

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

### **HEAD 709 - WATERWORKS**

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

#### **231WF – Reconstruction of catchwater channels on Hong Kong Island and Lantau Island**

Members are invited to recommend to Finance Committee the upgrading of **231WF** to Category A at an estimated cost of \$252.7 million in money-of-the-day prices for the reconstruction of catchwater channels on Hong Kong Island and Lantau Island and the associated slope works.

### **PROBLEM**

The catchwater channels on Hong Kong Island and Lantau Island 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 Works, proposes to upgrade **231WF** to Category A at an estimated cost of \$252.7 million in money-of-the-day (MOD) prices for the reconstruction of defective sections of the catchwater channels on Hong Kong Island and Lantau Island and for upgrading 20 adjoining substandard slopes in conjunction with the reconstruction works.

**/PROJECT .....**

**PROJECT SCOPE AND NATURE**

3. The scope of the works under **231WF** comprises –
- (a) the reconstruction of 6 kilometres (km) of defective sections of catchwater channels on Hong Kong Island;
  - (b) major repair to 18 km of defective sections of catchwater channels on Hong Kong Island and 3 km of defective sections of catchwater channels on Lantau Island; and
  - (c) the upgrading of 20 substandard slopes adjoining the defective sections of catchwater channels on Hong Kong Island and Lantau Island identified under (a) and (b) above.
4. We plan to start the proposed works in mid 2002 for completion by mid 2005. Site plans showing the location of the proposed works are at Enclosure 1.

**JUSTIFICATION**

5. The 64 km of catchwater channels on Hong Kong Island and Lantau Island have been in use for about 70 years on average. Many sections of the catchwater channels are showing signs of ageing. The deteriorating condition of the catchwater channels may lead to wastage of natural water resources through leakage. There is also the risk of breaking of the channels during rainstorms resulting in flooding and slope failures. To ensure the continued stability of the catchwater channels, we propose to reconstruct or repair, as appropriate, the defective sections of the catchwater channels as detailed in paragraph 3(a) and (b) above.

6. During the investigation study for **231WF**, we engaged geotechnical consultants to carry out Engineer Inspection<sup>1</sup> for the slopes adjoining the catchwater channels. The consultants have identified 23 substandard slopes adjoining the defective sections of catchwater channels that could affect developments nearby. We consider that it will be cost-effective to carry out the

/upgrading .....

---

<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.

upgrading works for the 20 substandard slopes as described in paragraph 3(c) above in conjunction with the proposed reconstruction of catchwater channels. As regards the remaining three substandard slopes, one has already been upgraded and two will soon be upgraded under the Landslip Preventive Measures Programme of Geotechnical Engineering Office.

## FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the project to be \$252.7 million in MOD prices (see paragraph 8 below), made up as follows –

	<b>\$ million</b>	
(a) Reconstruction and repair of catchwater channels	129.4	
(b) Slope works	65.6	
(i) upgrading	64.1	
(ii) landscaping	1.5	
(c) Consultants' fees	30.9	
(i) contract administration	1.8	
(ii) site supervision	29.1	
(d) Environmental mitigation measures	1.5	
(e) Contingencies	22.7	
	<hr/>	
Sub-total	250.1	(in September 2001 prices)
(f) Provision for price adjustment	2.6	
	<hr/>	
Total	252.7	(in MOD prices)
	<hr/>	

/A .....

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 2001)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2002 – 2003	16.6	0.99700	16.6
2003 – 2004	82.0	1.00398	82.3
2004 – 2005	91.1	1.01101	92.1
2005 – 2006	41.5	1.01808	42.3
2006 – 2007	18.9	1.02521	19.4
	250.1		252.7

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 2002 to 2007. We will tender the proposed works under a standard remeasurement contract because the exact quantities of catchwater channel reconstruction and repair works have to be determined on site and the quantities of slope works may vary with actual ground conditions. The contract will provide for price adjustments because the contract period will exceed 21 months.

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

/11. ....

11. The project by itself would lead to an increase in water charges<sup>2</sup> by about 0.09% in real terms by 2007.

## **PUBLIC CONSULTATION**

12. We consulted the Capital Works Committee of the Southern District Council on 9 July 2001, the Wan Chai District Council on 17 July 2001, the Islands District Council on 13 August 2001 and the Works and Development Committee of the Eastern District Council on 6 September 2001. The District Councils and committees supported the proposal. We also consulted the Food, Environment, Hygiene and Works Committee of the Central and Western District Council by circulation in July 2001. The committee expressed no objection to 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 \$1.5 million (in September 2001 prices) for implementing these mitigation measures in the project estimate and will incorporate these requirements into the works contract for implementation.

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 20 000 cubic metres (m<sup>3</sup>) of C&D

/materials .....

---

<sup>2</sup> The increase in water charges is calculated on the assumption that the demand remains static during the period from 2001 to 2007 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.

materials will be generated by the project. Of these, we will reuse about 2 100 m<sup>3</sup> (10.5%) on site, 12 900 m<sup>3</sup> (64.5%) as fill in public filling areas<sup>4</sup> and dispose of 5 000 m<sup>3</sup> (25.0%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$625,000 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 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 **231WF** to Category B in August 1997.

18. We have engaged consultants to complete the investigation study for the project and the Engineer Inspection for slopes adjoining the catchwater channels at a cost of \$6.8 million. We have charged the cost to the block allocation under **Subhead 9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme".

19. In December 2000, we commissioned another consultancy study for the detailed design of the proposed works at a cost of \$10.1 million, also chargeable to the block allocation under **Subhead 9100WX**. The consultants have substantially completed the detailed design.

/20. ....

---

<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.

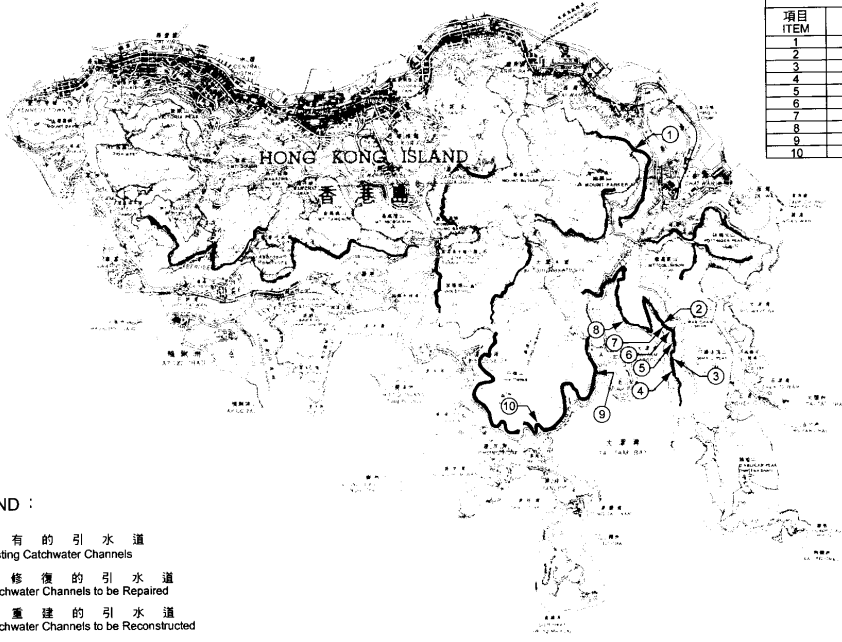
<sup>5</sup> This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m<sup>3</sup>), nor the cost to provide 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.

20. We estimate that the project will create some 150 jobs comprising 25 professional/technical staff and 125 labourers, totalling 4 600 man-months.

-----

Works Bureau  
February 2002

(pWSC231wffin.doc)

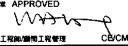


待加固的斜坡 SLOPES TO BE UPGRADED	
項目 ITEM	登記編號 REGISTRATION NO.
1	15SE - D/F 136
2	15NE - B/CR 128
3	15NE - B/CR 167
4	15NE - B/F 78
5	15NE - B/F 72
6	15NE - B/F 66
7	15NE - B/F 65
8	15NE - B/F 84
9	15NE - A/CR 458(2)
10	15NE - A/C 422

- 圖例 LEGEND :
- 現有的引水道  
Existing Catchwater Channels
  - 待修復的引水道  
Catchwater Channels to be Repaired
  - 待重建的引水道  
Catchwater Channels to be Reconstructed

比例尺 SCALE 1 : 75 000

A GENERAL AMENDMENT 4/1/2001

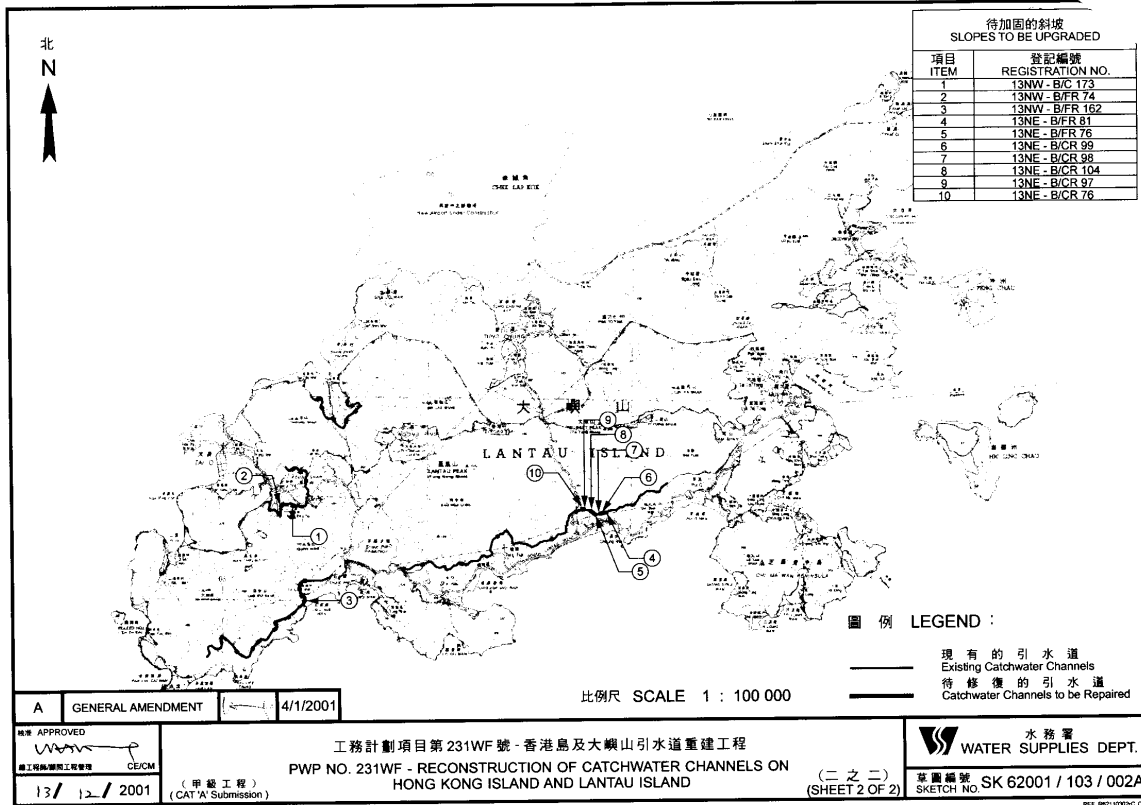
核准 APPROVED  
  
 總工程師/總管理工程師管理 CB/M  
 13 / 12 / 2001

工務計劃項目第 231WF 號 - 香港島及大嶼山引水道重建工程  
 PWP NO. 231WF - RECONSTRUCTION OF CATCHWATER CHANNELS ON  
 HONG KONG ISLAND AND LANTAU ISLAND  
 (二之一)  
 (SHEET 1 OF 2)

水務署  
 WATER SUPPLIES DEPT.  
 草圖編號  
 SKETCH No. SK 62001 / 103 / 001A  
 REF: PWS1001/10 001

附件一(第一頁共二頁) ENCLOSURE 1 (SHEET 1 OF 2)





**Enclosure 2 to PWSC(2001-02)101**

**231WF - Reconstruction of catchwater channels  
on Hong Kong Island and Lantau Island**

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

			Estimated	Average		Estimated
			man-	MPS*		fee
			months	salary	Multiplier	(\$ million)
				point		
<b>Consultants' staff costs</b>						
(a)	Contract administration	Professional	12	38	2.4	1.7
		Technical	2	14	2.4	0.1
(b)	Site supervision by resident site staff of the consultants	Professional	105	38	1.7	10.8
		Technical	553	14	1.7	18.3
<b>Total consultants' staff costs</b>						30.9

\* 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 1.4.2001, MPS pt. 38 = \$60,395 per month and MPS pt. 14 = \$19,510 per month.)
2. The figures given above are based on estimates prepared by the Director of Water Supplies. The consultancy works for this project have been included as part of the consultancy Agreement No. CE 35/2000 "Reconstruction of Catchwater Channels and Upgrading of Adjoining Slopes on Hong Kong Island and Lantau Island - Design and Construction". The assignment will only be triggered subject to the Finance Committee's approval for upgrading **231WF** to Category A.