For information
on 26 April 2016

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Legislative Council Panel on Development

53WS – Uprating of Chai Wan Salt Water Supply System

PURPOSE

This paper briefs Members on the proposal to upgrade **53WS** to Category A, entitled "**Uprating of Chai Wan salt water supply system**", at an estimated cost of $379.1 million in money-of-the-day (MOD) prices to carry out uprating works for the Chai Wan salt water supply system to cope with the anticipated increase in salt water demand of Chai Wan and Siu Sai Wan areas and improve reliability of the supply system.

PROPOSAL

2. The scope of works under **53WS** comprises –

(a) uprating the output capacity of Siu Sai Wan salt water pumping station (SWPS) from 30 million litres per day (Mld) to 41.7 Mld, including replacement of existing pumpsets with new and higher output capacity pumpsets and replacement of existing electro-chlorination system by sodium hypochlorite solution dosing system with associated electrical and mechanical (E&M) plant and equipment, as well as modification works[1] to the pumping station;

(b) laying of about 3.8 kilometres (km) salt water mains ranging from 150 millimetres (mm) to 600 mm in diameter; and

(c) laying of about 0.3 km fresh water mains of 450 mm in diameter for providing contingent augmentation to salt water supply.

A layout plan showing the proposed works is at **Enclosure 1**.

[1] Modification works include construction of cable trench, construction of openings in switchgear room, modification of pump plinths, replacement of bellmouth and puddle pipe, etc.

3. The design of the proposed works has been completed. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed works in December 2016 for completion in early 2020.

JUSTIFICATION

4. The Siu Sai Wan SWPS supplies salt water to Chai Wan and Siu Sai Wan areas. In 2016, the population and salt water demand is about 170 000 and 29 Mld respectively, which is expected to increase to about 179 000 and 30 Mld respectively in early 2020 and will further increase to about 196 000 and 35.3 Mld respectively in 2024. In order to cope with the increasing salt water demand arising from the planned developments in Chai Wan and Siu Sai Wan areas and to enhance the reliability of the Chai Wan salt water supply system, it is necessary to uprate the output capacity of Siu Sai Wan SWPS to 41.7 Mld and implement the associated mainlaying works. As part of the uprating works, the existing electro-chlorination system of the Siu Sai Wan SWPS will be replaced by a sodium hypochlorite solution dosing system for better cost effectiveness.

5. The existing salt water supply system for Chai Wan and Siu Sai Wan areas is operated on a single-line configuration of the trunk mains. Any need for shutting down the trunk mains will lead to widespread suspension of salt water supply to the majority area. To improve the reliability of the salt water supply system to the area, it is proposed to change the single-line configuration of the trunk mains to a ring mains system by laying a new leg of salt water trunk mains. The ring mains system will ensure uninterrupted water supply to the majority of consumers in the supply zone, even when a section of the ring mains needs to be shut down. To further enhance the reliability of the supply system, it is proposed to lay a section of about 0.3 km fresh water mains of 450 mm in diameter for providing augmentation to salt water supply in case of emergency situations when the Siu Sai Wan SWPS is required to be shut down.

FINANCIAL IMPLICATIONS

6. We estimate the cost of the proposed works to be $379.1 million in MOD prices, broken down as follows –

			$ million
(a)	Uprating of Siu Sai Wan SWPS		92.4
	(i) civil and E&M modification works	17.0	

			$ million	
	(ii) Uprating of pumpsets, uprating of chlorine dosing system and associated E&M plant and equipment	75.4		
(b)	Laying of salt water mains		174.2	
	(i) conventional method[2]	141.8		
	(ii) trenchless method[3]	32.4		
(c)	Laying of fresh water mains by conventional method		7.2	
(d)	Environmental mitigation measures		4.5	
(e)	Contingencies		27.8	
		Sub-total	306.1	(in September 2015 prices)
(f)	Provision for price adjustment		73.0	
		Total	379.1	(in MOD prices)

PUBLIC CONSULTATION

7. We consulted the Planning, Works and Housing Committee of the Eastern District Council on 1 February 2016. The Committee generally supported the proposed works with an aim of enhancing the reliability of the water supply system in Chai Wan with mitigation measures in place.

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[2] Conventional method refers to laying pipelines in trench. It involves opening up the road surface for laying of pipelines. We estimate that about 92% of the salt water mains under this project will be laid by conventional method. The actual percentage will depend on the site conditions.

[3] Trenchless method (sometimes referred to as 'minimum dig' or 'reduced dig' method) refers to the use of pipe jacking, micro-tunnelling or boring techniques to construct underground pipelines without opening up the road surface for laying of the pipelines. This method will be employed when the conventional method is not feasible due to site constraints such as unacceptable traffic conditions. We estimate that around 8% of the salt water mains under this project will be laid by trenchless method. The actual percentage will depend on the site conditions.

ENVIRONMENTAL IMPLICATIONS

8. The proposed works is not a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (Cap 499). We have completed the Preliminary Environmental Review (PER) for the project. The PER has concluded and the Director of Environmental Protection agreed that the project would not have any long-term environmental impacts. We will incorporate into the works contract the mitigation measures recommended in the PER to control the environmental impacts arising from the construction works to within established standards and guidelines. These measures include frequent watering of the site, provision of wheel-washing facilities, covering of materials on trucks and use of silenced construction plant. We have included in paragraph 6(d) above a sum of $4.5 million (in September 2015 prices) in the project estimate for the implementation of the environmental mitigation measures.

9. At the planning and design stages, we have optimised the design and layouts to reduce the generation of construction waste. In addition, we will require the contractor to reuse inert construction waste (e.g. demolished concrete and excavated soil and rock) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste to public fill reception facilities[4]. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

10. At the construction stage, we will 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 and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

11. We estimate that the proposed works will generate in total 25 300 tonnes of construction waste. Of these, we will reuse 18 200 tonnes (72%) of inert construction waste on site and deliver 6 000 tonnes (24%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 1 100 tonnes (4%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfills is estimated to be $0.3 million for this project (based on a unit charge rate of $27 per tonne for disposal at public fill reception facilities and $125 per tonne at landfills as stipulated in the Waste Disposal

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[4] 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.

(Charges for Disposal of Construction Waste) Regulation).

HERITAGE IMPLICATIONS

12. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

13. The proposed works do not involve resumption of private land.

TRAFFIC IMPLICATIONS

14. We have carried out a Traffic Impact Assessment (TIA) for the proposed works. The TIA concluded that the propsed works through implementation of appropriate temporary traffic management schemes would not cause any significant impact on the traffic.

BACKGROUND

15. We upgraded **53WS** to Category B in September 2012.

16. In May 2013, we included an item under block allocation **Subhead 9100WX** "Waterworks, studies and investigations for items in Category D of the Public Works Programme" at an estimated cost of $2.6 million in MOD prices for carrying out ground investigation and engagement of consultants to undertake the traffic impact assessment study and the landscape design and tree felling proposal for the proposed works.

17. We have substantially completed the detailed design of the proposed works using in-house resources.

18. We estimate that the proposed works will create about 110 jobs (95 for labourers and 15 for professional or technical staff) providing a total employment of 3 840 man-months.

WAY FORWARD

19. We plan to seek support from the Public Works Subcommittee for the proposed upgrading of **53WS** to Category A before seeking funding approval from the FC.

Development Bureau
Water Supplies Department
April 2016

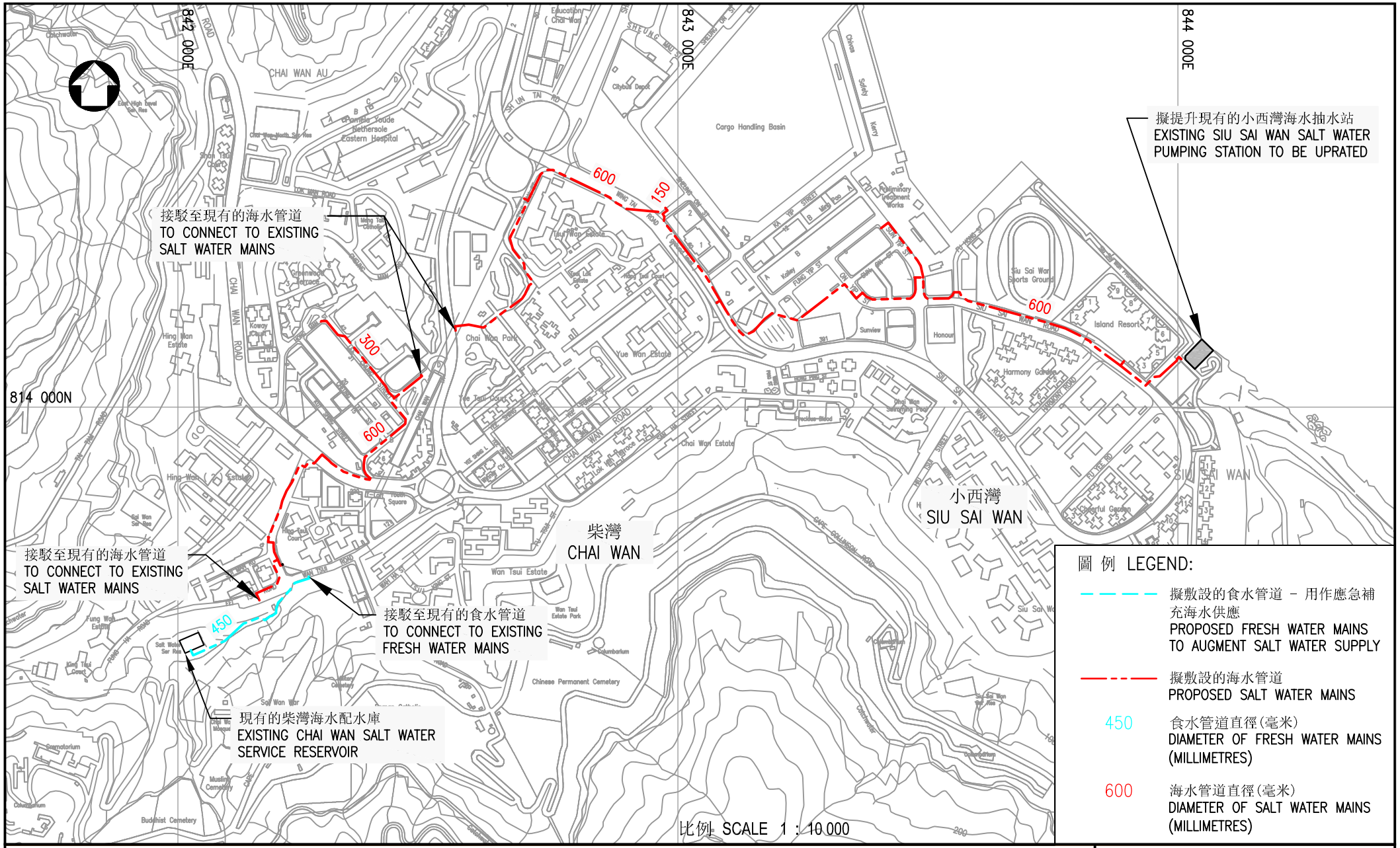

圖 例 LEGEND:

- 擬敷設的食水管道 – 用作應急補充海水供應
  PROPOSED FRESH WATER MAINS TO AUGMENT SALT WATER SUPPLY
- 擬敷設的海水管道
  PROPOSED SALT WATER MAINS
- 450 食水管道直徑(毫米)
  DIAMETER OF FRESH WATER MAINS (MILLIMETRES)
- 600 海水管道直徑(毫米)
  DIAMETER OF SALT WATER MAINS (MILLIMETRES)

工務計劃項目第53WS號 --- 柴灣海水供應系統提升工程
P.W.P. Item No 53WS --- Uprating of Chai Wan Salt Water Supply System

水 務 署
WATER SUPPLIES DEPARTMENT

草圖編號 SKETCH NO. SK62015 / 103

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附件 – Enclosure 1