

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 709 – WATERWORKS

#### Water Supplies – Combined fresh/salt water supply

#### 76WC – Improvement to Hong Kong Central mid level and high level areas water supply – remaining works

Members are invited to recommend to Finance  
Committee –

- (a) the upgrading of part of **76WC**, entitled  
“Improvement to Hong Kong Central mid level  
and high level areas water supply – stage II”, to  
Category A at an estimated cost of  
\$70.6 million in money-of-the-day prices; and
- (b) the retention of the remainder of **76WC** in  
Category B.

### PROBLEM

The existing fresh water supply system in Hong Kong Central mid level and high level areas does not have adequate capacity to provide reliable fresh water supply with adequate operational safety.

### PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **76WC** to

/Category.....

Category A at an estimated cost of \$70.6 million in money-of-the-day (MOD) prices for the stage II improvement works for fresh water supply to the Hong Kong Central mid level and high level areas.

### PROJECT SCOPE AND NATURE

3. The updated scope of works under **76WC** comprises –
- (a) construction of the Magazine Gap Road No. 3 fresh water service reservoir (FWSR) with a capacity of 4 600 cubic metres (m<sup>3</sup>);
  - (b) laying of about 2.2 kilometres (km) of fresh water mains ranging from 300 to 400 millimetres in diameter in the Bowen Road group high level fresh water supply system<sup>1</sup>;
  - (c) uprating of the Magazine Gap Road fresh water pumping station (FWPS) from 3 450 m<sup>3</sup>/day to 6 200 m<sup>3</sup>/day, Bowen Road FWPS from 9 600 m<sup>3</sup>/day to 16 000 m<sup>3</sup>/day and Severn Road FWPS from 1 200 m<sup>3</sup>/day to 1 400 m<sup>3</sup>/day;
  - (d) replacement of the existing Hatton Road FWSR with a new FWSR;
  - (e) further laying of about 12 km fresh and salt water mains in other areas; and
  - (f) uprating of Elliot fresh and salt water pumping station, and improvement of the water supply system to the Peak area by converting the existing one-stage pumping into two-stage pumping.
4. The improvement works which we now propose to upgrade to Category A comprise works described in paragraphs 3(a), (b) and (c) above.

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<sup>1</sup> The Bowen Road group high level fresh water supply system includes Bowen Road FWPS, Magazine Gap Road FWPS, Severn Road FWPS, Magazine Gap Road Nos. 1 and 2 FWSRs, Severn Road FWSR, Mount Gough fresh water tank (FWT), Wan Chai Gap Road FWT, Barker Road FWT and the associated water mains.

5. We plan to start construction in July 2003 for completion in 2006. A site plan showing the proposed works is at Enclosure 1. A perspective of the proposed Magazine Gap Road No. 3 FWSR is at Enclosure 2.

### JUSTIFICATION

6. The Bowen Road group high level fresh water supply system supplies fresh water to the Hong Kong Central mid level and high level areas from the east of Peak Tramway to Wan Chai Gap. Developments over the past 15 years in the areas have led to a considerable increase in the water demand from 5 870 m<sup>3</sup> to 8 250 m<sup>3</sup>. This has lowered the reliability of the existing water supply system because the capacities of the service reservoirs, pumping stations and water mains are small in relation to the water demand. As a result, a large area will suffer from weak water pressure or interruption of water supply even when a small scale repair or planned maintenance is carried out. To enhance the reliability of the fresh water supply in the areas, the Bowen Road group high level fresh water supply system needs to be improved by expanding the service reservoirs' capacity, upgrading pumping stations and laying new water mains.

7. The Magazine Gap Road No. 1 FWSR was constructed in the early 20th century. It used to have a capacity of 2 123 m<sup>3</sup>. Due to ageing of the facility and leakage problem, and for safety of the slope on which the FWSR is located and the developments below the slope, the service reservoir was decommissioned in 1997. Fresh water supply to the affected area is currently provided by the existing Magazine Gap Road No. 2 FWSR and a temporary glass reinforced plastic tank with capacities of 2 282 m<sup>3</sup> and 1 000 m<sup>3</sup> respectively. In order to allow for the additional storage required to improve the reliability of water supply, it is necessary to re-provision the Magazine Gap Road No. 1 FWSR. We therefore propose to construct a new service reservoir, the Magazine Gap Road No. 3 FWSR with a capacity of 4 600 m<sup>3</sup>, adjacent to the existing Magazine Gap No.2 FWSR to replace the temporary tank.

8. In addition, the 20 to 30 years' old mechanical and electrical installations including pumps and electrical gears in the Magazine Gap Road, Bowen Road and Severn Road FWPSs do not meet current safety standard. They would pose fire hazards and have to be replaced to enhance operational safety. Additional fresh water mains of about 2.2 km are also required to improve the hydraulics of the system.

/FINANCIAL.....

**FINANCIAL IMPLICATIONS**

9. We estimate the capital cost of the proposed works to be \$70.6 million in MOD prices (see paragraph 10 below), made up as follows –

	<b>\$ million</b>	
(a) Construction of the Magazine Gap Road No. 3 FWSR	24.8	
(b) Laying of fresh water mains of about 2.2 km	23.1	
(c) Uprating of the FWPSs in Magazine Gap Road, Bowen Road and Severn Road	21.1	
(i) civil works	8.6	
(ii) electrical and mechanical works	12.5	
(d) Environmental mitigation measures	0.5	
(e) Contingencies	6.4	
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	Sub-total	75.9 (in September 2002 prices)
(f) Provision for price adjustment	(5.3)	
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	Total	<u>70.6</u> (in MOD prices)

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

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Year	\$ million (Sept 2002)	Price adjustment factor	\$ million (MOD)
2003 – 2004	2.9	0.94300	2.7
2004 – 2005	33.9	0.93003	31.5
2005 – 2006	25.4	0.93003	23.6
2006 – 2007	9.0	0.93003	8.4
2007 – 2008	4.7	0.93003	4.4
	<u>75.9</u>		<u>70.6</u>

11. 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 purchase mechanical and electrical equipment through supplies contracts for installation by in-house staff and term contractors. We will tender the works on a remeasurement basis because the quantities of works are subject to variation during construction to suit the actual site conditions. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract.

12. We estimate the annually recurrent expenditure arising from the proposed works to be about \$2.29 million.

13. This project by itself will lead to an increase in production cost of water by 0.06% in real terms by 2008<sup>2</sup>.

## **PUBLIC CONSULTATION**

14. We consulted the Food, Environment, Hygiene and Works Committee of the Central and Western District Council on 17 October 2002. The Committee had no objection to the proposed works.

**/ENVIRONMENTAL.....**

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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 2003 to 2008 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

## ENVIRONMENTAL IMPLICATIONS

15. The Director of Environmental Protection conducted an Environmental Review and advised that the project would not have any long-term adverse environmental impacts. The Director of Environmental Protection agrees that an Environmental Impact Assessment will not be required. We have designed the service reservoir and pumping station such that the level of noise during their operation will comply with the established criteria, standards and guidelines. For short-term impacts during the construction stage, standard environmental pollution control measures would be sufficient to mitigate the impacts. These include provision of wheel washing facilities, de-silting traps, and the use of silenced plants. We have included in the project estimate the cost of implementing these mitigation measures (\$0.5 million in September 2002 prices) and will incorporate these requirements into the works contract.

16. At the planning and design stages of this project, we have taken due consideration in designing the layouts of the proposed service reservoir to minimise the generation of construction and demolition (C&D) materials. To further minimise the generation of C&D materials, we will encourage the contractor to use steel instead of timber for formwork and temporary works. We estimate that the project will generate about 15 850 m<sup>3</sup> of C&D materials. Of these, we will use about 1 300 m<sup>3</sup> (8.2%) on site, 14 000 m<sup>3</sup> (88.3%) as fill in public filling areas<sup>3</sup> and dispose of 550 m<sup>3</sup> (3.5%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$68,750 for this project (based on a notional unit cost<sup>4</sup> of \$125/m<sup>3</sup>).

17. We will require the contractor to submit a waste management plan (WMP) with appropriate mitigation measures, including the allocation of areas for waste segregation on site to facilitate reuse or recycling of C&D materials, for approval. We will ensure that the day-to-day operations on site comply with the approved WMP. We will implement a trip-ticket system to control the proper disposal of C&D materials and will record the reuse, recycling and disposal of C&D materials for monitoring purposes.

**/LAND.....**

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<sup>3</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>4</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**

18. The proposed works do not require land acquisition.

**BACKGROUND INFORMATION**

19. We upgraded **76WC** to Category B in July 1994.

20. In January 1995, Finance Committee approved the upgrading of part of **76WC** to Category A as **77WC** “Improvement to Hong Kong Central mid level and high level areas water supply – stage I” at an estimate cost of \$20.5 million for the construction of the extension of New Albany fresh water pumping station and the laying of salt water mains along Robinson Road. Works commenced in November 1995 and completed in September 1999.

21. We have substantially completed the detailed design for the proposed works using in-house resources.

22. The remaining works described in paragraphs 3(d), (e) and (f) above are in the investigation stage. Construction is planned to commence in mid-2005 for completion in mid-2009.

23. We estimate that the proposed works will create 33 jobs comprising 6 professional/technical staff and 27 labourers, totalling 890 man-months.

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Environment, Transport and Works Bureau  
April 2003







擬建的馬己仙峽道三號食水配水庫  
 配水庫：49.6米(長) x 22.6米(闊) x 6.1米(高)  
 PROPOSED MAGAZINE GAP ROAD  
 NO. 3 FRESH WATER SERVICE RESERVOIR  
 SERVICE RESERVOIR : 49.6m( L) x 22.6m(W) x 6.1m(H)

核准 APPROVED  
  
 核准日期 DATE: 5 / 2 / 2003

擬建的馬己仙峽道三號食水配水庫透視圖  
 PERSPECTIVE OF THE PROPOSED MAGAZINE GAP ROAD NO. 3 FRESH WATER SERVICE RESERVOIR  
 (中環工程)  
 (CAT 'A' Submission)

 水務署  
 WATER SUPPLIES DEPT.  
 草圖編號 SKETCH NO. SK 62002 / 209

附件 2 ENCLOSURE 2