

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 704 - DRAINAGE

#### Environmental Protection – Sewerage and sewage treatment

#### 340DS – Port Shelter sewerage stage 3 – Sai Kung Area 4 and Mang Kung Uk sewerage

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **340DS**, entitled “Port Shelter sewerage stage 3 – Sai Kung Area 4 sewerage”, to Category A at an estimated cost of \$73.0 million in money-of-the-day prices; and
- (b) the retention of the remainder of **340DS**, retitled “Port Shelter sewerage stage 3 – Mang Kung Uk sewerage”, in Category B.

### PROBLEM

The existing sewerage facilities in Sai Kung do not have adequate capacity to cope with the additional sewage flow generated from the planned developments at Sai Kung Area 4 and from the unsewered villages stretching from Sai Kung town to Tai Mong Tsai areas.

**/PROPOSAL .....**

## PROPOSAL

2. The Director of Drainage Services (D of DS), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **340DS** to Category A at an estimated cost of \$73.0 million in money-of-the-day (MOD) prices for the construction of a trunk sewerage and the associated facilities in Sai Kung.

## PROJECT SCOPE AND NATURE

3. The part of **340DS** that we now propose to upgrade to Category A comprises –

- (a) construction of a sewage pumping station at Sai Kung Area 4;
- (b) construction of about 2 200 metres (m) twin rising mains of 450 millimetres (mm) in diameter; and
- (c) construction of about 700 m sewers of 600 mm in diameter and ancillary works.

———— A site plan showing the location of the proposed works is at Enclosure 1. We plan to start construction in March 2006 for completion in October 2008.

## JUSTIFICATION

4. Located on the northern side of Sai Kung town centre, Sai Kung Area 4 covers 37 hectares in area and has a population of about 200. The existing developments which include a school, an electricity substation, a police station, a community centre, car parks and public leisure facilities, generate sewage of about 50 cubic metres per day (m<sup>3</sup>/day). We plan to further develop Sai Kung Area 4 for residential, commercial, cultural, recreational and tourism-related uses (including a hotel). The projected population upon full development by 2016 will be about 6 800, which will generate sewage of 3 750 m<sup>3</sup>/day.

5. The sewage generated in Sai Kung Area 4 is now conveyed to the Sai Kung sewage treatment works by the existing sewerage serving Sai Kung town. The existing sewerage is handling sewage of 8 000 m<sup>3</sup>/day, which is about 90% of its design capacity and therefore does not have sufficient capacity to handle additional sewage arising from the planned developments. Due to site constraints

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for expansion of the existing sewerage serving Sai Kung town and to avoid disruption to its operation, we propose to construct a separate trunk sewerage and the associated facilities with a capacity of 7 500 m<sup>3</sup>/day to cater for all existing and future developments in Sai Kung Area 4 and the planned future expansion of the sewerage network to serve the environs up to Tai Mong Tsai.

## FINANCIAL IMPLICATIONS

6. We estimate the capital cost of the proposed works to be \$73.0 million in MOD prices (see paragraph 7 below), made up as follows –

	<b>\$ million</b>	
(a) Sewage pumping station	33.8	
(i) civil works	19.3	
(ii) electrical and mechanical works	14.5	
(b) Rising mains	19.1	
(c) Sewers and ancillary works	10.4	
(d) Environmental mitigation measures	3.2	
(e) Contingencies	6.4	
	<hr/>	
Sub-total	72.9	(in September 2005 prices)
(f) Provision for price adjustment	0.1	
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Total	73.0	(in MOD prices)
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7. Subject to approval, we will phase expenditure as follows –

/2006 – 2007.....

Year	\$ million (Sept 2005)	Price adjustment factor	\$ million (MOD)
2006 – 2007	14.7	1.00125	14.7
2007 – 2008	25.4	1.00125	25.4
2008 – 2009	19.6	1.00125	19.6
2009 – 2010	8.6	1.00125	8.6
2010 – 2011	4.6	1.01627	4.7
	72.9		73.0

8. We have derived the MOD estimate 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 2006 to 2011. We will implement the works under two contracts: a civil works contract and an electrical and mechanical (E&M) works contract. We will tender the civil works on a re-measurement basis because of the uncertain underground conditions that may affect the profile of the rising mains and sewers as well as the foundation of the pumping station. The civil works contract will also provide for price adjustments because the contract period will exceed 21 months. We will tender the E&M works contract for the supply and installation of E&M equipment on a lump-sum basis without any price adjustment given the clearly defined scope.

9. We estimate the annual recurrent expenditure arising from the proposed works to be about \$2.5 million.

10. Based on the current level of expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves will lead to an increase in the recurrent cost of providing sewage services by about 0.15%, which will need to be taken into account in determining future sewage charges.

/PUBLIC .....

## **PUBLIC CONSULTATION**

11. We presented the proposals for the implementation of Port Shelter sewerage stage 3 works to the Food and Environmental Hygiene Committee of Sai Kung District Council in August 2001 and to the Sai Kung Rural Committee in September 2001. Both the Sai Kung District Council and the Sai Kung Rural Committee supported the implementation of the project.

12. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) in October 2001 and received no objection. The Director of Environmental Protection authorised the proposed works in January 2002.

13. We consulted the Sai Kung District Council again on 6 June 2005. The District Council supported the implementation of the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on the project on 24 October 2005. Whilst Members supported the implementation of the proposed project, they requested the Government to provide further information on the water quality assessment as a result of the increase in sewage flow to the Sai Kung Sewage Treatment works. The required materials were circulated to the Panel Members on 9 November 2005.

## **ENVIRONMENTAL IMPLICATIONS**

15. Among the proposed works, only the proposed sewage pumping station at Sai Kung Area 4 is a designated project under the Environmental Impact Assessment Ordinance. The Director of Environmental Protection granted permission for D of DS to apply directly for an environmental permit (EP) on 11 September 2001 and subsequently granted the EP to construct and operate the proposed Sai Kung Area 4 sewage pumping station on 27 June 2002. We will install a forced ventilation system fitted with deodoriser in the proposed pumping station to combat the potential odour problem. During construction, we will control noise, dust and site run-off within established standards and guidelines through implementation of mitigation measures, such as the use of temporary noise barriers and quieter construction equipment, and frequent water-spraying on site. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices would be properly implemented. We have included \$3.2 million (in September 2005 prices) in the project estimate for implementation of the environmental mitigation measures.

/16. ....

16. We have considered ways of minimising construction and demolition (C&D) materials and maximising the use of recycled C&D materials. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will require the contractor to reuse the excavated material as filling material on site or on other construction sites as far as possible. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable materials for temporary works. We will control the disposal of public fill and C&D waste to public fill reception facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

17. We estimate that the project will generate about 43 000 tonnes of C&D materials. Of these, we will reuse about 17 600 tonnes (40.9%) on site, and deliver 25 200 tonnes (58.6%) to public fill reception facilities<sup>1</sup> for subsequent reuse. In addition, we will dispose of 200 tonnes (0.5%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about \$0.7 million for this project (based on an unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>2</sup> at landfills).

## LAND ACQUISITION

18. The project does not require any land resumption.

**/BACKGROUND .....**

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<sup>1</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

<sup>2</sup> 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<sup>3</sup>), nor the cost to provide new landfills, (which is likely to be more expensive) when the existing ones are filled.

**BACKGROUND INFORMATION**

19. The Port Shelter sewerage master plan study was completed in March 1991 under **102DS** “Port Shelter sewerage master plan study – consultants’ fees and investigations”. The study recommended measures to reduce water pollution in Port Shelter.

20. In December 1991, we upgraded **132DS** “Port Shelter sewerage” to Category B for implementation of the sewerage works in three stages. In June 1993, we part-upgraded **132DS** to Category A as **166DS** “Port Shelter sewerage, stage 1 phase 1” to carry out sewerage works at Tan Cheung, Po Lo Che and Tui Min Hoi and to undertake phase 1 upgrading of the Sai Kung sewage treatment works. We started the works in November 1993 and completed them in February 1996. In January 1995, we upgraded another part of **132DS** to Category A as **190DS** “Port Shelter sewerage, stage 2 phase 1” for construction of sewers at Sai Kung old town. We started the works in May 1995 and completed them in April 1997.

21. Since October 1995, **132DS** has been solely for the remaining stage 1 works entitled “Port Shelter sewerage, stage 1 remainder”, while the remainder of stage 2 works and stage 3 works have been included under **272DS** “Port Shelter sewerage, stage 2” and **273DS** “Port Shelter sewerage, stage 3” respectively.

22. In November 1996, we upgraded **132DS**, together with part of **272DS**, to Category A as **283DS** “Port Shelter sewerage, stage 1 phase 2 and stage 2 phase 2”, for construction of sewerage at Silverstrand, Tai Wan and Sha Ha. We started the works in November 1996 and completed them in October 2001.

23. In October 2004, we included the proposed sewerage at Sai Kung Area 4 and Mang Kung Uk, originally under **273DS** and **272DS** respectively, in Category B as **340DS**. The proposed sewerage aims to provide trunk sewerage for Sai Kung Area 4 and nearby villages, and a trunk sewer and branch sewers for Mang Kung Uk and the nearby villages. We plan to implement **340DS** in two packages. We have completed the detailed design for the proposed sewerage for Sai Kung Area 4 using in-house resources and will also deploy in-house staff to supervise the construction works. The planning and design for the proposed sewerage for Mang Kung Uk is underway.

24. The proposed works will involve the removal of one tree. The tree to be removed is not an important tree<sup>3</sup>. We will incorporate the planting proposals as part of the project, including estimated quantities of about 20 trees.

25. We estimate that the proposed works will create about 50 jobs (43 for labourers and another seven for professional/technical staff) providing a total employment of 1 200 man-months.

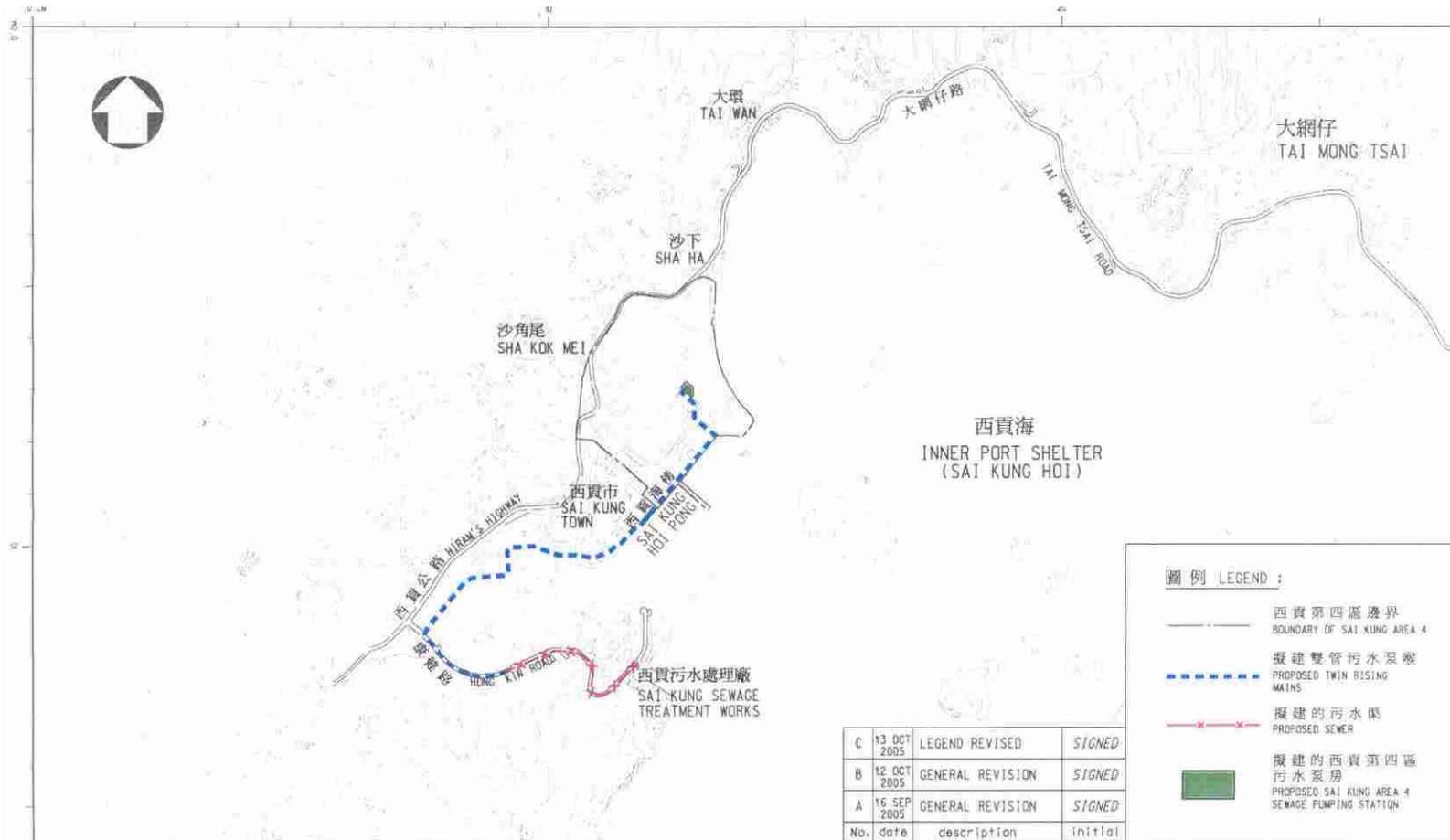
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Environment, Transport and Works Bureau  
November 2005

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<sup>3</sup> 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).



No.	date	description	initial
C	13 OCT 2005	LEGEND REVISED	SIGNED
B	12 OCT 2005	GENERAL REVISION	SIGNED
A	16 SEP 2005	GENERAL REVISION	SIGNED

**圖例 LEGEND :**

- 西貢第四區邊界  
BOUNDARY OF SAI KUNG AREA 4
- 擬建雙管污水泵廠  
PROPOSED TWIN RISING MAINS
- 擬建的污水渠  
PROPOSED SEWER
- 擬建的西貢第四區污水泵房  
PROPOSED SAI KUNG AREA 4 SEWAGE PUMPING STATION

drawing title  
 牛尾海污水收集系統第三階段  
 西貢第4區污水收集系統  
 PORT SHELTER SEWERAGE STAGE 3  
 SAI KUNG AREA 4 SEWERAGE

drawn	SIGNED	Y. W. YIP	date	26.06.05
checked	SIGNED	S.C. CHIU	date	28.08.05
approved	SIGNED	T. Y. YUEN	date	12.10.05
office	SEWERAGE PROJECTS DIVISION			

drawing no.  
DDN/340DS/0005C

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附件1 ENCLOSURE 1