

For discussion
on 25 October 2000

PWSC(2000-01)50

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

**81CD – Main drainage channels for Yuen Long and Kam Tin stage 2 –
remainder**

Members are invited to recommend to Finance Committee the upgrading of **81CD** to Category A at an estimated cost of \$291.6 million in money-of-the-day prices.

PROBLEM

We need to improve two sections of the tributaries of Kam Tin River, namely the section between Ng Ka Tsuen and Shui Lau Tin (Ng Ka Tsuen Channel) and the section between Shek Tau Wai and Sheung Tsuen San Tsuen (Shek Tau Wai Channel), to alleviate the flooding hazard to the low-lying areas of Kam Tin.

PROPOSAL

2. The Director of Territory Development (DTD), with the support of the Secretary for Works, proposes to upgrade **81CD** to Category A at an estimated cost of \$291.6 million in money-of-the-day (MOD) prices for the construction of Ng Ka Tsuen Channel and Shek Tau Wai Channel.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of **81CD** comprises –
- (a) the construction of a trapezoidal drainage channel about 2.5 kilometres long from Ng Ka Tsuen to Shui Lau Tin ;
 - (b) the construction of a trapezoidal drainage channel about 0.9 kilometre long from Shek Tau Wai to Sheung Tsuen San Tsuen;
 - (c) the provision of five vehicular bridges and two footbridges;
 - (d) the provision of roads and ramps with associated drainage and water works;
 - (e) the implementation of environmental mitigation measures including landscaping works; and
 - (f) the implementation of an environmental monitoring and audit (EM&A) programme for works mentioned in items (a) to (e) above.

Details of the proposed works are shown at Enclosure 1. We plan to commence construction in May 2001 for completion in June 2003.

JUSTIFICATIONS

4. For many years, Kam Tin has been susceptible to flooding due to its low-lying topography. The extensive changes in land use and rapid development in recent years have significantly aggravated the flooding problem in this area. The “North West New Territories Base Strategy Studies” (the Initial Study), completed in 1983, recommended a series of river training works to alleviate the flooding hazard in the North West New Territories, including the low-lying areas of Kam Tin. The “Territorial Land Drainage and Flood Control Strategy Study - Phase II”, completed in 1993, also confirmed the recommendations of the Initial Study. As part of an overall flood alleviation programme, the river training works for the downstream sections of the Kam Tin River under **60CD** and **43CD** (see paragraph 23 below) were completed in July 1999 and those for upstream sections

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under **95CD** and **97CD** (see paragraph 21 below) are in progress. The proposed works under **81CD** are the continuation of the downstream works aiming to alleviate flooding upstream of Kam Tin River and form part of the programme. The locations of related flood protection works in Yuen Long and Kam Tin are shown at Enclosure 2.

5. The existing sections of the tributaries of Kam Tin River between Ng Ka Tsuen and Shui Lau Tin and between Shek Tau Wai and Sheung Tsuen San Tsuen are narrow and meandering. The proposed works will turn them into wider and deeper drainage channels and will substantially increase the hydraulic capacity of the river. With a design capacity of accommodating a 50-year return period rainstorm, the drainage channels will significantly reduce the risk of flooding in the area.

6. To facilitate access around and across the embankments of the proposed drainage channels, we will construct five vehicular bridges and two footbridges. These will benefit the 3,300 or so villagers living around the works area.

7. In addition, we will construct roads and ramps along the proposed drainage channels to facilitate future maintenance.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the project to be \$291.6 million in MOD prices (see paragraph 9 below), made up as follows -

	\$ million
(a) Drainage channels	139.0
(b) Five vehicular bridges and two footbridges	14.0
(c) Roads and ramps with associated drainage and water works	51.0
(d) Environmental mitigation measures (including landscaping works)	17.0

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		\$ million	
(e)	EM&A programme	3.0	
(f)	Consultants' fees for -	26.0	
	(i) construction stage	2.0	
	(ii) resident site staff costs	24.0	
(g)	Contingencies	25.0	
	Sub-total	275.0	(in September 2000 prices)
(h)	Provision for price adjustment	16.6	
	Total	291.6	(in MOD prices)

DTD proposes to employ consultants to carry out the construction supervision. A breakdown of the estimate for consultants' fees by man-months is at Enclosure 3.

9. Subject to approval, we will phase the expenditure as follows -

Year	\$ million (Sept 2000)	Price adjustment factor	\$ million (MOD)
2001 - 2002	40.0	1.02550	41.0
2002 - 2003	170.0	1.05627	179.6
2003 - 2004	55.0	1.08795	59.8
2004 - 2005	10.0	1.12059	11.2
	275.0		291.6

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10. 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 2005. We will tender the proposed works under a standard remeasurement contract because the works involve extensive earthworks, the quantities of which may vary according to the actual ground conditions. The contract will provide for price adjustments as the construction period will exceed 21 months.

11. We estimate the annually recurrent expenditure arising from this project to be \$3.13 million.

PUBLIC CONSULTATION

12. We consulted the Pat Heung Rural Committee and Kam Tin Rural Committee on **81CD** on 1 August 1997 and 5 September 1997 respectively. Members of the Committees supported the proposed works. We also consulted the Environmental Improvement Committee of the Yuen Long Provisional District Board about the proposed works on 26 September 1997 and received support from its members. On 2 February 2000, we presented the Tin Shui Wai/Yuen Long Development Programme, including this project, to Yuen Long District Council. Members did not raise any objection to the proposed works.

13. We presented the findings and the environmental mitigation measures recommended in the Environmental Impact Assessment (EIA) report to the Yuen Long District Board on 13 June 1996. Members had no objection to the proposed measures. We consulted the EIA Sub-committee of the Advisory Council on the Environment (ACE) on the report on 1 July 1996. The ACE endorsed the report on the conditions prescribed in paragraph 16 below.

14. We gazetted the proposed road scheme ancillary to the drainage channels under the Roads (Works, Use and Compensation) Ordinance on 19 February 1999 and did not receive any objections. We then gazetted the authorization of the road scheme on 7 May 1999. To rectify some information about the land under resumption, we gazetted amendments to the authorized road scheme on 10 March 2000. One of the affected landowners has lodged an objection to the amendments on grounds of partial resumption of his lot. On 10 October 2000, the Chief Executive in Council overruled the objection in the public interest and authorized the amendments to the road works without modification.

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15. On 18 May 2000, we briefed and updated the Legislative Council Panel on Planning, Lands and Works on the overall flood control and prevention measures. We are committed to and Members supported expediting all flood control schemes in the North West New Territories, including this project.

ENVIRONMENTAL IMPLICATIONS

16. We completed an EIA report on the main drainage channels for Yuen Long, Kam Tin and Ngau Tam Mei in May 1996. The EIA report concluded that the environmental impact arising from the project could be controlled to within established standards and guidelines through the implementation of the recommended mitigation measures. The ACE endorsed the report in July 1996 on the conditions that -

- (a) the old river channels should be considered for restoration into wildlife habitats;
- (b) the disposal of contaminated mud should be to the satisfaction of the Marine Fill Committee (MFC) (i.e. the then Fill Management Committee) and such disposal should have no adverse effects on the environment; and
- (c) the proponents should review the conceptual off-site wetland compensation measures in the light of the Government's latest policy on off-site wetland compensation and report back to the EIA Sub-committee their specific proposals for this project.

For (a) and (c), the Agriculture, Fisheries and Conservation Department is carrying out a study and will report to the Sub-committee by end 2000. As regards (b), the MFC approved the arrangements for the disposal of contaminated mud in June 2000.

17. We shall formulate an EM&A programme to ensure timely and effective implementation of the measures. The key measures include re-vegetation of embankment slopes and open space with "species of ecological utility"¹. For short-term impact during construction, we shall require the

/contractor

¹ "Species of ecological utility" are plant species which will enhance the biodiversity of the area by providing food, shelter, breeding sites etc. for birds, amphibians, mammals, reptiles and insects.

contractor to -

- (a) ensure frequent watering of the site and to provide wheel-washing facilities in order to reduce emission of fugitive dust;
- (b) use silenced construction plant to reduce noise generation and to erect temporary noise barriers;
- (c) use closed mechanical grabs when dredging contaminated mud on site so as to avoid spillage; and
- (d) use barges and hoppers with tight-fitting seals in order to avoid leakage of materials.

We have included the cost of implementing the environmental mitigation measures (\$17 million) and the EM&A programme (\$3 million) in the overall project estimate.

18. At the planning and design stage, we have purposely located the proposed channels in a way that will allow us to reduce the generation of construction and demolition material (C&DM) and to reuse suitable material excavated on site as far as possible. We estimate that -

- (a) about 15 000 cubic metres (m³) of construction and demolition (C&D) waste will be disposed of at landfills;
- (b) about 117 000 m³ of public fill will be delivered to public filling facilities; and
- (c) about 95 500 m³ of contaminated mud will be disposed of at East Sha Chau marine dumping site.

19. We shall require the contractor to submit a waste management plan to the Engineer for approval, with appropriate mitigation measures including the allocation of an area for waste segregation. We shall require the Engineer to ensure that the day-to-day operations on site comply with the approved waste management plan. We shall require the contractor to reuse the excavated material on site or on other construction sites as filling materials as far as possible to

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minimize the disposal of public fill to public filling facilities. To further minimize the generation of C&DM, we shall require the contractor not to use hardwood for site hoarding, falsework or shoring of excavation, but to use metal in all components of site hoardings and signboards. We shall control the disposal of public fill and C&D waste at designated facilities through a trip-ticket system. We shall require the contractor to separate public fill from C&D waste for disposal at public filling facilities and landfills respectively and to sort the C&DM on site by category to facilitate reuse and recycling. The reused and recycled materials shall include paper, cardboard, timber and metal. We shall record the disposal, reuse and recycling of C&DM for monitoring purposes.

LAND ACQUISITION

20. We will resume about 8.3 hectares of agricultural land and 41 square metres of private residential land for the proposed works. The land acquisition and clearance will affect 49 households involving 147 persons and 45 temporary structures. Under the existing policy, the Director of Housing will offer eligible families accommodation in public housing. We will charge the costs of land acquisition and clearance, estimated at \$166 million, to **Head 701 - Land Acquisition**.

BACKGROUND INFORMATION

21. We upgraded **81CD** to Category B in September 1995. Since then, Finance Committee has approved the upgrading of parts of the project to Category A, as follows –

Date of upgrading	Project title (Approved project estimate)	Start date	Target completion date
March 1999	95CD – Main drainage channels for Yuen Long and Kam Tin stage 2 – Kam Tin San Tsuen to Wang Toi Shan section (\$419.3 million)	August 1999	March 2002
May 1999	97CD – Main drainage channels for Yuen Long and Kam Tin stage 2 – Kam Tin Road to Tai Kek section (\$410.4 million)	July 1999	March 2002

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22. The remaining scope of **81CD** comprises the works as described in paragraph 3 above. In July 1996, we engaged consultants to undertake the investigation and detailed design for the proposed works and charged the cost of \$3.12 million to the block allocation **7100CX** "New towns and urban area works, studies, and investigations for items in Category D of the Public Works Programme". The consultants have completed the detailed design and drawings.

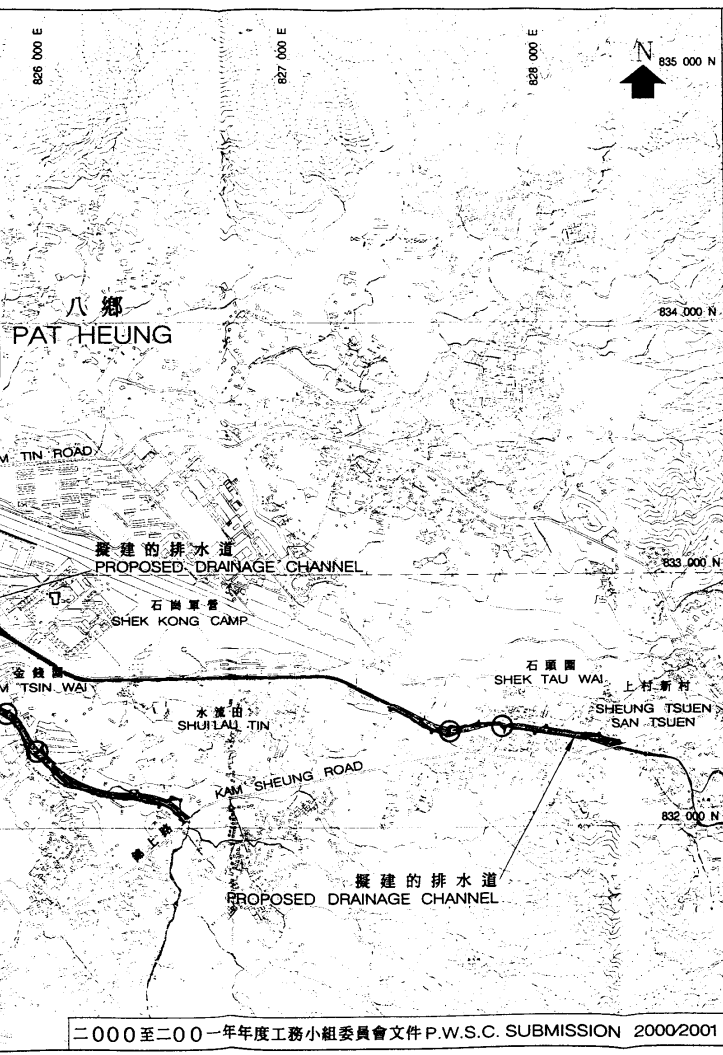
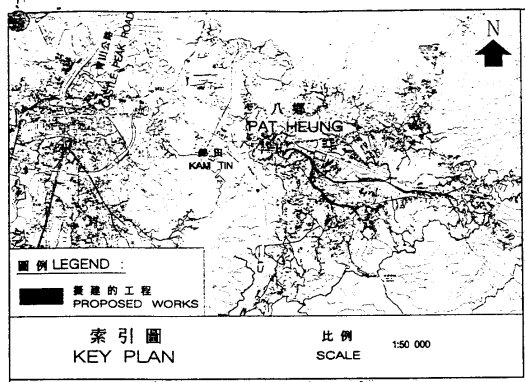
23. As part of the overall flood alleviation programme, we have completed the following flood protection projects in the Yuen Long and Kam Tin areas under other PWP items –

Date of upgrading	Project title (Approved project estimate)	Start date	Completion date
May 1993	60CD – North West New Territories development – main drainage channels for Yuen Long and Kam Tin stage 1 phase 1 (\$880 million)	October 1993	July 1999
June 1995	43CD – North West New Territories development – main drainage channels for Yuen Long and Kam Tin stage 1 phase 2 (\$356.8 million)	October 1995	July 1999

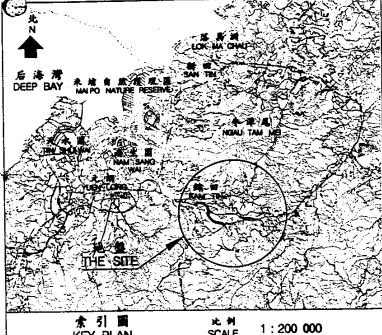
24. We estimate that the project will create some 265 jobs comprising 45 professional/technical staff and 220 labourers, totalling 6 200 man-months.

Works Bureau
October 2000

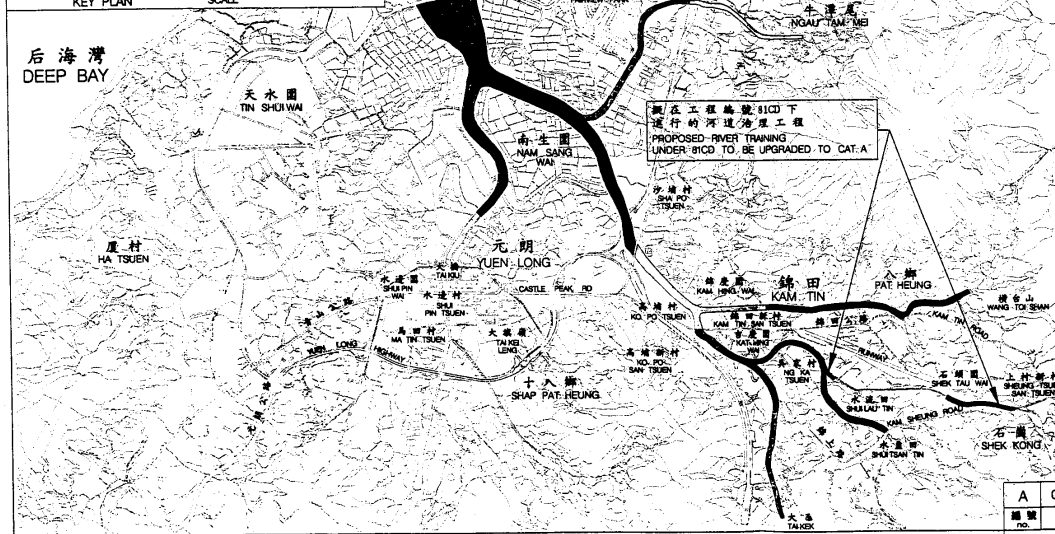
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C 16.10.00	LEGEND REVISED		
B 13.10.00	LEGEND REVISED		
A 12.10.00	LEGEND REVISED		
編號 / 日期 no. / date	內容 / 簽署 description / (initials) signature	日期 date	簽署 / 日期 (initials) / date
修訂 REVISION			
繪圖 drawn	姓名 name	日期 initial date	日期 date
Y P HUNG			30.08.00
核准 approved			
B S LIU			30.08.00
圖工 工程師 / 日期 chief engineer / date			
工程編號 project no. 81CD			
檔案編號 file no.			
合約編號 contract no.			
合約 contract			
圖名 drawing title			
元朗及錦田的主要排水道第2階段 餘下工程 MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN STAGE 2 - REMAINDER			
圖號 drawing no.	比例 scale		
NTN 2072C	1:15 000		
辦事處 office 新界北拓展處 NEW TERRITORIES NORTH DEVELOPMENT OFFICE			
拓展署 TERRITORY DEVELOPMENT DEPARTMENT			



后海灣
DEEP BAY



擬進行的工程
PROPOSED WORKS TO BE UPGRADED TO CAT. A

81CD/B 元朗及錦田的主要排水道第 2 階段 - 餘下工程
MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN STAGE 2 - REMAINDER

在元朗及錦田有關的防洪工程
RELATED FLOOD PROTECTION PROJECTS IN YUEN LONG AND KAM TIN

- 60CD/A 新界西北發展計劃一
元朗及錦田的主要排水道 - 第 1 階段第 1 期工程
MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN - STAGE 1, PHASE 1
- 43CD/A 新界西北發展計劃一
元朗及錦田的主要排水道 - 第 1 階段第 2 期工程
NWN DEVELOPMENT MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN - STAGE 1, PHASE 2
- 97CD/A 元朗及錦田的主要排水道第 2 階段 - 錦田公路至大馬路
MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN STAGE 2 - KAM TIN ROAD TO TAI KEK SECTION
- 95CD/A 元朗及錦田的主要排水道第 2 階段 - 錦田新村至樓台山段
MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN STAGE 2 - KAM TIN SAN TSUEN TO WANG TOI SHAN SECTION
- 100CD/A 牛潭尾的主要排水道第 1 期 - 牧其新村至大生圍段
MAIN DRAINAGE CHANNEL FOR NGAU TAM MEI PHASE 1 - YAU MEI SAN TSUEN TO 'A' I SANG WAI SECTION
- 29CD/A 牛潭尾的主要排水道第 2 期 - 牛潭尾至牧其新村段
MAIN DRAINAGE CHANNEL FOR NGAU TAM MEI TO YAU MEI SAN TSUEN SECTION

A	02.10.2000	LOCATION OF 3 ITEMS DELETED	SIGNED	SIGNED
編號 no.	日期 date	內容摘要 checkpoints	核對 checked	核准 approved
修訂 REVISION				

二〇〇〇至二〇〇一年度工務小組委員會文件

P.W.S.C. SUBMISSION 2000/2001

元朗及錦田的主要排水道第 2 階段 - 餘下工程

MAIN DRAINAGE CHANNELS FOR YUEN LONG & KAM TIN STAGE 2 - REMAINDER

繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office
C CHUN	SIGNED	30.08.2000	81CD	新界北拓展處 NEW TERRITORIES NORTH DEVELOPMENT OFFICE
核對 checked	簽署 initial	日期 date	比例 scale	
Y P HUNG	SIGNED	30.08.2000	1:50 000	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.	拓展署 TERRITORY DEVELOPMENT DEPARTMENT
B S LIU	SIGNED	30.08.2000	NTN 2074A	

**81CD – Main drainage channels for Yuen Long and Kam Tin
stage 2 – remainder**

Breakdown of the estimate for consultants' fees

Consultants' staff costs			Estimated man- months	Average MPS* salary point	Multiplier factor	Estimated fee (\$ million)
(a)	Consultants' fees for construction stage					
(i)	contract administration	Professional	10.0	40	2.4	1.50
		Technical	5.0	16	2.4	0.25
(ii)	preparation of as-built drawings	Professional	1.0	40	2.4	0.15
		Technical	2.0	16	2.4	0.10
(b)	Resident site staff costs	Professional	94.0	40	1.7	10.0
		Technical	392.0	16	1.7	14.0
Total consultants' staff costs						26.0

* MPS = Master Pay Scale

Notes

1. A multiplier factor of 2.4 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profits, as the staff will be employed in the consultants' offices. A multiplier factor of 1.7 is applied to the average MPS point in the case of resident site staff supplied by consultants. (At 1.4.2000, MPS pt. 40 = \$62,780 p.m. and MPS pt. 16 = \$21,010 p.m.)
2. The figures given above are based on estimates prepared by the Director of Territory Development. The consultancy works for this project have been included as part of the consultancy agreement for the main drainage channel works for Ngau Tam Mei phase 2 and Yuen Long and Kam Tin - remainder phase 3.