For discussion **PWSC(2008-09)28**
on 13 June 2008

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 – WATERWORKS
Water Supplies – Salt water supplies
13WS – Salt water supply system for Pok Fu Lam area

Members are invited to recommend to Finance Committee the upgrading of **13WS** to Category A at an estimated cost of $268.0 million in money-of-the-day prices for providing salt water supply to Pok Fu Lam area.

PROBLEM

There is at present no salt water supply system to provide salt water for flushing in the Pok Fu Lam area.

PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for Development, proposes to upgrade **13WS** to Category A at an estimated cost of $268.0 million in money-of-the-day (MOD) prices for constructing a salt water supply system to serve Pok Fu Lam area.

PROJECT SCOPE AND NATURE

3. The scope of works under **13WS** comprises -

(a) construction of Telegraph Bay salt water pumping station (SWPS) with a pumping capacity of 19 900 cubic metres per day (m^3/day) and the associated sea water intake culvert;

/(b) .....

(b) construction of Wah Fu salt water service reservoir (SWSR) with a storage capacity of 3 000 cubic metres (m^3);

(c) construction of Wah Fu SWPS with a pumping capacity of 8 700 m^3/day;

(d) construction of Pok Fu Lam SWSR with a storage capacity of 2 000 m^3;

(e) laying of about 600 metres (m) of salt water mains of diameters ranging from 400 to 600 millimetres (mm); and

(f) associated greening works.

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

4. We have engaged consultants to undertake the detailed design for the proposed works described in paragraph 3 above. We plan to commence the proposed works in December 2008 for completion in December 2011.

JUSTIFICATIONS

5. At present, the Water Supplies Department is providing fresh water for flushing to the Pok Fu Lam area with the exception of Wah Fu Estate, Wah Kwai Estate and Ka Lung Court, to which the Housing Department (HD) is supplying salt water for the purpose. The mean daily demand for fresh water for flushing is about 9 500 m^3/day. To relieve the burden on the fresh water supply systems in Pok Fu Lam area and to save fresh water resources, we propose to build a salt water supply system to cater for the salt water demand at Pok Fu Lam area. The new system will also serve Wah Fu Estate, Wah Kwai Estate and Ka Lung Court as HD's salt water supply system is nearing the end of its service life after being in operation for about 40 years. The mean daily demand for salt water of the three estates is about 5 600 m^3/day. The new system will be able to meet the total salt water mean daily demand of 15 100 m^3/day for the whole Pok Fu Lam area.

6. The proposed salt water supply system comprises the Telegraph Bay SWPS and the associated sea water intake culvert, Wah Fu SWSR, Wah Fu SWPS, Pok Fu Lam SWSR and associated water mains.

7. The Telegraph Bay SWPS[1] of the proposed salt water supply system will extract salt water from the sea via the proposed sea water intake culvert for supply to the whole Pok Fu Lam area. A typical section of the proposed sea water intake culvert is at Enclosure 2. Salt water will be pumped by the Telegraph Bay SWPS to the Wah Fu SWSR, which will store salt water for distribution to developments at a level below the Wah Fu SWSR which have a mean daily demand of about 8 500 m^3/day.

8. The Wah Fu SWSR will also supply salt water to the Wah Fu SWPS[2], which will pump salt water to the Pok Fu Lam SWSR for distribution to developments at a level above the Wah Fu SWSR. These developments have a mean daily demand of about 6 600 m^3/day.

9. We will implement greening measures as part of the project. Photomontages showing the proposed greening measures on the roofs of the proposed SWSRs are at Enclosure 3.

FINANCIAL IMPLICATIONS

10. We estimate the cost of the proposed works to be $268.0 million in MOD prices (see paragraph 11 below), made up as follows –

		$ million	
(a)	construction of salt water pumping stations and associated sea water intake culvert		93.2
	(i) Telegraph Bay SWPS	44.8	
	(ii) Wah Fu SWPS	5.9	
	(iii) sea water intake culvert	42.5	
(b)	construction of salt water service reservoirs		33.7

/(i) .....

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[1] In estimating the pumping capacity of the proposed Telegraph Bay SWPS to meet the total mean daily demand of 15 100 m^3/day for the whole Pok Fu Lam area, we have allowed 10% for contingency and 20% for surge loading due to fluctuation of salt water flushing at different periods each day. The proposed pumping capacity of the Telegraph Bay SWPS is therefore 19 900 m^3/day.

[2] In estimating the pumping capacity of the proposed Wah Fu SWPS to meet the total mean daily demand of 6 600 m^3/day for the developments at a level above the Wah Fu SWSR, we have allowed 10% for contingency and 20% for surge loading due to fluctuation of salt water flushing at different periods each day. The proposed pumping capacity of the Wah Fu SWPS is therefore 8 700 m^3/day.

			$ million	
	(i)	Wah Fu SWSR	20.3	
	(ii)	Pok Fu Lam SWSR	13.4	
(c)	Electrical and mechanical works		63.0	
	(i)	Telegraph Bay SWPS	39.4	
	(ii)	Wah Fu SWPS	19.7	
	(iii)	salt water service reservoirs	3.9	
(d)	Mainlaying		8.1	
(e)	Greening works		0.5	
(f)	Environmental mitigation measures		2.2	
(g)	Consultants' fees		20.8	
	(i)	contract administration	1.4	
	(ii)	resident site staff costs	19.4	
(h)	Contingencies		18.7	
		Sub-total	240.2	(in September 2007 prices)
(i)	Provision for price adjustment		27.8	
		Total	268.0	(in MOD prices)

A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 4.

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

Year	$ million (Sept 2007)	Price Adjustment Factor	$ million (MOD)
2008 – 2009	5.0	1.02575	5.1
2009 – 2010	70.0	1.06293	74.4
2010 – 2011	85.0	1.10545	94.0
2011 – 2012	45.0	1.14967	51.7
2012 – 2013	20.0	1.19566	23.9
2013 – 2014	15.2	1.24348	18.9
	240.2		268.0

12. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2008 to 2014. We will tender the proposed works on a lump sum basis and with remeasurement items for earthworks to cater for uncertain ground conditions. We will provide for price adjustments as the contract period will exceed 21 months.

13. We estimate the annual recurrent expenditure arising from the project to be about $6.8 million.

14. The project by itself will lead to an increase in the production cost of water by about 0.24% in real terms by 2014[3].

PUBLIC CONSULTATION

15. We consulted the District Development and Environment Committee of the Southern District Council on the proposed works on 10 March 2008. The Committee supported the proposed works.

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3 The increase in the 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 2008 to 2014.

16. We consulted the Legislative Council Panel on Development on the proposed works by circulation of an information paper on 20 May 2008. Members raised no objection to the proposal.

ENVIRONMENTAL IMPLICATIONS

17. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap 499). We completed a Preliminary Environmental Review (PER) for the project in April 2008. The PER concluded and the Director of Environmental Protection agreed that the project would not have any long-term environmental impacts. We have included $2.2 million (in September 2007 prices) in the project estimates for the implementation of measures recommended in the PER to mitigate construction and operational stage impacts. We will incorporate these measures in the works contract.

18. We have considered the alignment of the proposed salt water mains, the layouts and foundation levels of the proposed SWPSs and SWSRs in 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 facilities[4]. We will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

19. 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 the 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.

20. We estimate that the project will generate in total about 32 600 tonnes of construction waste. Of these, we will reuse about 10 600 tonnes (32.5%) of inert construction waste on site and deliver 21 700 tonnes (66.6%) of

/inert .....

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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.

inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of 300 tonnes (0.9%) 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 $0.6 million for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne at landfills[5]).

TRAFFIC IMPLICATIONS

21. To minimize possible disruption to traffic during construction, we have completed a traffic impact assessment (TIA) for the proposed works. The TIA has concluded that the proposed works, which are located outside public roads except for a few water mains connections, would not cause any significant traffic impact. For the water mains connections, we will maintain smooth traffic flow through implementing temporary traffic management measures and will display notice boards on site to explain the reasons of temporary traffic arrangements and indicate the expected completion dates of the concerned sections of works. In addition, we will set up telephone hotlines for public enquiries or complaints.

HERITAGE IMPLICATIONS

22. The project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interests and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

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

BACKGROUND INFORMATION

24. We included **13WS** in Category B in March 1984.

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5 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 is likely to be more expensive) when the existing ones are filled.

25. In June 1990, we upgraded part of **13WS** to Category A as **19WS** "Salt water supply system for Pok Fu Lam area – Advance mainlaying along Victoria Road" at an estimated cost of $7.5 million for carrying out the mainlaying works along Victoria Road in conjunction with roadworks project. The mainlaying works were completed in June 2003.

26. In November 1992, we included **24WS** "Salt water supply system for Pok Fu Lam area – Advance mainlaying along Pok Fu Lam Road" in Catetory D at an estimated cost of $1.5 million for laying short sections of salt water mains at road crossings along Pok Fu Lam Road in conjunction with road reconstruction. The mainlaying works were completed in February 1995.

27. In June 1995, we upgraded part of **13WS** to Category A as **30WS** "Salt water supply system for Pok Fu Lam area – mainlaying" at an estimated cost of $141.2 million for carrying out the mainlaying works along Pok Fu Lam Road, Mount Davis Road, Victoria Road, Sandy Bay Road and other minor roads. The mainlaying works were completed in June 2004.

28. We included the proposed remaining works under **13WS** in Category B in December 2006.

29. In July 2007, we engaged consultants to undertake detailed design of the proposed works under **13WS** at an estimated cost of $2.6 million. We charged the amount to block allocation **Subhead 9100X** "Waterworks, studies and investigations for items in Category D of the Public Works Programme". We have substantially completed the design of the proposed works mentioned in paragraph 3 above.

30. Of the 177 trees within the project boundary, we will preserve 78 trees. The proposed construction works will involve the removal of 99 trees including 95 trees to be felled and 4 trees to be replanted within the project site. All trees to be removed are not important trees[6]. We will incorporate planting proposals as part of the project, including estimated quantities of 229 trees and 1 650 square metres of grassed area.

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6 "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 of 100 years old or above;
(b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree as landmark of monastery or heritage monument, and trees in memory of an important person or event;
(c) trees of precious or rare species;
(d) trees of outstanding form (taking account of overall tree 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.

31. We estimate that the proposed works will create about 187 jobs (151 for labourers and another 36 for professional/technical staff) providing a total employment of 6 000 man-months.

Development Bureau
June 2008

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龍虎山郊野公園
LUNG FU SHAN COUNTRY PARK

擬建華富海水配水庫
PROPOSED WAH FU SALT WATER SERVICE RESERVOIR

現有的海水進水口組件
EXISTING SEAWATER INTAKE UNIT

擬建鋼綫灣海水抽水站
PROPOSED TELEGRAPH BAY SALT WATER PUMPING STATION

擬建薄扶林海水配水庫
PROPOSED POK FU LAM SALT WATER SERVICE RESERVOIR

擬建華富海水抽水站
PROPOSED WAH FU SALT WATER PUMPING STATION

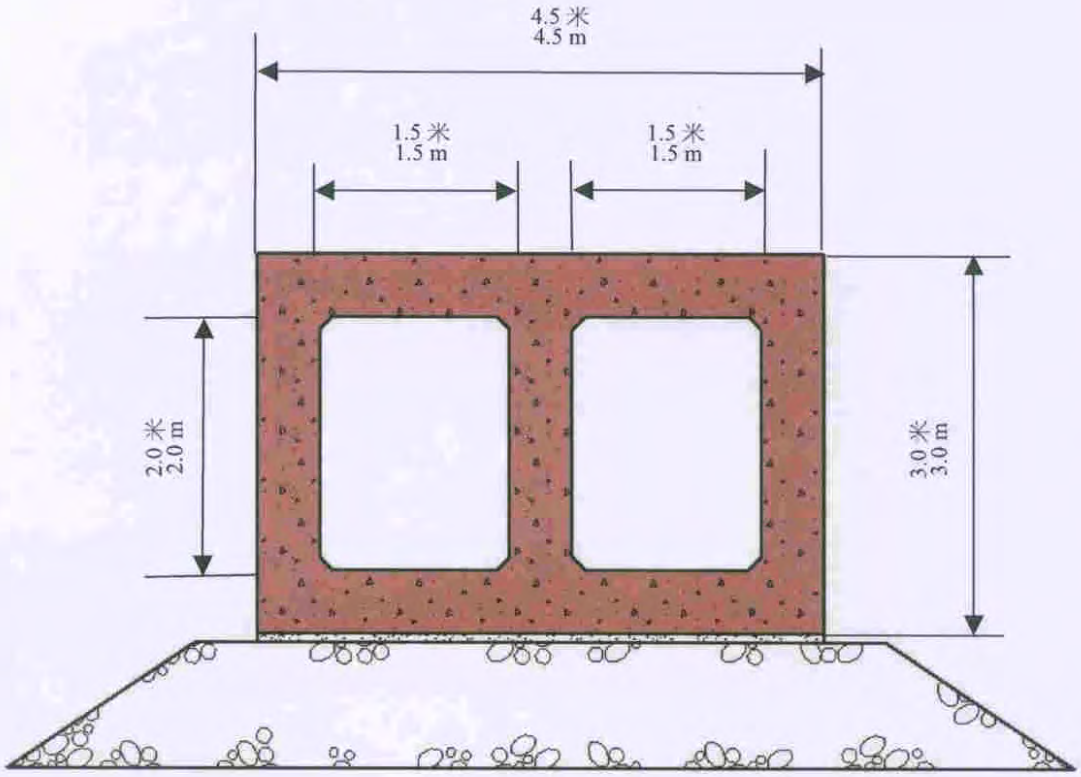
LEGEND 圖 例 :

- 薄扶林區 — 薄扶林海水配水庫的供應區
  POK FU LAM AREA - SUPPLY ZONE OF POK FU LAM SALT WATER SERVICE RESERVOIR
- 薄扶林區 — 華富海水配水庫的供應區
  POK FU LAM AREA - SUPPLY ZONE OF WAH FU SALT WATER SERVICE RESERVOIR
- 擬建海水進水暗渠
  PROPOSED SEA WATER INTAKE CULVERT
- 擬敷設的海水水管
  PROPOSED SALT WATER MAINS
- 在相關工務計劃工程項目包括第 19WS、24WS 及 30WS號下建造的現有海水水管
  EXISTING SALT WATER MAINS COMPLETED UNDER PROJECTS INCLUDING PWP ITEM NO. 19WS, 24WS AND 30WS

比例 SCALE 1 : 10 000

核准 APPROVED 總工程師/顧問工程管理 CE/CM 23 / 4 / 2008	工務計劃工程項目第 13WS 號 — 薄扶林區海水供應系統 PWP ITEM NO. 13WS — SALT WATER SUPPLY SYSTEM FOR POK FU LAM AREA	水務署 WATER SUPPLIES DEPT. 草圖編號 SKETCH NO. SK 62008 / 018

REF: 62008-018.CDR



海水進水暗渠的典型切面圖

TYPICAL SECTION OF SALT WATER INTAKE CULVERT

工務計劃工程項目第 13WS 號 – 薄扶林區海水供應系統 PWP ITEM NO. 13WS – SALT WATER SUPPLY SYSTEM FOR POK FU LAM AREA	水務署 WATER SUPPLIES DEPT.
	草圖編號 SKETCH NO. IC1

擬建薄扶林海水配水庫上蓋的擬議綠化措施
PROPOSED GREENING MEASURES ON THE ROOF OF THE PROPOSED POK FU LAM SALT WATER SERVICE RESERVOIR

現有的薄扶林三號食水配水庫
EXISTING POK FU LAM NO. 3 FRESH WATER SERVICE RESERVOIR

擬建薄扶林海水配水庫
PROPOSED POK FU LAM SALT WATER SERVICE RESERVOIR

工務計劃工程項目第 13WS 號 – 薄扶林區海水供應系統
PWP ITEM NO. 13WS – SALT WATER SUPPLY SYSTEM FOR POK FU LAM AREA

水務署
WATER SUPPLIES DEPT.

草圖編號 SKETCH NO. 1

附件 3 (第 1 頁 / 共 2 頁) ENCLOSURE 3 (Sheet 1 of 2)

擬建華富海水配水庫上蓋的擬議綠化措施
PROPOSED GREENING MEASURES ON THE ROOF OF THE PROPOSED WAH FU SALT WATER SERVICE RESERVOIR

現有的華富食水配水庫
EXISTING WAH FU FRESH WATER SERVICE RESERVOIR

擬建華富海水配水庫
PROPOSED WAH FU SALT WATER SERVICE RESERVOIR

工務計劃工程項目第 13WS 號 – 薄扶林區海水供應系統
PWP ITEM NO. 13WS – SALT WATER SUPPLY SYSTEM FOR POK FU LAM AREA

水務署
WATER SUPPLIES DEPT.

草圖編號
SKETCH NO. 2

附件 3 (第 2 頁 / 共 2 頁) ENCLOSURE 3 (Sheet 2 of 2)

Enclosure 4 to PWSC(2008-09)28

13WS – Salt water supply system for Pok Fu Lam area

Breakdown of the estimate for consultants' fees (in September 2007 prices) –

Consultants' staff costs		**Estimated man-months**	**Average MPS* salary point**	**Multiplier** (Note 1)	**Estimated fee ($million)**
(a) Contract administration (Note 2)	Professional	-	-	-	1.0
	Technical	-	-	-	0.4
(b) Resident site staff (Note 3)	Professional	92	38	1.6	8.4
	Technical	365	14	1.6	11.0
				Total	**20.8**

*MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS point to arrive at the cost of resident site staff supplied by the consultants (As at 1 April 2007, MPS point 38 = $56,945 per month and MPS point 14 = $18,840 per month).

2. The consultants' staff costs for contract administration is calculated in accordance with the existing consultancy agreement for the provision of contract administration for **13WS**. The assignment will only be executed subject to Finance Committee's approval to upgrade the proposed works to Category A.

3. The consultants' staff costs for site supervision are based on the estimate prepared by the Director of Water Supplies. We will only know the actual man-months and actual fees after completion of the works.