

For discussion  
on 21 October 1998

PWSC(98-99)30

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 711 - HOUSING

#### Water Supplies - Fresh water supplies

#### 212WF - Transfer facilities from Butterfly Valley primary service reservoir to secondary service reservoirs in the metropolitan area - stage 1

Members are invited to recommend to Finance Committee the upgrading of **212WF** to Category A at an estimated cost of \$751.1 million in money-of-the-day prices for the laying of water mains to transfer fresh water from a new primary service reservoir at Butterfly Valley to three secondary service reservoirs in Kowloon.

### PROBLEM

The existing fresh water transfer facilities feeding the secondary service reservoirs in Kowloon will not be able to cope with the projected growth in demand by 2000.

### PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Housing, proposes to upgrade **212WF** to Category A at an estimated cost of \$751.1 million in money-of-the-day (MOD) prices for the laying of water mains to transfer fresh water from a new primary service reservoir being

/constructed .....

constructed under project **272WF**<sup>1</sup> at Butterfly Valley to a proposed secondary service reservoir to be constructed under **58WC**<sup>2</sup> at Tai Po Road and to two existing secondary service reservoirs at Ho Man Tin to meet the expected growth in demand.

### PROJECT SCOPE AND NATURE

3. The scope of the project comprises -
- (a) laying of about 0.5 kilometres of fresh water trunk mains ranging from 1 400 millimetres to 2 200 millimetres in diameter from Tung Chau West Street to Lai Chi Kok Road;
  - (b) laying of about 2.2 kilometres of fresh water trunk mains ranging from 1 200 millimetres to 1 800 millimetres in diameter from Castle Peak Road to the proposed Shek Kip Mei No. 3 fresh water service reservoir at Tai Po Road to be constructed under project **58WC**; and
  - (c) laying of about 4.3 kilometres fresh water trunk mains of 1 200 millimetres diameter from Cherry Street to the two secondary service reservoirs, namely Ho Man Tin East fresh water service reservoir and extension, and Ho Man Tin West fresh water service reservoir, in Ho Man Tin.

**/JUSTIFICATION .....**

---

<sup>1</sup> In July 1996, Finance Committee (FC) approved the upgrading of part of **140WF** as **272WF** to Category A at an estimated cost of \$2,305.2 million in MOD prices for the construction of a new Butterfly Valley primary service reservoir and aqueducts from Tai Po treatment works to this reservoir. The construction of the primary service reservoir and the aqueducts started in May and June 1997 respectively. Both are scheduled for completion in July 2000.

<sup>2</sup> On 23 September 1998, PWSC recommended the upgrading of part of **58WC** as **92WC** to Category A at an estimated cost of \$162.19 million in MOD prices. FC will consider this recommendation at its meeting on 16 October 1998.

## JUSTIFICATION

4. The existing Sha Tin and Ma On Shan groups of water treatment works provide fresh water for the metropolitan area (Hong Kong and Kowloon) and the north-eastern New Territories (Sha Tin and Ma On Shan). They have a total output capacity of 1 796 000 cubic metres per day and are serving a population of 2 899 000. We anticipate that by the year 2000, the daily demand for fresh water from the metropolitan area and north-eastern New Territories will increase to 1 816 000 cubic metres for an estimated population of about 3 084 000. If no new facilities are provided there will be a shortfall of 20 000 cubic metres per day. Furthermore, we forecast that the daily demand for fresh water will increase to 2 046 000 cubic metres by 2004 for an estimated population of about 3 234 000, leading to a shortfall of 250 000 cubic metres per day in the absence of additional supply facilities.

5. To cope with the above anticipated growth in demand, we are implementing project **140WF** "Additional treatment and water transfer facilities for the metropolitan area and north-eastern New Territories - stage 1, construction of Tai Po treatment works and pumping station"<sup>3</sup>. By October 2000, these new facilities will provide an additional 250 000 cubic metres of fully treated fresh water per day, bringing the combined output capacity of the integrated Sha Tin and Ma On Shan groups of treatment works to 2 046 000 cubic metres per day, to meet the projected demand up to 2004. Another project **272WF** "Additional treatment and water transfer facilities for the metropolitan area and north-eastern New Territories - stage 1, construction of Butterfly Valley primary service reservoir and aqueducts from Tai Po to Butterfly Valley" is also underway for the construction of a primary service reservoir at Butterfly Valley and the laying of aqueducts to transfer the treated fresh water from Tai Po treatment works to the latter.

6. To deliver treated fresh water from the new Butterfly Valley primary service reservoir to consumers in the metropolitan area, we have to lay trunk water mains to transfer the water to a number of secondary service reservoirs in Kowloon. These include Ho Man Tin East fresh water service reservoir and extension, Ho Man Tin West fresh water service reservoir (which are currently providing water for the area) and the proposed Shek Kip Mei No. 3

/fresh .....

---

<sup>3</sup> In January 1997, FC approved the upgrading of **140WF** to Category A at an estimated cost of \$2,226.9 million in MOD prices for the construction of Tai Po treatment works and pumping station. The construction works started in February 1998 for completion in October 2000.

fresh water service reservoir, which is to be constructed under project **58WC** "Water supply to West Kowloon reclamation, stage 2 - main works". To tie in with the roadworks programme of the West Kowloon reclamation, we have already advanced part of the mainlaying works under project **211WF**<sup>4</sup> "Transfer facilities from the Butterfly Valley primary service reservoir to secondary service reservoirs in the metropolitan area - mainlaying works in West Kowloon reclamation". We now need to lay the remaining water mains under this project to enable the transfer of treated fresh water to the three secondary service reservoirs mentioned above to meet the projected demand in the metropolitan area up to 2004. We will continue to plan and implement further projects to cope with the water demand beyond 2004.

## FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the project to be \$751.1 million in MOD prices (see paragraph 8 below), made up as follows -

	<b>\$ million</b>	
(a) Pipe materials	55.7	
(b) Mainlaying	410.9	
(c) Consultants' fees	58.4	
(i) construction stage	0.6	
(ii) resident site staff expenses	57.8	
(d) Contingencies	52.5	
	<hr/>	
Sub-total	577.5	(at December 1997 prices)

/(e) .....

<sup>4</sup> In June 1995, FC approved the upgrading of **211WF** to Category A at an estimated cost of \$77.8 million in MOD prices for the laying of fresh water mains on the West Kowloon reclamation. The construction works started in August 1995 for completion in November 1998.

(e) Inflation allowance	173.6	
	<hr/>	
Total	751.1	(in MOD prices)
	<hr/>	

A breakdown by man months of the estimate for consultants' fees and resident site staff expenses is at the Enclosure.

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

Year	\$ million (Dec 1997)	Price adjustment factor	\$ million (MOD)
1998 - 99	2.0	1.06000	2.1
1999 - 2000	110.5	1.14878	126.9
2000 - 01	195.0	1.24642	243.1
2001 - 02	167.5	1.35237	226.5
2002 - 03	85.2	1.46732	125.0
2003 - 04	17.3	1.59204	27.5
	<hr/>		<hr/>
	577.5		751.1
	<hr/>		<hr/>

9. We derived the MOD estimates on the basis of the Government forecast of trend labour and construction prices for the period between 1998 and 2004. We will invite tenders for the works under a standard remeasurement contract because the quantities of the mainlaying works may vary with the actual ground conditions. We will provide for price fluctuations in the contracts as the construction period will be longer than 21 months.

/10. ....

10. We estimate the annually recurrent expenditure arising from the project to be \$520,000.

11. This project by itself will lead to an increase in water charges by 0.3% in real terms by 2004<sup>5</sup>.

## **PUBLIC CONSULTATION**

12. We consulted the Yau Tsim Mong Provisional District Board, the Kowloon City Provisional District Board, and the Sham Shui Po Provisional District Board (SSPPDB) on 30 October 1997, 6 November 1997 and 27 November 1997 respectively. The three Boards supported the project. However, members of all three Boards expressed concern on the environmental and traffic impacts of the proposed works during the construction period. Members of the SSPPDB also requested us to carefully consider the alignments and method of construction of the water mains to minimise nuisance to the public. We have taken due consideration of such concerns in the detailed design stage. We will include the environmental control measures and traffic management requirements in relevant works contracts and keep the Boards informed of the implementation of these measures during the progress of the works.

## **ENVIRONMENTAL IMPLICATIONS**

13. In June 1995, the Director of Environmental Protection conducted an environmental review and concluded that the project would have no long term environmental impact and no environmental impact assessment would be necessary. We will control noise, dust and site run-off nuisances during construction to comply with established standards and guidelines by incorporating relevant environmental pollution control clauses in the works contracts.

## **LAND ACQUISITION**

14. The project does not require land acquisition.

**/BACKGROUND .....**

---

<sup>5</sup> The increase in water charges is calculated on the assumption that the demand remains static during the period from 1998 to 2004 and the amount of Government subsidy to the Waterworks operations is to be contained at the present level.

**BACKGROUND INFORMATION**

15. We upgraded **212WF** to Category B in September 1995. In October 1996, we engaged consultants at a cost of \$2.5 million to carry out the investigation study for the project. Upon completion of the study, we engaged consultants in March 1998 at a cost of \$1.1 million to proceed with the detailed design for the works. We charged the costs of both consultancies to block allocation **Subhead B100HX** "Minor housing development related works, studies and investigations for items in Category D of the Public Works Programme". The consultants have now substantially completed the detailed design.

16. Subject to Finance Committee's approval to upgrade this project to Category A, we will invite tenders for the works contracts in November 1998. We plan to start the construction works in March 1999 for completion of the sections of water mains from Tung Chau West Street to Lai Chi Kok Road and from Cherry Street to the two existing secondary service reservoirs in Ho Man Tin by October 2000. We plan to complete the section of water main from Castle Peak Road to the proposed secondary service reservoir at Tai Po Road by end 2001. By then, these water mains, together with the new facilities under projects **140WF**, **272WF** and **211WF**, mentioned at paragraphs 5 and 6 above, will improve the supply to the secondary service reservoirs in Kowloon to enable them to cope with the anticipated demands up to 2004.

-----

Housing Bureau  
October 1998

**212WF - Transfer facilities from Butterfly Valley primary service reservoir  
to secondary service reservoirs in the metropolitan area - stage 1**

**DETAILS OF CONSULTANTS' FEES**

**Breakdown of estimates for consultants' fees**

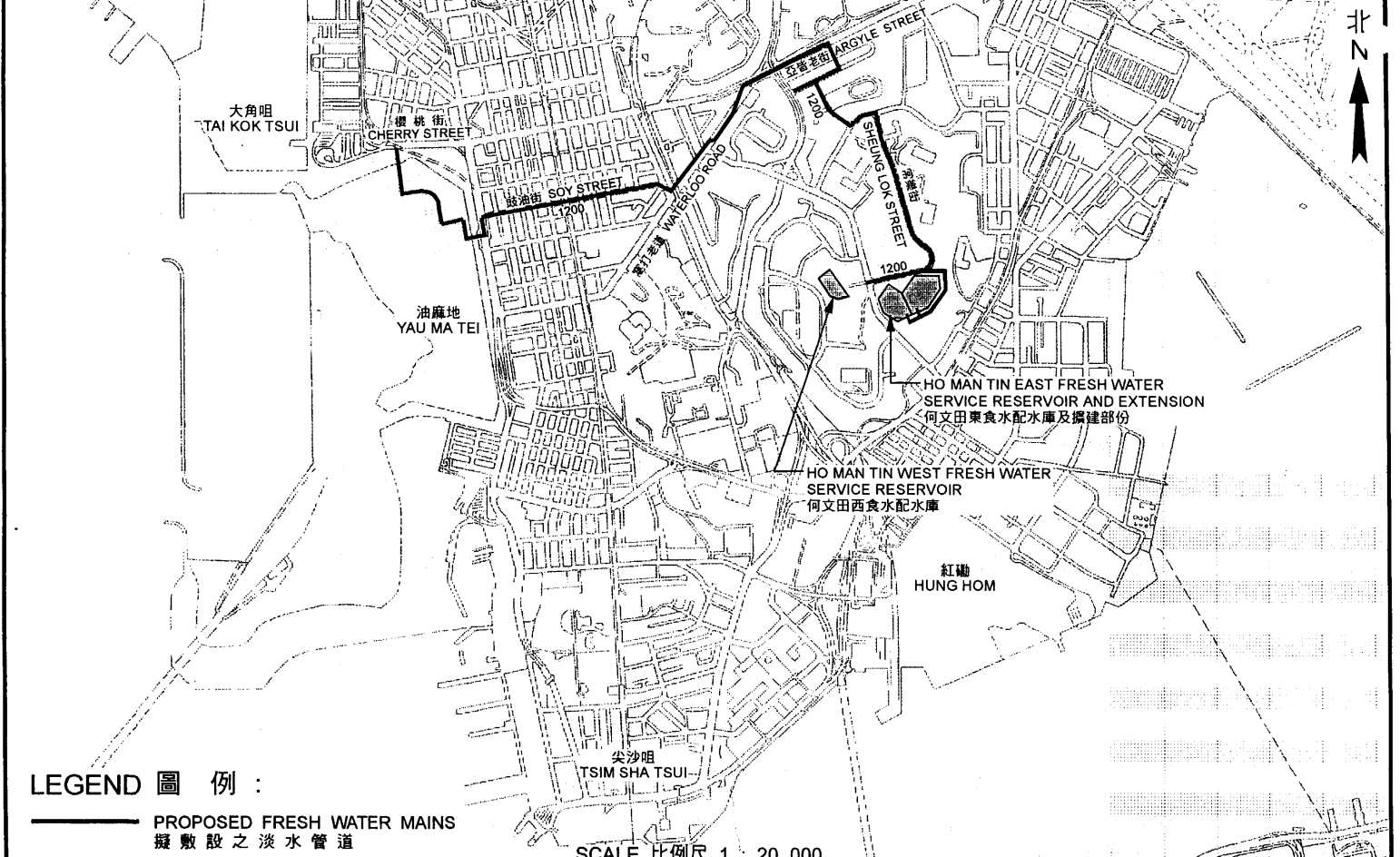
<b>Consultants' staff costs</b>		<b>Estimated Man Months</b>	<b>Average MPS* salary point</b>	<b>Multiplier factor</b>	<b>Estimated fee (\$ million)</b>	
(a)	Consultants' fees for works in construction stage	Professional Technical	3.0 1.5	40 16	3.0 3.0	0.5 0.1
				Sub-total	0.6	
(b)	Site supervision by resident site staff employed by the consultants	Professional Technical	230 700	40 16	2.1 2.1	28.6 29.2
				Sub-total	57.8	
				<b>Total consultants' staff costs</b>	<b>58.4</b>	

\*MPS = Master Pay Scale

**Notes**

1. The above figures are based on information provided by the Director of Water Supplies. The consultants' fees for supervision of the construction stage works have been agreed as part of Consultancy Agreement No. CE 58/97 "Transfer facilities from Butterfly Valley primary service reservoir to secondary service reservoirs in the metropolitan area - stage 1, design and construction".
2. A multiplier factor of 3.0 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profits, as the staff will be employed by the consultants' office. (At 1.4.97, MPS 40 = \$59,210 p.m. and MPS 16 = \$19,860 p.m.). A multiplier factor of 2.1 is applied in the case of site staff supplied by the consultants.





**LEGEND 圖例：**  
 PROPOSED FRESH WATER MAINS  
 擬敷設之淡水管道

SCALE 比例尺 1 : 20 000

APPROVED  
*[Signature]*  
 CE / CM(1)  
 3 / 7 / 98

P.W.P. ITEM NO. 212WF — TRANSFER FACILITIES FROM BUTTERFLY VALLEY  
 PRIMARY SERVICE RESERVOIR TO SECONDARY SERVICE RESERVOIRS  
 IN THE METROPOLITAN AREA - STAGE I  
 工務計劃項目第212WF號 — 蝴蝶谷主配水庫至  
 都會區內副配水庫輸水設施 - 第一階段

WATER SUPPLIES DEPT.  
 HONG KONG  
 (SHEET 1 OF 2)  
 (二之一)  
 SKETCH NO. 03798 / 106 / 001



SHEK KIP MEI NO. 2 FRESH WATER SERVICE RESERVOIR (UNDER CONSTRUCTION)  
石硤尾二號食水配水庫 (在 施 工 階 段)

BUTTERFLY VALLEY PRIMARY SERVICE RESERVOIR (UNDER CONSTRUCTION)  
蝴蝶谷主配水庫 (在 施 工 階 段)

TRUNK MAIN (UNDER CONSTRUCTION)  
幹管 (在 施 工 階 段)

SHEK KIP MEI NO. 3 FRESH WATER SERVICE RESERVOIR (UNDER DESIGN)  
石硤尾三號食水配水庫 (在 設 計 階 段)

荔枝角 LAI CHI KOK

深水埗 SHAM SHUI PO

LEGEND 圖 例 :

— PROPOSED FRESH WATER MAINS  
擬 敷 設 之 淡 水 管 道

SCALE 比例尺 1 : 20 000

APPROVED  
*[Signature]*  
CE / CM(1)  
317 / 98

P.W.P. ITEM NO. 212WF — TRANSFER FACILITIES FROM BUTTERFLY VALLEY PRIMARY SERVICE RESERVOIR TO SECONDARY SERVICE RESERVOIRS IN THE METROPOLITAN AREA - STAGE I  
工務計劃項目第212WF號 — 蝴蝶谷主配水庫至都會區內副配水庫輸水設施 - 第一階段

WATER SUPPLIES DEPT.  
HONG KONG  
(SHEET 2 OF 2)  
(二 之 二)  
SKETCH NO. 03798 / 106 / 002