

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 – WATERWORKS

Water Supplies – Combined fresh/salt water supply

186WC – Replacement and rehabilitation of water mains, stage 3

Members are invited to recommend to Finance Committee -

- (a) the upgrading of part of **186WC**, entitled “Replacement and rehabilitation of water mains, stage 3 – investigation and detailed design” to Category A at an estimated cost of \$64.7 million in money-of-the-day prices; and
- (b) the retention of the remainder of **186WC** in Category B.

PROBLEM

Ageing fresh and salt water mains throughout the territory are prone to frequent bursts and leaks, disrupting water supplies and traffic flow and causing inconvenience to the public.

/PROPOSAL

PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **186WC** to Category A at an estimated cost of \$64.7 million in money-of-the-day (MOD) prices for engaging consultants to carry out investigation and detailed design for the proposed works under stage 3 of the territory-wide water mains replacement and rehabilitation programme.

PROJECT SCOPE AND NATURE

3. The full scope of works under **186WC** comprises the replacement and rehabilitation of approximately 620 kilometres (km) of fresh water mains and 180 km of salt water mains, at sites scattering over different districts throughout the territory. Due to insufficient in-house resources, we plan to investigate the site, design and supervise the replacement and rehabilitation of water mains under **186WC** partly by consultants and partly by in-house resources.

4. The part of **186WC** that we now propose to upgrade to Category A comprises –

- (a) consultancies for traffic impact assessment, drainage impact assessment, environmental reviews and detailed design of the replacement and rehabilitation of –
 - (i) about 560 km of fresh water mains ranging from 20 millimetres (mm) to 1 500 mm in diameter including associated service pipes and connections; and
 - (ii) about 160 km of salt water mains ranging from 20 mm to 1 000 mm in diameter including associated service pipes and connections; and
- (b) site investigation including condition survey for all the works under **186WC**.

5. We plan to start the proposed consultancies and site investigation works in October 2006 for completion by phases before early 2009. Plans showing the sites of the proposed works under **186WC** are at Enclosure 1. Details of the typical water mains replacement and rehabilitation works are shown in Enclosure 2.

/JUSTIFICATION

JUSTIFICATION

6. Hong Kong's fresh water and salt water supplies are provided through a network of about 7 400 km of water mains. Most of these water mains are underground. About 45% of the water mains were laid more than 30 years ago. They are approaching the end of their service life and have become increasingly difficult and costly to maintain.

7. Due to considerable length of water mains approaching the end of their service life, we are experiencing an increasing number of main bursts causing more and more inconvenience to the public. As the previous way of carrying out small scale replacement works on a local basis was no longer effective, we engaged consultants in February 1996 to carry out an Underground Asset Management Study (the Study) to develop a comprehensive and cost-effective management plan for the water supply network. The Study recommended the replacement and rehabilitation of some 3 000 km of aged water mains in stages to prevent further deterioration of the water supply network.

8. The whole replacement and rehabilitation programme was originally scheduled for completion by 2020. To bring about earlier improvement to the supply system and minimise inconvenience to the public due to frequent main bursts, we have advanced the completion of the whole replacement and rehabilitation programme to 2015. We will continue to review the programme taking account of prevailing constraints and the residual service life of the water mains to be replaced with a view to completing the works within a shorter time frame before 2015.

9. To meet the compressed programme of replacement and rehabilitation of the ageing water mains, we need to commence investigation and detailed design of the stage 3 works in October 2006. As there are insufficient in-house staffing resources to carry out all the proposed works under **186WC** in view of its scale and complexity, we propose to engage consultants to carry out the proposed investigation, assessments and detailed design so as to enable the construction works to proceed as scheduled. We will use in-house staffing resources to investigate, design and supervise the replacement and rehabilitation of the remaining ageing water mains under the stage 3 works (about 60 km of fresh water mains and about 20 km of salt water mains).

/FINANCIAL

FINANCIAL IMPLICATIONS

10. We estimate the cost of the proposed consultancies and site investigation works to be \$64.7 million in MOD prices (see paragraph 11 below), made up as follows –

	\$ million	
(a) consultants' fees	28.6	
(i) design, tender documentation and assessments	20.1	
(ii) traffic impact assessment	2.0	
(iii) drainage impact assessment	0.5	
(iv) environmental review	1.0	
(v) supervision of site investigation and condition survey works	5.0	
(b) Site investigation and condition survey works	28.0	
(c) Contingencies	5.7	
	62.3	(in September 2005 prices)
	<hr/>	
(f) Provision for price adjustment	2.4	
	64.7	(in MOD prices)
	<hr/>	
	Total	

_____ A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 3.

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

/2006 – 2007

Year	\$ million (Sept 2005)	Price adjustment factor	\$ million (MOD)
2006 – 2007	2.0	1.01500	2.0
2007 – 2008	32.0	1.03023	33.0
2008 – 2009	22.0	1.04568	23.0
2009 – 2010	6.3	1.06136	6.7
	62.3		64.7

12. We have derived the MOD estimate 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 from 2006 to 2010. We will tender the proposed consultancies for the site investigations, impact assessments, environmental review and detailed design on a lump sum basis. We will provide for price adjustment in the consultancy agreements as their consultancy periods exceed 12 months.

13. There will be no additional recurrent expenditure arising from the proposed consultancy services and site investigation works.

PUBLIC CONSULTATION

14. We consulted the Legislative Council Panel on Planning, Lands and Works on the proposal by circulation of an information paper on 15 May 2006. Members had no objection to the proposal.

15. We will consult the relevant District Councils and take their views into consideration at the design stage of **186WC**. We previously consulted all relevant District Councils on **90WC** – “Replacement and rehabilitation of water mains, stage 1 phase 1” and **174WC** – “Replacement and rehabilitation of water mains, stage 1 phase 2”. All of them supported the projects.

/ENVIRONMENTAL

ENVIRONMENTAL IMPLICATIONS

16. The proposed consultancies themselves will not have adverse environmental implications. We will look into the environmental implications of the project. If there is any designated project under the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) identified in the consultancies, we undertake to comply with the statutory process under the EIA Ordinance.

17. We will implement environmental pollution control measures to control the environmental impacts of the associated site investigation and condition survey works. The works will only generate a minimal amount of construction and demolition (C&D) materials. We will require the consultants to plan and design the works in such a way to minimise, reuse and recycle C&D materials as much as possible at the construction stage.

LAND ACQUISITION

18. The proposed consultancies and site investigation works do not require any land acquisition.

BACKGROUND INFORMATION

19. We upgraded **186WC** to Category B in October 2005.

20. The estimated value of works under **186WC** is \$2.5 billion in September 2005 prices. We plan to commence the investigation and detailed design consultancies in October 2006 for completion by phases before early 2009 and to commence the construction works by end 2008 for completion in 2013.

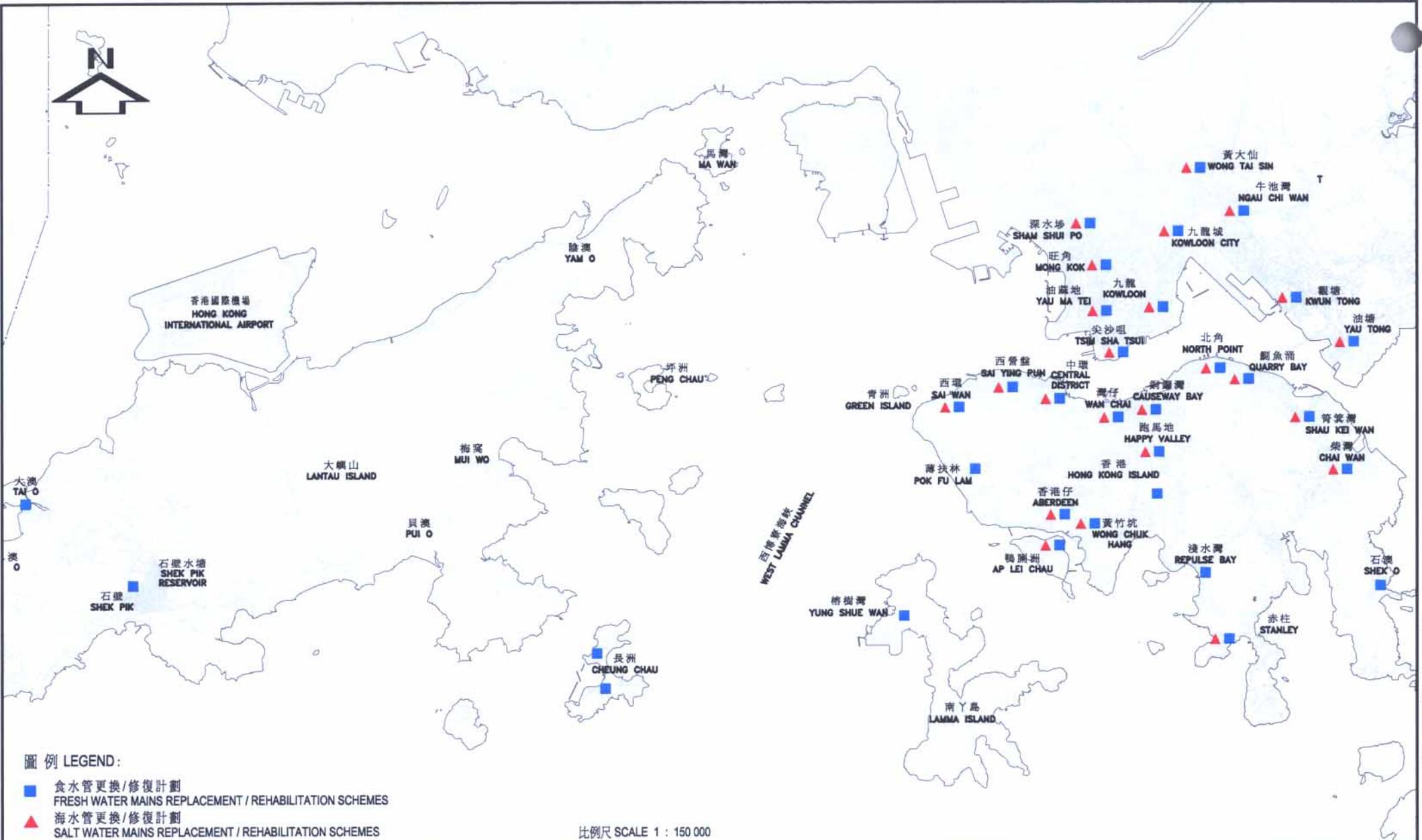
21. We will continue planning of the remaining stage 4 of the improvement works with a view to completing the entire replacement and rehabilitation programme before 2015 drawing on the experience gained in the first three stages.

22. The proposed site investigation and condition survey works will not involve any tree removal or planting proposal.

/23.

23. We estimate that the proposed consultancies and site investigation works will create about 70 jobs (30 for labourers and another 40 for professional/technical staff) providing a total employment of 1 100 man-months.

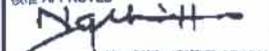
Environment, Transport and Works Bureau
May 2006



圖例 LEGEND:

- 食水管更換/修復計劃
FRESH WATER MAINS REPLACEMENT / REHABILITATION SCHEMES
- ▲ 海水管更換/修復計劃
SALT WATER MAINS REPLACEMENT / REHABILITATION SCHEMES

比例尺 SCALE 1 : 150 000

核准 APPROVED

 總工程師/工程管理 CE / PM
 3/3/2002

(甲級工程)
(CAT 'A' Submission)

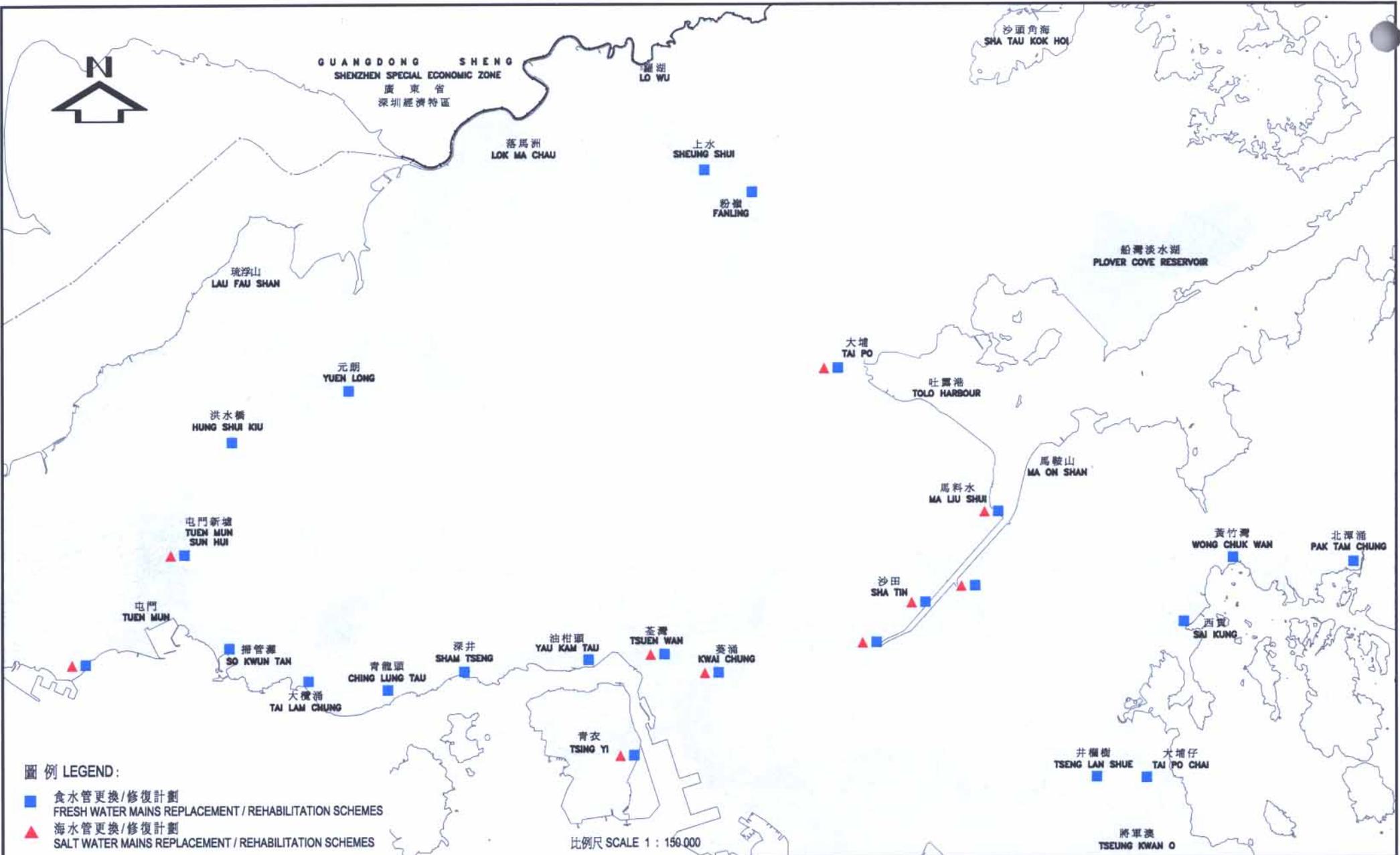
工務計劃項目第 186WC 號——更換及修復水管工程第 3 階段
 (圖一—香港、九龍及離島區)
 P.W.P. Item no. 186WC — Replacement and rehabilitation of water mains, stage 3
 (Sheet 1 - Hong Kong, Kowloon & Islands)



水務署
WATER SUPPLIES DEPT.

草圖編號
SKETCH NO.

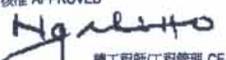
62005 / 195 / 001



圖例 LEGEND:

- 食水管更換/修復計劃
FRESH WATER MAINS REPLACEMENT / REHABILITATION SCHEMES
- ▲ 海水管更換/修復計劃
SALT WATER MAINS REPLACEMENT / REHABILITATION SCHEMES

比例尺 SCALE 1 : 150 000

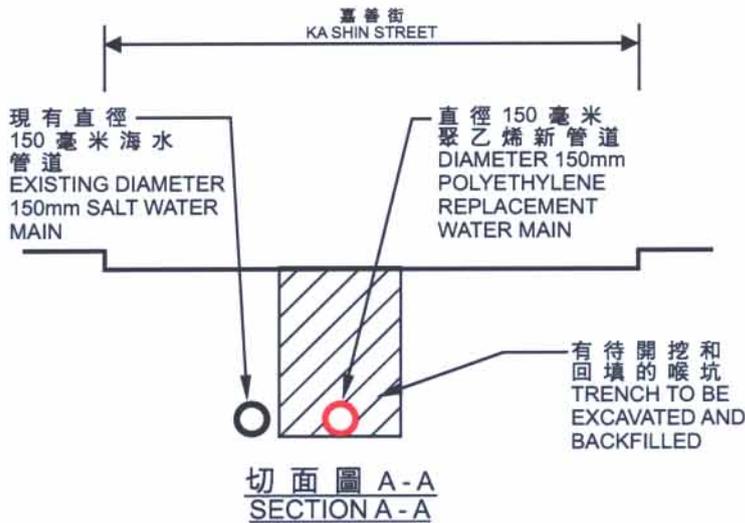
核准 APPROVED

 總工程師/工程管理 CE / PM
 31/3/2006

工務計劃項目第 186WC 號 —— 更換及修復水管工程第 3 階段
 (圖二 - 新界區)
 P.W.P. Item no. 186WC —— Replacement and rehabilitation of water mains, stage 3
 (Sheet 2 - New Territories)

 水務署
 WATER SUPPLIES DEPT.
 草圖編號 SKETCH NO. SK 62005 / 195 / 002



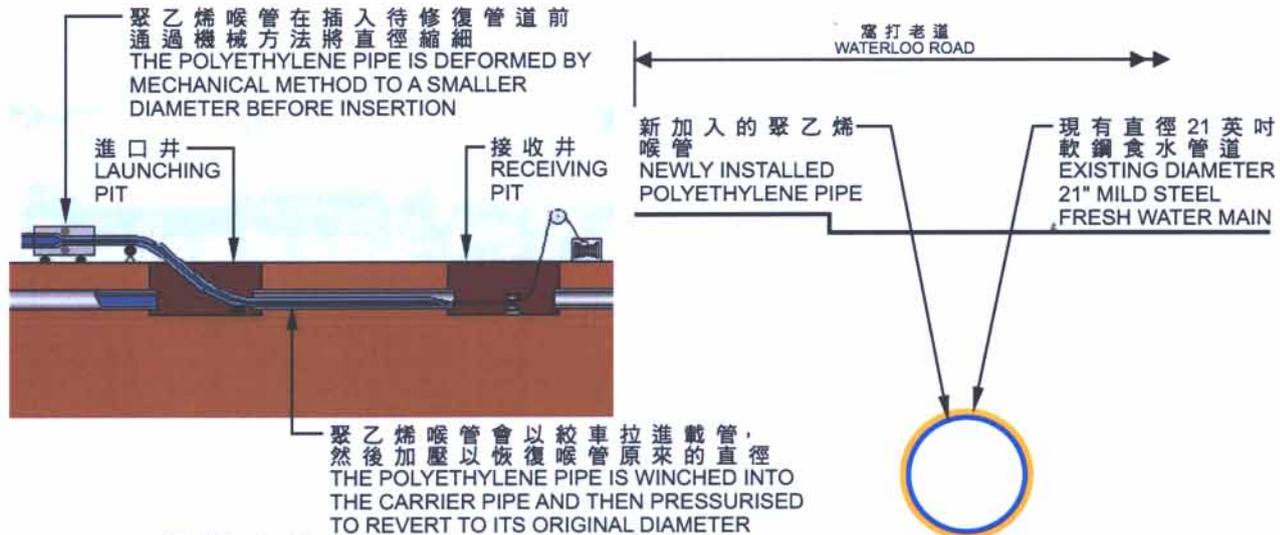
地盤平面圖 - 更換水管
SITE PLAN - WATER MAIN REPLACEMENT
比例尺 SCALE 1 : 2 000



切面圖 A-A
SECTION A-A



地盤平面圖 - 修復水管
SITE PLAN - WATER MAIN REHABILITATION
比例尺 SCALE 1 : 2 000



修復水管圖解
WATER MAIN REHABILITATED
ILLUSTRATION

切面圖 B-B
SECTION B-B

核准 APPROVED
Ng...
總工程師/工程管理 CE / PM

工務計劃項目第186WC號 — 更換及修復水管工程第3階段
更換及修復水管範例

P.W.P. Item no. 186WC — Replacement and rehabilitation of water mains, stage 3
Typical water main replacement and rehabilitation details

水務署
WATER SUPPLIES DEPT.

草圖編號
SKETCH NO. SK 62005 / 208

Enclosure 3 to PWSC(2006-07)21

186WC – Replacement and rehabilitation of water mains, stage 3

Breakdown of estimates for consultants' fees:

Consultants' staff costs		Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$million)
(a) Design, tender documentation and assessments	Professional	130	38	2.0	14.1
	Technical	167	14	2.0	6.0
(b) Traffic impact assessment	Professional	10	38	2.0	1.1
	Technical	25	14	2.0	0.9
(c) Drainage impact assessment	Professional	3	38	2.0	0.3
	Technical	6	14	2.0	0.2
(d) Environmental review	Professional	6	38	2.0	0.7
	Technical	8	14	2.0	0.3
(e) Supervision of site investigation and condition survey works	Professional	28	38	2.0	3.0
	Technical	56	14	2.0	2.0
Total (Note 2)					28.6

*MPS = Master Pay Scale

Notes

1. A multiplier factor of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultant's office overhead and profit, as the staff will be employed in the consultant's office. (As at 1.1.2005, MPS Pt. 38 = \$54,255 per month and MPS Pt. 14 = \$18,010 per month).
2. We will only know the actual man-months and actual cost after completion of the construction works.