For discussion **PWSC(2004-05)62**
on 2 March 2005

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 -WATERWORKS
Water Supplies – Salt water supplies
36WS – Ring mains for Cha Kwo Ling salt water supply system

Members are invited to recommend to Finance Committee the upgrading of the remainder of **36WS** to Category A at an estimated cost of $81.2 million in money-of-the-day prices for the mainlaying works for Cha Kwo Ling salt water supply system.

PROBLEM

The existing Cha Kwo Ling salt water supply system has a single-line configuration and cannot ensure stable supply of salt water to the residents in the eastern Kowloon areas.

PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade the remainder of **36WS** to Category A at an estimated cost of $81.2 million in money-of-the-day (MOD) prices to improve the reliability of the Cha Kwo Ling salt water supply system.

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PROJECT SCOPE AND NATURE

3. The scope of the proposed works comprises the laying of about 6 kilometres (km) of salt water trunk mains ranging from 600 millimetres (mm) to 1 200 mm in diameter along Cha Kwo Ling Road, Tseung Kwan O Road, Sau Mau Ping Road, Kai Lim Road, Tsui Ping Road, Hip Wo Street, Hong Ning Road and Chun Wah Road.

4. We plan to start the proposed mainlaying works in October 2005 for completion in September 2009. A site plan showing the alignment of the water mains is at Enclosure 1.

JUSTIFICATION

5. The Cha Kwo Ling (CKL) salt water supply system was commissioned in 1960 to supply salt water to a population of about 800 000 in the eastern Kowloon areas for flushing. The system comprises two pumping stations[1], four salt water service reservoirs[2], trunk mains and distribution mains. Salt water is delivered via the trunk mains from the pumping stations to service reservoirs and via the distribution mains to customers. For the CKL salt water supply system, each service reservoir is basically served by one single trunk main for distribution purpose. Since the system is operated on a single-line configuration, any shut down of the trunk mains for operation and maintenance will lead to widespread suspension of the salt water supply and will cause considerable inconvenience to the residents in the eastern Kowloon areas.

6. To improve the reliability of the salt water supply, we propose to lay the trunk mains as described in paragraph 3 above in order to provide each service reservoir with an additional trunk main. This will turn the single-line configuration of the trunk mains into a ring-main system, under which water can circulate from one trunk main to the other trunk main in the same ring. As a result, even when a section of the ring mains is shut down, the ring main system will ensure uninterrupted water supply to the remaining part of the system and to the majority of residents outside the supply area of the shut-down section.

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1 The two pumping stations are Cha Kwo Ling salt water pumping station and Sau Mau Ping salt water pumping station.

2 The four service reservoirs are Jordan Valley salt water service reservoir, Kwun Tong high level salt water service reservoir, Sau Mau Ping salt water service reservoir and Ma Yau Tong salt water service reservoir.

7. The proposed additional trunk mains should be commissioned as soon as possible to improve the reliability of the existing salt water supply system in the eastern Kowloon areas.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be $81.2 million in MOD prices (see paragraph 9 below), made up as follows –

			$ million	
(a)	Mainlaying by		73.1	
	(i) traditional method	65.1		
	(ii) trenchless method[3]	8.0		
(b)	Environmental mitigation measures		1.0	
(c)	Contingencies		7.4	
		Sub-total	81.5	(in September 2004 prices)
(d)	Provision for price adjustment		(0.3)	
		Total	81.2	(in MOD prices)

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

Year	**$ million (Sept 2004)**	**Price adjustment factor**	**$ million (MOD)**
2005 – 2006	4.0	0.99000	4.0
2006 – 2007	20.5	0.98753	20.2

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[3] Trenchless method refers to the use of micro-tunnelling or boring techniques to construct underground pipelines without opening up the road surface along the pipelines.

Year	$ million (Sept 2004)	Price adjustment factor	$ million (MOD)
2007 – 2008	26.0	0.99123	25.8
2008 – 2009	20.0	0.99990	20.0
2009 – 2010	11.0	1.01515	11.2
	81.5		81.2

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 2005 to 2010. We will invite tender for the proposed works under a design-and-build contract on a lump sum basis. The contract will provide for price adjustment as the contract period will exceed 21 months.

11. We estimate the annual recurrent expenditure arising from this project to be $350,000.

12. The project by itself would lead to an increase in production cost of water by 0.07% in real terms by 2010[4].

PUBLIC CONSULTATION

13. We consulted the Kwun Tong District Council on 18 November 2004. The Council supported the proposed works.

14. We consulted the Panel on Planning, Lands and Works on the proposed works by circulation of an information paper in February 2005. Members have not raised any objection to the proposal.

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4 The increase in production cost of water is calculated at the present price level on the assumption that the water demand remains static during the period from 2005 to 2010.

ENVIRONMENTAL IMPLICATIONS

15. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We carried out a Preliminary Environmental Review (PER) in 1996 and agreed the findings with the Director of Environmental Protection. The PER has concluded that the project would not have adverse long term environmental impact and that the short term construction impacts can be mitigated through the implementation of standard pollution control measures. Due to the proximity of the proposed salt water mains to several landfill sites, we will follow the Standard Site Safety Guidelines for Development Close to Landfills during construction to avoid the landfill gas hazard. We have included about $1 million in the project estimate to implement these mitigation measures and will incorporate these requirements into the works contracts for implementation.

16. We will require the contractor to submit for approval waste management plans (WMP) with appropriate mitigation measures to avoid, reduce, reuse and recycle construction and demolition (C&D) materials, including the allocation of areas for waste segregation. We will require the contractor to sort C&D materials on site to recover the inert portion, reusable and recyclable materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip ticket system. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

17. We have minimised C&D materials in planning and designing the alignments of the proposed water mains. To further minimise C&D materials, we will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We estimate that about 13 900 cubic metres (m^3) of C&D materials will be generated by the project. Of these, we will reuse about 8 070 m^3 (58.1%) on site, 5 690 m^3 (40.9%) as fill in public filling areas[5] and dispose of 140 m^3 (1.0%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $17,500 for this project (based on a notional[6] unit cost of $125/$m^3$).

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5 A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering and Development.

6 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 $90/$m^3$), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

TRAFFIC IMPLICATIONS

18. We have carried out a traffic impact assessment (TIA) for the proposed works. The TIA has concluded that the proposed works would not cause unacceptable traffic impact. We will implement temporary traffic arrangements to minimise impacts on traffic during construction. Furthermore, the trenchless method will be used to construct the water mains across busy roads, e.g. Kwun Tong Road and Wai Fat Road.

LAND ACQUISITION

19. The project does not require any land acquisition.

BACKGROUND INFORMATION

20. The project **36WS** was included in Category B in August 1997. We upgraded part of the project to Category A as **42WS** entitled "Ring mains for Cha Kwo Ling salt water supply system – advance mainlaying in Cha Kwo Ling Road" in June 2002. The works under **42WS** has been entrusted to Housing Authority and are in progress for completion in June 2006.

21. We have substantially completed the preliminary design of the proposed works and will supervise the construction using in-house resources.

22. The proposed construction works will involve the felling of two trees on a densely wooded slope within the project site. The two trees are not important trees[7]. It is not feasible to transplant these two trees or provide compensatory planting in the midst of the trees on the densely wooded slope without disturbing other existing trees.

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[7] Important trees include trees on the Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria:
(a) trees over 100 years old;
(b) trees of cultural, historical or memorable significance;
(c) trees of precious or rare species;
(d) trees of outstanding form; or
(e) trees with trunk diameter exceeding one metre (measured at one metre above ground level).

23. We estimate that the proposed works will create about 31 jobs (26 for labourers and five for professional/technical staff) providing a total employment of 1 290 man-months.

Environment, Transport and Works Bureau
February 2005

附件1 ENCLOSURE 1