

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 – WATERWORKS

Water Supplies – Fresh water supplies

237WF – Mainlaying along Fanling Highway and near She Shan Tsuen

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **237WF**, entitled “Mainlaying along Fanling Highway and near She Shan Tsuen – Stage 1”, to Category A at an estimated cost of \$52.6 million in money-of-the-day prices; and
- (b) the retention of the remainder of **237WF** in Category B.

PROBLEM

Fanling, Sheung Shui and Tai Po East areas receive fresh water supply from the Sheung Shui water treatment works (WTW). In the event of breakdown in the Sheung Shui water treatment works, there will be a widespread suspension of fresh water supply.

PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for Development, proposes to upgrade part of **237WF** to Category A at an estimated cost of about \$52.6 million in money-of-the-day (MOD) prices to upgrade the integration between the Sheung Shui and the Tai Po WTWs by laying additional water mains.

PROJECT SCOPE AND NATURE

3. The proposed part-upgrading of **237WF** to Category A comprises laying of about 1 kilometre (km) of 1 200 millimetres (mm) diameter fresh water mains along Fanling Highway and Tai Wo Service Road West. Site plans showing the proposed works are at Enclosure 1.

4. We plan to start the construction of the proposed works in May 2009 for completion in May 2013.

JUSTIFICATION

5. Currently, the Fanling, Sheung Shui and Tai Po East areas covering a population of about 314 000 receive fresh water supply from the Sheung Shui WTW. In the event of a breakdown in the Sheung Shui WTW, only around 127 000 of these population in Fanling town centre, Sheung Shui town centre (part) and Tai Po East areas will receive back-up supply from the Tai Po WTW. Full back-up supply is not available due to capacity constraint of the existing water mains linking the two WTWs. Therefore, there exists a risk of widespread suspension of fresh water supply affecting a population of about 187 000 if the Sheung Shui WTW breaks down.

6. To improve the reliability of fresh water supply, we propose to lay additional water mains between the Sheung Shui and the Tai Po WTWs. The proposed mainlaying works will enable the transfer of fresh water from the Tai Po WTW to the supply zones of the Sheung Shui WTW when needed.

7. The proposed mainlaying works described in paragraphs 3 falls within the project boundary of **720TH** – “Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling” to be implemented by Highways Department. In order to reduce repeated road openings and interface problems arising from two contractors working on the same site, we will entrust

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the proposed mainlaying works to Highways Department for construction in conjunction with the roadworks under **720TH**. The roadworks under **720TH** is currently planned for implementation in stages commencing May 2009. To tie in with this works programme, the mainlaying works as described in paragraph 3 above needs to be upgraded to Category A in early 2009 for incorporation into the roadworks contract.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be about \$52.6 million in MOD prices (see paragraph 9 below), made up as follows –

		\$ million
(a)	Mainlaying	38.3
	(i) conventional method	31.8
	(ii) trenchless methods ¹	6.5
(b)	Environmental mitigation measures	0.4
(c)	Consultants' fees	3.2
	(i) contract administration	0.2
	(ii) resident site staff costs	3.0
(d)	Contingencies	4.2
	Sub-total	46.1 (in September 2008 prices)
(e)	Provision for price adjustment	6.5
	Total	52.6 (in MOD prices)

We propose to engage consultants to undertake contract administration and site supervision of the proposed mainlaying works, which will be entrusted to Highways Department for implementation under **720TH**. A breakdown of the estimates for consultants' fees by man-months is at Enclosure 2.

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¹ Mainlaying by trenchless methods refers to the use of pipe jacking, micro-tunnelling or boring techniques to construct underground pipelines without opening up the road surface for the whole length of the pipelines.

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

Year	\$ million (Sept 2008)	Price adjustment factor	\$ million (MOD)
2009 – 2010	2.5	1.04000	2.6
2010 – 2011	11.1	1.08160	12.0
2011 – 2012	12.9	1.12486	14.5
2012 – 2013	10.6	1.16986	12.4
2013 – 2014	6.1	1.21665	7.4
2014 – 2015	2.9	1.26532	3.7
	46.1		52.6

10. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2009 to 2015. We will tender the proposed works under **720TH** on a remeasurement basis because of the extensive underground works which are subject to variation during construction to suit the actual site conditions. We will provide for price adjustments in the contract.

11. We estimate the annual recurrent expenditure arising from this project to be about \$60,000.

12. The project by itself will lead to an increase in production cost of water by 0.02% in real terms by 2015².

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² The increase in production cost of water is calculated at the present price level and on the assumption that the water demand remains static during the period from 2009 to 2015.

PUBLIC CONSULTATION

13. We consulted Lam Tsuen Valley Committee, village representatives of Wai Tau Tsuen and Tai Hang Tsuen as well as the concerned District Council member on the proposed works through District Office/Tai Po in July 2008. They supported the proposed works.

14. We circulated to the Legislative Council Panel on Development an information paper on the proposed works on 17 November 2008. Members raised no objection to the proposal.

ENVIRONMENTAL IMPLICATIONS

15. The proposed mainlaying works is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We have completed the Preliminary Environmental Review (PER) for the project. The PER concluded and the Director of Environmental Protection agreed that the project would not have any long-term environmental impacts. We will incorporate the implementation of standard pollution measures to mitigate short-term construction impacts in the works contract.

16. For short-term impacts during construction, we will control noise, dust and site run-off within established standards and guidelines through the implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plant to reduce noise generation and water-spraying to reduce emission of fugitive dust. We have included about \$0.4 million (in September 2008 prices) in the project estimate for the implementation of these mitigation measures.

17. We have considered the alignment of the water mains in the planning and design stages to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities³. We will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

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³ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

18. We will also require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

19. We estimate that the project will generate in total about 10 000 tonnes of construction waste. Of these, we will reuse about 8 400 tonnes (84%) of inert construction waste on site and deliver 1 500 tonnes (15%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of 100 tonnes (1%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$53,000 for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne⁴ at landfills).

TRAFFIC IMPLICATIONS

20. To reduce repeated road openings and interface problems arising from two contractors working on the same site, we will incorporate the proposed mainlaying works into **720TH** so that they would be carried out in conjunction with the roadworks contract. During construction, we will maintain smooth traffic flow through implementing temporary traffic management measures, and display notice boards on site to explain the reasons of temporary traffic arrangements and indicate the expected completion dates of the concerned sections of works. In addition, we will set up telephone hotlines for public enquiries or complaints. We will carry out construction works in busy road sections during non-peak hours. Moreover, trenchless method will be used for laying of watermains across busy road junctions.

HERITAGE IMPLICATIONS

21. The mainlaying works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by Antiquities and Monuments Office.

/LAND

⁴ 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/m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

LAND ACQUISITION

22. The proposed works do not require any land acquisition.

BACKGROUND INFORMATION

23. We upgraded **237WF** in Category B in October 1999. The full scope of **237WF** comprises –

- (a) laying of about 3.3 km long of 1 200 mm diameter fresh water mains along Fanling Highway and Tai Wo Service Road; and
- (b) laying of about 1.4 km long fresh water mains in diameter ranging from 1 200 mm to 1 400 mm in the verge along Tai Po Road, under the footpath in Mui Shue Hang Playground and near She Shan Tsuen.

24. We have planned to implement the proposed works under **237WF** on two fronts. The works described in paragraph 23(a) fall within the project boundary of **720TH** and will therefore be entrusted to Highways Department to synchronise with the roadworks programme to reduce repeated road openings and interface problems.

25. We engaged a consultant through **720TH** to undertake the site investigation and design of the entrusted mainlaying works in 2001 at a total cost of about \$2.3 million. We charged this amount to block allocation Subhead **9100WX** “Waterworks, studies and investigations for items in Category D of the Public Works Programme”. The consultant has substantially completed the design of the mainlaying works described in paragraph 3 above.

26. On a separate front, the works described in paragraph 23(b) above will be undertaken by Water Supplies Department. The department has completed ground investigation and is designing the works using in-house resources. We will programme the completion of the works to tie in with that to be implemented by Highways Department under the roadworks contract.

27. The proposed mainlaying works will not involve any tree removal or planting proposals.

28. We estimate that the proposed works will create about 26 jobs (21 for labourers and another 5 for professional/technical staff) providing a total employment of 1 030 man-months.

**Development Bureau
January 2009**



圖例 LEGEND:

- 上水濾水廠供水區
SHEUNG SHUI WATER TREATMENT WORKS SUPPLY ZONE
- 擬議的食水管道 (委託路政署720TH項目下敷設)
PROPOSED FRESH WATER MAINS (TO BE ENTRUSTED TO HyD UNDER PROJECT 720TH)
- 餘下的食水管道 (將於稍後提升至甲級)
REMAINING FRESH WATER MAINS (TO BE UPGRADED TO CATEGORY A LATER)
- 現有的食水管道
EXISTING FRESH WATER MAINS

上水濾水廠
SHEUNG SHUI WATER TREATMENT WORKS

上水
SHEUNG SHUI

粉嶺
FANLING

請參閱附件一的第二張
PLEASE REFER TO SHEET 2
OF ENCLOSURE 1

往大埔東
TO TAI PO EAST

大埔頭食水主配水庫
TAI PO TAU PRIMARY
FRESH WATER
SERVICE RESERVOIR

社山村
SHE SHAN
TSUEN

大埔
TAI PO

大埔濾水廠
TAI PO WATER
TREATMENT WORKS

比例尺 SCALE 1 : 100 000

核准 APPROVED

總工程師/設計 CE / Des

12 / 1 / 2009

(甲級工程)
(CAT 'A' Submission)

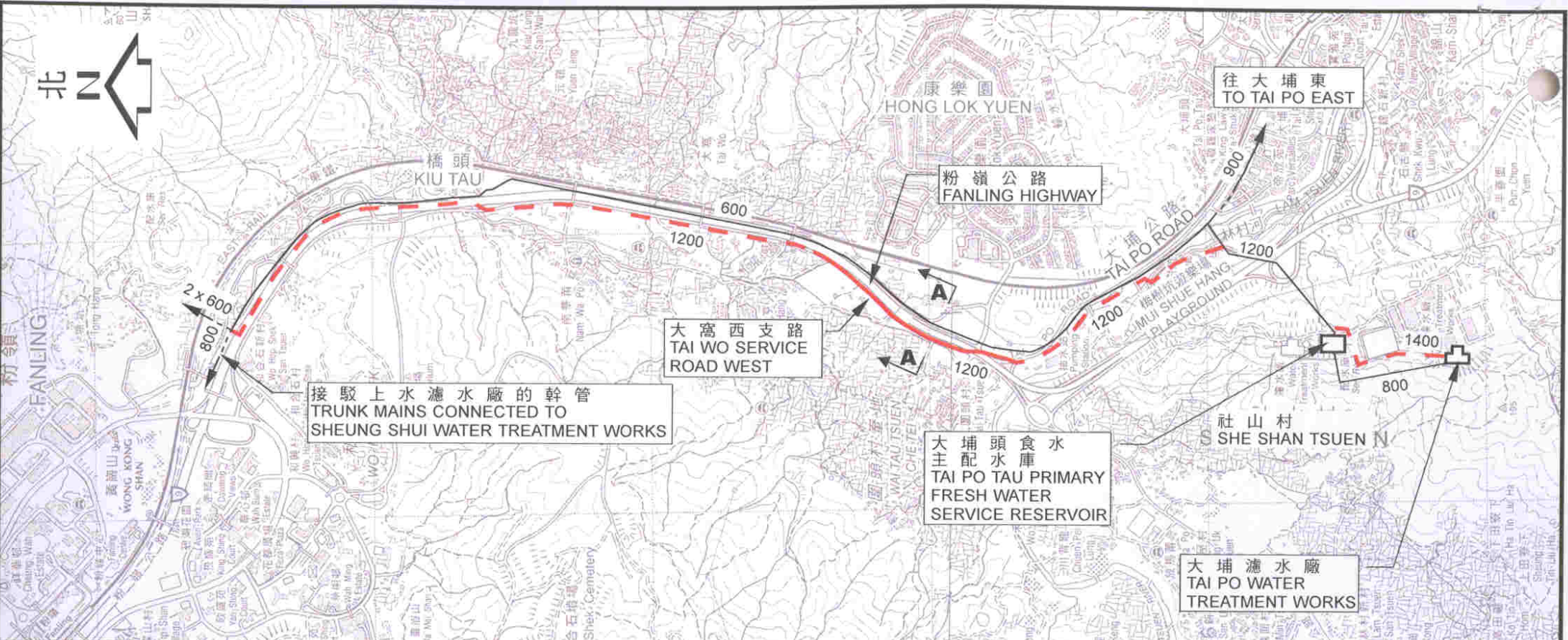
工務計劃項目237WF號 - 粉嶺公路及社山村附近進行的水管敷設工程
P.W.P. ITEM NO. 237WF - MAINLAYING ALONG FANLING HIGHWAY AND NEAR SHE SHAN TSUEN



水務署
WATER SUPPLIES DEPT.

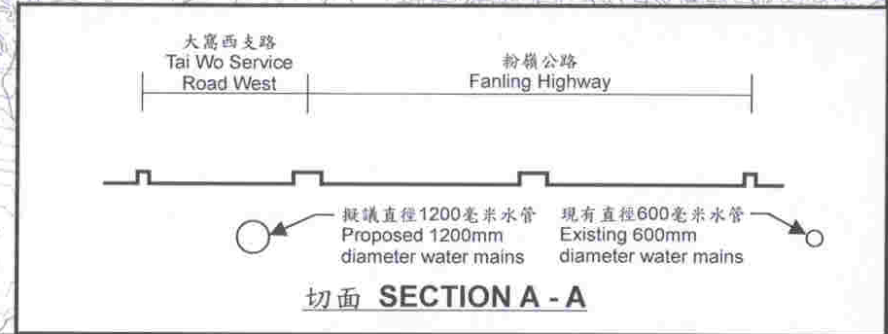
草圖編號
SKETCH NO.

SK 62008 / 088a



圖例 LEGEND :

-  擬議的食水管
(委託路政署 720TH 項目下敷設)
PROPOSED FRESH WATER MAINS
(TO BE ENTRUSTED TO HyD UNDER PROJECT 720TH)
-  餘下的食水管(將於稍後提升至甲級)
REMAINING FRESH WATER MAINS
(TO BE UPGRADED TO CATEGORY A LATER)
- 1200 水管直徑(毫米)
DIAMETER OF WATER MAINS (MILLIMETRES)
-  現有的食水管
EXISTING FRESH WATER MAINS



比例尺 SCALE 1 : 20 000

核准 APPROVED



總工程師/設計 CE / Des

12/1/2009

工務計劃項目第237WF號 — 粉嶺公路及社山村附近進行的水管敷設工程
P.W.P. ITEM NO. 237WF — MAINLAYING ALONG FANLING HIGHWAY AND NEAR SHE SHAN TSUEN

(甲級工程)
(CAT 'A' Submission)

 水務署
WATER SUPPLIES DEPT.

草圖編號 SK 62008 / 091a
SKETCH NO.

附件一(兩張中的第二張) Enclosure 1 (Sheet 2 of 2)

237WF – Mainlaying along Fanling Highway and near She Shan Tsuen**Breakdown of estimate for consultants' fees (in September 2008 prices)**

Consultants' staff costs		Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$million)
(a) Contract administration (Note 2)	Professional	-	-	-	0.1
	Technical	-	-	-	0.1
(b) Site supervision by resident site staff of the consultants (Note 3)	Professional	13	38	1.6	1.3
	Technical	55	14	1.6	1.7
				Total	3.2

*MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS point to arrive at the cost of resident site staff supplied by the consultants. (As at 1 April 2008, MPS point 38 = \$60,535 per month and MPS point 14 = \$19,835 per month.)
2. The consultants' staff costs for contract administration are calculated in accordance with the existing consultancy agreement for the provision of contract administration for **720TH**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade the proposed works to Category A.
3. We will only know the actual man-months and actual cost for site supervision after completion of the construction works.