

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 707 - NEW TOWNS AND URBAN AREA DEVELOPMENT**

#### **New Territories North Development**

#### **Civil Engineering - Drainage and erosion protection**

#### **30CD – Village flood protection for Yuen Long, Kam Tin and Ngau Tam Mei, North West New Territories, stage 1 - remainder**

Members are invited to recommend to Finance Committee the upgrading of **30CD** to Category A at an estimated cost of \$136.4 million in money-of-the-day prices for village flood protection works at Pok Wai and Wang Chau in Yuen Long.

### **PROBLEM**

The villages in Pok Wai and Wang Chau in the North West New Territories are in low-lying areas and are prone to frequent flooding during typhoons or heavy rainstorms.

### **PROPOSAL**

2. The Director of Territory Development, with the support of the Secretary for Works, proposes to upgrade **30CD** to Category A at an estimated cost of \$136.4 million in money-of-the-day (MOD) prices for village flood protection works at Pok Wai and Wang Chau in Yuen Long.

**/PROJECT .....**

## **PROJECT SCOPE AND NATURE**

3. The scope of **30CD** comprises -
  - (a) flood protection works at Pok Wai, including construction of -
    - (i) a rectangular drainage channel about 830 metres long and associated drainage works; and
    - (ii) associated access roads for maintenance;
  - (b) flood protection works at Wang Chau, including construction of -
    - (i) an underground floodwater storage tank;
    - (ii) a floodwater pumping station and outlet drain pipe;
    - (iii) associated road for maintenance and drainage works; and
    - (iv) a penstock chamber at the outlet of the existing box culvert;
  - (c) environmental mitigation measures including landscaping works; and
  - (d) an environmental monitoring and audit (EM&A) programme for works mentioned in items (a) to (c) above.

\_\_\_\_\_ Details of the proposed works at Pok Wai and Wang Chau are shown at Enclosures 1 and 2 respectively. We plan to start construction in December 2001 for completion in October 2004.

## **JUSTIFICATION**

4. Several flooding incidents in the past have adversely affected the properties of local residents, and have caused economic losses and disruption to transport and social activities in the villages in Pok Wai and Wang Chau, which are situated in the low-lying flood plains of Yuen Long. The proposed flood protection works form part of the Government's overall flood control programme for the North West New Territories and will alleviate flooding problems in the said villages.

5. The proposed works will protect the villages in Pok Wai and Wang Chau from being flooded in the following ways -

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### **Pok Wai**

- (a) a floodwater storage pond cum pumping station is under construction in Pok Wai under **98CD** (see paragraph 27 below). A main drainage channel is also being constructed in Ngau Tam Mei under **100 CD** (see paragraph 29 below). Both are scheduled for completion in August 2002. Upon completion, the proposed drainage channel under **30CD** will convey the rainwater, discharged from Pok Wai floodwater pumping station as well as from the nearby villages during typhoons or heavy rainstorms, to the Ngau Tam Mei Main Drainage Channel. We will also construct access roads to facilitate future maintenance of the proposed drainage channel; and

### **Wang Chau**

- (b) during typhoons or heavy rainstorms, the rainwater within Wang Chau area collected from an existing stream will be discharged into the proposed underground floodwater storage tank. Before the tank starts to overflow, the pumping system will be activated to pump the water via an outlet drain pipe into Yuen Long Nullah. We will provide a penstock at the outlet of the existing box culvert to prevent back flow from Yuen Long Nullah to the low-lying areas of Wang Chau during high tide.

The proposed drainage channel, floodwater storage tank and pumping station are capable of accommodating a 50-year return period rainstorm. The 50-year return period is the desired standard adopted by the Government for new drainage facilities in rural areas. It is derived to achieve cost-effectiveness based on land requirement considerations as well as the social and economic impacts of flooding.

### **FINANCIAL IMPLICATIONS**

6. We estimate the capital cost of the project to be \$136.4 million in MOD prices (see paragraph 7 below), made up as follows –

/(a) .....

	<b>\$ million</b>	
(a) Drainage channel	36.1	
(b) Road works and associated drainage works	18.5	
(c) Underground floodwater storage tank	25.0	
(d) Floodwater pumping station	32.9	
(i) civil works	15.5	
(ii) electrical and mechanical (E&M) works	17.4	
(e) Outlet drain pipe and penstock chamber	6.9	
(f) Environmental mitigation measures including landscaping works	3.8	
(g) EM&A programme	1.5	
(h) Overseas inspection of E&M equipment	0.1	
(i) Contingencies	13.0	
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Sub-total	137.8	(in September 2000 prices)
(j) Provision for price adjustment	(1.4)	
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Total	136.4	(in MOD prices)
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7. Subject to approval, we will phase the expenditure as follows -

<b>Year</b>	<b>\$ million (Sept 2000)</b>	<b>Price Adjustment Factor</b>	<b>\$ million (MOD)</b>
2001 – 2002	3.0	0.98000	2.9
2002 – 2003	29.9	0.97976	29.3
2003 – 2004	47.5	0.98759	46.9
2004 – 2005	42.0	0.99549	41.8
2005 – 2006	10.1	1.00346	10.1
2006 – 2007	5.3	1.01149	5.4
	137.8		136.4

8. We have derived the MOD estimate on the basis of the Government's latest forecast of trend labour and construction prices for the period from 2001 to 2007. We will tender the proposed civil engineering works under standard remeasurement contracts because the works involve extensive earthworks, the quantities of which may vary according to the actual ground conditions. The contracts will provide for price adjustments, as the construction periods will exceed 21 months. We will tender the proposed E&M works on a fixed-price lump-sum basis because we can clearly define the scope of works in advance.

9 We estimate the annually recurrent expenditure arising from this project to be \$1.19 million.

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## **PUBLIC CONSULTATION**

### **Pok Wai**

10. For the Pok Wai flood protection scheme, we consulted San Tin Rural Committee and Yuen Long Provisional District Board on 20 September 1993 and 22 July 1999 respectively. Members supported the project.

11. We gazetted the road works associated with the proposed drainage channel under the Roads (Works, Use and Compensation) Ordinance on 14 January 2000 and received three objections. These objections were lodged on the grounds that the project would affect the village access in the area. We had a series of discussions with the objectors and all of them subsequently withdrew their objections unconditionally. On 2 November 2000, the Secretary for Transport authorised the proposed road works.

12. As the proposed works at Pok Wai would involve filling below high tide level, we gazetted the proposed reclamation works under the Foreshore and Sea-bed (Reclamations) Ordinance on 27 October 2000. We received one objection. The objector was concerned about any adverse environmental impact and the corresponding mitigation measures in this respect. We had a series of discussions with the objector who subsequently withdrew her objection unconditionally. On 23 February 2001, the Director of Lands authorised the proposed reclamation works.

### **Wang Chau**

13. For the Wang Chau flood protection scheme, we consulted the Ping Shan Rural Committee and Yuen Long Provisional District Board on 5 January 1999 and 28 January 1999 respectively. Members supported the project.

### **The Project**

14. We briefed the Legislative Council Panel on Planning, Lands and Works on the overall flood protection strategy on 18 May 2000. Members supported the early implementation of all flood protection schemes in the New Territories, including this project. We further presented the Tin Shui Wai/Yuen Long Development Programme (2000/2001 Edition), including this project, to the Yuen Long District Council on 14 December 2000. Members did not raise any objection to the proposed works at the meeting.

## ENVIRONMENTAL IMPLICATIONS

### Pok Wai

15. Under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance, the Pok Wai drainage channel is a designated project and an environmental permit (EP) is required for the construction and operation of the project. The Environmental Protection Department (EPD) issued the EP on 23 March 2001 for the proposed Pok Wai drainage channel.

16. In May 1994, we employed consultants to carry out an EIA to assess the environmental impacts due to the construction and operation of a series of flood control projects including Pok Wai in Yuen Long, Kam Tin and Ngau Tam Mei.

17. The EIA report was completed in May 1996. It concluded that the environmental impact of the proposed works at Pok Wai could be controlled to within established standards and guidelines through the implementation of the mitigation measures as recommended in the EIA. We will implement the recommended environmental mitigation measures by incorporating them into the works contracts. These measures include landscaping works (hydroseeding/ planting trees) on the embankment and open space. No less than 130 standard trees will be planted along the access road to compensate for the 76 trees felled as a result of the project. In addition, approximately 5 000 trees and shrub seedling will be planted in filled area adjacent to the channel in ecological mitigation as required in the EIA Report. We will also incorporate into the works contracts standard measures to control pollution arising during construction. These measures will include frequent watering of fugitive dust, the use of silenced construction plant to reduce noise generation and other procedures as recommended in EPD's Recommended Pollution Control Clauses. We have included the costs of implementing the environmental mitigation measures including landscaping works (\$3.8 million) and an EM&A programme (\$1.5 million) in the overall project estimate.

18. We consulted the Advisory Council on the Environment (ACE) on the EIA report in July 1996. ACE endorsed the report on condition that -

- (a) the old river channels would be considered for restoration into wildlife habitats;

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- (b) the disposal of contaminated mud should be to the satisfaction of the Fill Management Committee (FMC), now replaced by the Marine Fill Committee (MFC), and such disposal would have no adverse effects on the environment; and
- (c) the proponents should review the conceptual off-site wetland compensation measures in the light of Government's latest policy on off-site wetland compensation and report back to the EIA Sub-committee of the ACE their specific proposals for this project.

19. The MFC has approved the arrangements for the disposal of contaminated mud (see paragraph 23 below). As regards the other conditions set by ACE, the Agriculture, Fisheries and Conservation Department (AFCD) is currently carrying out a study to address the restoration of the old river channels and off-site wetland compensation and will report the findings to the EIA Sub-committee in end 2002 once AFCD has completed the study.

### **Wang Chau**

20. A separate Environmental Review on the proposed works at Wang Chau conducted by EPD in August 1996 concluded that the proposed works would not cause insurmountable environmental problems and an EIA would not be necessary.

### **The Project**

21. We have considered in the planning and design stages ways of minimizing the generation of construction and demolition (C&D) materials by giving due consideration to designing the level and layout of the proposed works under this project. We estimate that the project will generate about 17 880 cubic metres (m<sup>3</sup>) of C&D materials. Of these, about 2 180 m<sup>3</sup> (12%) will be reused on site, 12 700 m<sup>3</sup> (71%) will be reused as fill in public filling areas and 3 000 m<sup>3</sup> (17%) will be disposed of at landfills.

22. The excavated materials will also be transported via watertight trucks to the designated dumping areas to avoid pollution.

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23. The part of the project at Pok Wai will generate about 31 900 m<sup>3</sup> of marine mud and 1 430 m<sup>3</sup> of contaminated mud. The marine mud will be delivered by barges to marine disposal areas at South Cheung Chau/East Ninepin and the contaminated mud will be delivered by barges to the disposal facility at East Sha Chau. Besides stipulating the need for proper disposal of dredged materials, we will require the contractor to make use of closed mechanical grabs and to avoid stockpiling of contaminated mud on site.

24. We will require the contractor under the contract to submit a waste management plan for approval with appropriate mitigation measures, including the allocation of an area for waste segregation. We will ensure that day-to-day operations on site will comply with the approved plan. We will require the contractor to reuse the excavated materials on site or on other construction sites as filling materials as far as possible to minimize the disposal of public fill. To further minimize the generation of C&D materials, we will encourage the contractor to use non-timber materials for hoarding, formwork and other temporary works. We will control the disposal of public fill and C&D waste to the designated public filling areas and landfills respectively through a trip-ticket system. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

## **LAND ACQUISITION**

25. We will resume about two hectares of agricultural land for the proposed works. The land acquisition and clearance will affect two households involving seven persons. The Director of Housing will offer the eligible clearerees accommodation in public housing in accordance with the existing rehousing policy. We will charge the costs of land acquisition and clearance, estimated at \$46.3 million, to Head 701 - Land Acquisition.

## **BACKGROUND INFORMATION**

26. In August 1990 and December 1995, we upgraded **30CD** and **74CD**<sup>1</sup> respectively to Category B for the construction of flood protection works for low-lying villages in Yuen Long, Kam Tin and Ngau Tam Mei.

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<sup>1</sup> The scope of **74CD** "Village flood protection for Yuen Long, Kam Tin and Ngau Tam Mei, NWNT – stage II" comprises flood protection works in six villages. We plan to implement the works under **74CD** in late 2001 for completion by phases from late 2003 to mid 2005.

27. Finance Committee has approved the upgrading of parts of **30CD** to Category A, as detailed below -

<b>Upgrade to Cat. A</b>	<b>Project Title (Approved project estimate)</b>	<b>Start date</b>	<b>Completion date</b>
June 1995	<b>71CD</b> - "Village flood protection for Sha Po Tsuen, Kam Tin, New Territories" (\$96.6 million)	Sept 1996	June 1999
June 1999	<b>98CD</b> - "Phase 1 village flood protection for Pok Wai and Wang Chau, North West New Territories" (\$106.8 million)	Oct 1999	Aug 2002
June 2000	<b>107CD</b> - "Village flood protection for Chuk Yuen Tsuen and Ha San Wai, North West New Territories" (\$152.1 million)	Nov 2000	Mar 2003

28. The remaining scope of **30CD** comprising works for Pok Wai and Wang Chau is described in paragraph 3 above. D of DS has completed the detailed design and drawings using in-house resources.

29. Other than **30CD**, the following flood protection projects have either started or been completed in the vicinity of Pok Wai and Wang Chau -

<b>Upgrade to Cat. A</b>	<b>Project Title (Approved project estimate)</b>	<b>Start date</b>	<b>Completion date</b>
May 1993	<b>60CD</b> - "North West New Territories development - main drainage channels for Yuen Long and Kam Tin stage 1, phase 1" (\$880 million)	Oct 1993	July 1999
July 1999	<b>100CD</b> - "Main drainage channel for Ngau Tam Mei phase 1 - Yau Mei San Tsuen to Tai Sang Wai section" (\$442.5 million)	Nov 1999	Aug 2002

/Nov 1999 .....

Nov 1999    **29CD** - "Main drainage channels for    Mar 2000    Aug 2002  
Ngau Tam Mei phase 2 - Ngau Tam  
Mei to Yau Mei San Tsuen section"  
(\$142.1 million)

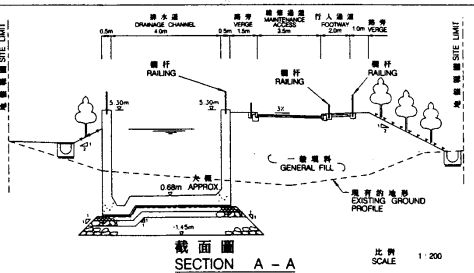
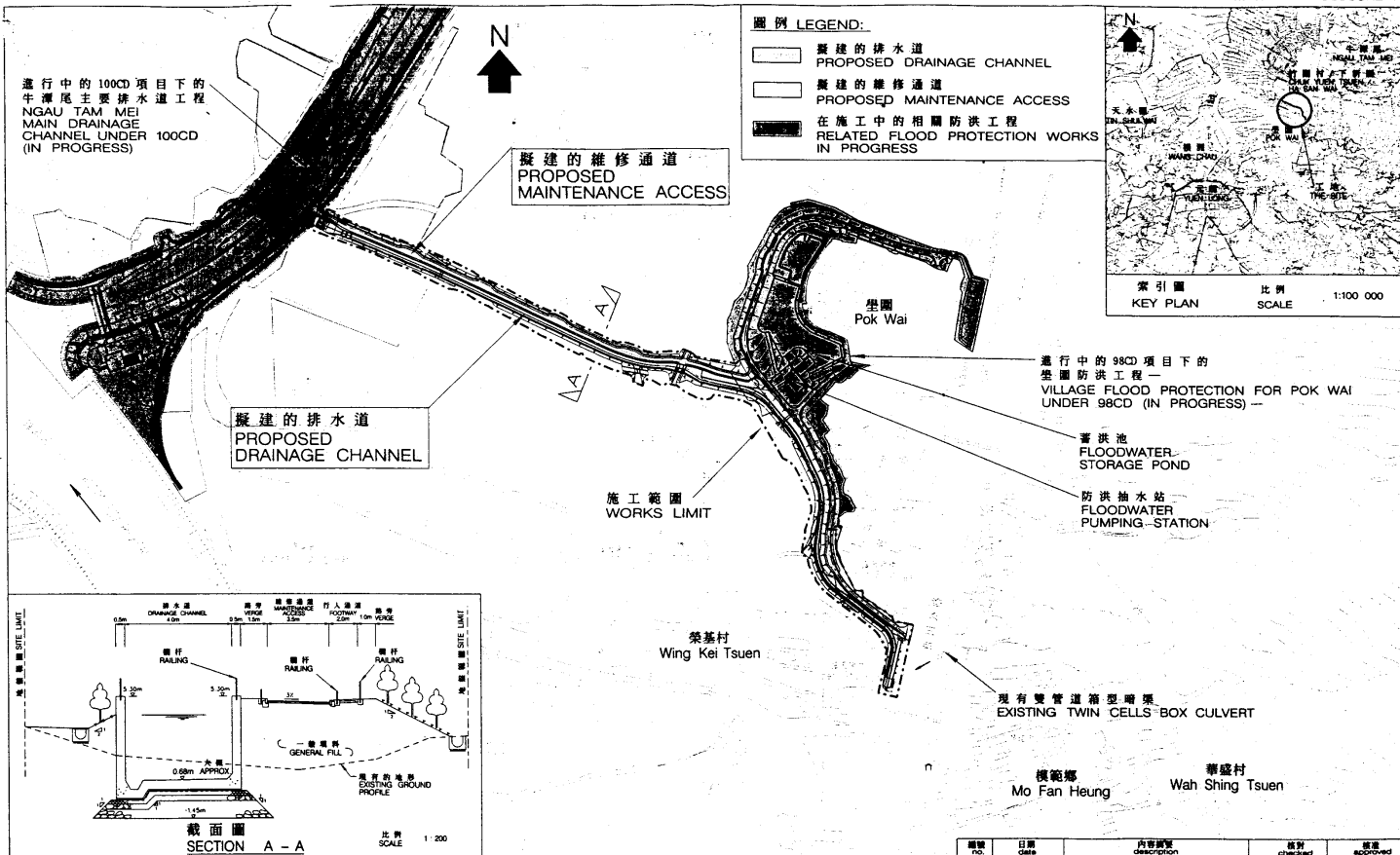
### **Job Opportunities**

30.            We estimate that the project will create some 100 new jobs, comprising 25 professional/technical staff and 75 labourers, totalling 2 600 man-months.

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Works Bureau  
May 2001

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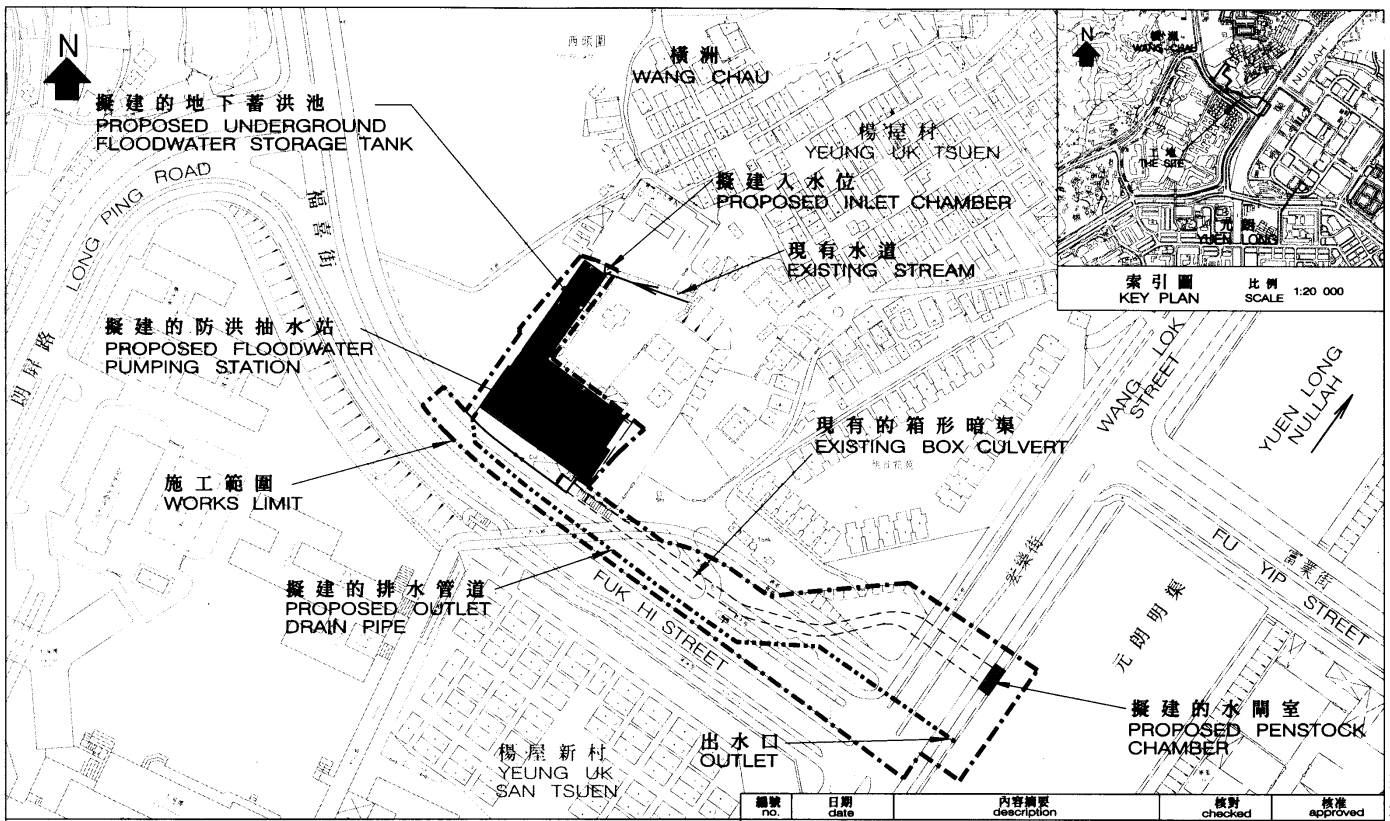
二〇〇一至二〇〇二年度工務小組委員會文件 P.W.S.C. SUBMISSION 2001/2002

圖則名稱 drawing title

擬建的壆圍排水道  
PROPOSED POK WAI DRAINAGE CHANNEL

編號 no.	日期 date	內容描述 description	核對 checked	核准 approved
修訂 REVISION				
繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office 新界北拓展處 NEW TERRITORIES NORTH DEVELOPMENT OFFICE
K S LO	SIGNED	11.01.2001	30 CD	
核對 checked	簽署 initial	日期 date	比例 scale	拓展署 TERRITORY DEVELOPMENT DEPARTMENT
W K HO	SIGNED	18.01.2001	1:4 000	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.	
TSUI Wai	SIGNED	26.03.2001	NTN 2089	

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二〇〇一至二〇〇二年度工務小組委員會文件 P.W.S.C. SUBMISSION 2001/2002		修訂 REVISION		核對 checked	核准 approved
圖則名稱 drawing title		繪圖 drawn	簽署 initial	日期 date	項目編號 item no.
擬建的橫洲蓄洪池及防洪抽水站 PROPOSED WANG CHAU FLOODWATER STORAGE TANK AND FLOODWATER PUMPING STATION		K S LO	SIGNED	11.01.2001	30CD
		核對 checked	簽署 initial	日期 date	比例 scale
		W K HO	SIGNED	16.01.2001	1:1 000
		核准 approved	簽署 initial	日期 date	圖則編號 drawing no.
		TSUI Wai	SIGNED	26.03.2001	NTN 2090

辦事處 office  
 新界北拓展處  
 NEW TERRITORIES NORTH  
 DEVELOPMENT OFFICE

拓展署  
 TERRITORY  
 DEVELOPMENT  
 DEPARTMENT

附件 2 ENCLOSURE 2