For discussion **PWSC(2005-06)30**
on 23 November 2005

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE
Environmental Protection – Sewerage and sewage treatment
238DS – Harbour Area Treatment Scheme stage 2A – environmental impact assessment, investigations, tunnel conveyance system design

Members are invited to recommend to Finance Committee the upgrading of **238DS** to Category A at an estimated cost of $166.5 million in money-of-the-day prices for the environmental impact assessment, investigations, preliminary planning, and design of the tunnel conveyance system of the Harbour Area Treatment Scheme (HATS) stage 2A.

PROBLEM

Sewage generated in the north, west and southwest of Hong Kong Island (from North Point to Ap Lei Chau) is only receiving preliminary treatment before being discharged into Victoria Harbour. This is a major pollution source which has a significant impact on harbour water quality.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **238DS** to Category A at an estimated cost of $166.5 million in money-of-the-day (MOD) prices for the environmental impact assessment, investigations, preliminary planning, and design of the tunnel conveyance system of HATS stage 2A.

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PROJECT SCOPE AND NATURE

3. The scope of the proposed project **238DS** comprises –

(a) the environmental impact assessment (EIA) study for HATS stage 2A;

(b) site investigations for HATS stage 2A; and

(c) preliminary planning and design of the tunnel conveyance system.

A layout plan showing the proposed works constituting HATS stage 2A is at Enclosure 1.

4. We plan to start the above work in February 2006 for completion in November 2009.

JUSTIFICATION

5. Since the full commissioning of HATS stage 1 at the end of 2001, sewage generated from Kowloon and the northeast of Hong Kong Island is being conveyed to Stonecutters Island Sewage Treatment Works (SCISTW) for treatment before discharge to Victoria Harbour. About 75% of the sewage (amounting to about 1.4 million m^3/day) generated from both sides of the Harbour is now being treated before disposal.

6. Although HATS stage 1 has brought about significant improvements to the water quality of Victoria Harbour, the sewage generated from the north, west and southwest of Hong Kong Island, which accounts for about 25% (0.45 million m^3/day) of the sewage generated from both sides of the harbour, is still only receiving preliminary treatment. Under HATS stage 2A this sewage will be conveyed to SCISTW for treatment, and disinfection will be provided to all the sewage before it is discharged into the western harbour area. Taking into account the existing sewage volume and the projected future flow increase, the capacity of SCISTW is proposed to be expanded from 1.7 million m^3/day to about 2.8 million m^3/day. Given the substantial recurrent operating costs, the implementation of HATS stage 2A is subject to acceptance by the community that the full recurrent costs of the scheme will be recovered through sewage charges. The 2005 October Policy Address has also stated that while the Government will bear the construction costs, the public has to pay for the operating costs of sewage treatment in line with the "polluter-pays" principle.

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7. As HATS stage 2A is a designated project under the Environmental Impact Assessment Ordinance, we need to carry out an EIA study to identify the potential environmental impacts (e.g. visual, odour and water quality impacts) arising from the proposed works, recommend mitigation measures, and prepare the necessary environmental monitoring and audit programme for the works during the construction and operation stages.

8. As there is insufficient information about the ground conditions, we have to carry out an extensive programme of site investigation and various types of surveys such as condition surveys of existing buildings, utility surveys and traffic surveys. By carrying out the investigations and surveys, we can better ascertain the sub-surface conditions of the works sites, determine the characteristics of the soil and rock masses, and identify the presence of underground utilities so as to provide the required information for early finalisation of the tunnel alignment and design.

9. Though the contractor for the tunnel conveyance system will eventually be responsible for producing the detailed design for the proposed tunnel conveyance system, we would need to carry out a preliminary design so as to establish the requirements to meet the project constraints and to be used as a reference for detailed design. This reference design will also form the basis for cost-estimation. In view of the complexity of the tunnel conveyance system and the need to consider the hydraulic design of the system and the treatment plants as a whole, the tunnel alignments, the hydraulic design, the inlet structures, etc., will be incorporated as part of the reference design.

10. As expert input is required for conducting the EIA study, and the planning and design of the tunnels, we will appoint consultants with suitable experience and expertise to undertake the required services as well as to advise on the site investigation works.

FINANCIAL IMPLICATIONS

11. We estimate the capital cost of the proposed works to be $166.5 million in MOD prices (see paragraph 12 below), made up as follows –

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		$ million		
(a)	Site Investigations and surveys		95.0	
	(i) ground investigations and laboratory tests	88.3		
	(ii) precondition surveys	5.0		
	(iii) surveys and tests for EIA study and traffic surveys	1.7		
(b)	Consultants' fees		56.9	
	(i) EIA study	5.6		
	(ii) supervision of site investigations and surveys	7.4		
	(iii) traffic impact assessment	0.6		
	(iv) preliminary planning and design of the tunnel conveyance system (including preparation of D&B tender documents for the conveyance system)	43.3		
(c)	Contingencies		14.2	
	Sub-total		166.1	(in September 2005 prices)
(d)	Provision for price adjustment		0.4	
	Total		166.5	(in MOD prices)

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

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

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Year	$ million (Sept 2005)	Price adjustment factor	$ million (MOD)
2006 – 2007	18.0	1.00125	18.0
2007 – 2008	54.6	1.00125	54.7
2008 – 2009	70.7	1.00125	70.8
2009 – 2010	13.0	1.00125	13.0
2010 – 2011	7.8	1.01627	7.9
2011 – 2012	2.0	1.03659	2.1
	166.1		166.5

13. We have derived the MOD estimates 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 from 2006 to 2012. We will tender two lump-sum consultancy agreements, one for the EIA study and one for the planning and design of the tunnel conveyance system, with provision for price adjustment as each agreement will exceed 12 months. The consultancy for the EIA study will cover the supervision of the surveys and tests required under the EIA study whereas the consultancy for the planning and design of the tunnel conveyance system will cover the supervision of the site investigations and other survey works. We will tender the site investigation and survey works under standard re-measurement contracts because of the uncertainties of ground conditions and the quantity of works required. The contracts will not provide for price adjustments because the contract period will be less than 21 months.

14. The proposed EIA study, site investigations and design consultancy will not give rise to any recurrent expenditure. The implementation of HATS stage 2A will however have annual recurrent cost of about $428 million. This will be recovered through the sewage charges.

PUBLIC CONSULTATION

Consultation with the Key Stakeholders and the General Public

15. We conducted a five-month public consultation exercise on the way forward for HATS stage 2 between 21 June and 20 November 2004. To enable our key stakeholders to understand the project, we organised a series of in-depth technical briefings, discussion forums and public hearings with a broad spectrum of the community including the Environmental Affairs Panel of the Legislative Council and political parties, advisory committees, District Councils in the Harbour area, professional bodies, academia, special interest groups, and various business/trade organisations. Through these outreach activities, we collected comments from 46 key stakeholders and 81 written submissions made by individual persons or companies from the community at large. It is clear from the comments received that:

(a) the community attaches high importance to cleaning up Victoria Harbour as a matter of priority;

(b) most people support the centralisation of treatment of all the Harbour area sewage at Stonecutters Island;

(c) while some would like to see both stages 2A and 2B implemented in one go, the majority opinion is willing to accept a phased programme given the scale of HATS stage 2, the financial implications, and uncertainty surrounding the future sewage flow build-up;

(d) there are divergent views on the need for disinfection, and in particular the use of the chlorination-dechlorination process; and

(e) the community believes that it is worth paying higher sewage charges if the outcome is a cleaner harbour, though many considered it important to take into account affordability in adjusting sewage charges and to consult the public extensively beforehand.

Consultation with District Councils

16. From July to September 2004, we consulted the Sham Shui Po, Tsuen Wan, Central and Western, Wan Chai, Eastern and Southern District Councils on the planning of HATS stage 2. Members of the District Councils generally supported the Government taking action to improve the Harbour water quality. They have also made some specific comments on HATS stage 2 which are summarised below –

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(a) Members of the Sham Shui Po District Council expressed concern over the supporting facilities, i.e. a sludge incinerator. They said they would like to be informed once further information was available on long-term arrangements for dealing with the sewage sludge.

(b) Members of the Tsuen Wan District Council requested the Government to take note of the fishermen's concern in planning of HATS stage 2. They also requested us to brief them once additional information, such as the results of the environmental impact assessment, became available.

(c) Members of the Central and Western District Council expressed strong views requesting the Government to improve the Harbour water quality as soon as possible. Whilst they had no conclusive views on the location of the works sites, they requested us to consult them again during the design stage when additional geological information became available following the site investigations.

Consultation with the Legislative Council Panel on Environmental Affairs

17. We reported our proposed way forward for HATS stage 2 to the Legislative Council Panel on Environmental Affairs on 25 April 2005. Members had no objections to the proposal. On 5 July 2005, we sought the Panel's support to proceed with the EIA study and the site investigations, planning and design of the tunnel conveyance system, which are the most time-critical elements for completion of HATS stage 2A. Whilst Members supported the implementation of the proposed project, they also requested the Government to develop a clear trigger mechanism for the commencement of HATS stage 2B. The required materials were circulated to the EA Panel members on 3 November 2005.

ENVIRONMENTAL IMPLICATIONS

18. While HATS stage 2A is a designated project under the EIA Ordinance, the proposed site investigation work itself is not a designated project under the ordinance, and will not cause long term environmental impact. We will require the consultants to fully consider measures for minimising the generation of construction and demolition (C&D) materials and for reusing/recycling C&D materials as much as possible in the future implementation of the construction works. We will control noise, dust and site run-off during construction through the implementation of mitigation measures in the site investigation contract, and we have included in the project estimate the cost of implementing suitable mitigation measures to control short term environmental impacts.

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LAND ACQUISITION

19. The project does not require any land resumption.

BACKGROUND INFORMATION

20. In 1989, the Sewage Strategy Study recommended the Strategic Sewage Disposal Scheme (now renamed as HATS) to collect and convey all sewage from the urban areas surrounding Victoria Harbour through deep tunnels, to one or two centralised sewage treatment plants for treatment, before final disposal to the waters south of Hong Kong. The scheme was originally divided into four stages for implementation. To bring about early improvement in the water quality of Victoria Harbour, stage 1 focused on collecting and conveying the sewage from Kowloon and northeast Hong Kong Island to SCISTW for treatment, while stages 3 and 4 aimed to collect and convey the sewage from the north and southwest of Hong Kong Island. Stage 2 of the scheme was planned to discharge the effluent away from the harbour in order to meet the environmental standards. HATS stage 1 was commenced in early 1995 and was completed at the end of 2001.

21. In April 2000, an International Review Panel (IRP) was set up to consider the future development of the sewage treatment system for the main urban area in the light of experience with HATS stage 1 and developments in technology. In its report released on 30 November 2000, the IRP recommended that the Government adopt biological treatment and discharge the treated effluent into Victoria Harbour. The IRP also proposed options with different degrees of decentralisation for further assessment and consideration. Nevertheless, all these options involved the use of the Biological Aerated Filters (BAF) technology for treatment, deep tunnels for conveying the sewage and short outfalls for disposal of effluent.

22. On 25 May 2001, the Finance Committee approved $73.6 million for upgrading **5227DS** to Category A to carry out a series of trials and studies to evaluate and select a final configuration for the remaining stages of HATS based on the options recommended by the IRP. The trials and studies were completed in June 2004. They confirmed that the recommended options were environmentally acceptable and technically feasible. Among the options, the centralised treatment at SCISTW was the preferred one in terms of cost, environmental and engineering aspects. It comprises –

(a) Stage 2A – the proposed additional facilities, including the upgrading of existing preliminary treatment works (PTWs) in the Harbour area

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catchment on the northern and western sides of Hong Kong Island, the construction of about 20 kilometres of deep tunnels to convey sewage from the above PTWs to Stonecutters Island, and the upgrading of the existing SCISTW to provide chemical treatment and disinfection for an ultimate flow of 2.8 million m^3/day; and

(b) Stage 2B – the proposed biological treatment facility at a site adjacent to the existing SCISTW.

23. We included **238DS** in Category B in April 2005.

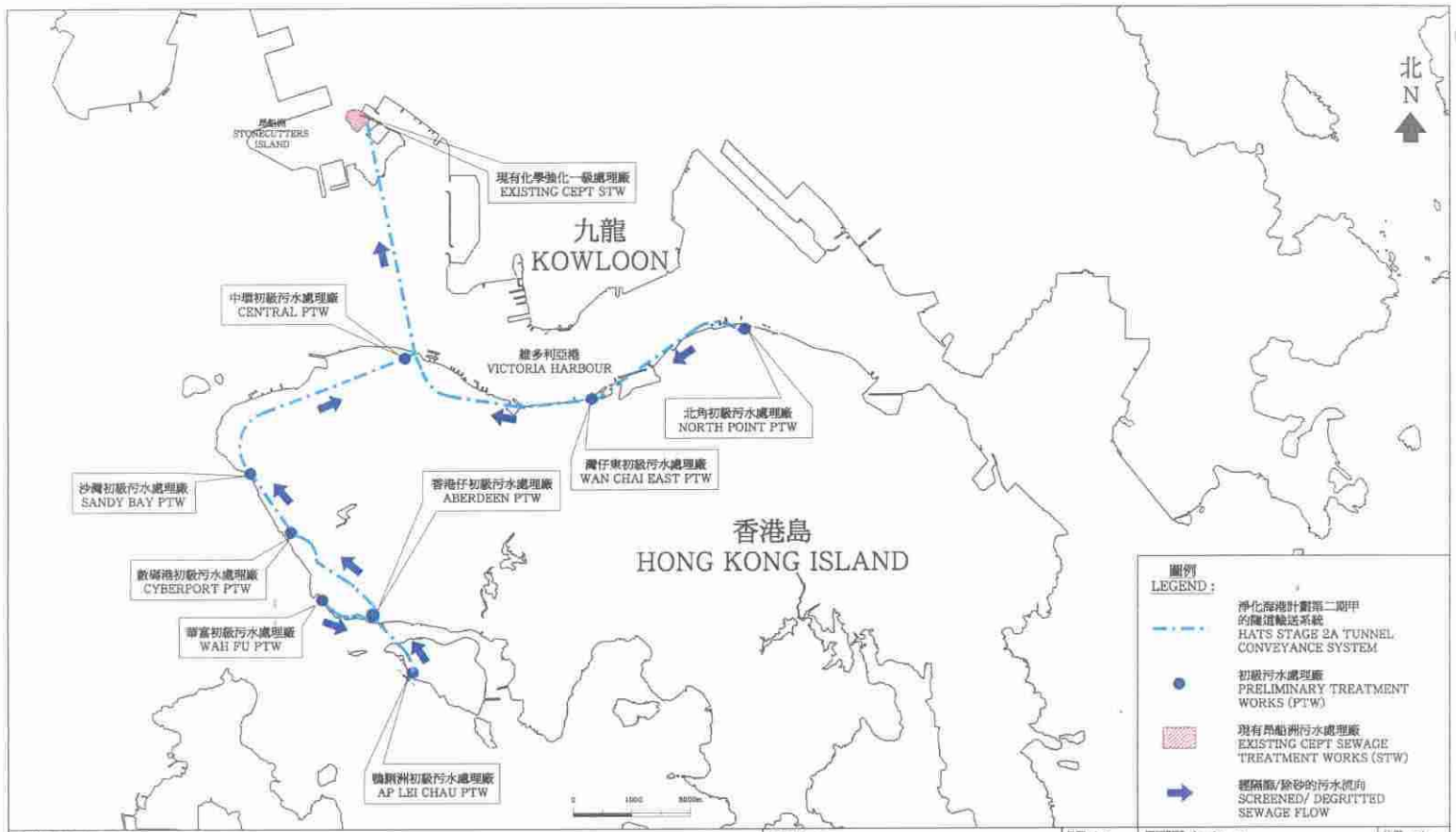
24. In April 2005, we have included an item under block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme" at an estimated cost of $5.03 million in MOD prices for engaging consultants to undertake site investigations, surveys and an environmental impact assessment for the proposed advance disinfection facilities at SCISTW under HATS stage 2A. The Category D item commenced in July 2005 for completion in June 2006.

25. In July 2005, we also included an item under block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme" at an estimated cost of $9.0 million in MOD prices to carry out advance site investigation works for collecting ground information, in particular under the sea, so as to facilitate early planning of the proposed study and the full scale ground investigation. The Category D item commenced in August 2005 for completion in April 2006.

26. The proposed project will not involve any tree removal or planting proposal.

27. We estimate that the proposed works will create about 86 jobs (45 for labourers and another 41 for professional/technical staff) providing a total employment of 2 200 man-months.

Environment, Transport and Works Bureau
November 2005



圖則名稱 drawing title

淨化海港計劃第二期甲
規劃圖
HARBOUR AREA TREATMENT SCHEME STAGE 2A
LAYOUT PLAN

繪圖 drawn	ORIGINAL SIGNED	C.W. CHAN	日期 date 03-08-2005
核對 checked	ORIGINAL SIGNED	W.L. CHAN	日期 date 05-08-2005
批核 approved	ORIGINAL SIGNED	K.F. SEIT	日期 date 05-08-2005
部門 office	淨化海港計劃部 HARBOUR AREA TREATMENT SCHEME DIVISION		

圖則編號 drawing no. FIGURE PWSC-001

比例 scale AS SHOWN

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

238DS – Harbour Area Treatment Scheme stage 2A – environmental impact assessment, investigations, tunnel conveyance system design

Breakdown of estimates for consultants' fees

EIA Study for HATS stage 2A -

Consultants' staff costs			Estimated man-month	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Environmental impact assessment	Professional	46	38	2.0	5.0
		Technical	17	14	2.0	0.6
					Total estimated fees (Note 2)	5.6

Planning and design of tunnel conveyance system -

Consultants' staff costs			Estimated man-month	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Supervision of site investigations and surveys by resident site staff employed by the consultants	Professional	63	38	1.6	5.5
		Technical	66	14	1.6	1.9
(b)	Traffic impact assessment	Professional	4	38	2.0	0.4
		Technical	6	14	2.0	0.2
(c)	Preliminary planning, investigation and design (including preparation of tender documents)	Professional	349	38	2.0	37.9
		Technical	150	14	2.0	5.4
					Total estimated fees (Note 2)	51.3

MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit for staff to be employed in the consultant's offices. A multiplier of 1.6 is applied to the average MPS point to estimate the cost of resident site staff 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. We will know the actual man-months and actual fees when we have selected the consultants through the usual competitive fee bid system.