

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE

Environmental Protection – Sewerage and sewage treatment

351DS – Harbour Area Treatment Scheme, stage 2A – planning and design of the upgrading works of Stonecutters Island sewage treatment works and the preliminary treatment works

Members are invited to recommend to Finance Committee the upgrading of **351DS** to Category A at an estimated cost of \$105.6 million in money-of-the-day (MOD) prices for the planning and design of the upgrading works of Stonecutters Island Sewage Treatment Works and the preliminary treatment works of the Harbour Area Treatment Scheme (HATS) stage 2A.

PROBLEM

Sewage generated from the northern and western shores of Hong Kong Island is only receiving preliminary treatment before being discharged into Victoria Harbour. This is a major pollution source which has significant impact on the water quality of the harbour.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **351DS** to Category A at an estimated cost of \$105.6 million in MOD prices for the planning and design of the upgrading works of Stonecutters Island Sewage Treatment Works (SCISTW) and the preliminary treatment works (PTWs) of the Harbour Area Treatment Scheme (HATS) stage 2A.

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PROJECT SCOPE AND NATURE

3. The scope of **351DS** comprises –
- (a) planning and design of the expansion works¹ and the disinfection facility² at the SCISTW and the upgrading works of the eight PTWs along the northern and western shores of Hong Kong Island;
 - (b) associated investigations and surveys³; and
 - (c) preliminary baseline monitoring of key water quality parameters of the harbour water.
4. We plan to start the above planning and design work in July 2007 for completion in August 2010. Field work for the preliminary baseline monitoring of key water quality parameters of the harbour water is programmed to start in 2008.

JUSTIFICATION

5. HATS stage 1 has brought about significant improvements to the water quality of Victoria Harbour by collecting about 75% of the sewage (amounting to about 1.4 million cubic metres per day) generated from both sides of Victoria Harbour for treatment. However, the remaining 25% (0.45 million cubic metres per day) generated from the northern and western shores of Hong Kong Island is still only receiving preliminary treatment. Further work is required for cleaning up the harbour.
6. HATS stage 2A will comprise completion of the deep tunnel network to carry sewage from the northern and western shores of Hong Kong Island to Stonecutters Island for chemically-enhanced primary treatment and disinfection, upgrading of the preliminary treatment works at the system nodes, and expansion and upgrading of the SCISTW to increase capacity to cater for the further flows from Hong Kong Island and the projected increase in flow in the future from the HATS catchment. It will also include the addition of the necessary disinfection process. A layout plan showing the proposed works constituting HATS stage 2A is at Enclosure 1.

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¹ The expansion works will cover the chemical treatment facility and other facilities at the existing SCISTW to cope with the further sewage from Hong Kong Island and with the projected future increases in sewage flows.

² The disinfection facility covered under **351DS** will be the portion other than the advance disinfection facilities being planned under another Category B item **352DS** (see paragraph 24 of the paper), and will provide disinfection to all the HATS treated effluent before being discharged into Victoria Harbour.

³ The associated investigations and surveys include ground investigations and laboratory testing, precondition surveys and traffic surveys.

7. To apply the polluter-pays principle to the provision of sewage services, the Sewage Services (Sewage Charge) (Amendment) Regulation 2007 was published in the Gazette on 23 March 2007 and tabled in Legislative Council on 28 March 2007. On 16 May 2007, the Regulation was passed with a Government amendment to commence the new Sewage Charge rate on 1 April 2008, which is nine months later than the original proposal. We now propose to initiate the next most urgent works package for HATS stage 2A, namely the planning and design of the remaining core works of this phase as described in paragraph 3 above. These design items need to be carried out in parallel with the design of the sewage conveyance system currently proceeding under item 238DS, such that the different components of the stage 2A works dovetail with one another in a timely fashion.

8. In addition, we need to carry out a programme of preliminary baseline monitoring of key water quality parameters of the waters in Victoria Harbour. The monitoring will mainly collect data from the harbour water and around the effluent outfall of the HATS system.

9. Due to inadequate in-house expertise, the Director of Drainage Services proposes to employ consultants to conduct the planning and design of the upgrading works of SCISTW and the PTWs, as well as the water quality monitoring.

FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the proposed works to be \$105.6 million in MOD prices (see paragraph 11 below), made up as follows –

	\$ million
(a) Consultants’ fees for planning and design of upgrading works of SCISTW and the PTWs	75.1
(i) Planning and design for the:	
(1) overall HATS stage 2A system in relation to the interfaces with the SCISTW and the eight PTWs	11.6
(2) expansion and upgrading of SCISTW	42.1
(3) expansion and upgrading of eight PTWs	13.9
	/(ii).....

	\$ million	
(ii) Preparation of tender documents and assessment of tenders	7.5	
(b) Surveys, investigations and testing works	14.0	
(c) Water quality monitoring	5.0	
(d) Contingencies	8.9	
Sub-total	103.0	(in September 2006 prices)
(e) Provision for price adjustment	2.6	
Total	105.6	(in MOD prices)

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

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

Year	\$ million (Sept 2006)	Price adjustment factor	\$ million (MOD)
2007 – 2008	6.5	0.99900	6.5
2008 – 2009	24.6	1.00649	24.8
2009 – 2010	30.7	1.01656	31.2
2010 – 2011	17.6	1.02672	18.1
2011 – 2012	7.9	1.03699	8.2
2012 – 2013	5.7	1.05514	6.0
2013 – 2014	4.5	1.07624	4.8

/2014 – 2015

Year	\$ million (Sept 2006)	Price adjustment factor	\$ million (MOD)
2014 – 2015	3.5	1.09777	3.8
2015 – 2016	2.0	1.11972	2.2
	103.0		105.6

12. We have derived the MOD estimates on the basis of Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2007 to 2016. We will tender two lump-sum consultancy agreements, one for the planning and design of the upgrading works of SCISTW and the PTWs and the other for the water quality monitoring, with provision for price adjustment as both agreements will exceed 12 months.

13. The proposed planning and design consultancy, investigations and surveys as well as the water quality monitoring work will not give rise to any recurrent expenditure.

PUBLIC CONSULTATION

14. Starting from June 2004, we have been consulting the Legislative Council, District Councils, key stakeholders and the general public on various occasions on the way forward for HATS stage 2. There is a general consensus that cleaning up Victoria Harbour has high importance and that the works for HATS stage 2A should be implemented as early as possible so that the target completion dates of 2009 for the advance disinfection and 2014 for the full stage 2A can be met.

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 2004 and 20 November 2004 by organising a series of in-depth technical briefings, discussion forums and public hearings with groups and individuals from a broad spectrum of the community. Most of the comments received on the issue (87% of those from the key stakeholders and 77% of those from individuals) indicated support for the timely

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implementation of HATS stage 2 in order to clean up the harbour. It is also clear from the comments received that the community attached high importance to cleaning up Victoria Harbour, most people supported centralised treatment and phased implementation, most people believed it was worth paying higher, but still reasonable, sewage charges to secure a cleaner harbour.

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 in taking action to further improve the water quality of Victoria Harbour. Some Members would like to be informed once further information was available on long-term arrangements for dealing with the sewage sludge and the results of the environmental impact assessment. From December 2006 to January 2007, we also consulted the Sham Shui Po, Kwai Tsing, Central and Western, Wan Chai, Eastern and Southern District Councils on the construction of tunnel conveyance system of HATS stage 2A. Members of the District Councils generally supported the Government's proposal and requested the Government to minimise disturbance to the nearby public during the implementation of the project.

Consultation with the Legislative Council Panel on Environmental Affairs

17. On a number of occasions in 2005 and 2007, we put forward proposals and reported progress of HATS stage 2 to the Legislative Council Panel on Environmental Affairs. Members had no objection to the implementation of HATS.

18. We consulted the Legislative Council Panel on Environmental Affairs on 28 May 2007 on the proposed works. Members raised no objection to our plan to submit the proposal to the Public Works Subcommittee (PWSC) but requested the Administration to provide, before the relevant PWSC meeting, supplementary information about, amongst other things, the scope and cost breakdown of the proposed planning and design consultancy. The requested information was provided in an information paper to the Panel issued on 6 June 2007, a copy of which is at Enclosure 3.

ENVIRONMENTAL IMPLICATIONS

19. While HATS stage 2A is a designated project under the EIA Ordinance, the proposed site investigation works itself is not a designated project under the Ordinance, and will not cause long-term environmental impact. We will

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control noise, dust and site run-off through the implementation of mitigation measures in the site investigations contracts, and we have included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts. The proposed site investigation works will only generate a very small amount of construction and demolition (C&D) materials. We will require the consultants to fully consider and propose measures for minimising the generation of C&D materials and for reusing/recycling C&D materials as much as possible in carrying out the site investigation works as well as in the future implementation of the construction projects.

LAND ACQUISITION

20. The project does not require any land resumption.

BACKGROUND INFORMATION

21. In 1989, the Sewage Strategy Study recommended the Strategic Sewage Disposal Scheme (renamed as HATS in 2001) 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. Under this scheme, the proposed works were divided into stages for implementation. To bring about early improvement in the water quality of Victoria Harbour, the proposed stage 1 works commenced in early 1995 and completed at the end of 2001. Under this stage, sewage from Kowloon and northeast Hong Kong Island was collected and conveyed to SCISTW for treatment.

22. 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 the experience with HATS stage 1 and developments in technology. The IRP presented its recommendations in its report released on 30 November 2000. The IRP also proposed options with different degrees of decentralisation for further assessment and consideration.

23. 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 all 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.

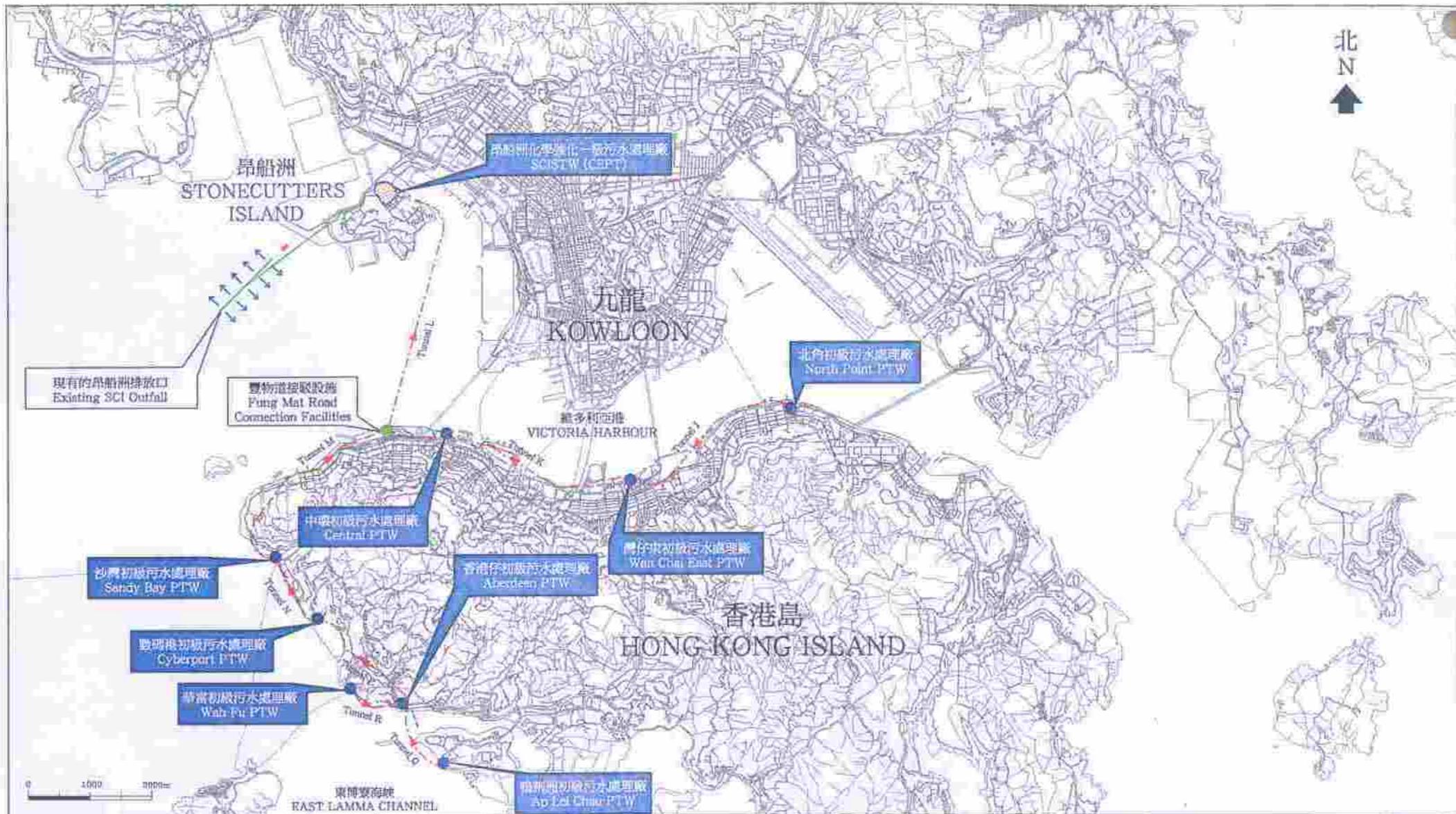
24. In 2005, we have included two items under block allocation **Subhead 4100DX** “Drainage works, studies and investigations for items in Category D of the Public Works Programme” at a total estimated cost of \$14.03 million in MOD prices for engaging consultants to undertake site investigations, surveys and an environmental impact assessment for the proposed disinfection facilities, including the advance facilities under a Category B item **352DS** “Harbour Area Treatment Scheme stage 2A – construction of advance disinfection facilities at Stonecutters Island sewage treatment works”, at SCISTW. The Category D items commenced in 2005 for completion by June 2007.

25. In December 2005, we upgraded **238DS** “Harbour Area Treatment Scheme stage 2A – environmental impact assessment, investigations, tunnel conveyance system design” to Category A at an estimated cost of \$166.5 million in MOD prices, for carrying out the environmental impact assessment study, site investigations and preliminary planning and design of the tunnel conveyance system for HATS stage 2A. The works under **238DS** commenced in January 2006 for completion in November 2009.

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

27. We estimate that the proposed works will create about 45 jobs (6 for labourers, 17 for professionals and another 22 for technical and ancillary staff) providing a total employment of 1 391 man-months.

Environment, Transport and Works Bureau
June 2007



圖則名稱 Drawing title

「淨化海港計劃」第二期甲 - 昂船洲污水處理廠及初級污水處理廠的擬議改善工程
 HARBOUR AREA TREATMENT SCHEME STAGE 2A -
 PROPOSED UPGRADING WORKS IN THE STONECUTTERS ISLAND AND
 THE PRELIMINARY TREATMENT WORKS

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C.W. CHAN

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比例 scale

AS SHOWN

核對 checked

MICHAEL LUNG

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淨化海港計劃部
HARBOUR AREA TREATMENT SCHEME DIVISION



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

351DS – Harbour Area Treatment Scheme, stage 2A – planning and design of the upgrading works of Stonecutters Island sewage treatment works and the preliminary treatment works

Breakdown of estimates for consultants' fees

Consultants' staff costs			Estimated man-month	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Planning and design	Professional	539	38	2.0	58.5
		Technical	252	14	2.0	9.1
(b)	Preparation of tender documents and assessment of tenders	Professional	58	38	2.0	6.3
		Technical	34	14	2.0	1.2
Total consultants' staff costs (Note 2)						75.1

* 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, as the staff will be employed in the consultant's offices. (As at 1 January 2007, MPS Point 38 = \$54,255 per month and MPS Point 14 = \$18,010 per month.)
2. We will only know the actual man-months and actual fees when we have selected the consultants through the usual competitive fee bid system.

For information

NOTE FOR LEGISLATIVE COUNCIL PANEL ON ENVIRONMENTAL AFFAIRS

Supplementary information on 351DS - Harbour Area Treatment Scheme, stage 2A – planning and design of the upgrading works of Stonecutters Island sewage treatment works and the preliminary treatment works

INTRODUCTION

In considering the paper referenced CB(1) 1666/06-07(16) on the above project on 28 May 2007, the Legislative Council Panel on Environmental Affairs requested the Administration to provide, before the relevant Public Works Subcommittee meeting, supplementary information on –

- (a) the breakdown of the project costs and consultancy costs;
- (b) the scope of work of the consultancy;
- (c) whether there is any overlapping of the proposed consultancy with the on-going Environmental Impact Assessment consultancies; and
- (d) the reasons for using a single consultancy.

THE ADMINISTRATION'S RESPONSE

Breakdown of the project costs and consultancy costs

2. The breakdown of the project costs including the consultancy costs is as follows–

	<u>Estimated Costs</u> (\$ million)		
	Breakdown	Sub-total	Item Total
(a) Consultants' fees for planning and design of upgrading works of Stonecutters Island Sewage Treatment Works (SCISTW) and the preliminary treatment works (PTWs)			75.1

	<u>Estimated Costs</u> (\$ million)		
	Breakdown	Sub-total	Item Total
(i) Planning and design for the: <ul style="list-style-type: none"> ● overall HATS stage 2A system in relation to the interfaces with the SCISTW and the eight PTWs ● expansion and upgrading of SCISTW ● expansion and upgrading of eight PTWs 	11.6	67.6	
(ii) Preparation of tender documents and assessment of tenders		7.5	
(b) Surveys, investigations and testing works			14.0
(c) Water quality monitoring			5.0
(d) Contingencies			8.9
Sub-total			103.0 (in September 2006 prices)
(e) Provision for price adjustment			2.6
Total			105.6 (in MOD prices)

Scope of work of the consultancy

3. Given the scale and complexity of the HATS stage 2A, the planning and design of the expansion and upgrading works at SCISTW and the eight PTWs is a very substantial task involving a lot of specialist input from many disciplines. The facilities to be expanded or upgraded are large-scale and located on highly congested and constrained sites with substantial interfaces with the existing facilities and other works to be carried out at the same time. It is essential, therefore,

that the planning and design be carried out in a fully integrated manner. It is important also that appropriate construction sequences should be carefully mapped out with due attention to interfaces with the plant operation, so as to minimise disturbance. The scope of the proposed consultancy under this project item comprises–

- (a) Planning and design for the overall HATS stage 2A system in relation to the interfaces with the SCISTW and the eight PTWs
 - coordination of the planning and design for the whole stage 2A system, and management of interfaces with the SCISTW and the eight PTWs;
 - determination of the sewage characteristics;
 - updating of the projected sewage flows and pollution loads;
 - review of the overall system hydraulic design, and determination of the need for intermediate sewage conveyance pumping stations at the PTWs; and
 - review and design of the overall remote operation control and data acquisition system.

- (b) Planning and design for the expansion and upgrading of SCISTW
 - design of the new influent pumping station;
 - review of the latest chemically-enhanced primary treatment (CEPT) technologies, evaluation and investigation of their applicability and design of the CEPT facilities;
 - design of the sludge dewatering and handling facilities;
 - review of the design of the advance disinfection facilities, and design of the disinfection facilities to be added; and
 - design of the effluent conveyance tunnel.

- (c) Planning and design for the expansion and upgrading of eight PTWs
 - design of the expansion and upgrading works of eight PTWs; and
 - design of the intermediate sewage conveyance pumping stations at PTWs if needed.

- (d) Preparation of tender documents and assessment of tenders.

4. In conjunction with the planning and design tasks highlighted above, the consultants will also have to design the necessary environmental control and mitigation facilities as well as the operational control and data acquisition system for all the individual facilities at SCISTW and the PTWs. They will also need to update the cost estimates as the designs develop, recommend the most appropriate contract strategy and carry out prequalification exercises to shortlist tenderers for major contracts before proceeding with tendering.

Whether there is any overlapping of the proposed consultancy with the on-going Environmental Impact Assessment consultancies

5. The scope of HATS stage 2A, costing an estimated \$8 billion, comprises:
- (a) extension of the sewage conveyance system to cover the remaining parts of Hong Kong Island;
 - (b) expansion of the existing treatment capacity and provision of disinfection facilities at SCISTW; and
 - (c) upgrading of the eight associated PTWs on Hong Kong Island.
6. To implement HATS stage 2A, three separate consultancies have been commissioned for:
- (a) the EIA study of the proposed advance disinfection facilities at SCISTW;
 - (b) the EIA study covering the whole HATS stage 2A; and
 - (c) the planning and design of the sewage conveyance system, (i.e. for item 5(a) above).

7. The consultancy for 6(a) above is being conducted by means of a Category D item under block allocation **Subhead 4100DX** at a cost of about \$4 million in MOD prices. The consultancy commenced in July 2005 and the EIA study report for the proposed advance disinfection facilities was completed in June 2007. As for the consultancies for 6(b) and (c), they are being carried out under a Category A item **238DS**, and their costs are about \$5 million and \$51 million respectively in MOD prices. The consultancies started in February and January 2006 respectively. The EIA study report for HATS stage 2A is expected to be produced by December 2007, and the planning and design of the sewage conveyance system is scheduled for completion in November 2009.

8. The proposed consultancy under **351DS** comprises the remaining planning and design work to cover the works described in items 5(b) and (c) above.

The four consultancies for HATS stage 2A thus cover different packages of study, planning and design work. There is no overlap between the consultancy proposed under **351DS** and the other on-going consultancies, including the EIA studies. The proposed consultancy under **351DS** will allow scope to take into account the findings of the EIA on the advance disinfection facilities.

Reasons for using a single consultancy

9. As mentioned in paragraphs 6 and 8 above, four separate consultancies have been carefully planned for the implementation of HATS stage 2A, with due consideration to the timing, nature of works involved and expertise required to deliver the services. While these consultancies have different commencement dates, they all have the same aim of achieving the target completion date of the HATS stage 2A by 2014.

10. **351DS** will cover the remaining core planning and design work under HATS stage 2A, namely that for the expansion and upgrading works of the SCISTW and the eight PTWs. This involves extensive system-wide planning and design issues to ensure that the upgraded SCISTW and the eight PTWs will be commissioned on time and will interface seamlessly with the other existing facilities under HATS stage 2A, including the sewage conveyance system being planned. All these are critical in achieving integrated and effective operation of the HATS system. In the light of the substantial complex interfacing requirements, the most efficient arrangement is to group all the planning and design work for upgrading the SCISTW and the eight PTWs under a single consultancy. This will facilitate the timely commissioning of HATS stage 2A, as will our well-established procedures for ensuring that the most suitable firm will be selected for the consultancy, and its work and recommendations closely scrutinised.

Environmental Protection Department
June 2007