

## **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**  
**70CD – Yuen Long bypass floodway**

Members are invited to recommend to Finance Committee the upgrading of **70CD** to Category A at an estimated cost of \$476.2 million in money-of-the-day prices.

### **PROBLEM**

We need to construct a main drainage channel for use as a bypass floodway to alleviate the flooding problems in and around Yuen Long Town.

### **PROPOSAL**

2. The Director of Territory Development (DTD), with the support of the Secretary for Works, proposes to upgrade **70CD** to Category A at an estimated cost of \$476.2 million in money-of-the-day (MOD) prices for the construction of a bypass floodway from Sham Chung Tsuen to Kam Tin River near Sha Po Tsuen in Yuen Long.

### **PROJECT SCOPE AND NATURE**

3. The scope of **70CD** comprises –

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- (a) construction of a drainage channel of about 3.8 kilometres long from Sham Chung Tsuen to Kam Tin River near Sha Po Tsuen;
- (b) construction of an inflatable dam and a low flow pumping station at the downstream end of the proposed drainage channel;
- (c) construction of nine vehicular bridges and five footbridges;
- (d) construction of roads and ramps with associated drainage and water works along the proposed drainage channel;
- (e) implementation of environmental mitigation measures including creation of an artificial wetland and landscaping works; and
- (f) implementation of an environmental monitoring and audit (EM&A) programme for the works mentioned in items (a) to (e) above.

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Details of the proposed works are shown at Enclosures 1 and 2. We plan to commence construction in November 2002 for completion in May 2006.

## JUSTIFICATIONS

4. In the past, serious flooding incidents occurred in and around Yuen Long Town. The floodings caused economic losses and disruption to transport and social activities in the surrounding villages. The proposed drainage works form part of the Government's overall flood control programme for North West New Territories and will alleviate flooding problems in the concerned villages.

5. Due to rapid urbanisation in Yuen Long Town in the last two decades, fishponds in the area have been filled up. This has reduced the overall flood storage capacity and further aggravated the flooding problem in the area. The Territorial Land Drainage and Flood Control Strategy Study – Phase II, completed by the Drainage Services Department in 1993, confirmed the inadequacy of the existing Yuen Long main nullah and its subsidiary channels to protect Yuen Long Town from periodic flooding. The study recommends the

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construction of a new floodway for providing additional drainage capacity to cater for the present needs and to increase the discharge capacity of the existing nullah system for accommodating further developments in the Yuen Long area.

6. The proposed floodway will intercept floodwater from existing nullahs, streams and Sham Chung Channel in the south and east of Yuen Long Town and discharge the flow to Kam Tin River. It will have a design capacity to withstand rainstorms with a 50-year return period<sup>1</sup>.

7. The section of Kam Tin River, to which the proposed floodway is connected, is subject to tidal wave of Deep Bay. Backflow of tidal river water into the proposed floodway 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 floodway. Under normal weather conditions, we will inflate the dam to prevent water of Kam Tin River from entering the floodway. When the water behind the dam reaches a specified level, we will activate the pumping system to discharge water flow into Kam Tin River. During heavy rainstorms when the upstream water level of the proposed floodway is high, we will deflate the inflatable dam to discharge the flood water into Kam Tin River.

8. To facilitate access around and across the proposed floodway, we will construct nine vehicular bridges and five footbridges. We will also construct roads and ramps along the proposed floodway to facilitate future maintenance.

9. As part of the environmental mitigation measures, we will create an artificial wetland to the north of the confluence with Kam Tin River to compensate for the ecological habitat loss due to construction of the proposed floodway. We will provide grasscrete on the inner lining of the proposed floodway with perennial vegetation. We will implement an EM&A programme during the construction and operation stages of the project.

## FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the project to be \$476.2 million in MOD prices (see paragraph 11 below), made up as follows –

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<sup>1</sup> “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.

		<b>\$ million</b>	
(a)	Drainage channel	190.0	
(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)	Nine vehicular bridges and five footbridges	85.0	
(d)	Roads and ramps with associated drainage and water works	64.0	
(e)	Environmental mitigation measures (including creation of an artificial wetland and associated landscaping works)	55.0	
(f)	EM&A programme	6.0	
(g)	Contingencies	44.0	
	Sub-total	484.0	(in September 2001 prices)
(h)	Provision for price adjustment	(7.8)	
	Total	476.2	(in MOD prices)

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

<b>Year</b>	<b>\$ million (Sept 2001)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2002 – 2003	6.0	0.98625	5.9
2003 – 2004	125.0	0.98378	123.0
/2004 – 2005 .....			

2004 – 2005	135.0	0.98378	132.8
2005 – 2006	103.0	0.98378	101.3
2006 – 2007	95.0	0.98378	93.5
2007 – 2008	20.0	0.98378	19.7
	<hr/> 484.0 <hr/>		<hr/> 476.2 <hr/>

12. 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 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. We will tender the proposed E&M works under a fixed-price lump-sum contract because we can clearly define the scope of works in advance.

13. We estimate the annual recurrent expenditure arising from this project to be \$4.9 million.

## **PUBLIC CONSULTATION**

14. We consulted the Shap Pat Heung Rural Committee on 10 July 1998, 6 August 1998 and 12 May 2000. We also consulted the Environmental Improvement Committee of the then Yuen Long Provisional District Board and the Yuen Long District Council on 23 July 1998 and 17 May 2000 respectively on the proposed works. Members of the Committees supported the proposed works, and had no adverse comments on the main findings of the Environmental Impact Assessment (EIA) study report.

15. 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 North West New Territories to bring early relief to the flooding problem.

16. We gazetted the proposed road scheme ancillary to the proposed floodway under the Roads (Works, Use and Compensation) Ordinance on 8 December 2000 and received 16 objections, of which 13 remain unresolved. On 30 November 2001, we gazetted the amendment to the proposed road scheme to rectify the discrepancies in designations and areas of certain lots affected and received no objection to the amendment scheme. On 19 March 2002, the Chief Executive in Council overruled the objections in public interest and authorised the amendment scheme with modifications. The modifications involve adjustment of land resumption boundary to avoid resumption of two private lots at Shung Ching San Tsuen.

17. 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 1 December 2000 and received two objections, of which one remains unresolved. On 19 March 2002, the Chief Executive in Council overruled the objection in public interest and authorised the proposed reclamation without modification.

## **ENVIRONMENTAL IMPLICATIONS**

18. The project is designated under Schedule 2 of the EIA Ordinance and an environmental permit is required for the construction and operation of the project. We completed an EIA report on the project in June 1998. 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 EIA report was endorsed by the Advisory Council on the Environment on 28 September 1998 and approved by the Director of Environmental Protection (DEP) on 17 October 1998 without condition. We subsequently conducted a reassessment on the proposed ecological mitigation measures to relocate the originally proposed wetland from private land to government land in order to minimise land resumption. The recommendations of the reassessment have been incorporated into the Environmental Permit issued by DEP on 16 August 2000.

19. We will construct the proposed floodway in accordance with the terms and conditions of the Environmental Permit and implement an EM&A programme during the construction and operation stages. We estimate the total cost of implementing the environmental mitigation measures and EM&A programme to be \$61 million. We have included this cost in the project estimate (i.e., paragraphs 10(e) and (f)).

20. We have considered at the planning and design stages ways of minimising the generation of construction and demolition (C&D) materials by giving due consideration to designing the levels and layout of the proposed works. We estimate that the project will generate about 652 500 cubic metres (m<sup>3</sup>) of C&D materials. Of these, about 249 000 m<sup>3</sup> (38%) will be reused on site, 397 000 m<sup>3</sup> (61%) will be reused as fill in public filling area<sup>2</sup> and 6 500 m<sup>3</sup> (1%) will be disposed of at landfills. The notional cost of accommodating C&D waste at landfill site is estimated to be \$812,500 for this project (based on a notional unit cost<sup>3</sup> of \$125/m<sup>3</sup>).

21. The project will generate about 26 750 m<sup>3</sup> of uncontaminated mud and about 26 750 m<sup>3</sup> of contaminated mud. The uncontaminated mud will be delivered by barges to marine disposal areas at South Cheung Chau/East Ninepin and the contaminated mud to the disposal facility at East Sha Chau.

22. 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 the day-to-day operations on site comply with the approved WMP. We will require the contractor to reuse the excavated material 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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<sup>2</sup> 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.

<sup>3</sup> 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<sup>3</sup>), 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

23. We will resume about 13.6 hectares of agricultural land and 839.5 square metres of building/private residential land for the proposed works. The land acquisition and clearance will affect 77 households involving 202 persons and 638 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 to be \$298 million, to **Head 701** – Land Acquisition.

## BACKGROUND INFORMATION

24. We upgraded **70CD** to Category B in September 1995. In December 1996, we upgraded parts of **70CD** to Category A as **86CD** “Yuen Long bypass floodway – advance works at intersection with Route 3 (Country Park section)” and **87CD** “Yuen Long bypass floodway – site investigation and consultants’ fees”.

25. We started the works under **86CD** and **87CD** in January 1997 and March 1997 and completed the works in December 1997 and June 2002 respectively.

26. 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.

27. We estimate that the project will create some 215 new jobs comprising 40 professional/technical staff and 175 labourers, totalling 8 130 man-months.

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