

**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 –

- (a) the upgrading of part of **227WF**, entitled “Mainlaying between Au Tau treatment works and Yuen Long Town – main works”, to Category A at an estimated cost of \$122.4 million in money-of-the-day prices; and
- (b) the retention of the remainder of **227WF** in Category B.

PROBLEM

The existing trunk main between the Au Tau treatment works and the Yuen Long Town will not be able to cope with the anticipated increase in water demand arising from the planned developments in the Tuen Mun-Yuen Long Corridor and the north-western part of Tuen Mun by 2003.

/PROPOSAL

PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Works, proposes to upgrade part of **227WF** to Category A at an estimated cost of \$122.4 million in money-of-the-day (MOD) prices for the laying of four sections of fresh water main between Au Tau treatment works and Yuen Long Town.

PROJECT SCOPE AND NATURE

3. The full scope of works under **227WF** comprises the laying of fresh water main of about 3 770 metres in length and 1 400 millimetres in diameter, between the Au Tau treatment works and Yuen Long Town along access road of Au Tau treatment works, Castle Peak Road, Fung Yau Street East, Fung Yau Street South, Ma Tong Road, Ma Tin Road, Town Park Road South and Shan Ha Road.

4. The part of **227WF** we now propose to upgrade to Category A comprises:

- (a) laying of 300 metres of 1 400 millimetres diameter fresh water main from the entrance of the existing Au Tau treatment works to Kam Tin Road;
- (b) laying of 1 050 metres of 1 400 millimetres diameter fresh water main along Castle Peak Road between Au Tau Roundabout and Pok Oi Interchange. A section of the water main of 100 metres long crossing Yuen Long Southern Bypass will be laid by using pipe jacking method;
- (c) laying of 500 metres of 1 400 millimetres diameter fresh water main along Fung Yau Street East and Fung Yau Street South; and
- (d) laying of 750 metres of 1 400 millimetres diameter fresh water main along Ma Tin Road and Town Park Road South.

JUSTIFICATIONS

5. In view of the rapid developments in the Tuen Mun area, we envisage

/that

that the population in areas currently served by the Tuen Mun treatment works will increase from 405 000 in 1999 to 497 000 in 2003 and 634 000 in 2008. Together with the demand arising from other industrial and commercial developments under planning, we expect the daily water demand to increase from 182 000 cubic metres in 1999, to 226 000 cubic metres in 2003 and further to 334 000 cubic metres in 2008.

6. 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 cubic metres. To cope with the projected growth in demand beyond 2003, we need to provide a trunk main of about 11 kilometres long and the related facilities 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 – project **227WF** covers the works from Au Tau to Shan Ha Road and project **34WF** covers the remaining part from Shan Ha Road to Tuen Mun Road, and in several phases to tie in with various roadworks and mainlaying programmes.

7. The current proposal covers the laying of about 2 600 metres of trunk main along Castle Peak Road, Fung Yau Street East, Fung Yau Street South, Ma Tin Road, Town Park Road South and Shan Ha Road and is the main part of project **227WF**.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of this phase of the project to be \$122.4 million in MOD prices (see paragraph 9 below), made up as follows –

	\$ million
(a) Pipe materials	20.4
(b) Mainlaying	58.4
(c) Pipe jacking	4.7
(d) Consultants' fees	18.1
(i) Construction stage	0.5
(ii) resident site staff costs	17.6

/(e)

		\$ million	
(e)	Environmental mitigation measures	0.5	
(f)	Contingencies	10.2	
	Sub-total	112.3	(in December 1999 prices)
(g)	Provision for price adjustment	10.1	
	Total	122.4	(in MOD prices)

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

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

Year	\$ million (Dec 1999)	Price adjustment factor	\$ million (MOD)
2000 – 2001	7.4	1.00000	7.4
2001 – 2002	42.2	1.04500	44.1
2002 – 2003	44.0	1.10770	48.7
2003 – 2004	15.1	1.17416	17.7
2004 – 2005	3.6	1.24461	4.5
	112.3		122.4

10. We derived the MOD estimates on the basis of Government's latest forecast of trend labour and construction prices for the period 2000 to 2005. 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 allow provision for price adjustment in the contract as the construction period will exceed 21 months.

/11.

11. We estimate the additional annually recurrent expenditure to be \$170,000.

12. This phase of the project by itself would lead to an increase in water charges¹ by 0.05% in real terms by 2005.

PUBLIC CONSULTATION

13. We consulted the Environmental Improvement Committee and the Traffic and Transport Committee of Yuen Long Provisional District Board on 24 September 1998 and 3 November 1998 respectively. Both Committees had no objection to the project.

ENVIRONMENTAL IMPLICATIONS

14. The Director of Environmental Protection (DEP) vetted the Preliminary Environmental Review (PER) conducted by DWS in February 1996. The PER concluded that the project would have no long term environmental impact and no Environmental Impact Assessment would be required. For short term construction impacts, standard pollution measures² would be sufficient to mitigate the impacts. We have included in the project estimate of **227WF** the cost of implementing these mitigation measures (\$0.5 million in December 1999 prices) and will incorporate these requirements into the works contracts for implementation.

15. We estimate that about 5 000 cubic metres (m³) of public fill will be delivered to public filling areas after allowing for reuse and about 25m³ of construction and demolition (C&D) waste will be disposed of at landfills. We have considered in the planning and design stages to minimize the generation of construction and demolition material (C&DM). We will require the contractor to submit a waste management plan with appropriate mitigation measures, including the allocation of an area for waste segregation, for approval. We will ensure that the
/day-to-day

¹ The increase in water charges is calculated on the assumption that the demand remains static during the period from 1999 to 2005 and the amount of government subsidy to the Waterworks operations is to be contained at the present level.

² 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.

day-to-day operations on site comply with the waste management plan. We shall reuse the public fill generated from the project either on site or in other construction sites as far as possible. To further minimise the generation of C&DM, we will encourage the contractor to use non-timber formwork, hoarding and other temporary works. We will require the contractor to sort the C&DM on-site to facilitate reuse, recycling and disposal as appropriate. We will also require the contractor to break down any over-sized public fill/C&DM to less than 250 millimetres in size so as to facilitate its reuse by other reclamation or earth-filling projects. We will control the disposal of public fill and C&D waste to designated public filling facility and landfills respectively through a trip ticket system, and record the disposal, reuse and re-cycling of C&DM for monitoring purpose.

LAND ACQUISITION

16. The proposed mainlaying works do not require any land acquisition.

BACKGROUND INFORMATION

17. For the section of trunk main between Shan Ha Road and Tuen Mun Road, we upgraded the project **34WF** in three phases to Category A as **229WF**³ “Tan Kwai Tsuen fresh water service reservoir stage 2 and mainlaying works in Tuen Mun area 52” in January 1997, **234WF**⁴ “Mainlaying between Yuen Long and Tan Kwai Tsuen” in late 1997 and **34WF**⁵ “Additional trunk transfer facilities between Tan Kwai Tsuen and Tuen Mun” in June 1999. We also constructed a small section of the trunk main across Shun Tat Street as advance work under Category D item **67AWF**⁶ “Additional trunk transfer facilities between Yuen Long and Tuen Mun - mainlaying across Shun Tat Street”.

18. For the section of trunk main between the Au Tau treatment works and Shan Ha Road, we upgraded the project **227WF** to Category A in two phases as **233WF**⁷ “Mainlaying between Au Tau treatment works and Yuen Long Town - advance works near Fung Yau Street East” and **242WF**⁸ “Mainlaying between Au Tau treatment works and Yuen Long Town - advance mainlaying work along Kam

/Tin

³ We completed the works under **229WF** in December 1999.

⁴ We commenced the works of **234WF** in May 1998 for completion in October 2000.

⁵ We commenced the works of **34WF** in December 1999 for completion in early 2003.

⁶ We completed the works under **67AWF** in October 1998.

⁷ We completed the works under **233WF** in September 1999.

⁸ We commenced the works of **242WF** in April 1999 for completion in October 2001.

Tin Road” in late 1997 and early 1999 for laying two sections of the trunk main along Fung Yau Street and along Kam Tin Road respectively. We also constructed a small section of the trunk main inside the proposed Pond Fish Wholesale Market near Pok Oi Interchange as advance works under Category D item **24BWF**⁹ “Advance mainlaying across the pond fish wholesale market near Pok Oi Interchange”.

19. As regards the works which we now propose to upgrade to Category A, DWS has completed the detailed design by engaging consultants. We plan to start the proposed mainlaying works in this phase in November 2000 for completion in March 2003.

20. DWS is continuing with the design work for the section of trunk main under the remaining part of **227WF**. The remaining section of trunk main will fall within the project boundaries of project items **27CG** “Yuen Long south eastern extension – site formation, roads and drainage works” and **28CG** “Yuen Long south western extension – site formation, roads and drainage works”. To avoid unnecessary repetitive road openings and interface problems arising from two contractors working on the same site, we plan to incorporate this section of mainlaying works into the site formation contract under project items **27CG** and **28CG**. We plan to start construction works for this section in 2002 for completion in 2003.

21. We estimate that the project will create some 50 new jobs comprising 10 professional or technical staff and 40 labourers during the construction period.

Works Bureau
April 2000

(PWSC0235/WIN9)

⁹ We completed the works under **24BWF** in November 1999.

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

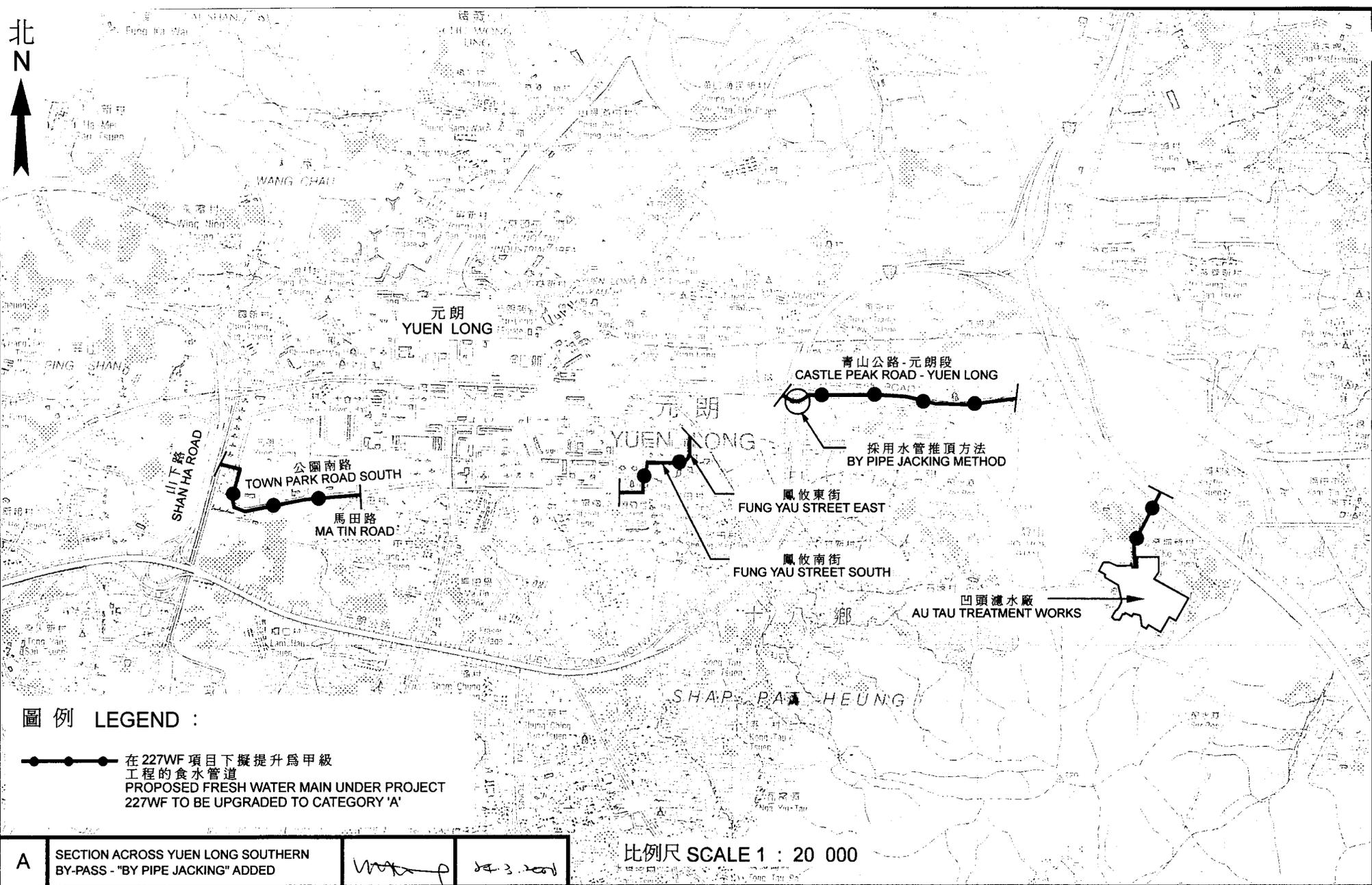
Breakdown of estimates for consultants' fees

Consultants' staff costs		Estimated man months	Average MPS* salary point	Multiplier factor	Estimated fee (\$ million)	
(a)	Consultants' fees for construction stage	Professional	3	40	2.4	0.4
		Technical	2	16	2.4	0.1
(b)	Site supervision by resident site staff employed by the consultants	Professional	47	40	1.7	5.0
		Technical	353	16	1.7	12.6
Total consultants' staff costs					18.1	

* MPS = Master Pay Scale

Notes

1. The above figures are based on estimates prepared by the Director of Water Supplies. The consultancy works for this project will be included as part of Consultancy Agreement No. CE114/98 "Extension of Au Tau Treatment Works Supply System - Mainlaying between Au Tau Treatment Works and Yuen Long Town, Design and Construction". The assignment will only be triggered subject to Finance Committee's agreement to upgrade **227WF** to Category A as proposed.
2. A multiplier factor of 2.4 is applied to the average MPS point to arrive at the indicative full staff costs including the consultants' overheads and profits, as the staff will be employed by the consultants' office. (At 1.4.99, MPS 40 = \$62,780 per month and MPS 16 = \$21,010 per month). A multiplier factor of 1.7 is applied in the case of site staff supplied by the consultants.



A SECTION ACROSS YUEN LONG SOUTHERN BY-PASS - "BY PIPE JACKING" ADDED

[Signature] 24.3.2000

核准 APPROVED

[Signature]
 總工程師/顧問工程師(1) CE / CM(1)

工務計劃項目第 227WF 號 — 凹頭濾水廠至元朗市鎮的水管敷設工程-現擬進行的工程
 PWP ITEM NO.227WF — MAINLAYING BETWEEN AU TAU TREATMENT WORKS AND YUEN LONG TOWN - PROPOSED WORKS

 水務署
 WATER SUPPLIES DEPT.

(3 / 3 / 2000)

(甲級工程)
 (CAT 'A' Submission)

草圖編號 SKETCH NO. 62000 / 015A



元朗
YUEN LONG

青山公路-元朗段
CASTLE PEAK ROAD - YUEN LONG

錦田路
KAM TIN ROAD

凹頭濾水廠
AU TAU TREATMENT WORKS

鳳攸東街
FUNG YAU STREET EAST

鳳攸南街
FUNG YAU STREET SOUTH

馬田路
MA TIN ROAD

馬棠路
MA TONG ROAD

公園南路
TOWN PARK ROAD SOUTH

山下路
SHAN HA ROAD

輕鐵路
LIGHT RAIL TRANSIT

丹桂村
TAN KWAI TSUEN

丹桂村食水抽水站
(在34WF項目下)
TAN KWAI TSUEN FRESH WATER
PUMPING STATION
(UNDER 34WF)

丹桂村食水配水庫第一期
(在229WF項目下)
TAN KWAI TSUEN FRESH WATER
SERVICE RESERVOIR STAGE 1
(UNDER 229WF)

丹桂村食水配水庫第二期
(在229WF項目下)
TAN KWAI TSUEN FRESH WATER
SERVICE RESERVOIR STAGE 2
(UNDER 229WF)

元朗公路
YUEN LONG HIGHWAY

順達街
SHUN TAT STREET

屯門
TUEN MUN

屯門濾水廠
TUEN MUN TREATMENT WORKS

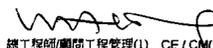
屯門公路
TUEN MUN ROAD

圖例 LEGEND :

- 在227WF項目下擬提升為甲級工程的食水管道
PROPOSED FRESH WATER MAIN UNDER PROJECT 227WF TO BE UPGRADED TO CATEGORY 'A'
- 在242WF項目下正在敷設的食水管道(屬227WF提升的部份工程)
FRESH WATER MAIN BEING CONSTRUCTED UNDER PROJECT 242WF (FROM PART UPGRADING OF 227WF)
- 在233WF項目下已敷設的食水管道(屬227WF提升的部份工程)
EXISTING FRESH WATER MAINS COMPLETED UNDER PROJECT 233WF (FROM PART UPGRADING OF 227WF)
- 在227WF項目下餘下的食水管道
REMAINING FRESH WATER MAINS UNDER PROJECT 227WF
- 在229WF項目下已敷設的食水管道(屬34WF提升的部份工程)
EXISTING FRESH WATER MAIN COMPLETED UNDER PROJECT 229WF (FROM PART UPGRADING OF 34WF)
- 在234WF項目下正在敷設的食水管道(屬34WF提升的部份工程)
FRESH WATER MAIN BEING CONSTRUCTED UNDER PROJECT 234WF (FROM PART UPGRADING OF 34WF)
- 在34WF項目下正在敷設的食水管道
FRESH WATER MAIN BEING CONSTRUCTED UNDER PROJECT 34WF
- 在整體撥款分目9100WX項下已敷設的食水管道
EXISTING FRESH WATER MAIN COMPLETED UNDER BLOCK ALLOCATION SUBHEAD 9100WX
- - - - - 現有的輸水管道
EXISTING FRESH WATER MAIN

比例尺 SCALE 1 : 30 000

核准 APPROVED



總工程師/顧問工程管理(1) CE / CM(1)

13 / 3 / 2000

凹頭濾水廠至屯門的增設幹管轉運設施
 ADDITIONAL TRUNK TRANSFER FACILITIES BETWEEN
 AU TAU TREATMENT WORKS AND TUEN MUN

(甲級工程)
 (CAT 'A' Submission)

 水務署
 WATER SUPPLIES DEPT.

草圖編號 62000 / 014
 SKETCH NO.