

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

### **HEAD 709 – WATERWORKS**

#### **Water Supplies – Fresh water supplies**

#### **232WF – Reconstruction of catchwater channels and tunnels in Tai Lam Chung**

Members are invited to recommend to Finance Committee the upgrading of **232WF** to Category A at an estimated cost of \$138.1 million in money-of-the-day prices for the reconstruction of catchwater channels and tunnels in Tai Lam Chung and the associated slope works.

### **PROBLEM**

The catchwater channels and tunnels in Tai Lam Chung are showing signs of deterioration due to ageing. In addition, some slopes adjoining the defective sections of catchwater channels are not up to current geotechnical standards.

### **PROPOSAL**

2. The Director of Water Supplies (DWS), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **232WF** to Category A at an estimated cost of \$138.1 million in money-of-the-day (MOD) prices for the reconstruction of defective sections of the catchwater channels and tunnels in Tai Lam Chung, and for upgrading 16 substandard slopes adjoining the defective sections of the catchwater channels in conjunction with the reconstruction works.

**/PROJECT .....**

**PROJECT SCOPE AND NATURE**

3. The scope of the works under **232WF** comprises –
- (a) reconstructing 2 kilometres (km) of defective sections of catchwater channels in Tai Lam Chung;
  - (b) repairing 6.5 km of defective sections of catchwater channels in Tai Lam Chung;
  - (c) repairing 1 km of defective sections of catchwater tunnels in Tai Lam Chung; and
  - (d) upgrading 16 substandard slopes adjoining defective sections of the catchwater channels in Tai Lam Chung identified under (a) and (b) above.

4. We plan to start the proposed works in April 2003 for completion by early 2006. Site plan showing the location of the proposed works is at  
———— Enclosure 1.

**JUSTIFICATION**

5. The 29 km of catchwater channels and 9 km of catchwater tunnels in Tai Lam Chung have been in use for about 40 years. Many sections of the catchwater channels and tunnels are showing signs of ageing. The deteriorating condition of the catchwater channels and tunnels may lead to water leakage. Breaking of the channels during rainstorms may result in flooding and slope failures. To ensure the continued stability of the catchwater channels and tunnels, we propose to reconstruct or repair, as appropriate, the defective sections of the catchwater channels and tunnels as detailed in paragraph 3(a) to (c) above.

/6. ....

6. During the investigation study for **232WF**, we engaged geotechnical consultants to carry out Engineer Inspection<sup>1</sup> for the slopes adjoining the catchwater channels. The consultants identified 16 substandard slopes adjoining the defective sections of the catchwater channels that could affect the roads and developments nearby. We consider it cost-effective to carry out upgrading works for the 16 substandard slopes in conjunction with the proposed reconstruction and repair of catchwater channels.

### FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the project to be \$138.1 million in MOD prices (see paragraph 8 below), made up as follows –

	<b>\$ million</b>
(a) Reconstruction and repairing of catchwater channels and tunnels	59.3
(b) Slope works	51.1
(i) upgrading	49.6
(ii) landscaping	1.5
(c) Consultants' fees	14.1
(i) contract administration	1.8
(ii) site supervision	12.3
(d) Environmental mitigation measures	2.0

/(e) .....

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<sup>1</sup> An Engineer Inspection for slope is an inspection to be conducted once every five years or more frequently to assess the state of maintenance and condition of the slope by a professionally qualified geotechnical engineer in accordance with Geoguide 5: Guide to Slope Maintenance published by the Geotechnical Engineering Office.

		<b>\$ million</b>	
(e)	Contingencies	12.7	
		<hr/>	
	Sub-total	139.2	(in September 2002 prices)
(f)	Provision for price adjustment	(1.1)	
		<hr/>	
	Total	138.1	(in MOD prices)
		<hr/>	

\_\_\_\_\_ A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

<b>Year</b>	<b>\$ million (Sept 2002)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2003 – 2004	23.0	0.99250	22.8
2004 – 2005	46.9	0.99250	46.5
2005 – 2006	41.7	0.99250	41.4
2006 – 2007	22.6	0.99250	22.4
2007 – 2008	5.0	0.99250	5.0
	<hr/>		
	139.2		<hr/>
			138.1
			<hr/>

9. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2003 to 2008. We will tender the proposed works under a standard re-measurement contract because the exact quantities of the reconstruction and repair works for the catchwater channels and tunnels have to be determined on site and the quantities of slope works may vary with actual ground conditions. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract. /10. ....

10. This project will not give rise to any additional recurrent expenditure.

11. The project by itself would lead to an increase in production cost of water<sup>2</sup> by about 0.05% in real terms by 2008.

## **PUBLIC CONSULTATION**

12. We consulted the Town Planning and Development Committee of the Yuen Long District Council on 17 July 2002, the Environment, Hygiene and District Development Committee of the Tuen Mun District Council on 19 July 2002 and the Tsuen Wan District Council on 30 July 2002. The Committees and District Council supported the proposal.

## **ENVIRONMENTAL IMPLICATIONS**

13. We completed a Preliminary Environmental Review (PER) in February 1997. The PER concluded that the project would have no long-term adverse environmental impacts. The Director of Environmental Protection vetted the PER and agreed that an Environmental Impact Assessment would not be necessary. For short-term construction impacts, standard pollution control measures<sup>3</sup> would be sufficient to mitigate the environmental impacts within established standards and guidelines. We have included \$2 million (in September 2002 prices) for implementing these mitigation measures in the project estimate and will incorporate these requirements into the works contract for implementation.

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<sup>2</sup> The increase in production cost of water is calculated on the assumption that the demand remains static during the period from 2002 to 2008 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

<sup>3</sup> The standard pollution control measures include the use of silenced plant, desilting traps, wheel washing facilities and other procedures as recommended in Environmental Protection Department's Recommended Pollution Control Clauses.

14. We have considered measures to reduce the generation of construction and demolition (C&D) materials in the design for the slope upgrading works. We estimate that about 26 550 cubic metres (m<sup>3</sup>) of C&D materials will be generated by the project. Of these, we will reuse about 3 710 m<sup>3</sup> (14.0%) on site, 21 840 m<sup>3</sup> (82.2%) as fill in public filling areas<sup>4</sup> and dispose of 1 000 m<sup>3</sup> (3.8%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$125,000 for this project (based on a notional unit cost<sup>5</sup> of \$125/m<sup>3</sup>).

15. We will require the contractor to submit a waste management plan to the Engineer for approval. The waste management plan 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 waste management plan. We will implement a trip-ticket system to control the disposal of C&D materials and will record the reuse, recycling and disposal of C&D materials for monitoring purposes.

## LAND ACQUISITION

16. The project does not require land acquisition.

## BACKGROUND INFORMATION

17. We upgraded 232WF to Category B in August 1997.

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<sup>4</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>5</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.

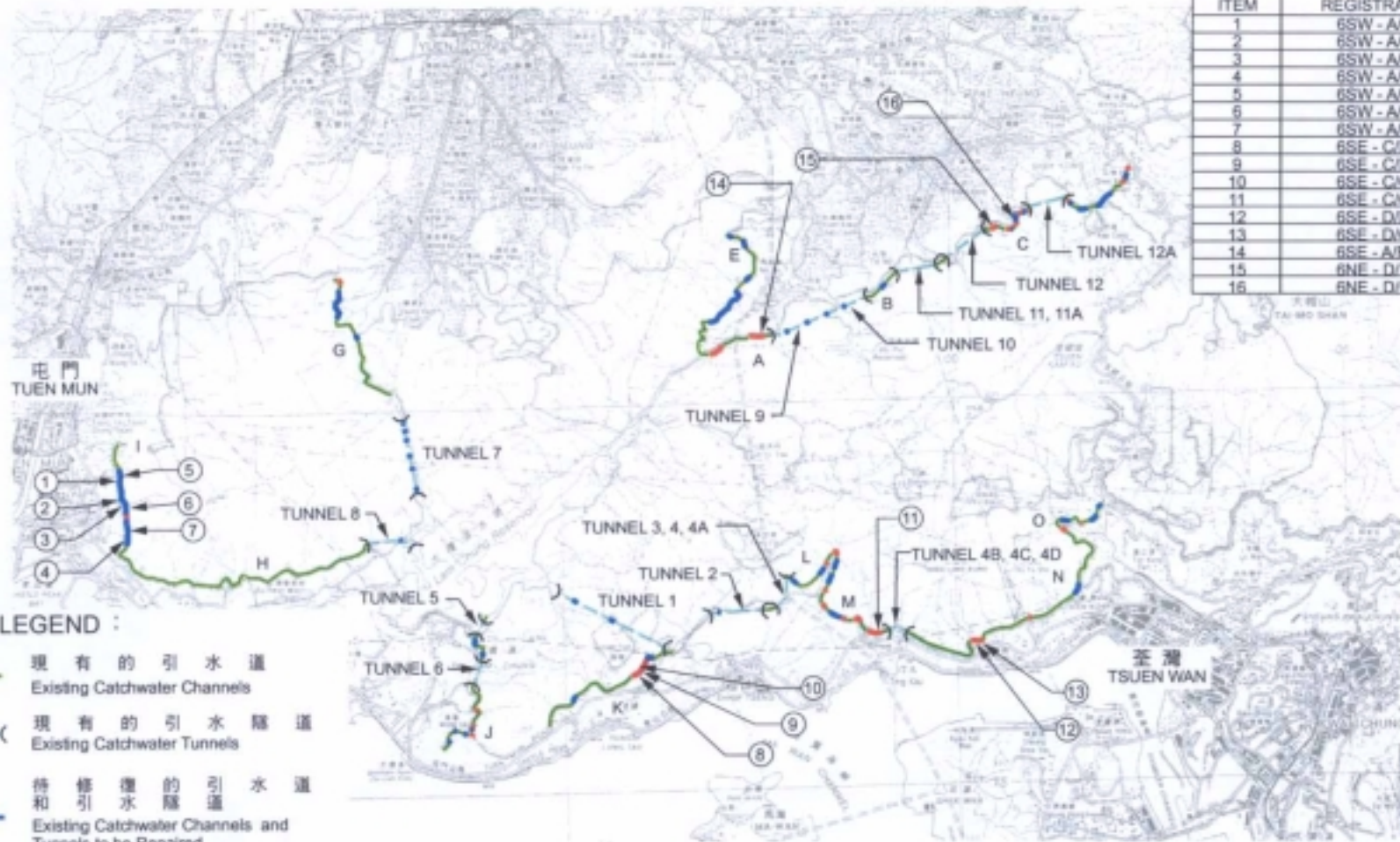
18. In March 1998, we engaged consultants to carry out the investigation study for the project and the Engineer Inspection for slopes adjoining the catchwater channels at a cost of \$7.6 million. We have charged the cost to the block allocation **Subhead 9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme". We completed the investigation study and Engineer Inspection in November 2000.

19. In June 2001, we commissioned another consultancy study for the detailed design of the proposed works at a cost of \$7 million. We have charged the cost to the block allocation **Subhead 9100WX**. We have substantially completed the detailed design.

20. We estimate that the project will create about 105 jobs comprising 25 professional/technical staff and 80 labourers, totalling 2 600 man-months.

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Environment, Transport and Works Bureau  
November 2002



待加固的斜坡 SLOPE TO BE UPGRADED	
項目 ITEM	登記編號 REGISTRATION NO.
1	6SW - A/F 101
2	6SW - A/F 110
3	6SW - A/FR 109
4	6SW - A/F 40
5	6SW - A/CR 216
6	6SW - A/CR 90
7	6SW - A/CR 84
8	6SE - C/F 82
9	6SE - C/FR 35
10	6SE - C/C 240
11	6SE - C/C 74
12	6SE - D/FR 118
13	6SE - D/CR 241
14	6SE - A/FR 2
15	6NE - D/F 11
16	6NE - D/CR 80

圖例 LEGEND :

- 現有的引水道  
Existing Catchwater Channels
- 現有的引水隧道  
Existing Catchwater Tunnels
- 待修復的引水道  
和引水隧道  
Existing Catchwater Channels and  
Tunnels to be Repaired
- 待重建的引水道  
Existing Catchwater Channels to be Reconstructed

比例尺 SCALE 1 : 75 000

核准 APPROVED  
  
 總工程師/總務工程師  
 CEDCM

工務計劃項目第 232WF 號 - 大欖涌引水道及引水隧道重建工程  
 P.W.P. NO. 232WF - RECONSTRUCTION OF CATCHWATER CHANNELS AND TUNNELS  
 IN TAI LAM CHUNG

水務署  
 WATER SUPPLIES DEPT.

草圖編號 SKETCH NO. SK 62002 / 040

5 / 11 / 2002

(甲類工程)  
 (CAT 'A' Submission)

附件一 ENCLOSURE 1



**232WF – Reconstruction of catchwater channels and tunnels in  
Tai Lam Chung**

**Breakdown of the estimates for the consultants' fees**

Consultants' staff costs		Estimated man- months	Average MPS* salary point	Multiplier <sup>(Note 1)</sup>	Estimated fee (\$ million)
(a)	Contract administration Professional	12	38	2.4	1.7
	Technical	2	14	2.4	0.1
(b)	Site supervision by Professional	36	38	1.7	3.5
	resident site staff of the Technical consultants <sup>(Note 2)</sup>	270	14	1.7	8.8
<b>Total consultants' staff costs</b>					14.1

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier of 1.7 is applied in the case of resident site staff supplied by the consultants. (As at 1.10.2002, MPS pt. 38 = \$57,730 per month and MPS pt. 14 = \$19,195 per month.)
2. The figures given above are based on estimates prepared by the Director of Water Supplies. The consultancy works for this project will be included as part of the Consultancy Agreement No. CE 5/2001 "Reconstruction of catchwater channels and tunnels and upgrading of adjoining slopes in Tai Lam Chung – design and construction". The assignment will only be triggered subject to the Finance Committee's approval for upgrading 232WF to Category A.