For discussion **PWSC(2002-03)14**
on 8 May 2002

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
73CD – Main drainage channels and poldered village protection schemes for San Tin, NWNT phase 3, part 1 – eastern main drainage channel for San Tin

Members are invited to recommend to Finance Committee the upgrading of **73CD,** retitled "San Tin Eastern Main Drainage Channel", to Category A at an estimated cost of $354.2 million in money-of-the-day prices.

PROBLEM

We need to construct a main drainage channel from Tung Chan Wai, San Tin to Shenzhen River to alleviate the risk of flooding in the low-lying areas of San Tin.

PROPOSAL

2. The Director of Territory Development (DTD), with the support of the Secretary for Works, proposes to upgrade **73CD** to Category A at an estimated cost of $354.2 million in money-of-the-day (MOD) prices for the construction of a main drainage channel (San Tin Eastern Main Drainage Channel) from Tung Chan Wai, San Tin to Shenzhen River.

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PROJECT SCOPE AND NATURE

3. The scope of **73CD** comprises –

(a) construction of a trapezoidal drainage channel of about 2.2 kilometres long from Tung Chan Wai, San Tin to Shenzhen River;

(b) construction of an inflatable dam and a low flow pumping station at the downstream end of the proposed drainage channel;

(c) construction of two vehicular bridges at both ends of the proposed drainage channel;

(d) construction of roads and ramps with associated drainage and water works along the proposed drainage channel;

(e) implementation of environmental mitigation measures; and

(f) 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 the Enclosure. We plan to commence construction in September 2002 for completion in September 2005.

JUSTIFICATIONS

4. For many years, San Tin has been susceptible to flooding due to its low-lying topography. The existing streamcourse at the western side of San Sham Road is one of the two main streamcourses discharging storm water to Shenzhen River in San Tin. This streamcourse serves to convey storm water collected from areas at the south of Fanling Highway and the lowland at Chau Tau into Shenzhen River. As the streamcourse is narrow and meandering, it can only accommodate moderate rainstorms. Thus, the areas at the south of Fanling Highway, the lowland at Chau Tau and the areas along the streamcourse at San Tin are

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susceptible to flooding from overflow of the streamcourse. We propose to widen this streamcourse into a deeper drainage channel to substantially increase its hydraulic capacity, thus reducing the risk of flooding in the area. We will design the proposed drainage channel with a capacity to withstand rainstorm with a 50-year return period[1].

5. The section of Shenzhen River to which the proposed channel is connected is subject to the tidal wave of Deep Bay. Back flow of tidal river water into the proposed channel will cause undesirable environmental impacts in the vicinity. To address this problem, we propose to construct an inflatable dam and a low flow pumping station at the downstream end of the proposed drainage channel. Under normal weather condition, we will inflate the dam to prevent water of Shenzhen River from entering the channel. When the water behind the dam reaches a specified level, we will activate the pumping system to discharge water flow into Shenzhen River. During heavy rainstorms when the upstream water level of the proposed drainage channel is high, we will deflate the inflatable dam to discharge the flood water into Shenzhen River.

6. To facilitate access around and across the embankments, we will construct two vehicular bridges at both ends of the proposed drainage channel. We will also construct roads and ramps along the western embankment of the proposed drainage channel to facilitate future maintenance.

7. As part of the environmental mitigation measures, we will create an artificial wetland with associated planting along the eastern side of the proposed channel. We will provide grasscrete on the inner lining of the channel with perennial vegetation. We will implement an EM&A programme during the construction and operation stage of the project.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the project to be $354.2 million in MOD prices (see paragraph 9 below), made up as follows –

/(a) .....

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[1] "Return period" is the average number of years during which a certain severity of flooding will occur once, statistically. A longer return period means a rarer chance of occurrence of a more severe flooding.

			$ million	
(a)	Drainage channel		150.0	
(b)	Inflatable dam and low flow pumping station		40.0	
	(i) civil works	27.0		
	(ii) electrical and mechanical (E&M) works	13.0		
(c)	Two vehicular bridges		35.0	
(d)	Roads and ramps with associated drainage and water works		44.0	
(e)	Environmental mitigation measures (including creation of an artificial wetland and associated landscaping works)		53.0	
(f)	EM&A programme		6.0	
(g)	Contingencies		32.0	
	Sub-total		360.0	(in September 2001 prices)
(h)	Provision for price adjustment		(5.8)	
	Total		354.2	(in MOD prices)

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

/**Year** .....

Year	$ million (Sept 2001)	Price adjustment factor	$ million (MOD)
2002 - 2003	12.0	0.98625	11.8
2003 - 2004	100.0	0.98378	98.4
2004 - 2005	130.0	0.98378	127.9
2005 – 2006	91.0	0.98378	89.5
2006 – 2007	20.0	0.98378	19.7
2007 – 2008	7.0	0.98378	6.9
	360.0		354.2

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 2002 to 2008. We will tender the proposed civil engineering 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 contract period will exceed 21 months. Since we can clearly define the scope of works in advance, we will tender the proposed E&M works under a fixed-price lump-sum contract.

11. We estimate the annually recurrent expenditure arising from this project to be $4.1 million.

PUBLIC CONSULTATION

12. We consulted the San Tin Rural Committee on 5 January 1994, 19 June 1998 and 30 October 2000. We also consulted the Environmental Improvement Committee of the Yuen Long Provisional District Board and the Town Planning and Development Committee of the Yuen Long District Council

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on 26 November 1998 and 15 November 2000 respectively. Members of the Rural Committee and the district councillors showed their support to the works on all these occasions.

13. We presented the findings and the environmental mitigation measures recommended in the Environmental Impact Assessment (EIA) report to the Yuen Long Provisional District Board and the San Tin Rural Committee on 27 May 1999 and 24 June 1999 respectively. Members had no objection to the proposed measures.

14. On 13 June 2001, we briefed the Legislative Council Panel on Planning, Lands and Works on the flooding occurred in the New Territories in June 2001. In August and September 2001, we provided information papers to the Panel and committed to speeding up implementation of the remaining flood protection projects (including the present submission) in Northern New Territories to bring early relief to the flooding problem.

15. We gazetted the proposed road scheme ancillary to the drainage channel under the Roads (Works, Use and Compensation) Ordinance on 23 January 2001 and received one objection which was subsequently withdrawn. The Secretary for Transport authorised the proposed road scheme on 25 May 2001.

16. As the proposed works involve filling below high tide level, we gazetted the proposed reclamation works under the Foreshore and Sea-bed (Reclamations) Ordinance on 19 January 2001 and received one objection which was subsequently withdrawn after some clarifications. On 13 July 2001, the Director of Lands authorised the proposed reclamation works.

ENVIRONMENTAL IMPLICATIONS

17. The project is designated under Schedule 2 of the EIA Ordinance (EIAO) and an environmental permit is required for the construction and operation of the project. In September 1999, the EIA report for the project was approved under the EIAO with the following conditions –

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(a) DTD shall liaise and negotiate with Architectural Services Department on integration of the wetlands for San Tin Eastern Main Drainage Channel and Lok Ma Chau Border Crossing Facilities;

(b) the disturbance to the wetland shall be minimised by limiting the use of the side-ways leading to the access road of San Tin Eastern Main Drainage Channel; and

(c) an Ecological Habitat Management Plan (the Plan) shall be submitted to the Director of Environmental Protection (DEP) for agreement.

At the design stage of the project, we have taken into account the requirements of items (a) and (b) above. As regards item (c), DEP approved the Plan and issued the environmental permit for implementing the proposed works in March 2002.

18. The EIA report concluded that the environmental impact of the project could be controlled to within the criteria under the EIAO and the Technical Memorandum on EIA Process. We will implement the measures recommended in the EIA report. The key measures include the control of noise, dust, and water quality to within established standards and guidelines through the implementation of pollution control measures in works contracts during the construction stage. We will carry out the EM&A programme during the construction and operation stage of the project. We estimate the total cost of implementing the environmental mitigation measures and EM&A programme to be $59 million. We have included this cost in the overall project estimate.

19. We have considered in the planning and design stages ways of minimising the generation of construction and demolition (C&D) materials by giving due consideration to designing the level and layout of the proposed works.

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We estimate that the project will generate about 184 000 cubic metres (m^3) of C&D materials. Of these, about 90 000 m^3 (49%) will be reused on site, 92 000 m^3 (50%) will be reused as fill in public filling areas[2] and 2 000 m^3 (1%) will be disposed of at landfills. The notional cost of accommodating C&D waste at landfill site is estimated to be $250,000 for this project (based on a notional unit cost[3] of $125/$m^3$).

20. The project will generate about 8 500 m^3 of uncontaminated mud and about 51 350 m^3 of contaminated mud. All the uncontaminated mud will be delivered by barges to marine disposal areas at South Cheung Chau/East Ninepin. Of the 51 350 m^3 of contaminated mud, some 45 500 m^3 will be delivered to the disposal facility at North Brothers/East Sha Chau while the remaining 5 850 m^3 will be reused as fill in public filling areas after special treatment.

21. We will require the contractor to submit a waste management plan (WMP) to the Engineer for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that day-to-day operations on site will comply with the approved WMP. We will require the contractor to reuse the excavated materials on site or on other construction sites as filling material as far as possible to minimise the disposal of public fill. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

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[2] A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

[3] This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at $90/$m^3$), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

LAND ACQUISITION

22. We will resume about 9.97 hectares of agricultural land for the proposed works. The land acquisition and clearance will affect eight households involving 32 persons and 119 temporary structures. Under the existing policy, the Director of Housing will offer eligible families accommodation in public housing. We will charge the land acquisition and clearance costs estimated at $193 million, comprising $183 million for land resumption and $10 million for clearance, to **Head 701** - Land Acquisition.

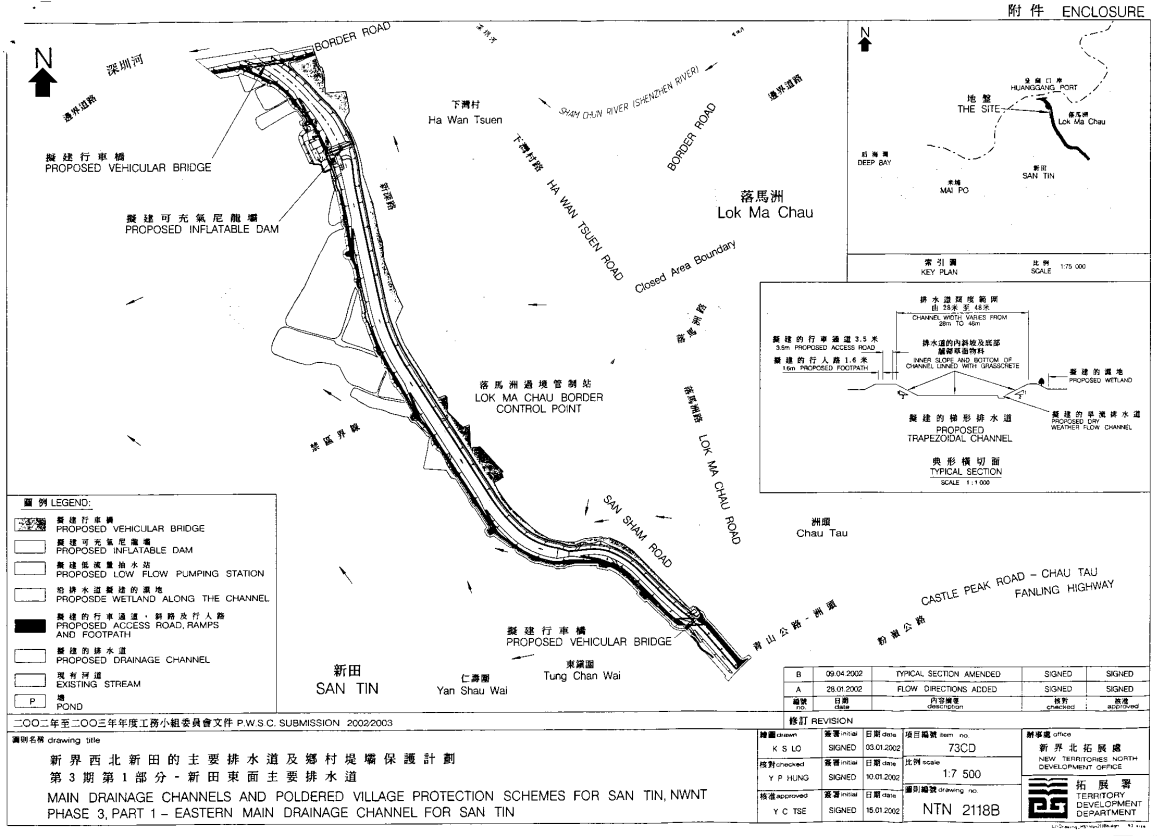
BACKGROUND INFORMATION

23. We upgraded **73CD** to Category B in January 1996. The Director of Drainage Services (D of DS) has completed the detailed design and drawings for the proposed works using in-house resources. D of DS will also supervise the construction works by in-house resources.

24. We estimate that the project will create some 190 new jobs, comprising 20 professional/technical staff and 170 labourers, totalling 6 200 man-months.

Works Bureau
April 2002

附件 ENCLOSURE



二OO二年至二OO三年年度工務小組委員會文件 P.W.S.C. SUBMISSION 2002/2003

修訂 REVISION					
B	09.04.2002	TYPICAL SECTION AMENDED	SIGNED	SIGNED
A	29.01.2002	FLOW DIRECTIONS ADDED	SIGNED	SIGNED
編號 no.	日期 date	內容摘要 description	核對 checked	批准 approved

圖則名稱 drawing title

新界西北新田的主要排水道及鄉村堤壩保護計劃
第3期第1部分 - 新田東面主要排水道
MAIN DRAINAGE CHANNELS AND POLDERED VILLAGE PROTECTION SCHEMES FOR SAN TIN, NWNT
PHASE 3, PART 1 – EASTERN MAIN DRAINAGE CHANNEL FOR SAN TIN

	簽署 initial	日期 date
繪圖 drawn: K S LO	SIGNED	05.01.2002
核對 checked: Y P HUNG	SIGNED	10.01.2002
核准 approved: Y C TSE	SIGNED	15.01.2002

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比例 scale 1:7 500
圖則編號 drawing no. NTN 2118B

新界北拓展處 NEW TERRITORIES NORTH DEVELOPMENT OFFICE
拓展署 TERRITORY DEVELOPMENT DEPARTMENT