

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 709 - WATERWORKS

#### Water Supplies – Fresh water supplies

#### 227WF – Mainlaying between Au Tau treatment works and Yuen Long Town – remaining works

Members are invited to recommend to Finance Committee the upgrading of the remaining part of **227WF** to Category A at an estimated cost of \$25.7 million in money-of-the-day prices.

### PROBLEM

The existing trunk main between Au Tau treatment works and Yuen Long Town will not be able to cope with anticipated increase in water demand arising from planned developments in the Tuen Mun – Yuen Long Corridor and the north-western part of Tuen Mun by 2005.

### PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Works, proposes to upgrade the remaining part of **227WF** to Category A at an estimated cost of \$25.7 million in money-of-the-day (MOD) prices for the laying of fresh water mains in conjunction with the roadworks under **27CG**<sup>1</sup> “Yuen Long south eastern extension – site formation, roads and drainage works” and **28CG**<sup>1</sup> “Yuen Long south western extension – site formation, roads and drainage works” along the proposed Road L4 and the existing Ma Tong Road and Ma Tin Road.

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<sup>1</sup> A related paper, PWSC(2002-03)29, for the upgrading of **27CG** and part of **28CG** under **Head 707** to Category A is submitted for Members' consideration at this meeting.

## PROJECT SCOPE AND NATURE

3. The scope of works under **227WF** comprises the laying of about 5 000 metres (m) of fresh water mains of 1 400 millimetres (mm) in diameter between Au Tau treatment works and Yuen Long Town via the access road of Au Tau treatment works, Kam Tin Road, Castle Peak Road, Yuen Ching Road, Yuen Lung Street, Fung Yau Street East, Fung Yau Street South, the proposed Road L4, Ma Tong Road, Ma Tin Road and Town Park Road South. A site plan showing the scope of works is at Enclosure 1. To tie in with the roadworks programmes in the area, Finance Committee has previously approved the upgrading of parts of **227WF**, essentially covering about 3 930 m of fresh water mains between Au Tau treatment works and Fung Yau Street South as well as along Town Park Road South, to Category A (details in paragraphs 21 to 24 below).

4. The remaining part of **227WF** that we now propose to upgrade to Category A comprises the laying of about 1 070 m of fresh water mains of 1 400 mm in diameter along the proposed Road L4 and the existing Ma Tong Road and Ma Tin Road in Yuen Long.

5. We plan to commence construction of the water mains in November 2002 for substantial completion in mid-2005 to tie in with the construction period of the roadworks under **27CG** and **28CG**. The whole mainlaying works including hydraulic pressure testing, sterilisation and connection to existing water mains will be completed by the end of 2005.

## JUSTIFICATION

6. In view of the rapid developments in the Tuen Mun areas, DWS envisages that the population in areas currently served by the Tuen Mun treatment works will increase from 455 000 in 2001 to 519 000 in 2005 and to 634 000 in 2008. Together with the demand arising from other residential and industrial developments under planning, we expect the daily water demand to increase from 201 000 cubic metres (m<sup>3</sup>) in 2001 to 241 000 m<sup>3</sup> in 2005 and further to 334 000 m<sup>3</sup> in 2008.

7. However, the capacity of the existing Tuen Mun treatment works will only be able to cater for the daily fresh water demand of 230 000 m<sup>3</sup>. To cope with the projected growth in demand by 2005 and beyond, we need to provide a trunk main of about 11 kilometres long to transfer fresh water from the existing Au Tau treatment works in Yuen Long to Tan Kwai Tsuen for further distribution to the Tuen Mun areas. We are carrying out the works under two projects – **227WF** and **34WF** “Additional trunk transfer facilities between Tan Kwai Tsuen and Tuen Mun”. **227WF** covers the laying of trunk main from Au Tau treatment works to Shan Ha Road and **34WF** covers the laying of trunk main from Shan Ha Road to Tuen Mun Road. We will implement all the mainlaying works in several phases to tie in with the various roadworks and mainlaying programmes as shown in Enclosure 1.

8. The proposed mainlaying works fall within the project boundaries of two roadworks projects – **27CG** and **28CG**, which are to be implemented by the Director of Territory Development (DTD). To avoid interface problems arising from two contractors working on the same site, we will entrust the proposed works to DTD forming part of the roadworks contract under **27CG** and **28CG**.

## FINANCIAL IMPLICATIONS

9. We estimate the capital cost of the proposed works to be \$25.7 million in MOD prices (see paragraph 10 below), made up as follows –

	<b>\$ million</b>
(a) Pipe materials	5.3
(b) Laying of about 1 070 m of fresh water mains	16.2
(i) by conventional method	11.4
(ii) by trenchless construction method	4.8
(c) Consultants’ fees	2.1
(i) contract administration	0.2
(ii) site supervision	1.9
	/(d) .....
	<b>\$ million</b>

(d) Environmental mitigation measures	0.3	
(e) Contingencies	2.3	
	26.2	(in September 2001 prices)
(f) Provision for price adjustment	(0.5)	
	25.7	(in MOD prices)
Sub-total		
Total		

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

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

Year	\$ million (Sept 2001)	Price adjustment factor	\$ million (MOD)
2002 – 2003	1.8	0.98625	1.8
2003 – 2004	9.9	0.98378	9.7
2004 – 2005	10.8	0.98378	10.6
2005 – 2006	3.7	0.98378	3.6
	26.2		25.7

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 2002 to 2006. We will incorporate the mainlaying works into DTD's roadworks contract on a remeasurement basis because the quantities of the works may vary with the actual ground conditions. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract.

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12. We estimate the additional annual recurrent expenditure arising from

this project to be \$66,000.

13. The project by itself will lead to an increase in water charges by 0.01% in real terms by 2006<sup>2</sup>.

## **PUBLIC CONSULTATION**

14. The entrusted mainlaying works form part of the essential service provisions of DTD's roadworks project.

15. DTD consulted the Shap Pat Heung Rural Committee on 26 August 1997. He also consulted the members of the Environmental Improvement Committee of the then Yuen Long Provisional District Board (YLPDB) on 26 September 1997 and the full Board of YLPDB on 28 August 1997 and 23 October 1997 respectively. They endorsed the proposed works.

16. DTD briefed Members of the Town Planning and Development Committee of the Yuen Long District Council on the proposed works on 2 September 1997, 15 September 1999 and 11 July 2001. They endorsed the proposed works and urged for its early implementation.

## **ENVIRONMENTAL IMPLICATIONS**

17. We completed a Preliminary Environmental Review (PER) for **227WF** in February 1996. The PER concluded that the project would not have any long-term environmental impact and no Environmental Impact Assessment would be required. For short-term construction impacts, standard pollution measures<sup>3</sup> would be sufficient to mitigate the impacts. We have included the cost of implementing these mitigation measures (\$0.3 million) in the project estimate and will incorporate these requirements into the roadworks contract for implementation.

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18. We have given due consideration to the need to minimise the generation of construction and demolition (C&D) materials in designing the levels and alignments of the proposed water mains. To further minimise the generation

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<sup>2</sup> The increase in water charges is calculated on the assumption that the demand remains static during the period from 2001 to 2006 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

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

of C&D materials, we will encourage the contractors to use steel instead of timber in formwork and temporary works. We estimate that about 2 490 m<sup>3</sup> of C&D materials will be generated by the project. Of these, about 2 140 m<sup>3</sup> (86%) will be reused on site, 260 m<sup>3</sup> (10%) will be reused as fill in public filling areas<sup>4</sup> and 90 m<sup>3</sup> (4%) will be disposed of at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$11,250 for this project (based on a notional unit cost<sup>5</sup> of \$125/m<sup>3</sup>).

19. We will require the contractors to submit waste management plans (WMP) for 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 ACQUISITION

20. The proposed mainlaying works will be undertaken as part of two concurrent roadworks projects **27CG** and **28CG** and do not require additional land acquisition or clearance beyond the scale envisaged for **27CG** and **28CG**. Details on the latter are set out in PWSC(2002-03)29, which is also submitted for consideration at this PWSC meeting.

## BACKGROUND INFORMATION

21. We upgraded **227WF** to Category B in September 1996 for the trunk main between the Au Tau treatment works and Shan Ha Road. Since then, we have upgraded parts of **227WF** to Category A as detailed in paragraphs 22 to 24 below.

22. In November 1997, we upgraded part of **227WF** as **233WF** “Mainlaying between Au Tau treatment works and Yuen Long Town – advance works near Fung Yau Street East” at an estimated cost of \$27.5 million. The mainlaying works commenced in June 1998 and were completed in

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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.

September 1999.

23. In February 1999, we upgraded another part of **227WF** as **242WF** “Mainlaying between Au Tau treatment works and Yuen Long Town – advance mainlaying work along Kam Tin Road” at an estimated cost of \$17.68 million. Construction commenced in April 1999 and was completed in October 2001.

24. In May 2000, we upgraded a further part of **227WF** as **251WF** “Mainlaying between Au Tau treatment works and Yuen Long Town Hall – main works” at an estimated cost \$122.4 million. The scope comprises mainlaying along the access road to Au Tau treatment works, Castle Peak Road, Fung Yau Street South and Town Park Road South to Shan Ha Road. Construction commenced in November 2000 and was scheduled for completion in March 2003.

25. We also constructed a small section of the trunk main inside the Pond Fish Wholesale Market near Pok Oi Interchange as advance works under Category D item **24BWF** “Advance mainlaying across the pond fish wholesale market near Pok Oi Interchange”.

26. The trunk mainlaying works between Shan Ha Road and Tuen Mun Road are being carried out under **34WF**, entitled “Additional trunk transfer facilities between Tan Kwai Tsuen and Tuen Mun”. The works commenced in December 1999 and were scheduled for completion in early 2003.

27. DWS has engaged consultants to complete the detailed design of the proposed mainlaying works under Category D item **05CWF** “Extension of Au Tau treatment works supply system – mainlaying between Au Tau treatment works and Yuen Long Town – consultants’ fees for investigation study and detailed design of mainlaying works under DTD's Consultancy Agreements Nos. CE 3/74 and CE 48/95” at an estimated cost of \$0.9 million.

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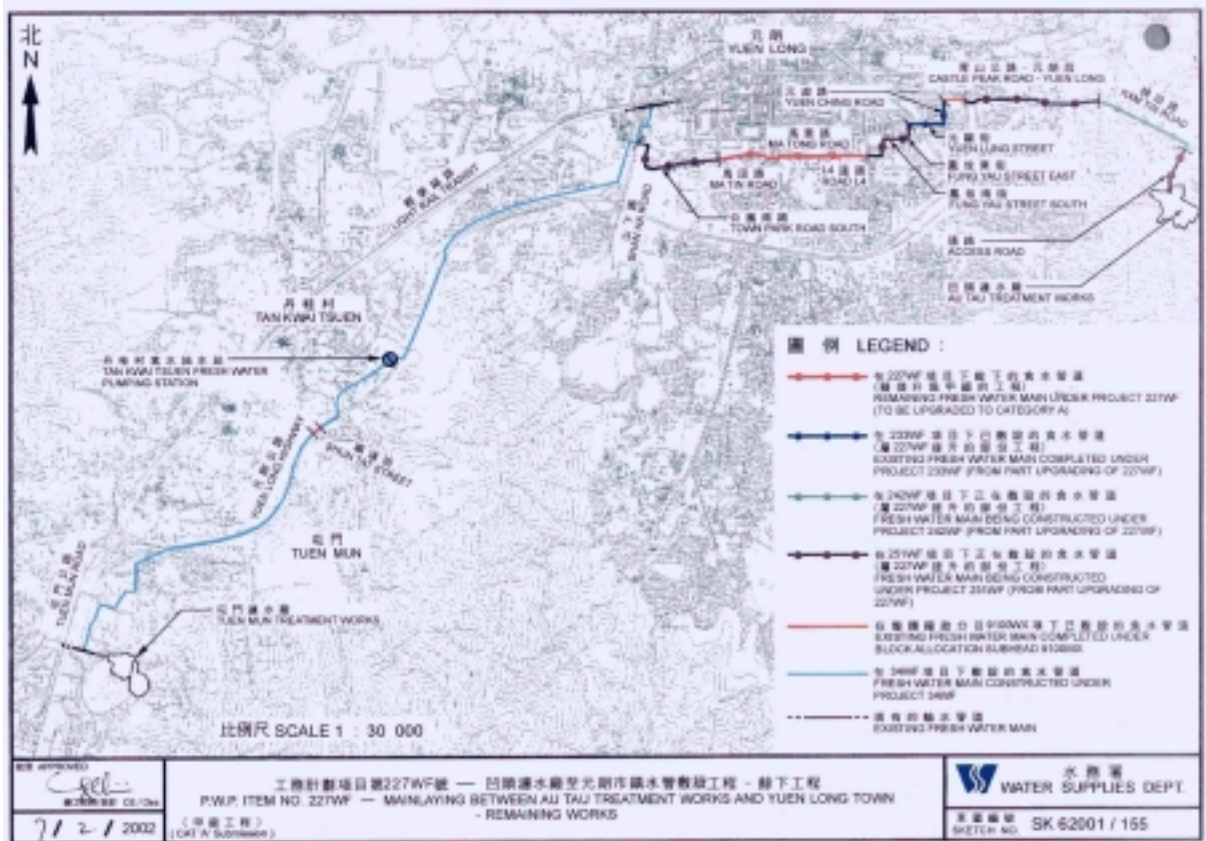
28. We estimate that the project will create 13 jobs comprising two professional/technical staff and 11 labourers, totalling 360 man-months.

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Works Bureau  
May 2002

(pwc227wffin.doc)





**227WF – Mainlaying between Au Tau treatment works  
and Yuen Long Town – remaining works**

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

Consultants' staff costs			Estimated man- months	Average MPS* salary point	Multiplier	Estimated fee (\$ million)
(a)	Contract administration	Professional	0.7	38	2.4	0.1
		Technical	2.0	14	2.4	0.1
(b)	Site supervision by resident site staff employed by the consultants	Professional	6.0	38	1.7	0.6
		Technical	40.0	14	1.7	1.3
Total consultants' staff costs						2.1

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full cost including the consultants' overheads and profit, as the staff will be employed in the consultant's offices. A multiplier of 1.7 is applied to the average MPS point in the case of resident staff supplied by the consultants. (As at 1.4.2002, MPS pt. 38 = \$60,395 per month and MPS pt. 14 = \$19,510 per month).
2. The above figures are based on estimates prepared by the Director of Water Supplies. The consultancy works for this project has been included as part of the Consultancy Agreement No. CE48/95 titled "Yuen Long South Development – Engineering Works in Area 13 and 14, Yuen Long". The assignment will only be triggered subject to the Finance Committee's approval for the upgrading of **227WF** to Category A.