

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 -WATERWORKS

Water Supplies – Salt water supplies

46WS – Uprating of Sha Tin salt water supply system

Members are invited to recommend to Finance Committee the upgrading of **46WS** to Category A at an estimated cost of \$207.4 million in money-of-the-day prices for uprating salt water supply system of Sha Tin.

PROBLEM

The existing salt water supply system in Sha Tin is not adequate to provide reliable salt water supply to the area.

PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for Development, proposes to upgrade **46WS** to Category A at an estimated cost of \$207.4 million in money-of-the-day (MOD) prices for uprating the salt water supply system of Sha Tin.

PROJECT SCOPE AND NATURE

3. The scope of works under **46WS** comprises –

/(a)

- (a) the uprating of Sha Tin seafront salt water pumping station (SWPS) to a total capacity of 112 000 cubic metres per day (m^3/day) by constructing an annex salt water pumping station of capacity of 17 000 m^3/day , and uprating of the existing facilities in Sha Tin seafront SWPS including valves and surge suppression equipment;
- (b) the increase of pumping head of Sha Tin salt water booster pumping station by replacing the existing four pumps with high-head pumps;
- (c) the reconstruction of the existing To Shek salt water service reservoir (SWSR) for a storage capacity of about 8 800 m^3 ;
- (d) the construction of Ma On Shan No. 3 salt water service reservoir of storage capacity of about 1 200 m^3 ; and
- (e) the laying of about 3.5 kilometres (km) and rehabilitation of about 2.9 km of salt water mains of diameters ranging from 200 millimetres (mm) to 800 mm.

_____ A site plan showing the proposed works is at Enclosure 1.

4. We plan to start construction in February 2008 for completion in June 2011.

JUSTIFICATION

5. With the planned developments in various areas in Sha Tin, such as Wu Kai Sha, Lok Wo Sha, Tai Wai, Shek Mun and Pak Shek Kok, etc., the water demand for flushing uses is on the rise. We estimate that the total mean daily water demand will increase gradually to 84 000 m^3 beyond 2011¹. As the existing salt water supply system in Sha Tin can only cope with a mean daily demand of 72 000 m^3 , we consider that uprating of the supply system is required to meet the projected shortfall.

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¹ To cope with a mean daily water demand of 84 000 m^3/day , we need the total output capacity of 112 000 m^3/day to cater for daily fluctuation and contingency.

6. To meet the increase in flushing water demand in Sha Tin, we propose to uprate the existing Sha Tin salt water supply system. The proposed works include the construction of an annex SWPS and the uprating of the existing facilities including valves and surge suppression equipment in Sha Tin seafront SWPS to give a total output capacity of 112 000 m³/day for provision of sufficient and reliable supply to cover the daily fluctuation in demand and contingency. Sha Tin salt water booster pumping station will also be uprated by replacing the existing pumps with high-head pumps to increase the pumping pressure to downstream of the supply system. To meet the increasing flushing water demand in Sha Tin town centre area (including Tai Wai and Shek Mun), we propose to increase the capacity of To Shek SWSR by reconstructing the existing To Shek SWSR to 8 800 m³. We also propose to extend the existing Ma On Shan SWSR by constructing a new salt water service reservoir (Ma On Shan No. 3 SWSR) of storage capacity about 1 200 m³ to cope with the increasing needs in Ma On Shan.

7. We also need to lay additional salt water mains within the district to enhance the reliability and improve the hydraulics of the system. Two sections of existing trunk mains of 700 mm diameter which have been used for 29 years are approaching the end of their service life and have become increasingly difficult and costly to maintain. We will take this opportunity to rehabilitate the trunk mains to prevent further deterioration of the salt water supply network.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be \$207.4 million in MOD prices (see paragraph 9 below), made up as follows –

	\$ million
(a) Salt water service reservoirs	56.2
(b) Salt water pumping stations	11.2
(c) Mainlaying and rehabilitation	84.5
(i) Mainlaying	40.6
(ii) Main rehabilitation	43.9
(d) Electrical and mechanical works	30.3
(e) Environmental mitigation measures	1.6

/(f)

		\$ million	
(f)	Contingencies	18.4	
	Sub-total	202.2	(in September 2007 prices)
(g)	Provision for price adjustment	5.2	
	Total	207.4	(in MOD prices)

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

Year	\$ million (Sept 2007)	Price adjustment factor	\$ million (MOD)
2007 – 2008	0.4	1.00000	0.4
2008 – 2009	21.3	1.00750	21.5
2009 – 2010	74.1	1.01758	75.4
2010 – 2011	66.7	1.02775	68.6
2011 – 2012	28.0	1.03803	29.1
2012 – 2013	11.7	1.05619	12.4
	202.2		207.4

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 2007 to 2013. We will tender the proposed works on a remeasurement basis because the extensive quantities of underground works which are subject to variation during construction to suit the actual site conditions. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract.

11. We estimate the annual recurrent expenditure arising from this project to be about \$4.2 million.

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12. The project by itself will lead to an increase in production cost of water by 0.20% in real terms by 2013².

PUBLIC CONSULTATION

13. We consulted the Development and Housing Committee of the Sha Tin District Council in August 2007. The Committee supported the proposed works.

14. We consulted the Legislative Council Panel on Development on the proposed works by circulation of an information paper on 15 October 2007. Members raised no objection to the proposal.

ENVIRONMENTAL IMPLICATIONS

15. The Director of Environmental Protection has confirmed that the construction and operation of part of the project relating to Ma On Shan No. 3 SWSR requires an environmental permit under the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). Having regard to the project profile, the Director of Environmental Protection is satisfied that the impact of the project and the recommended mitigation measures meet the requirements of the Technical Memorandum on EIA Process. The permission to apply directly for an environmental permit was granted in October 2007 with conditions. We shall implement the mitigation measures set out in the project profile and as required by the Director of Environmental Protection.

16. The remaining parts of the project would have no long-term adverse environmental impact. We will control short-term impacts caused by the construction works through the implementation of standard pollution control measures. We have included about \$1.6 million (in September 2007 prices) in the project estimates for implementation of the environmental mitigation measures of the project.

17. We have considered the alignment of the water mains, the layouts and foundation levels of the proposed service reservoirs and pumping stations in

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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 2007 to 2013.

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 maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

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 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 78 100 tonnes of construction waste. Of these, we will reuse about 19 200 tonnes (24.6%) of inert construction waste on site and deliver 58 100 tonnes (74.4%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of 800 tonnes (1.0%) 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 about \$1.7 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne at landfills⁴).

HERITAGE IMPLICATIONS

20. This project will not affect any heritage site, i.e. all declared monuments, graded historic buildings and sites of archaeological interests.

/TRAFFIC

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.

⁴ The 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.

TRAFFIC IMPACTS

21. To minimise possible disruption to traffic during construction, we have completed the traffic impact assessment which concluded that the proposed works would not cause unacceptable traffic impact. During construction, we will maintain smooth traffic flow as far as possible through implementing temporary traffic management measures and displaying notice boards on site to explain the reason of temporary traffic arrangements and 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 arrange to carry out construction works in busy road sections in non-peak hours. We will employ trenchless method as far as practicable at road junctions where traffic impact may be significant.

LAND ACQUISITION

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

BACKGROUND INFORMATION

23. We included **46WS** in Category B in November 2004. In December 2006, we carried out advance work at a cost of \$9.85 million to replace the four aged pumps of output capacity of 86 000 m³/day in the existing Sha Tin seafront SWPS by those of 95 000 m³/day to alleviate the progressive overloading of Sha Tin seafront SWPS and to ensure a reliable flushing water supply to meet the anticipated flushing water demand of Sha Tin and Ma On Shan areas. We have charged this amount to block allocation **9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme". The works commenced in April 2007 for completion in the end of 2008.

24. We have substantially completed the detailed design, and will supervise the proposed works under **46WS** using in-house staff.

25. Of the 245 trees within the project boundary, we will preserve 151 trees. The proposed construction works will involve removal of 94 trees including 28 trees to be felled and 66 trees to be transplanted within the

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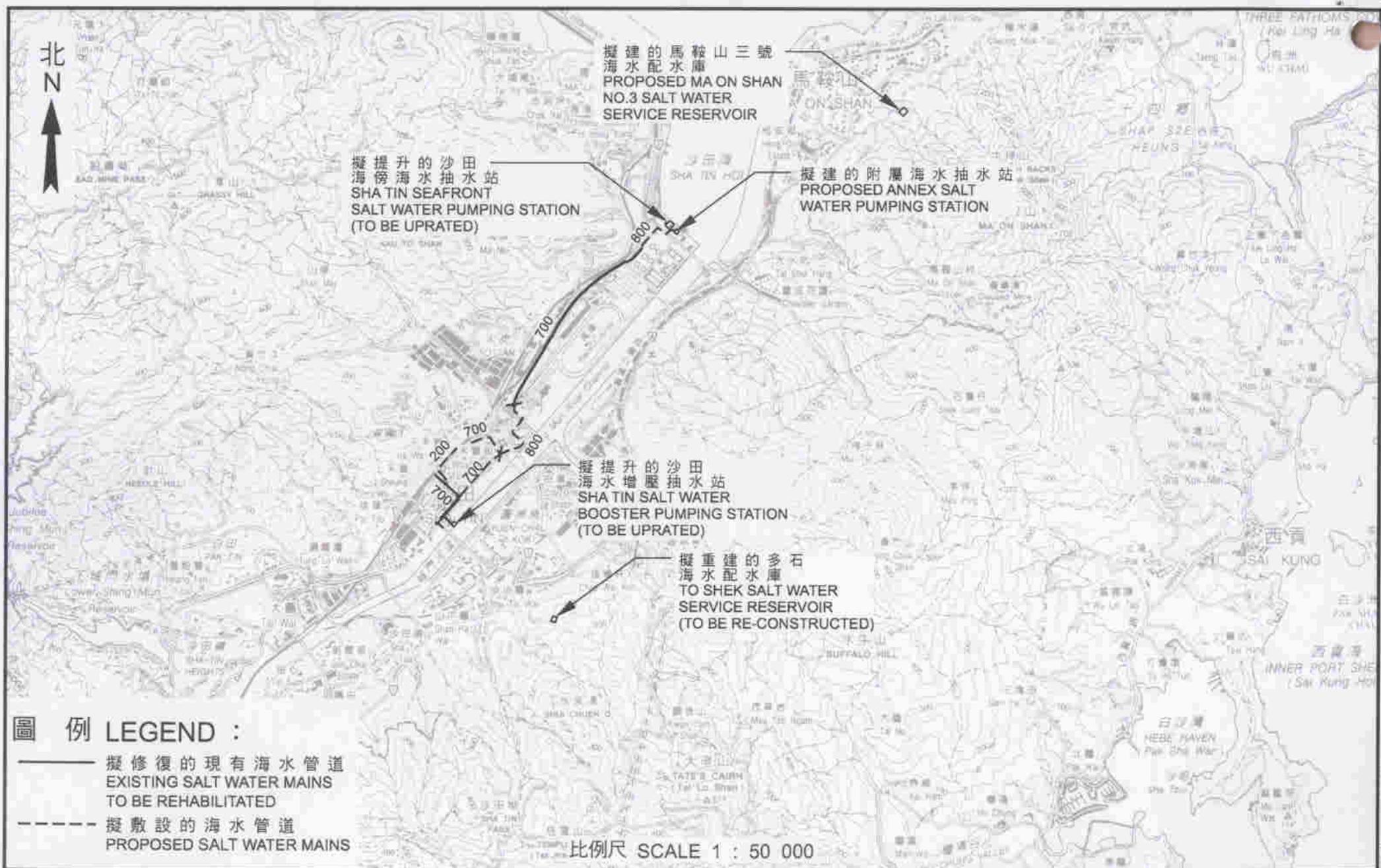
project site. All trees to be removed are not important trees⁵. We have adjusted the orientation of the new salt water service reservoir to keep the felling of trees to a minimum. We will incorporate planting proposals as part of the project, including estimated quantities of 48 trees, 1 500 shrubs and 1 200 m² of grassed area.

26. We estimate that the proposed works will create about 106 jobs (92 for labourers and another 14 for professional/technical staff) providing a total employment of 3 800 man-months.

Development Bureau
November 2007

⁵ “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria:

- (a) trees over 100 years old or above;
- (b) trees of cultural, historical or memorable significance, e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or events;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall trees sizes, shape and any special features), e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.



- 圖例 LEGEND :**
- 擬修復的現有海水管道
EXISTING SALT WATER MAINS TO BE REHABILITATED
 - 擬敷設的海水管道
PROPOSED SALT WATER MAINS

比例尺 SCALE 1 : 50 000

核准 APPROVED

 總工程師/設計 CE / Des
 16/10/2007

工務計劃項目第046WS號 — 沙田海水供應系統提升工程
 P.W.P. Item no. 046WS — Upgrading of Sha Tin salt water supply system

 水務署
 WATER SUPPLIES DEPT.
 互圖編號 SKETCH NO. 1

附件 1 ENCLOSURE 1