For discussion **PWSC(2005-06)3**
on 11 May 2005

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE
Environmental Protection – Sewerage and sewage treatment
208DS – Outlying Islands sewerage, stage 1 phase 1 part 1 – Ngong Ping village sewerage works

Members are invited to recommend to the Finance Committee the upgrading of the remainder of **208DS** to Category A at an estimated cost of $25.8 million in money-of-the-day prices for the construction of the proposed Ngong Ping village sewerage works.

PROBLEM

There is no public sewer system at the Ngong Ping village.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade the remainder of **208DS** to Category A at an estimated cost of $25.8 million in money-of-the-day (MOD) prices for the construction of the proposed Ngong Ping village sewerage works.

PROJECT SCOPE AND NATURE

3. The scope of the proposed works comprises the construction of –

/(a) .....

(a) about 2.6 kilometres of gravity sewers;

(b) about 170 metres of twin rising mains and two small underground sewage pumping chambers; and

(c) ancillary works including landscape works.

4. We plan to start construction in October 2005 for completion in March 2008. A layout plan showing the scope of the proposed works is at Enclosure 1.

JUSTIFICATION

5. There is no public sewer system at Ngong Ping village. The sewage generated is mainly treated and disposed of by means of privately owned septic tank and soakaway systems[1]. To tie in with the planned tourism and recreation developments in Ngong Ping which will be completed in early 2006, we are now constructing a tertiary sewage treatment plant and the associated trunk and branch sewers for completion in late 2005. To provide proper treatment to the sewage generated from the Ngong Ping village, we propose to provide a public sewer system to collect and convey the sewage to the Ngong Ping sewage treatment plant for treatment and disposal.

6. If we do not implement the proposed sewerage works, Ngong Ping village will remain unsewered and the sewage generated cannot be collected for treatment at the Ngong Ping sewage treatment plant.

FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the proposed works to be $25.8 million in MOD prices (see paragraph 8 below), made up as follows –

/(a) .....

[1] Septic tank and soakaway systems operate by utilising the micro-organisms in the septic tank to degrade the suspended solids originating from the wastewater. Effluent leaving the septic tank would then percolate through the gravel in the soakaway pit where the organic pollutants and pathogens are further degraded and removed by micro-organisms in a natural manner. Sludge generated in the septic tank is tankered away periodically.

			$ million		
(a)	Construction of			18.3	
	(i)	gravity sewers	13.5		
	(ii)	two pumping chambers and the associated rising mains	3.6		
	(iii)	ancillary works	1.2		
(b)	Consultants' fees for			5.2	
	(i)	contract administration	0.6		
	(ii)	site supervision	4.6		
(c)	Environmental mitigation measures			0.2	
(d)	Contingencies			2.0	
		Sub-total		25.7	(in September 2004 prices)
(e)	Provision for price adjustment			0.1	
		Total		25.8	(in MOD prices)

A breakdown of the estimate 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 2004)**	**Price adjustment factor**	**$ million (MOD)**
2005 – 2006	3.9	1.00450	3.9
2006 – 2007	11.5	1.00576	11.6
2007 – 2008	6.5	1.00576	6.5

/2008 – 2009 .....

Year	$ million (Sept 2004)	Price adjustment Factor	$ million (MOD)
2008 – 2009	2.7	1.00576	2.7
2009 – 2010	1.1	1.00953	1.1
	25.7		25.8

9. We have derived the MOD estimate on the basis of Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2005 to 2010. We will tender the proposed works on a re-measurement basis because of uncertainties concerning the rock head level and underground utilities. The contract will provide for price adjustments because the contract period will exceed 21 months.

10. We estimate the annual recurrent expenditure arising from the proposed works to be about $510,000.

11. Based on the current level of expenditure on the 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 0.03%, which will need to be taken into account in determining future sewage charges.

PUBLIC CONSULTATION

12. On 28 June 2004, we consulted the villagers on the proposed works and obtained their support for the project. We also consulted the Environmental Improvement and Food Hygiene Committee of the Islands District Council on 20 September 2004. Members supported the implementation of the proposed works.

13. We consulted the Legislative Council Panel on Environmental Affairs on the proposed works on 24 March 2005. Members supported the implementation of the project.

/ENVIRONMENTAL .....

ENVIRONMENTAL IMPLICATIONS

14. The project is a designated project under the Environmental Impact Assessment (EIA) Ordinance and an environmental permit is required for the construction and operation of the project. The project will remove pollution risks to local streams in the water gathering ground. It will also solve the problem of village septic tanks discharging into the stream that flows through the planned tourist area. We have completed the EIA Study for the proposed works in accordance with the EIA Ordinance. The EIA report was approved under the EIA Ordinance in November 2002 and the Director of Environmental Protection issued an environmental permit for the construction and operation of the project in March 2003. The EIA report has concluded that with the implementation of mitigation measures, the environmental impacts of the project can be controlled to within the criteria set out in the Technical Memorandum on the Environmental Impact Assessment Process. We will implement the mitigation measures as recommended in the report. The mitigation measures include temporary noise barriers and silenced construction plant to reduce noise generation, water-spraying to reduce dust emission, and strict implementation of sewage flow diversion schemes. We will incorporate pollution control measures in the works contracts to control noise, dust and site run-off during the construction stage. We have included about $0.2 million in September 2004 prices in the project estimate for implementation of the environmental mitigation measures.

15. In the planning and design stages, we drew up a Construction and Demolition (C&D) Material Management Plan which recommended ways to minimise the generation and to maximise the reuse and recycling of C&D material on site. 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. To further minimise C&D materials, we will encourage the contractor to use steel formwork and prefabricated components for construction. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste in designated public filling 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. We will require the contractor to implement all the recommended good site practices and to provide proper training to site personnel in waste management.

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16. We estimate that about 9 560 cubic metres (m^3) of C&D materials and other construction wastes will be generated by the project. Of these, we will reuse about 4 680 m^3 (49%) on site and about 4 680 m^3 (49%) as fill in public filling areas[2], and dispose of about 200 m^3 (2%) at landfills. The notional cost of accommodating C&D wastes at landfill sites is estimated to be $25,000 for this project (based on a notional unit cost[3] of $125/$m^3$).

LAND ACQUISITION

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

BACKGROUND INFORMATION

18. In 1994, the Environmental Protection Department (EPD) completed the Sewerage Master Plan (SMP) Study under **146DS** "Outlying Islands Sewerage Master Plan Study – consultants' fees and investigations" and recommended a series of sewerage improvement works for six areas, namely, Cheung Chau, Peng Chau, Mui Wo, Siu Ho Wan, Yung Shue Wan and Ngong Ping. We subsequently included the proposed sewerage projects in Cheung Chau, Lantau Island and Lamma Island under **208DS** "Outlying Islands sewerage stage 1 phase 1" in Category B in 1995.

19. In 1996, Finance Committee approved the upgrading of part of **208DS** to Category A as **209DS** "Outlying Islands sewerage, stage 1, phase 1 – consultants' fees and investigations" for employing consultants to carry out impact assessments and investigation works for the sewerage works in these six areas, and the detailed design of the sewerage works at Ngong Ping and Siu Ho Wan. The design for the other four areas is done in-house. Preliminary investigation works for the Ngong Ping sewerage scheme commenced in May 1996 and were completed in January 1998.

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2 A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering and Development.

3 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 are likely to be more expensive) when existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

20. We commenced construction of the "Stage 1 phase 1A – upgrading of sewage sludge dewatering facilities at Mui Wo sewage treatment plant" in June 1998 under block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme" and completed the works in May 2000.

21. In March 2000, we upgraded part of **208DS** to Category A as **220DS** "Outlying Islands sewerage, stage 1, phase 1B – outfall replacement and sewage sludge dewatering facilities upgrading at Cheung Chau sewage treatment plant" for improvement works at the Cheung Chau sewage treatment plant. We commenced construction in September 2000 and completed the works in April 2003.

22. In May 2000, we upgraded part of **208DS** to Category A as **224DS** "Outlying Islands sewerage, stage 1, phase 1C – upgrading of Siu Ho Wan sewage treatment plant" to expand the capacity of the Siu Ho Wan sewage treatment plant and upgrade the treatment process from preliminary level to chemical treatment and disinfection. We commenced the construction works in July 2001 for completion in December 2006.

23. To implement the Administration's decision to develop a cable car system linking Ngong Ping and Tung Chung for tourism promotion, EPD completed a review of the Ngong Ping sewerage scheme in 2001 and concluded that the sewerage scheme should be expanded to cater for around 47 000 visitors per day and related developments. In June 2001, Finance Committee approved an increase of the approved project estimate of **209DS** by $12.6 million from $24.0 million to $36.6 million in MOD prices to cover the costs of impact assessments, investigation and design work for the revised Ngong Ping sewerage scheme.

24. In December 2002, we sub-divided the remainder of **208DS** into **208DS** "Outlying Islands sewerage, stage 1 phase 1 part 1 – Ngong Ping sewerage, sewage treatment plant and disposal" and **230DS** "Outlying Islands sewerage, stage 1 phase 1 part 2 – Yung Shue Wan sewage treatment works and outfall".

25 In May 2003, we upgraded part of **208DS** to Category A as **231DS** "Outlying Islands sewerage, stage 1 phase 1 part 1 – Ngong Ping sewerage, sewage treatment and disposal" for the construction of public sewers, a tertiary sewage treatment plant and an effluent export pipeline to serve the planned tourism and related developments in Ngong Ping. We commenced the construction works in August 2003 for completion in October 2005.

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26. The proposed works will affect six common trees, of which two will be felled and four will be transplanted within the project site. All trees to be removed are not important trees[4]. We will plant six new trees as part of the project.

27. We estimate that the proposed works will create about 30 jobs (23 for labourers and another seven for professional/technical staff) providing a total employment of 560 man-months.

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Environment, Transport and Works Bureau
May 2005

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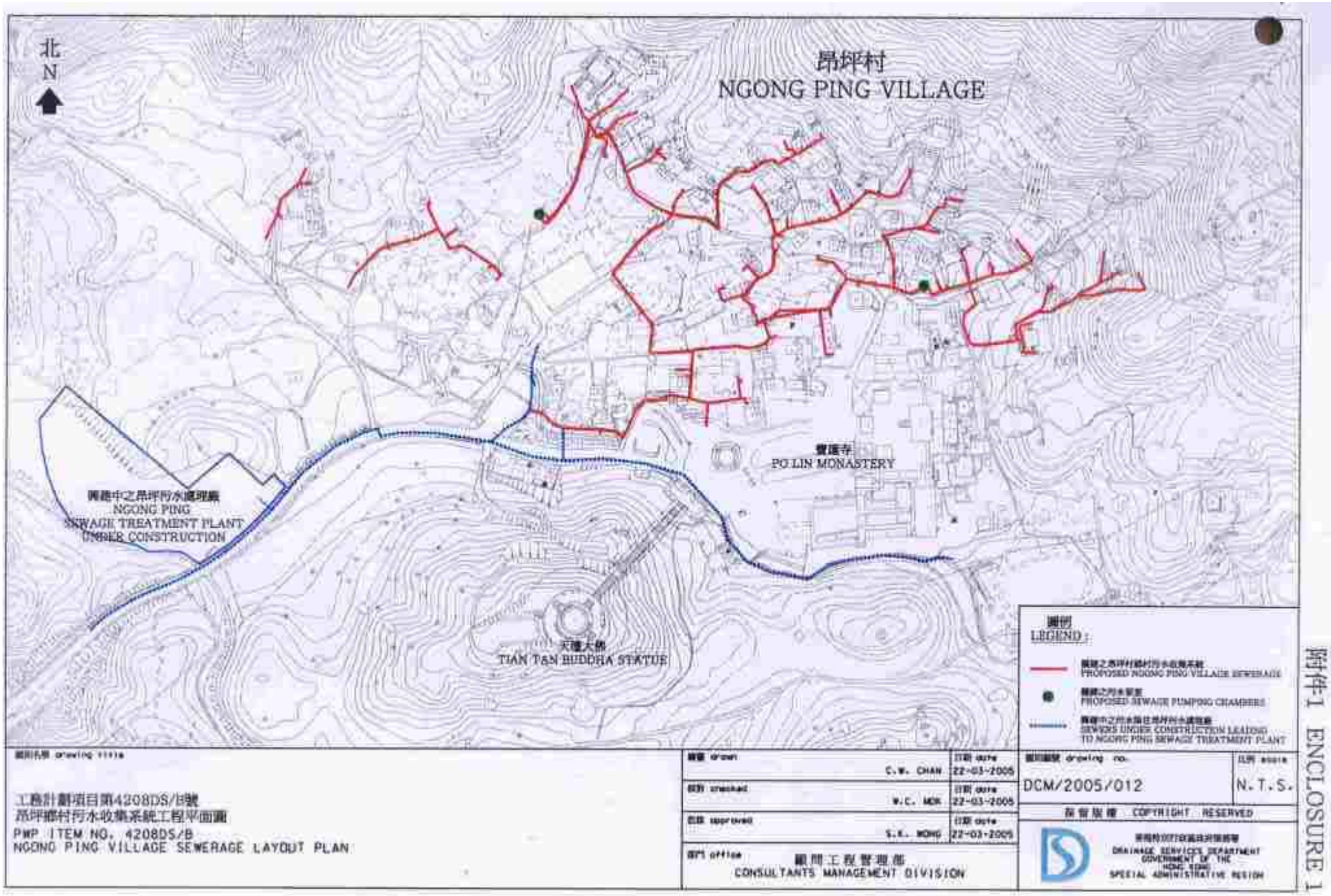
[4] Important trees include trees on the Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria –

(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).



圖則名稱 drawing title

工務計劃項目第4208DS/B號
昂坪鄉村污水收集系統工程平面圖
PWP ITEM NO. 4208DS/B
NGONG PING VILLAGE SEWERAGE LAYOUT PLAN

繪圖 drawn	C.W. CHAN	日期 date 22-03-2005
核對 checked	W.C. MOK	日期 date 22-03-2005
批准 approved	S.K. WONG	日期 date 22-03-2005
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

圖則編號 drawing no. DCM/2005/012

比例 scale N.T.S.

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

附件1 ENCLOSURE 1

208DS – Outlying Islands sewerage stage 1 phase 1 part 1 – Ngong Ping village sewerage works

Breakdown of estimates for consultants' fee

	Consultants' staff cost		Estimated man-month	Average MPS salary point	Multiplier (Note 1)	Estimated fee ($million)
(a)	Contract administration (Note 2)	Professional	-	-	-	0.5
		Technical	-	-	-	0.1
(b)	Site supervision by resident site staff employed by the consultants (Note 3)	Professional	30.0	38	1.6	2.6
		Technical	70.5	14	1.6	2.0
						5.2

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS point to estimate the resident site staff cost supplied by the consultants. (As at 1 January 2005, MPS pt. 38 = $54,255 per month and MPS pt. 14 = $18,010 per month.)

2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of **208DS**. The construction phase of the assignment for this project will only be executed subject to Finance Committee's approval to upgrade **208DS** to Category A.

3. We will only know the actual man-months and actual costs for site supervision after the completion of the works.