

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 709 – WATERWORKS**

**Water Supplies – Combined fresh/salt water supply**

**189WC – Replacement and rehabilitation of water mains, stage 4**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **189WC**, entitled “Replacement and rehabilitation of water mains stage 4 – investigation and detailed design”, to Category A at an estimated cost of \$198.4 million in money-of-the-day prices; and
  
- (b) the retention of the remainder of **189WC** 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. We need to replace and rehabilitate water mains approaching the end of their service life to improve the condition of the water supply network and to maintain an acceptable level of service.

### **PROPOSAL**

2. The Director of Water Supplies, with the support of the Secretary for Development, proposes to upgrade part of **189WC** to Category A at an estimated

/cost .....

cost of \$198.4 million in money-of-the-day (MOD) prices for the engagement of consultants to carry out investigation and detailed design for the proposed works under stage 4 of the territory-wide water mains replacement and rehabilitation programme (R & R programme).

## PROJECT SCOPE AND NATURE

3. The full scope of works under **189WC** comprises the replacement and rehabilitation of approximately 737 kilometres (km) of fresh water mains and 113 km of salt water mains, scattered in various districts throughout the territory. A plan showing the sites of the proposed works under **189WC** is at Enclosure 1. Due to insufficient in-house resources, we plan to engage consultants to carry out investigation, detailed design and site supervision for the replacement and rehabilitation of water mains under **189WC**.

4. The part of **189WC** that we now propose to upgrade to Category A comprises –

- (a) consultancies for traffic impact assessment, drainage impact assessment, environmental review and detailed design of the replacement and rehabilitation of –
  - (i) about 737 km of fresh water mains ranging from 20 to 2 200 millimetres (mm) in diameter including associated service pipes and connections; and
  - (ii) about 113 km of salt water mains ranging from 25 to 1 200 mm in diameter including associated service pipes and connections; and
- (b) site investigation including condition survey<sup>1</sup> for all the works under **189WC**.

5. We plan to commence the proposed consultancies and site investigation works in October 2008 for completion in phases by mid 2011.

## /JUSTIFICATION .....

---

<sup>1</sup> Condition survey will be conducted to gather necessary engineering data of the conditions of the existing water mains including its likely remaining life expectancy. The data will enable an informed decision be made on replacement or rehabilitation of the water mains.

## JUSTIFICATION

6. Hong Kong's fresh water and salt water supplies are provided through a network of about 7 700 km of water mains. Most of these water mains are underground. A substantial portion of the water mains was laid more than 30 years ago. They are progressively approaching the end of their service life and have become increasingly difficult and costly to maintain. As a result of the ageing problem, we faced an increasing number of main bursts and leakage causing inconvenience to the public and loss of precious water resources. The previous way of carrying out piece-meal and small-scale replacement works was not considered effective. Starting from 2000, we have implemented a comprehensive and cost-effective management plan for the water supply network. This involves the replacement and rehabilitation of some 3 000 km of aged water mains in stages to prevent further deterioration of the water supply network.

7. In view of the large scale of works and the long project duration, the R & R programme is implemented in four stages, within a period of 20 years between 2000 and 2020. Higher priority is given to the replacement and rehabilitation of those water mains that are in more critical conditions to bring about early benefits. In 2005, we decided to advance the target completion of the R & R programme from 2020 to 2015. We will continue reviewing the R & R programme taking into account prevailing constraints with a view to achieving earlier completion.

8. As regards stage 4 of the programme, we need to commence investigation and detailed design in October 2008 in order to enable the construction works to commence by early 2011 as scheduled. In view of the scale and complexity of the proposed works, considerable resources will be required over a relatively short period. As Water Supplies Department does not have adequate in-house resources, it is proposed to part-upgrade **189WC** for engagement of consultants to carry out investigation, impact assessments and detailed design of the proposed stage 4 works.

## FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed consultancies and site investigation works to be \$198.4 million in MOD prices (see paragraph 10 below), made up as follows –

(a) .....

	\$ million
(a) Consultants' fees	63.0
(i) design, tender documentation and tender assessments	46.1
(ii) traffic impact assessment	4.0
(iii) drainage impact assessment	1.0
(iv) environmental review	1.9
(v) supervision of site investigation and condition survey works	10.0
(b) Site investigation and condition survey works	100.0
(i) site investigation	18.0
(ii) condition surveys	82.0
(c) Contingencies	17.0
Sub-total	180.0
	(in September 2007 Prices)
(d) Provision for price adjustment	18.4
Total	198.4
	(in MOD prices)

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 2007)	Price adjustment factor	\$ million (MOD)
2008 – 2009	0.8	1.02575	0.8
2009 – 2010	72.0	1.06293	76.5
2010 – 2011	65.8	1.10545	72.7

Year	\$ million (Sept 2007)	Price adjustment factor	\$ million (MOD)
2011 – 2012	23.4	1.14967	26.9
2012 – 2013	<u>18.0</u>	<u>1.19566</u>	<u>21.5</u>
	180		198.4

11. 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 2008 to 2013. We will tender the proposed consultancies for site investigation, impact assessments, environmental review and detailed design on a lump sum basis because the scope of the consultancies can be clearly defined. We will provide for price adjustment in the consultancy agreements as the consultancy periods will exceed 12 months.

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

## PUBLIC CONSULTATION

13. We consulted the Legislative Council Panel on Development on the proposed works on 27 May 2008. Members raised no objection to the proposed works.

14. We will consult the relevant District Councils and take their views into consideration at the design stage of **189WC**. We previously consulted all the 18 District Councils on **186WC** – Replacement and rehabilitation of water mains, stage 3 and obtained their support on the stage 3 works.

## ENVIRONMENTAL IMPLICATIONS

15. The proposed site investigation and condition survey works will not have any adverse environmental implications. We will look into the environmental implications of the project. If any designated project under the Environmental Impact Assessment Ordinance (Cap. 499) is identified in the course of the consultancies, we will follow and comply with the statutory process under the Ordinance.

16. The proposed site investigation and condition survey works will only generate a minimal amount of construction waste. We will require the consultants to fully consider measures to minimize the generation of construction waste and to reuse/recycle construction waste as much as possible at the construction stage.

## **HERITAGE IMPLICATIONS**

17. The proposed site investigation and condition survey 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 the Antiquities and Monuments Office. We will investigate in the detailed design if the project will affect any heritage site.

## **LAND ACQUISITION**

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

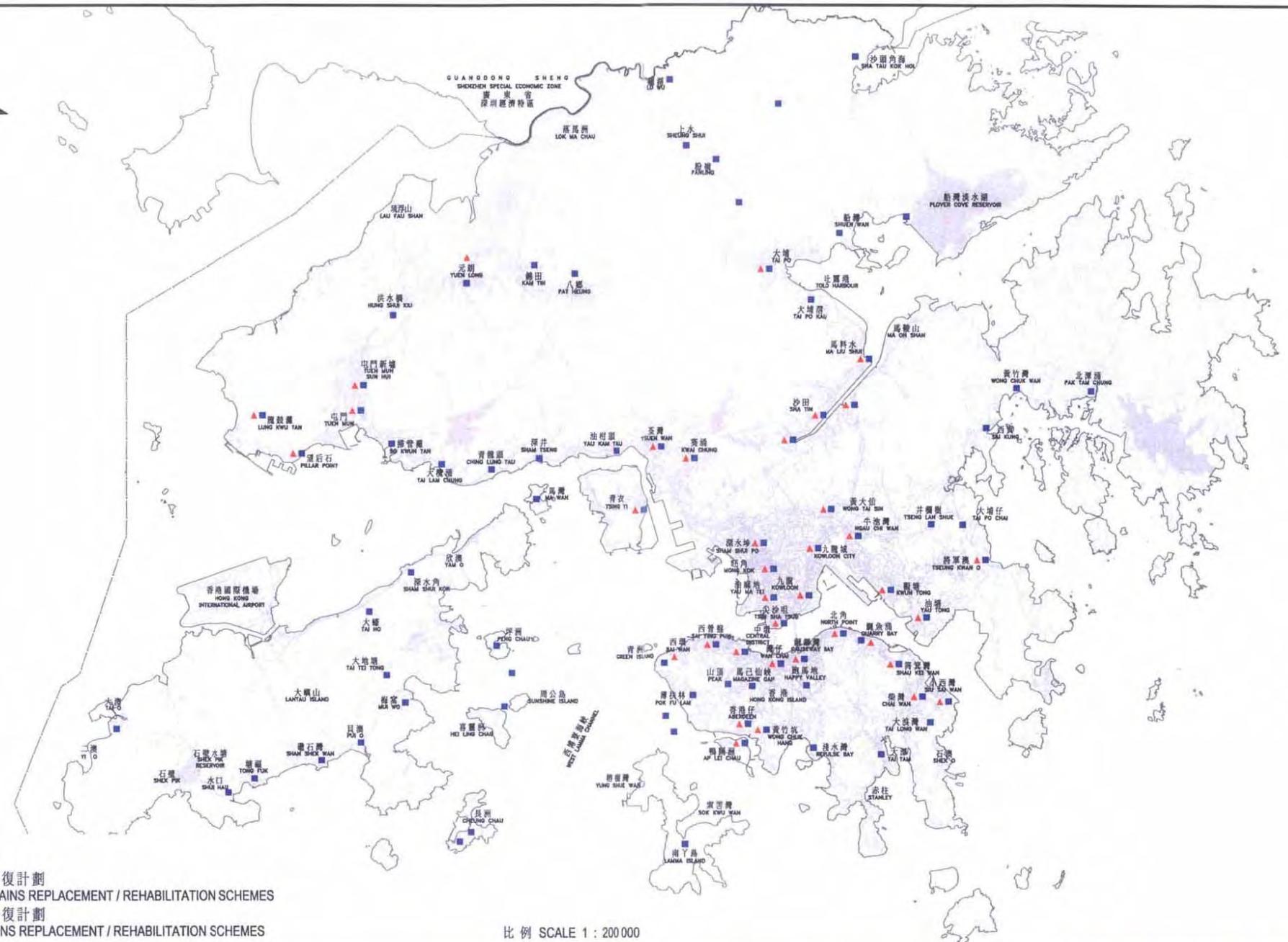
## **BACKGROUND INFORMATION**

19. We upgraded **189WC** to Category B in January 2008.

20. The estimated value of works under **189WC** is \$6,689 million in MOD prices. We plan to commence the construction works by early 2011 for completion in 2015.

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

22. We estimate that the proposed consultancies and site investigation works will create about 89 jobs (38 for labourers and another 51 for professional/technical staff) providing a total employment of 2 560 man-months.



### 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 SCALE 1 : 200 000

核准 APPROVED

 建築工程師/工程管理 CE/PM

19151208

(甲級工程)  
(CAT 'A' Submission)

工務計劃工程項目第189WC號-----更換及修復水管工程第4階段  
P.W.P. Item no. 189WC ----- Replacement and rehabilitation of water mains, stage 4



水務署  
WATER SUPPLIES DEPT.

草圖編號  
SKETCH NO.

SK 62008 / 054

**189WC – Replacement and rehabilitation of water mains, stage 4****Breakdown of estimates for consultants' fees:**

<b>Consultants' staff costs</b>			<b>Average MPS*</b>	<b>Estimated Multiplier (Note 1)</b>	<b>Estimated fee (\$million)</b>
			<b>Estimated man-months</b>		
(a) Design, tender documentation and tender assessments	Professional	284	38	2.0	32.3
	Technical	366	14	2.0	13.8
(b) Traffic impact assessment	Professional	19	38	2.0	2.2
	Technical	47	14	2.0	1.8
(c) Drainage impact assessment	Professional	5	38	2.0	0.6
	Technical	10	14	2.0	0.4
(d) Environmental review	Professional	11	38	2.0	1.3
	Technical	15	14	2.0	0.6
(e) Supervision of site investigation and condition survey works <small>(Note 2)</small>	Professional	53	38	2.0	6.0
	Technical	106	14	2.0	4.0
					<b><u>63.0</u></b>

\*MPS = Master Pay Scale

**Notes**

1. A multiplier of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultants' office overhead and profit, as the staff will be employed in the consultants' office. (As at 1.4.2007, MPS point 38 = \$56,945 per month and MPS point 14 = \$18,840 per month).
2. We will only know the actual man-months and actual cost after completion of the construction works.