Areas and Silver Mine Beach downstream from the proposed works Rivers.</p>

<b>Project Phase</b>	<b>Potential Impact</b>	<b>Proposed Mitigation Measures</b>
<i>Construction</i>	<i>Construction waste</i>	<p>Construction and demolition (C&amp;D) material will be generated from demolition of existing manmade banks and facilities. The C&amp;D material should be separated on-site into three categories:</p> <p>i) public fill, the inert portion of the C&amp;D material (e.g. concrete and rubble) should be re-used on-site or disposed at public filling areas;</p> <p>C&amp;D waste for re-use and/or recycling, the non-inert portion of the C&amp;D material (e.g. steel and other metals);</p> <p>ii) C&amp;D waste which cannot be re-used and/or recycled (e.g. wood, glass and plastic).</p> <p>iii) Unsuitable excavated material should be re-used for landscaping areas.</p> <p>The contractor will be required to follow good site practices for the construction waste arising, including provision of sufficient waste disposal points and regular collection for disposal and separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.</p>
	<i>Cultural Heritage</i>	<p>Since the project areas are in close vicinity to the Chung Hau Archaeological Site, archaeological survey is required to investigate the archaeological impact of the proposed works. Should archaeological materials be identified, appropriate mitigation measures will be designed and implemented. Please note that any physical disturbance to the listed and unlisted historic buildings and structures on the Study Area should be avoided, and the Antiquities and Monuments Office of the Leisure and Cultural Services Department should be consulted in advance on the detailed designs for the works.</p>
	<i>Landscape &amp; Visual Impact</i>	<p>Appropriate design and landscaping; conservation of topsoil for landscape mitigation works; tree preservation (where practicable) prior to construction.</p>
<i>Operation</i>	<i>Landscape &amp; Visual Impact</i>	<p>Monitor planting and landscape establishment</p>
	<i>Ecology</i>	<p>Monitoring effectiveness of mitigation.</p>

**5.2 The possible severity, distribution and duration of environmental effects are commented on the basis of the following effects:**

The Preliminary Environmental Review concluded that based on the largely qualitative assessment, no insurmountable environmental impacts were identified for construction and operation of the Project. Mitigation measures were formulated to reduce the environmental impacts to acceptable levels.

Flood prevention is a medium and long-term benefit to existing and future rural development in the Southern Lantau district.

Ecological and landscape and visual impacts will be mitigated when executing the detailed designs, benefiting nearby sensitive receivers in both the medium and long-term.

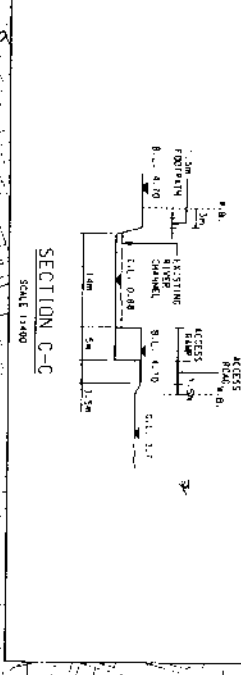
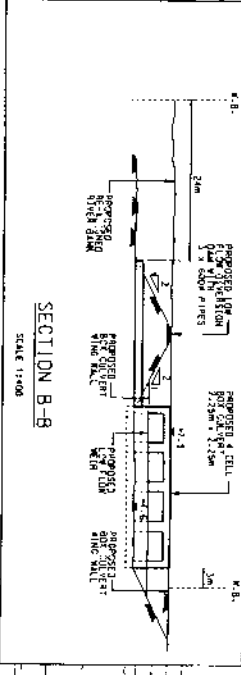
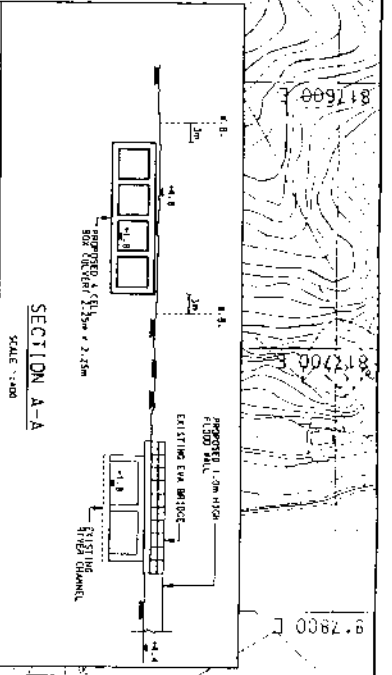
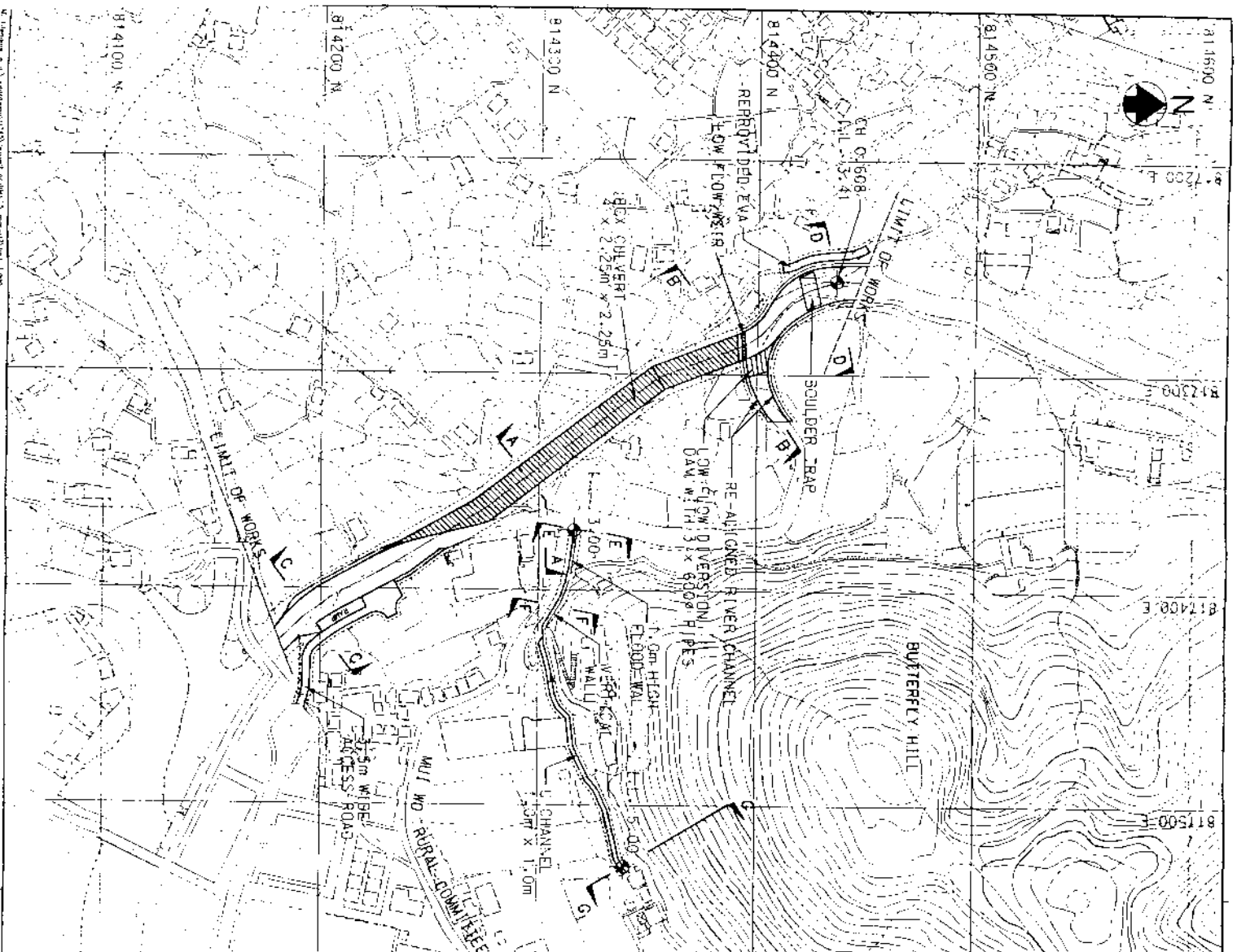
### **5.3 Comment on any further implications**

The Preliminary Environmental Review concluded that an EIA is required for the drainage improvements at Pak Ngan Heung, Tai Tei Tong, Luk Tei Tong and Luk Tei Tong 2 Rivers.

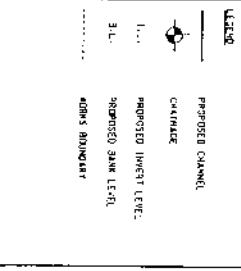
### **5.4 Use of Previously Approved EIA Reports**

No previously approved EIA has been conducted on the proposed project.

**END OF TEXT**



- NOTES:
1. CHANGES ARE IN BOLD CAPS UNLESS OTHERWISE INDICATED.
  2. ALL LEVELS ARE IN METERS ABOVE HIGH FLOOD WATER LEVEL.
  3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
  4. TYPE 2 WALLING WITH SCREWS (PAP AND GRATE) WITH FILL SHALL BE PROVIDED ON BOTH SIDES OF THE CHANNEL.
  5. THE CHANNEL BED SHALL BE GRASS WITH HIGH ROOTS/ROOTS DISASSEMBLED IN THE CHANNEL. STONES ARE STERILIZED AND LINED WITH CONCRETE LINING SHALL BE USED.
  6. THE CHANNEL BED SHALL BE NATURAL.
  7. PROPOSED CHANNEL SECTIONS REFER TO DRAWING NO. T/200/15 THE AREA AROUND THE CHANNEL.

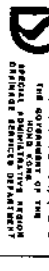


NO.	DATE	DESCRIPTION	BY	CHECKED
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2	02/02	...	...	...
3	02/02	...	...	...
4	02/02	...	...	...

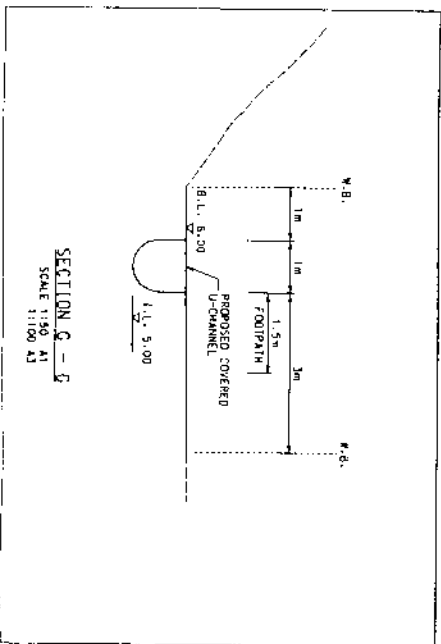
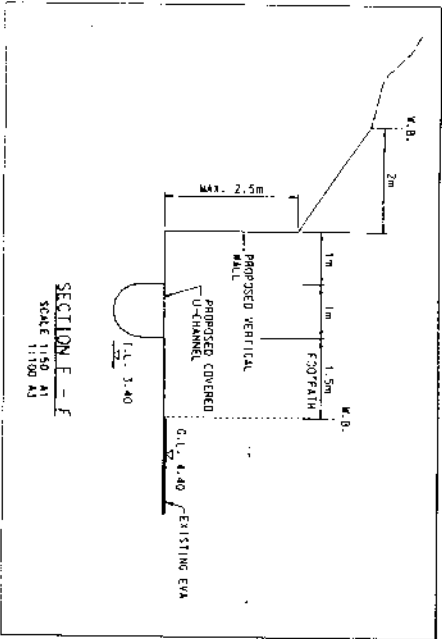
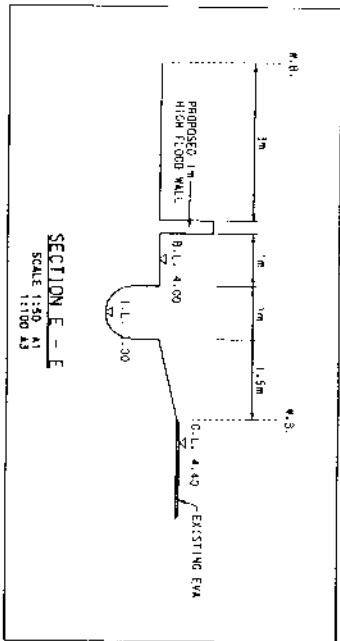
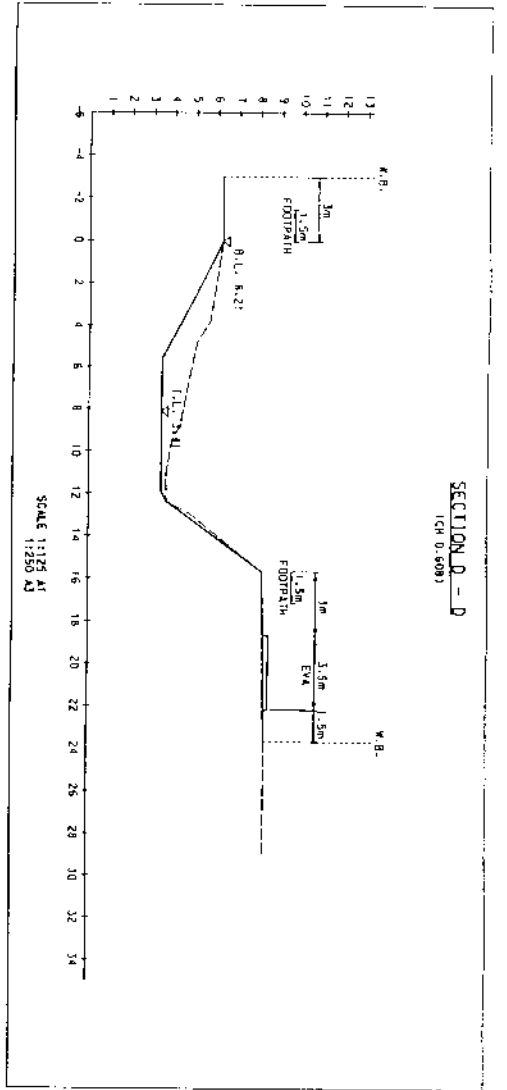
PROJECT: AGREEMENT NO. CE 22/798  
 STORMWATER DRAINAGE  
 WASTER PLAN STUDY  
 IN SAKUNG EAST KOWLOON  
 & SOUTHERN LANTAU

DRAWING TITLE: PRELIMINARY DESIGN - DRAINAGE IMPROVEMENT IN PAK NEGAN HEUNG RIVER (SHEET 1 OF 2)

SCALE: 1:1,000 (A), 1:2,000 (A)



THE HONG KONG SPECIAL ADMINISTRATIVE REGION  
 OFFICE OF THE ENGINEERING DEPARTMENT



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1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

2. ALL LEVELS ARE IN METERS ABOVE PRINCIPAL DATUM POINT.

3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.

4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH SHEET NO. 1100E 1.1.

**LEGEND**

--- PROPOSED CHANNEL

--- EXISTING CHANNEL

--- PROPOSED WATER LEVEL

--- PROPOSED BANK LEVEL

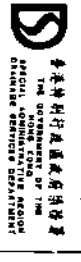
--- 5% SLOPE

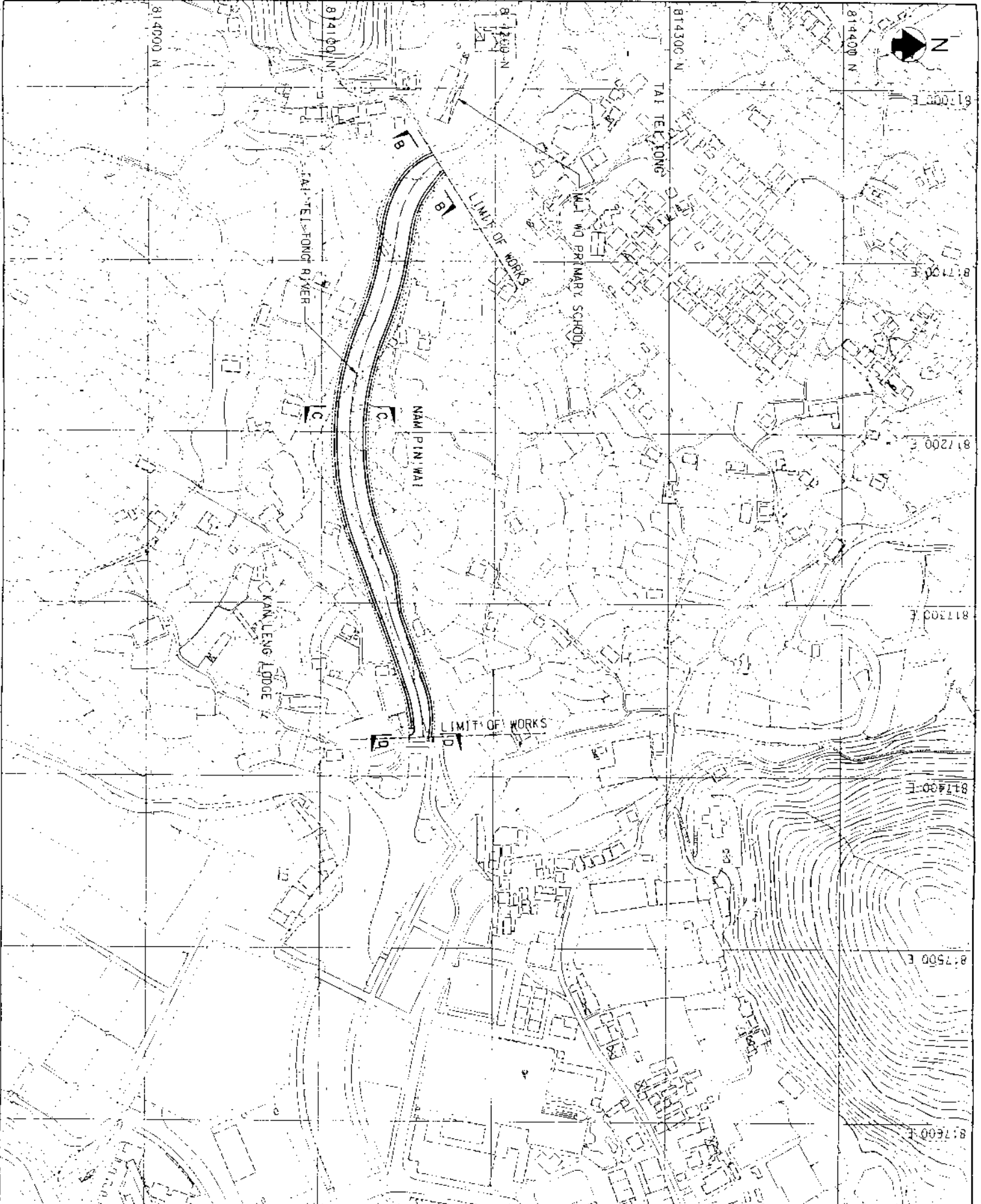
DATE	DESCRIPTION	BY	CHECKED
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22/02	DRAWN	SM	SM
22/02	CHECKED	SM	SM
22/02	APPROVED	SM	SM

PROJECT: AGREEMENT NO. CE 22/98  
STORMWATER DRAINAGE  
MASTER PLAN STUDY  
IN SAIKUNG, EAST KOWLOON  
& SOUTHERN LANTAU

DESIGNED BY: PRELIMINARY DESIGN -  
DRAINAGE IMPROVEMENT  
IN PAK HOAI HEUNG RIVER  
(SHEET 2 OF 2)

FIGURE NO. 1.2  
AS SHOWN





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**NOTES**

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. ALL LEVELS ARE IN METERS ABOVE MEAN SEA LEVEL UNLESS OTHERWISE SPECIFIED.
3. THE CHANNEL BED SHALL BE NATURAL MATERIAL.
4. PROPOSED CHANNEL SECTIONS REFER TO DRAWING NO. FIDR/01/1.
5. THE CHANNEL BATHYMETRY IS THE LEVELS ALONG THE CHANNEL.
6. THE CHANNEL BED SHALL BE NATURAL MATERIAL.
7. PROPOSED CHANNEL SECTIONS REFER TO DRAWING NO. FIDR/01/1.
8. THE CHANNEL BATHYMETRY IS THE LEVELS ALONG THE CHANNEL.

**LEGEND**

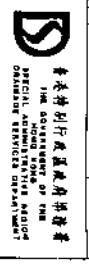
- PROPOSED CHANNEL
- CHA INLAND
- PROPOSED INVERT LEVEL
- 20M5 BOUNDARY

SYMBOL	DESCRIPTION	UNIT
0.00	PROPOSED CHANNEL	CH
0.00	CHA INLAND	CH
0.00	PROPOSED INVERT LEVEL	CH
0.00	20M5 BOUNDARY	CH

**Project:**  
 AGREEMENT NO. CE 32/98  
 STORMWATER DRAINAGE  
 MASTER PLAN STUDY  
 IN SAI KUNG, EAST KOWLOON  
 & SOUTHERN LANTAU

**Project Title:**  
 PRELIMINARY DESIGN -  
 DRAINAGE IMPROVEMENT  
 IN TAI TEL TONG RIVER  
 (SHEET 1 OF 2)

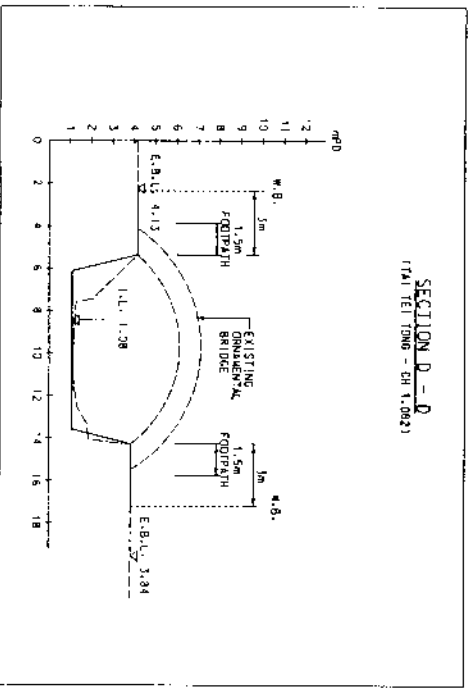
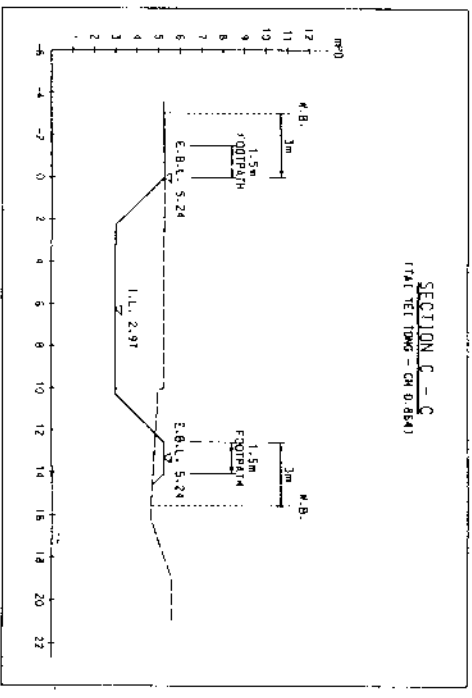
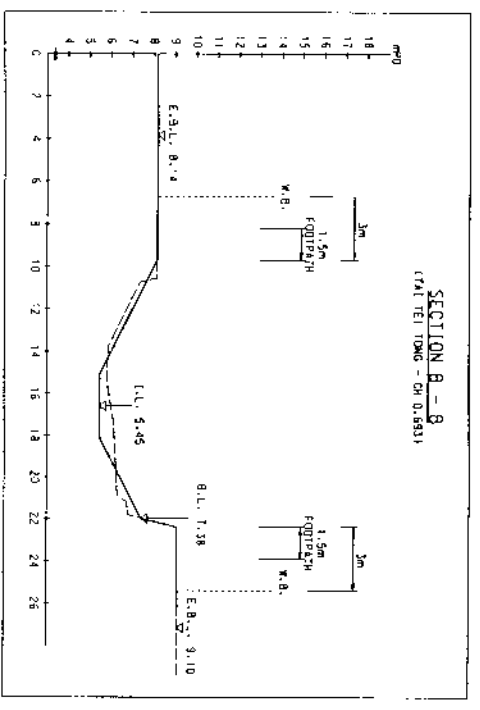
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 1:12000 AS  
 1:12000 AS



- NOTES**
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
  2. ALL LEVELS ARE IN METERS ABOVE MEAN SEA LEVEL (MSL).
  3. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
  4. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.

**LEGEND**

---	PROPOSED CHANNEL
---	EXISTING CHANNEL
---	PROPOSED INVERT LEVEL
---	PROPOSED BANK LEVEL
---	WATER BOUNDARY
---	EXISTING BANK LEVEL

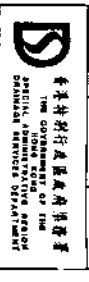


REVISED	DATE	DESCRIPTION	BY	CHECKED
1/14/68	1/14/68	REVISED	W.K.	E.D.
2/27/68	2/27/68	REVISED	W.K.	E.D.

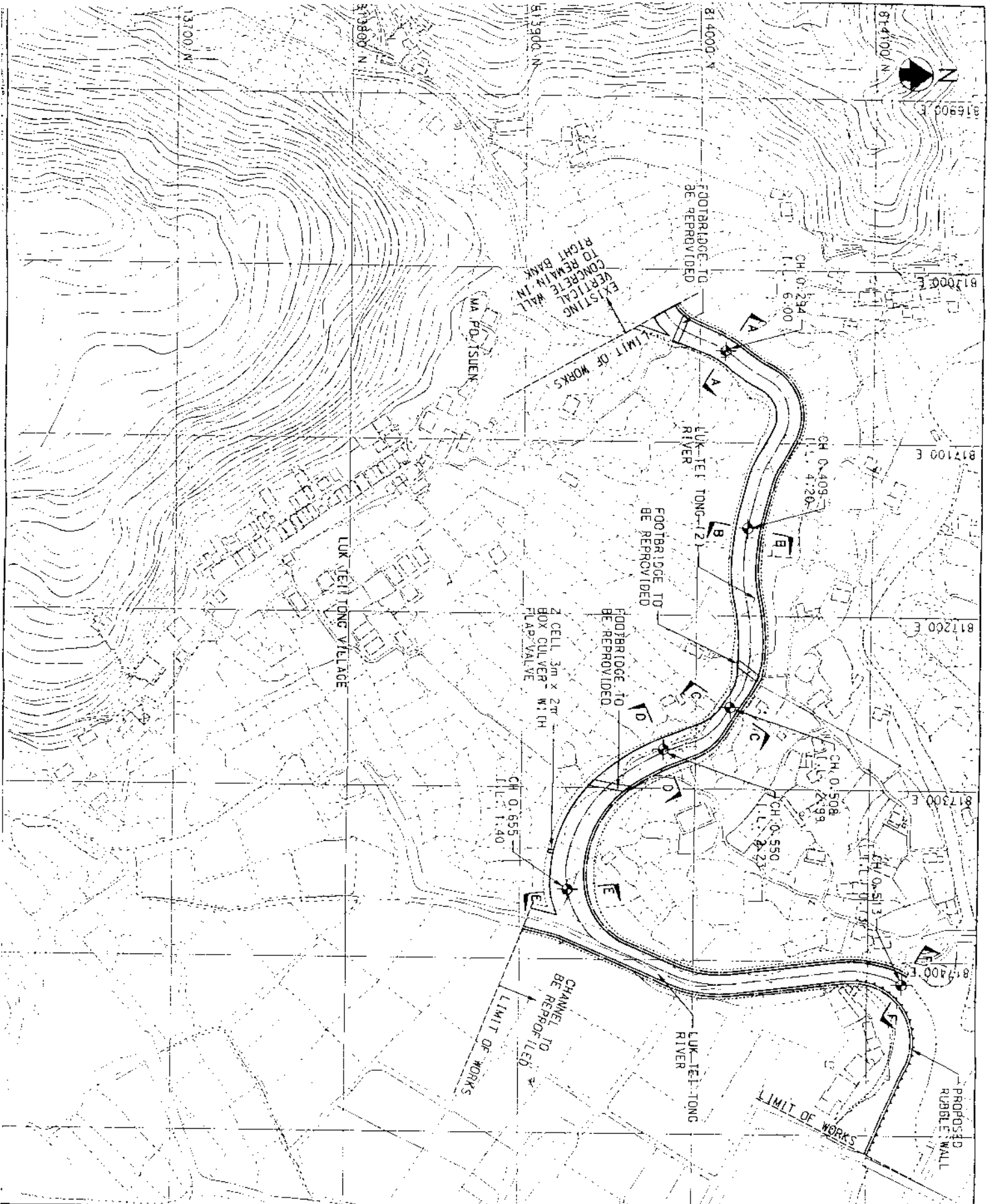
**Project**  
 AGREEMENT NO. CE 32/78  
 STORMWATER DRAINAGE  
 MASTER PLAN STUDY  
 IN SAKING, EAST KUALA LUMPUR  
 & SOUTHERN LAMPAU

**Design Title**  
 PRELIMINARY DESIGN -  
 DRAINAGE IMPROVEMENT  
 IN TAN TEL TONG RIVER  
 [SHEET 2 OF 2]

Drawing No. **SCALE**  
 FIGURE 1.4 1:125 A1  
 1:250 A3







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- NOTES**
- ALL CHANGES ARE IN RED UNLESS OTHERWISE INDICATED.
  - ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
  - THE CHANNEL BED SHALL BE GRAVEL MATERIAL.
  - PROPOSED CHANNEL SECTIONS REFER TO CHANNEL NO. 1 & 2.
  - THE CHANNEL WIDTH SHOWN IS THE AVERAGE ALONG THE CHANNEL.
  - THE CHANNEL FLOOR SHALL BE SLOPED WITH CHANNEL SIDES AND STEEPER THAN 1 IN 2 (UPPER) UNLESS OTHERWISE STATED.

- LEGEND**
- PROPOSED CHANNEL
  - CHANNEL
  - RIVER BOUNDARY
  - EDGE OF FOOTBRIDGE
  - PROPOSED SHEET PILE
  - PROPOSED RUBBLE WALL

DATE	DESCRIPTION	BY	CHECKED
02/02	DESIGN	YK	YK
02/02	DESIGN	YK	YK
02/02	DESIGN	YK	YK

**PROJECT**

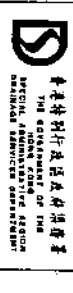
AGREEMENT NO. CE 32/98  
 STORMWATER DRAINAGE  
 MASTER PLAN STUDY  
 IN SAI KONG, EAST KOWLOON  
 & SOUTHERN LANTAU

**DRAWING TITLE**

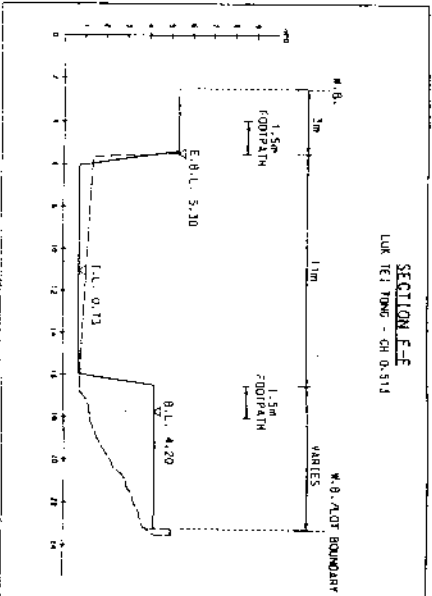
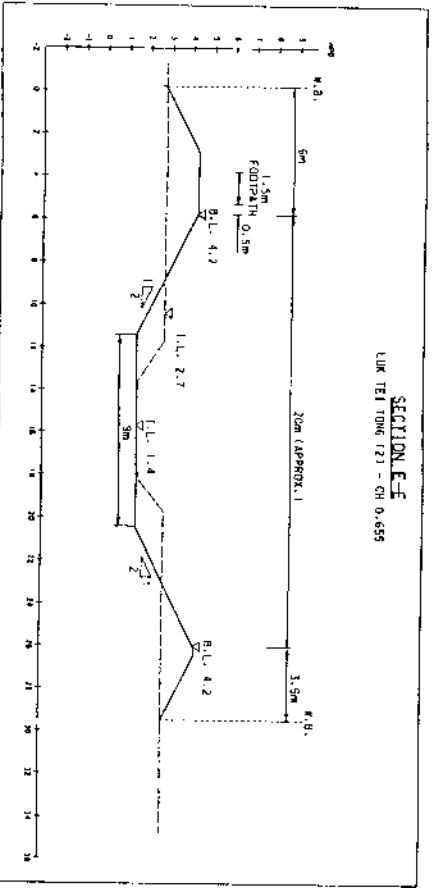
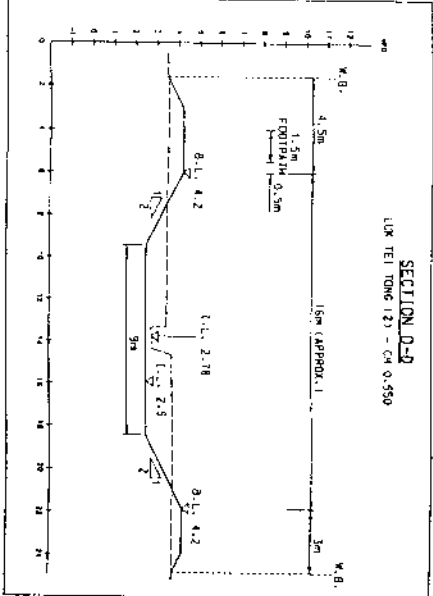
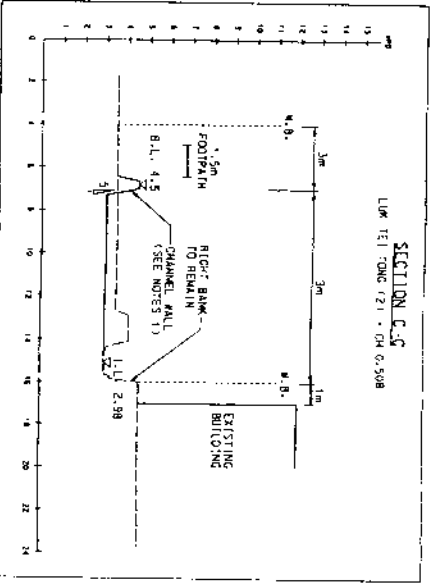
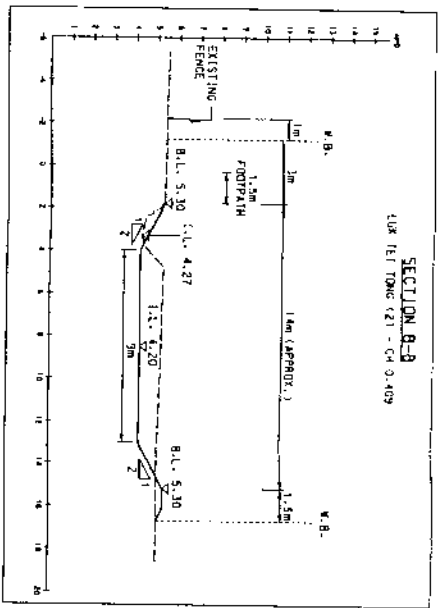
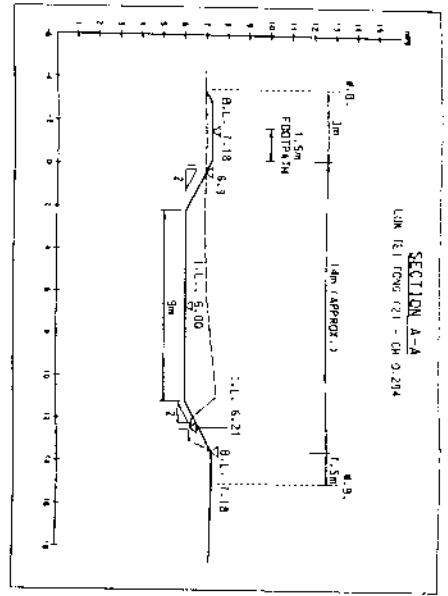
PRELIMINARY DESIGN -  
 DRAINAGE IMPROVEMENT  
 AT LUK TEI TONG RIVER  
 AND LUK TEI TONG(2) RIVER

**SCALE**

FIGURE 1-5  
 1:1000 A1  
 1:2000 A3



香港特別行政區政府  
 THE GOVERNMENT OF THE  
 HONG KONG SPECIAL ADMINISTRATIVE REGION  
 SPECIAL ADMINISTRATIVE REGION  
 REGIONAL SERVICES OPERATIONS



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- NOTES**
1. ALL DIMENSIONS ARE IN KILOMETRES UNLESS OTHERWISE INDICATED.
  2. ALL LEVELS ARE IN METERS ABOVE MEAN SEA LEVEL UNLESS OTHERWISE SPECIFIED.
  3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
  4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO. [ ] OF [ ].
  5. THE PROPOSED CHANNEL DESIGN AND FENCE PROVIDED AT THE NORTH BANK OF THE LUK TEI TONG (2) RIVER.

**LEGEND**

---	PROPOSED CHANNEL
---	EXISTING CHANNEL
---	PROPOSED INVERT LEVEL
---	PROPOSED BANK LEVEL
---	EXISTING BANK LEVEL

REVISION	DATE	DESCRIPTION	INITIAL
1	07/01	ISSUED FOR PERMIT	EDJ
2	07/01	REVISED	EDJ
3	07/01	REVISED	EDJ

**PROJECT**

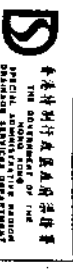
AGREEMENT NO. CE 18/98  
 STORMWATER DRAINAGE  
 MASTER PLAN STUDY  
 IN SIKKING EAST KOWLOON  
 & SOUTHERN LINTAU

**DESIGNER'S TITLE**

PRELIMINARY DESIGN -  
 DRAINAGE IMPROVEMENT  
 IN LUK TEI TONG RIVER  
 AND LUK TEI TONG(2) RIVER

**SCALE**

FIGURE 1.6 1:125 A1  
 1:250 A3



**THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION  
 DRAINAGE SERVICES DEPARTMENT**