

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 - WATERWORKS

Water Supplies - Fresh water supplies

225WF - Extension of fresh water supply to Tuen Mun East

Members are invited to recommend to Finance Committee the upgrading of **225WF** to Category A at an estimated cost of \$111.7 million in money-of-the-day prices.

PROBLEM

The fresh water supply serving the eastern part of Tuen Mun will not be able to cope with the anticipated increase in water demand arising from new developments by 2002.

PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Works, proposes to upgrade **225WF** to Category A at an estimated cost of \$111.7 million in money-of-the-day (MOD) prices for the provision of fresh water supply and fresh water for flushing to the new developments, including public and private housing and village developments, in the Tuen Mun East area.

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of the project comprises -
- (a) construction of an extension to the Siu Lam fresh water service reservoir with a storage capacity of 27 000 cubic metres¹, and a 600-millimetre diameter overflow pipe about 0.9 kilometres long from the Siu Lam fresh water service reservoir extension to the proposed Road L56A in area 56, Tuen Mun;
 - (b) laying of about 1.5 kilometres of fresh water distribution mains, with diameters ranging from 300 millimetres to 450 millimetres, along So Kwun Wat Road and a track off Kwun Fat Street in Siu Lam;
 - (c) laying of about 1.5 kilometres of flushing water distribution mains, with diameters ranging from 150 millimetres to 450 millimetres, along So Kwun Wat Road and a track off Kwun Fat Street in Siu Lam; and
 - (d) uprating of the existing So Kwun Tan fresh water pumping station from the existing capacity of 32 500 cubic metres per day to 66 100 cubic metres per day.²

JUSTIFICATION

4. The existing fresh water supply system serving the Tuen Mun East area has a capacity of 16 800 cubic metres per day. Given the new developments in the area, we expect the population to increase in phases from the current 34 000 to 42 000 in 2002 and 110 000 in 2008. At present, there is no salt water supply in the area. Together with the requirement for fresh water supply for flushing, we expect the total daily fresh water demand to increase from the current level of 12 700 cubic metres, to 17 000 cubic metres in 2002 and 42 400 cubic metres in 2008. There will be a shortfall in fresh water supply from 2002 onwards. We therefore plan to expand the existing fresh water supply system in Tuen Mun East area as detailed in paragraph 3(a) to (d) above to meet the projected growth in fresh water demand beyond 2002.

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¹ The existing capacity of the Siu Lam fresh water service reservoir is 14 200 cubic metres. With the proposed increase in capacity, it will have a combined capacity of 41 200 cubic metres, which will be sufficient to meet the daily fresh water demand in 2008.

² The increase in capacity of the pumping station in paragraph 3(d) is higher than the capacity of the service reservoir extension in paragraph 3(a) because it has to cater for peak demands during the day.

5. The Director of Home Affairs (DHA) will undertake a roadworks project “Improvement of So Kwun Wat Road, Tuen Mun”³ under the block allocation **Subhead 7014CX** “Rural Public Works Programme”. Among the 3 kilometres of distribution mains detailed in paragraph 3(b) and 3(c) above, about 1.5 kilometres will fall within the roadworks project boundary. To avoid unnecessary repetitive road opening and interface problems arising from two contractors working on the same site, we will incorporate this part of the mainlaying works into the contract for the roadworks project.

FINANCIAL IMPLICATIONS

6. We estimate the capital cost of the project to be \$111.7 million in MOD prices (see paragraph 7 below), made up as follows -

	\$ million	
(a) Construction of reservoir extension with overflow pipe	57.9	
(b) Mainlaying	18.1	
(c) Uprating of pumping station	2.3	
(d) Consultants’ fees	11.0	
(i) construction stage	0.9	
(ii) site staff expenses	10.1	
(e) Environmental mitigation measures	0.5	
(f) Contingencies	8.9	
Sub-total	98.7	(in December 1998 prices)

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³ DHA plans to commence the roadworks in mid 2001 for completion in end 2002.

	\$ million
(g) Provision for price adjustment	13.0
Total	<u>111.7</u> (in MOD prices)

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

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

Year	\$ million (Dec 1998)	Price adjustment factor	\$ million (MOD)
2000 - 01	9.5	1.05814	10.1
2001 - 02	49.8	1.11104	55.3
2002 - 03	34.3	1.16660	40.0
2003 - 04	4.9	1.22493	6.0
2004 - 05	0.2	1.28617	0.3
	<u>98.7</u>		<u>111.7</u>

8. We derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2000 to 2005. We will incorporate a portion of the mainlaying works into DHA's roadworks contract as mentioned in paragraph 5 above on a standard remeasurement basis because the quantities of works may vary with actual ground conditions. We will invite tenders for the construction of the reservoir extension with the overflow pipe and the remaining portion of the mainlaying works under a lump sum contract because we have firm quantities for the majority of the works. Separately, we will invite tenders for the supply of the new pump under a fixed price lump sum contract and will carry out the installation work by utilising in-house resources. We will not provide price adjustment for the above contracts because the construction period will not exceed 21 months.

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9. We estimate the additional annually recurrent expenditure to be \$2.4 million.

10. This project by itself would lead to an increase in water charges by 0.09% in real terms by 2005⁴.

PUBLIC CONSULTATION

11. We consulted the Environmental Improvement and District Development Committee of Tuen Mun Provisional District Board on 17 April 1998. The committee supported the proposal.

ENVIRONMENTAL IMPLICATIONS

12. The Director of Environmental Protection vetted the Preliminary Environmental Review (PER) conducted by the consultants of DWS in February 1996. The PER concluded that with the implementation of the recommendations from the consultancy study "Feasibility Study on Cleaning and Disinfection of Service Reservoirs and Disposal of Effluent" to ensure proper pre-treatment and disposal of sludge/washwater generated from cleaning the service reservoir, the project would have limited potential for long term environmental impacts. For short term construction impacts, standard pollution control measures⁵ would be sufficient to mitigate the impacts. We have included the cost of these mitigation measures in the project estimate (\$0.5 million in December 1998 prices) and will incorporate these requirements into the works contract for implementation.

13. We will minimize the generation of construction and demolition material (C&DM) in the planning and design stages. We shall reuse the public fill generated from the project either on site or in other construction sites as far as possible. We estimate that about 14 000 cubic metres (m³) of public fill will be delivered to public filling areas after allowing for reuse and about 40m³ of C&D waste will be disposed of at landfills. We shall also require the contractor to sort the

/C&DM

⁴ 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.

⁵ The standard pollution control measures include wheel washing facilities and de-silting traps and other procedures as recommended in Environmental Protection Department's recommended control clauses.

C&DM on-site to facilitate reuse, recycling and disposal as appropriate. We shall control the disposal of C&D waste and public fill and shall record the disposal, reuse and recycling of C&DM for monitoring purposes.

LAND ACQUISITION

14. The project does not require land acquisition.

BACKGROUND INFORMATION

15. We upgraded **225WF** to Category B in October 1996. In September 1997, we engaged consultants at a cost of \$1.1 million to carry out the investigation study for the project. Upon completion of the study, we engaged consultants in August 1998 at a cost of \$1.6 million to proceed with the detailed design for the works. We charged the costs of both consultancies to block allocation **Subhead 9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme". The consultants have now substantially completed the detailed design.

16. We plan to start the construction works in October 2000 for completion of the reservoir extension, uprating of the pumping station and a portion of the mainlaying works by mid 2002. The remaining portion of the mainlaying works to be incorporated into DHA's roadworks contract will be completed by end 2002 in conjunction with the roadworks.

17. We estimate that the project will create some 60 new jobs comprising 10 at professional or technical staff and 50 labourers during the construction period.

Works Bureau
March 2000

(PWSC0231/WIN9)

225WF - Extension of Fresh Water Supply to Tuen Mun East

Breakdown of estimates for consultants' fees

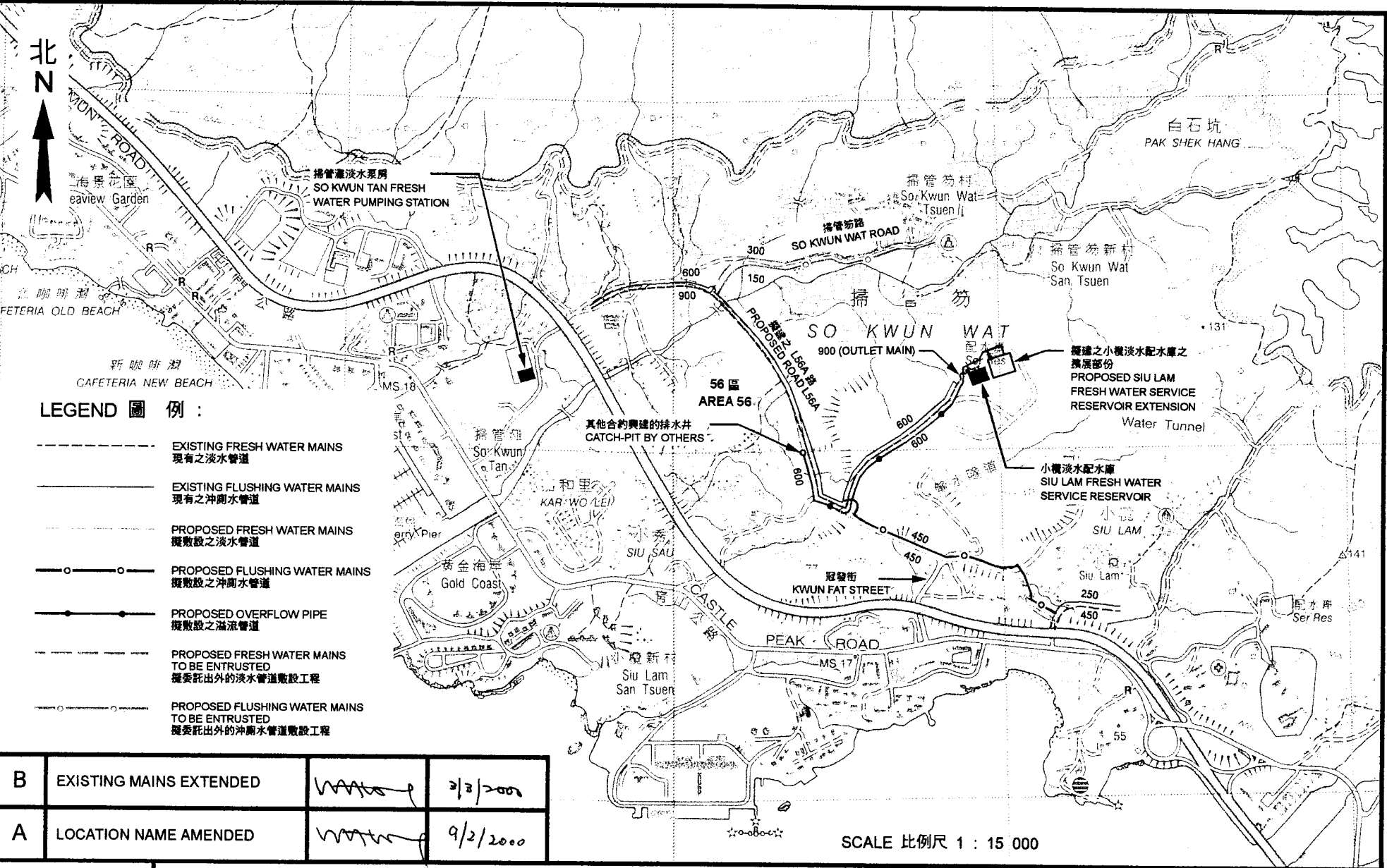
Consultants' staff costs			Estimated man months	Average MPS* salary point	Multiplier factor	Estimated fee (\$million)
(a)	Consultants' fees	Professional	5	40	2.4	0.8
	for works in construction stage	Technical	2	16	2.4	0.1
(b)	Site supervision	Professional	28	40	1.7	3.0
	by resident site staff employed by the consultants	Technical	200	16	1.7	7.1
Total consultants' staff costs						11.0

* 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 13/98 "Extension of fresh water supply to Tuen Mun East, design and construction". The assignment will only be triggered subject to Finance Committee's agreement to upgrade **225WF** 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 1.4.98, 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.

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LEGEND 圖例:

- EXISTING FRESH WATER MAINS
現有之淡水管道
- EXISTING FLUSHING WATER MAINS
現有之沖廁水管道
- - - PROPOSED FRESH WATER MAINS
擬敷設之淡水管道
- - - PROPOSED FLUSHING WATER MAINS
擬敷設之沖廁水管道
- - - PROPOSED OVERFLOW PIPE
擬敷設之溢流管道
- - - PROPOSED FRESH WATER MAINS
TO BE ENTRUSTED
擬委託出外的淡水管道敷設工程
- - - PROPOSED FLUSHING WATER MAINS
TO BE ENTRUSTED
擬委託出外的沖廁水管道敷設工程

B	EXISTING MAINS EXTENDED	<i>[Signature]</i>	2/2/2000
A	LOCATION NAME AMENDED	<i>[Signature]</i>	9/2/2000

SCALE 比例尺 1 : 15 000

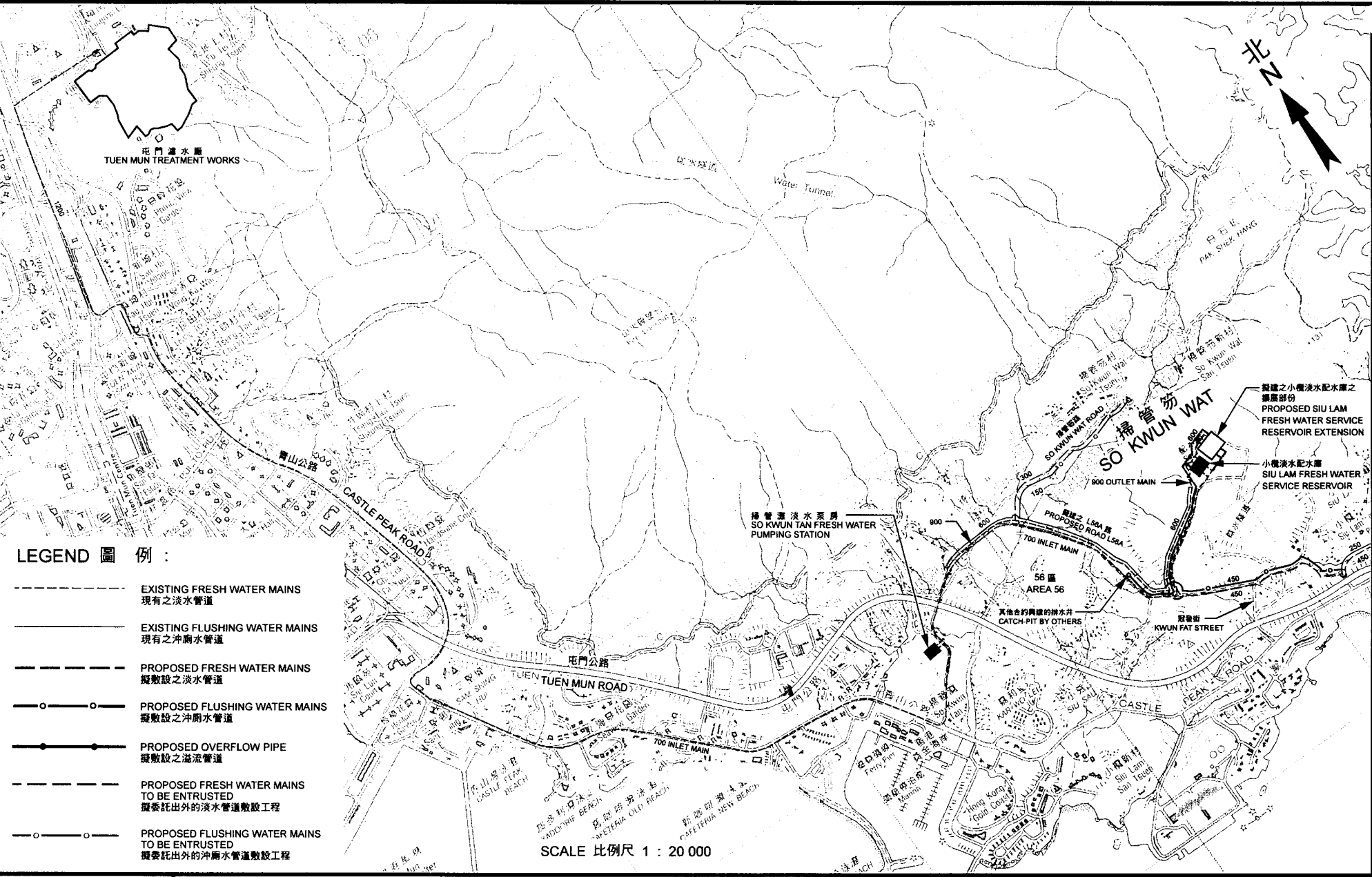
APPROVED:
[Signature]
CE/SM(1)
7/1/2000

P.W.P. ITEM NO. 225 WF — EXTENSION OF FRESH WATER SUPPLY TO TUEN MUN EAST
LOCATION PLAN

工務計劃項目 225 WF — 屯門東淡水供應系統擴展工程
分佈圖

WATER SUPPLIES DEPARTMENT
HONG KONG

SKETCH NO. 03798 / 151B



- LEGEND 圖例：**
- EXISTING FRESH WATER MAINS
現有之淡水管道
 - EXISTING FLUSHING WATER MAINS
現有之沖廁水管道
 - - - PROPOSED FRESH WATER MAINS
擬敷設之淡水管道
 - PROPOSED FLUSHING WATER MAINS
擬敷設之沖廁水管道
 - PROPOSED OVERFLOW PIPE
擬敷設之溢流管道
 - - - PROPOSED FRESH WATER MAINS
TO BE ENTRUSTED
擬委託外的淡水管道敷設工程
 - PROPOSED FLUSHING WATER MAINS
TO BE ENTRUSTED
擬委託外的沖廁水管道敷設工程

SCALE 比例尺 1 : 20 000

APPROVED

 CEV CM(1)
 3 / 3 / 2000

P.W.P. ITEM NO. 225 WF — EXTENSION OF FRESH WATER SUPPLY TO TUEN MUN EAST
 EXISTING SIU LAM FRESH WATER SERVICE RESERVOIR SUPPLY SYSTEM
 工務計劃項目 225 WF — 屯門東淡水供應系統擴展工程
 現有小欖淡水配水庫的供水系統

WATER SUPPLIES DEPT.
 HONG KONG
 SKETCH NO. 03798 / 166