For discussion **PWSC(2006-07)43**
on 22 November 2006

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
126DS – Sham Tseng sewerage stage 3

Members are invited to recommend to Finance Committee the upgrading of **126DS** to Category A at an estimated cost of $45.0 million in money-of-the-day prices for provision of public sewerage to the unsewered areas in Sham Tseng and Tsing Lung Tau.

PROBLEM

There is no public sewerage in the village areas at Sham Tseng and Tsing Lung Tau. Sewage discharging from these unsewered areas is polluting the nearby coastal waters.

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 **126DS** to Category A at an estimated cost of $45.0 million in money-of-the-day (MOD) prices for constructing the sewerage in Sham Tseng and Tsing Lung Tau.

PROJECT SCOPE AND NATURE

3. The scope of works under **126DS** comprises –

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(a) construction of one sewage pumping station in Tsing Lung Tau; and

(b) construction of about 5.5 kilometers (km) of sewers in nine villages, namely Sham Tseng East Village, Sham Tseng Commercial New Village, Sham Tseng Kau Tsuen, Sham Tseng San Tsuen, Shu On Terrace, Tsing Fai Tong New Village, Pai Min Kok Village, Yuen Tun Village and Tsing Lung Tau Tsuen.

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

4. We plan to commence construction in February 2007 for completion in December 2009.

JUSTIFICATION

5. At present, domestic sewage from unsewered areas in Sham Tseng and Tsing Lung Tau is discharged into nearby coastal waters either without treatment, for example in the cottage area in Sham Tseng, or after treatment by private treatment facilities. Most of these private treatment facilities, if available, are septic tanks and soakaway systems in village houses. The facilities in these areas are often ineffective in removing pollutants due to their close proximity to watercourses[1] and inadequate maintenance[2]. Sewage discharged from these unsewered areas is one of the causes of the serious water pollution in the nearby coastal waters including the beaches in the vicinity of Sham Tseng.

6. The proposed sewerage will collect and convey sewage from the unsewered areas of Sham Tseng and Tsing Lung Tau to the Sham Tseng sewage treatment plant for proper treatment and disposal. After completion of the project

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[1] Soakaway systems operate by allowing the effluent to percolate through the gravel so that pollutants would be removed in a natural manner. However, if a system is located in an area where the underground water table is high such as an area in close proximity to watercourses, it cannot function properly.

[2] Inadequate maintenance of septic tanks or soakaway systems would affect the pollutant removal efficiency of a system and may even lead to an overflow of effluent.

and subsequent connection of the village houses to the sewers, the pollution problems caused by the discharge of sewage from Sham Tseng and Tsing Lung Tau into local coastal waters will be alleviated.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $45.0 million in MOD prices (see paragraph 8 below), made up as follows –

			$ million	
(a)	Sewers		22.2	
(b)	One sewage pumping station		11.2	
	(i) civil engineering works	5.8		
	(ii) electrical and mechanical works	5.4		
(c)	Environmental mitigation measures		0.7	
(d)	Consultants' fees		5.4	
	(i) construction stage	0.5		
	(ii) resident site staff	4.9		
(e)	Contingencies		3.9	
	Sub-total		43.4	(in September 2006 prices)
(f)	Provision for price adjustment		1.6	
	Total		45.0	(in MOD prices)

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A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

Year	$ million (Sept 2006)	Price adjustment factor	$ million (MOD)
2006 – 2007	0.1	1.00000	0.1
2007 – 2008	6.9	1.01250	7.0
2008 – 2009	14.4	1.02769	14.8
2009 – 2010	15.6	1.04310	16.3
2010 – 2011	5.6	1.05875	5.9
2011 – 2012	0.8	1.08257	0.9
	43.4		45.0

9. We have derived the MOD estimate on the basis of the Government's latest forecasts of trend rate of change in the prices of public sector building and construction output for the period from 2006 to 2012. We will implement the works under two contracts: a civil engineering works contract and an electrical and mechanical (E&M) work contract. We will tender the civil engineering works as a re-measurement contract because of the uncertainties of the existence and location of various underground utilities. The contract will provide for price adjustments because the contract period will exceed 21 months. We will tender the proposed E&M works on a fixed-price lump-sum basis because we can clearly define the scope of works in advance.

10. We estimate the annual recurrent expenditure arising from the proposed works to be about $1 million.

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11. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works by themselves will lead to an increase in the recurrent cost of providing sewage services by about 0.03 %, which will need to be taken into account in determining sewage charges.

PUBLIC CONSULTATION

12. We consulted the Tsuen Wan Rural Area Committee and the Environmental and Health Affairs Committee of the Tsuen Wan District Council on 20 January 2005 and 3 March 2005 respectively. Members supported the implementation of the proposed works. We reported the development and the updated implementation programme of the project to the Tsuen Wan District Council on 27 September 2005, 28 March 2006 and 26 September 2006. Members raised no questions concerning the implementation programme.

13. We consulted the Legislative Council Panel on Environmental Affairs on 22 May 2006 on the proposed works. While Members raised no objection to our plan to submit the proposal to the Public Works Subcommittee, they requested the Government to provide information on the level of sewage treatment at Sham Tseng sewage treatment plant and the impact on the surrounding water bodies. The required materials were circulated to the Members on 12 September 2006.

14. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (WPC(S)R) on 25 November 2005. We received three objections during the statutory objection period. While all objectors in principle supported the proposed works for the benefit of the environment, they objected to the resumption of their land for implementing these works. We held several meetings with the objectors between January 2006 and June 2006 with a view to resolving the objections. Having considered their grounds for objection, we amended the proposed works to avoid resuming the objectors' land. We gazetted the amendment under the WPC(S)R on 4 May 2006. While one of the objectors withdrew his objection, the other two did not provide any feedback about their stance regarding their objections. The Chief Executive in Council authorised the proposed works without modifications under the WPC(S)R on 17 October 2006 and the notice of authorisation was gazetted on 27 October 2006.

/ENVIRONMENTAL .....

ENVIRONMENTAL IMPLICATIONS

15. We assessed and updated the environmental impacts arising from the construction and operation of the sewerage works in an Environmental Impact Assessment (EIA) study completed in August 1995 and in a Project Profile completed in May 2006 respectively. We concluded that the environmental impacts of the project including noise, odour and dust could be mitigated to within acceptable standards and guidelines. We have obtained an Environmental Permit under the EIA Ordinance for the construction and operation of the Tsing Lung Tau sewage pumping station. We will implement the mitigation measures as recommended. This will involve the provision of deodorization facilities to mitigate odour impact, the use of quieter equipment for noise control and limiting the height of the sewage pumping stations to reduce visual impact. For short term impacts during construction, we will control noise, dust and site run-off to levels within established standards and guidelines through implementation of mitigation measures, such as temporary noise barriers and quieter construction plant to reduce noise generation, water-spraying to reduce dust emission, and strict control over diversion of site run-off. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices are properly implemented. We have included $0.7 million (in September 2006 prices) in the project estimate for implementation of the environmental mitigation measures.

16. We have given due consideration to the need to minimise construction and demolition (C&D) materials in the planning and design stages of the proposed works. We will require the contractor to reuse inert C&D materials (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of C&D materials to public fill reception facilities[3]. We will encourage the contractor to maximise the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimise the generation of construction waste.

17. In addition, 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

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[3] 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.

will control the disposal of public fill and C&D waste to designated 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.

18. We estimate that the project will generate about 15 500 tonnes of C&D materials. Of these, we will reuse about 10 850 tonnes (70%) on site, and deliver 3 100 tonnes (20%) to public fill reception facilities for subsequent reuse. In addition, we will dispose of 1 550 tonnes (10%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about $280,000 for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne [4] at landfills.)

LAND ACQUISITION

19. The project does not require any land acquisition.

BACKGROUND INFORMATION

20. In 1989, the Environmental Protection Department (EPD) commissioned the Tsuen Wan, Kwai Chung and Tsing Yi Sewerage Master Plan Study (the Study) to review the sewerage requirement in these areas including Ting Kau, Sham Tseng and Tsing Lung Tau. As a long-term measure to address the water pollution problem in the areas, the Study recommended, among others, the provision of a sewage treatment plant, namely, the Sham Tseng sewage treatment plant, a submarine outfall at Sham Tseng and comprehensive sewerage stretching from Approach Beach in the east to Tsing Lung Tau in the west.

21. In November 1991, we upgraded **126DS** "Sham Tseng sewerage and sewage treatment and disposal facilities" to Category B for the provision of the

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[4] The estimate has taken into account the cost of 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.

proposed sewage treatment works and submarine outfall, and the sewage collection system for Sham Tseng and Tsing Lung Tau. Concurrently, we consulted the Town Planning Board (TPB) on reclaiming a piece of land to accommodate the proposed Sham Tseng sewage treatment plant. Some members of the TPB suggested the idea of identifying a suitable cavern site to house the works rather than reclaiming the land. Accordingly, we conducted a geological assessment study and compared the option of reclamation versus a cavern site. We completed the study in early 1993, confirming that the reclamation option was a better arrangement. The TPB subsequently endorsed the reclamation option in mid 1993. We then proceeded with the EIA study for the whole sewerage scheme and commissioned consultants in May 1995 to undertake site investigations and design for the Ting Kau and Sham Tseng sewerage works under block allocation **Subhead 4006DX** "Consultants' design fees and charges and major in-house investigations for drainage projects".

22. On 2 February 1996, Finance Committee approved the upgrading of part of **126DS** to Category A as **279DS** entitled "Sham Tseng sewerage stage 1 – Sham Tseng reclamation" at an approved project estimate of $176 million in MOD prices. The reclamation works started in February 1996 and were completed in June 1997.

23. On 30 October 1998, Finance Committee approved the upgrading of another part of **126DS** to Category A as **218DS** entitled "Sham Tseng sewerage, stage 2 phase 1" at an approved project estimate of $158.2 million in MOD prices for the Sham Tseng sewerage advance works. The works started in July 1999 and were completed in February 2002.

24. On 10 March 2000, Finance Committee approved the upgrading of the third part of **126DS** together with part of **52DS** to Category A as **221DS** entitled "Ting Kau sewerage stage 1 and Sham Tseng sewerage stage 2 phase 2" at an approved project estimate of $438.3 million in MOD prices for the Sham Tseng sewage treatment plant and trunk sewers along Castle Peak Road (Ting Kau section and Tsing Lung Tau section). Construction of the Sham Tseng sewage treatment plant started in May 2001 and was substantially completed for commissioning in December 2003. Since commissioning, the Sham Tseng sewage treatment plant has been serving most of the commercial and residential developments along both sides of Castle Peak Road in Sham Tseng.

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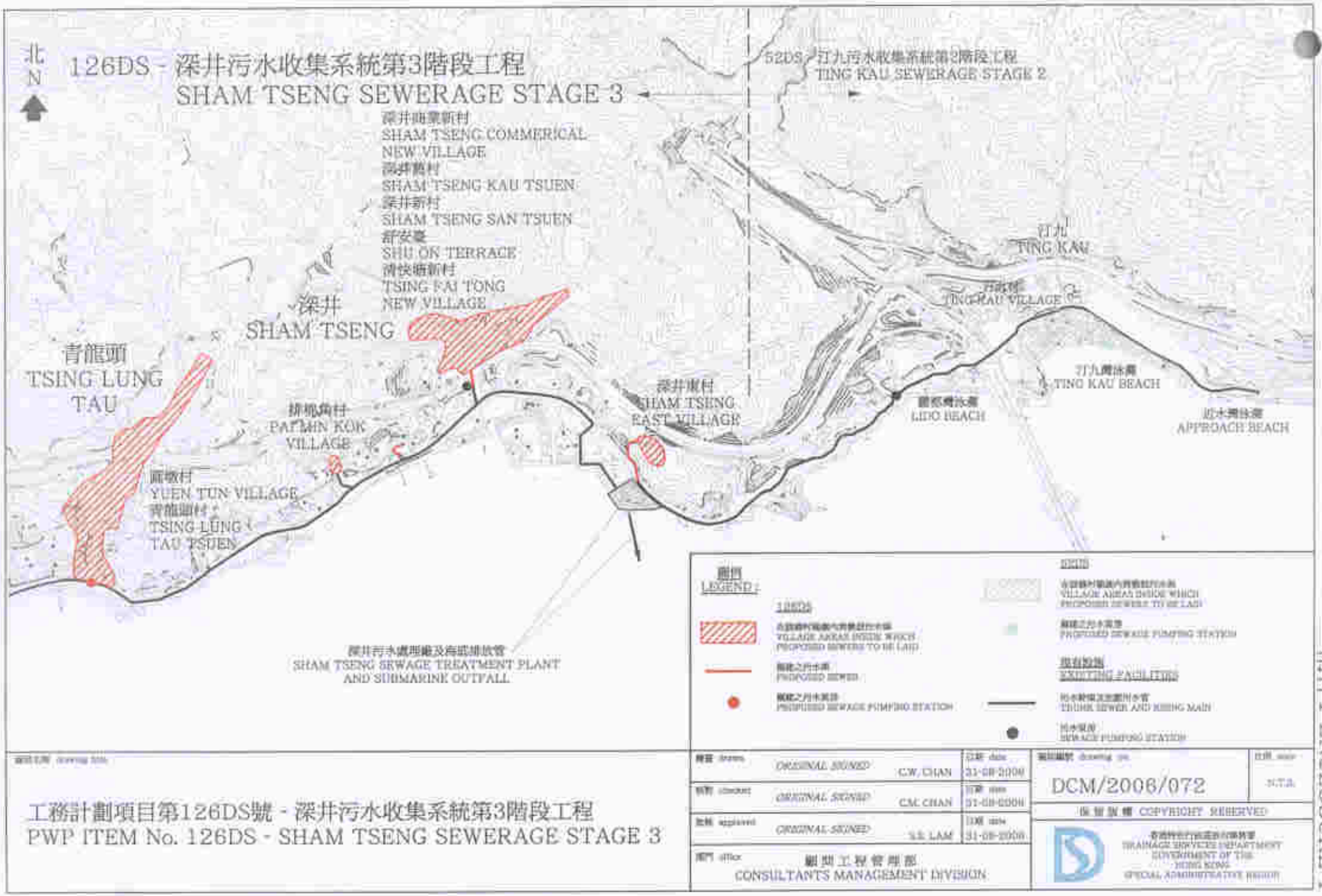
25. The proposed works would be the final stage of **126DS** which involve mainly the provision of public sewers in the unsewered areas of Sham Tseng and Tsing Lung Tau. Upon completion, the villagers will be required to connect their premises to these public sewers under the WPC(S)R.

26. The proposed works will not involve any tree removal. We will incorporate a planting proposal as part of the project, including estimated quantities of nine trees and 120 shrubs.

27. We estimate that the proposed works will create about 32 jobs (26 for labourers and another six for professional/technical staff) providing a total employment of 850 man-months.

Environment, Transport and Works Bureau
November 2006



工務計劃項目第126DS號 - 深井污水收集系統第3階段工程
PWP ITEM No. 126DS - SHAM TSENG SEWERAGE STAGE 3

繪圖 drawn	ORIGINAL SIGNED C.W. CHAN	日期 date 31-08-2006
核對 checked	ORIGINAL SIGNED C.M. CHAN	日期 date 31-08-2006
批准 approved	ORIGINAL SIGNED S.S. LAM	日期 date 31-08-2006
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

圖則編號 drawing no. DCM/2006/072

日期 date N.T.S.

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

附件1 ENCLOSURE 1

126DS – Sham Tseng Sewerage Stage 3

Breakdown of estimate for consultants' fees

Consultants' staff costs			**Estimated man-months**	**Average MPS* salary point**	**Multiplier** (Note 1)	**Estimated fee ($ million)**
(a)	Consultants' fees for construction stage	Professional	3	38	1.6	0.3
		Technical	7	14	1.6	0.2
(b)	Site supervision by resident site staff employed by the consultants	Professional	30	38	1.6	2.6
		Technical	80	14	1.6	2.3
					Total consultants' staff costs (Note 2)	5.4

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to arrive at the full staff costs, including the consultants' overheads and profit, for staff employed in the consultant's offices. MPS points 38 and 14 are used as the average MPS salary points for professionals and technical staff respectively. (As at 1 January 2006, MPS point 38 = $54,255 per month and MPS point 14 = $18,010 per month)

2. The consultants' fees for contract administration are estimated in accordance with the existing consultancy agreement for the design and construction of the project. We will only know the actual man-months and actual costs for site supervision after completion of the works.