For discussion
On 2 January 2001

Legislative Council
Panel on Environmental Affairs

Stonecutters Island sewage treatment works - pumping stations, buildings and site development

Purpose

This paper seeks Members' views on the Administration's proposal to seek Public Works Subcommittee's approval on 14 February 2001 to increase the approved project estimate (APE) for Public Works Project Item 308DS, namely "Stonecutters Island sewage treatment works - pumping stations, buildings and site development" from $97.3 million by $60.0 million to $157.3 million in money-of-the-day (MOD) prices.

Background

2. A sewage treatment works has been built at Stonecutters Island to treat sewage collected from urban Kowloon, Tsing Yi, Kwai Chung, Tseung Kwan O and northeast Hong Kong Island. The treatment works has been operating since May 1997 to treat sewage from Northwest Kowloon. Sewage from the other areas will be brought to the plant on completion of the six deep tunnels being built under Project Works Project items 286DS and 320DS.

3. The project 308DS comprises construction of the following facilities at the Stonecutters Island Sewage Treatment Works (SCISTW) -

(a) Pumping Stations

These include the Stonecutters Island Main Pumping Station (SCIMPS) and the North West Kowloon Pumping Station (NWKPS). Both pumping stations are located within the Stonecutters Island Sewage Treatment Works (SCISTW). The SCIMPS will lift sewage from the sewer tunnel system to the

sedimentation tanks at SCISTW whilst the NWKPS will lift sewage from the existing North West Kowloon Preliminary Treatment Works to the sedimentation tanks.

(b) Buildings

These include the Administration Building, the Switchgear Building, four minor buildings for electrical equipment and a gatehouse at the SCISTW.

(c) Site Development

This includes the process pipelines, culverts, chambers and service ducts required for various treatment units at SCISTW. It also includes roads and walkways, water supply mains, foul sewers and storm drains, telephone system, site lighting, landscaping and other ancillary site facilities.

A layout plan of the project is at Annex A.

4. 308DS was originally funded by the Sewage Services Trading Fund (SSTF) with an APE of $386.0 million in MOD prices. As preparation was made to wind up the SSTF, we estimated that $288.7 million would have been spent up to 31 March 1998. On the basis of this estimate, Finance Committee approved the creation and direct inclusion of 308DS "Strategic Sewage Disposal Scheme Stage I : Stonecutters Island sewage treatment works - pumping stations, buildings and site development" in Category A under the Capital Works Reserve Fund (CWRF) with an APE of $97.3[1] million on 27 February 1998 for completion of the remaining works upon closure of the SSTF.

5. We have substantially completed the works under 308DS.

[1] The approved project estimate of 308DS ($97.3 million) was established on the basis of our estimated cumulative expenditure under SSTF of $288.7 million up to 31 March 1998, leaving an outstanding commitment of $97.3 million to be funded under the CWRF.

Justification for the Additional Funding

6. Construction of the works for this project started in April 1995 and was originally scheduled for completion in May 1997. During the course of construction, progress was affected by -

(a) changes arising from the recommendations of the International Review Panel in 1995;

(b) forfeiture of the tunnel contracts; and

(c) interface with an electrical and mechanical (E&M) contract with respect to the construction of the main pumping station at Stonecutters Island.

Changes arising from the recommendations of the International Review Panel in 1995

7. In July 1994, Government commissioned an International Review Panel (IRP) to undertake a review of the proposed options for the further stages of SSDS including the treatment process at SCISTW to be built under Stage I. Originally, a chemically enhanced primary treatment process involving the addition of lime was adopted for SCISTW. In April 1995, the IRP recommended, among other things, that ferric chloride should be used instead of lime in the treatment process. The recommended process was more environmentally friendly and economical as it would reduce the number of sedimentation tanks required, the quantities of chemical to be dosed and the volume of sludge produced.

8. To implement the IRP's recommendations, we had to revise the design of the Stage I works including the sedimentation tanks, chemical dosing equipment, sludge treatment and disposal facilities. This also led to some modifications to the design of site development works under 308DS. Preparation works had already started on these. Although the changes and modifications did not result in any delay to the general completion of 308DS, there was considerable disruption to the contractor's planned activities, requiring re-sequencing of works and provision of additional resources by the

contractor. As the contractor was not responsible for these changes, the additional costs associated with the disruption of the works has to be borne by Government.

Forfeiture of the tunnel contracts

9. The construction of the sewage tunnel transfer system was originally included in two works contracts covering the eastern and western tunnels. Both contracts were awarded to the same contractor in January 1995. The tunnel contractor unilaterally suspended the works and the two tunnel contracts were eventually forfeited in December 1996.

10. The unfinished works left behind by the forfeited contractor included the interfacing works with 308DS at the adit to the SCIMPS, which had to be completed before the subsequent works for SCIMPS under 308DS could proceed and complete. To minimize the delay to the works of 308DS, we instructed the contractor of 308DS to carry out the said interfacing works which were critical to the completion of the project. In addition, as the rock surfaces exposed at the adit were left unprotected by the forfeited tunnel contractor and had become unstable with time, we instructed the tunnel maintenance contractor to complete the protective lining works as well. These works delayed the completion of the SCIMPS under 308DS by nine months. As the contractor for 308DS was not responsible for the delay, the prolongation costs have to be borne by Government under the terms of the contract.

11. We are currently pursuing a claim for losses arising from re-entry of the two tunnel contracts through arbitration.

Interface with an E&M contract with respect to the construction of the main pumping station at Stonecutters Island

12. The construction of the SCIMPS, which were critical to the completion of 308DS, involved two separate contracts – one civil works contract under 308DS and one E&M works contract for the supply and installation of the E&M equipment funded by 307DS. There were a lot of

interfacing works between these two contracts involving provision of details, access and works sequence. During construction of the SCIMPS, the E&M contractor had, on various occasions, caused material delays to the civil works contract. In particular, the civil works in the wet well of the SCIMPS were affected by the installation and testing of the penstocks[2] by the E&M contractor. The E&M contract caused a total delay of 15 months to the civil works.

13. Since the contractor for 308DS was not responsible for the knock-on delays caused by the interfacing E&M contract, the cost arising from the longer construction period have to be borne by the Government. Government is now seeking liquidated damages from the responsible contractor as provided for under the E&M contract.

Overall

14. As a result of these various problems, final completion of the project was delayed until May 1999. In respect of the disruption of the progress of works and the prolongation of the construction period, we have received claims for additional payments from the contractor. The Consulting Engineer is finalizing his assessment of these claims and is expected to certify payment on some of these claims soon. On the other hand, as the actual ground conditions of the building sites were better than expected, there were savings of $9.5 million in the buildings foundation works which have been used for covering some of the additional costs mentioned in the preceding paragraphs.

15. The approved project estimate remaining under Item 308DS is now at a low level and the increase in approved project estimate is required. If extra funding is not available, we will not be able to settle payments for claims as they are certified by the Engineer. This would lead to claims from the contractor against Government for breach of contract.

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[2] A penstock is a mechanical device which is commonly used for isolating or regulating flow in a channel or a chamber for operation and maintenance purposes.

Additional Information

16. In view of the size and complexity of the civil, electrical and mechanical works involved, the SSDS Stage I works was implemented under 15 construction contracts comprising four advance works contracts and 11 main works contracts. One of these contracts covers the works under 308DS. These contracts commenced in stages in 1994 and 1995 respectively.

17. The construction of the sewage tunnel transfer system was included in two of the 11 main works contracts. Owing to the unilateral suspension of works in all six sewage tunnels by the former contractor, the two tunnel contracts were forfeited in December 1996. Subsequently, the tunnel completion works were re-let in three separate contracts (two tunnels in each contract) in July 1997 and January 1998.

18. Excavation work on all the SSDS Stage I tunnels has been completed and the permanent tunnel lining works are in steady progress. Based on current progress, we forecast that the full SSDS Stage I will be commissioned in stages in the second half of 2001.

19. In April 2000, an 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 Stage I of SSDS and developments in technology. The IRP was also asked to give early advice as to whether its likely recommendations might have any bearing on the works underway on Stage I. As far as Stage I works are concerned, the IRP advised that Stage I should be completed as soon as possible. It also commented that the SCISTW is the world's most efficient Chemical Enhanced Primary Treatment plant and has full confidence that this plant will be capable of successfully treating the full Stage I flow. The IRP also recommended that the Stage I tunnel works should be completed.

Financial Implications

20. Following a review of the financial position of the project, we consider it necessary to increase the approved project estimate of 308DS from $97.3 million by $60 million to $157.3 million in MOD prices in order to

provide the necessary funding for the finalization of the project and for payment of claims. The proposed increase of $60.0 million represents an increase of about 15.5% over the original estimated cost of $386.0 million for this project. A summary of the proposed increase of $60.0 million is at Annex B.

21. A comparison of the cost breakdown of the approved project estimate and the revised project estimate is at Annex C.

22. 308DS is one of the 19 projects making up the SSDS Stage I programme that were transferred to the CWRF in April 1998 after closure of the Sewage Services Trading Fund (SSTF). If the proposed increase in the APE for 308DS is approved, the overall estimate for the completion of SSDS Stage I is forecast to be $8,298.6 million, which is $140.1 million less than the overall APE for the Stage I programme of $8,438.7 million (having taken into account the Finance Committee's approval for increasing the APE for 320DS by $115.0 million on 15 December 2000). This is due to savings of $200.1 million in the estimated costs of 12 projects under the SSDS Stage I programme. Details of the latest project estimates of the 19 items, taking into account the proposed increase in the APE for 308DS, are shown at Annex D.

23. Up to end of November 2000, the total expenditure on SSDS Stage I was $7.0 billion.

24. The proposed increase in the approved project estimate will not give rise to additional recurrent expenditure.

Public Consultation

25. The five then District Boards affected by the SSDS project were consulted in 1994. They supported the project. We have also kept the Legislative Council and its Panel on Planning, Lands and Works and Panel on Environmental Affairs updated on the progress of the project.

Environmental Implications

26. The proposed increase in the approved project estimate does not have any environmental implications.

Advice Sought

27. Subject to the views of Members, our proposal to increase the approved project estimate of 308DS will be submitted to the Public Works Subcommittee for consideration on 14 February 2001 with a view to seeking the funding approval of Finance Committee on 9 March 2001.

Environment and Food Bureau
December 2000

Annex B

A breakdown of the proposed increase in the approved project estimate of 308DS – "Strategic Sewage Disposal Scheme Stage I: Stonecutters Island Sewage Treatment Works - pumping stations, buildings and site development"

Item	Increase/(Decrease) *in MOD prices* ($ million)		%
Cost arising from the recommendations of 1995 International Review Panel	17.9		29.8
i) modification works	9.2		
ii) disruption cost	8.7		
Prolongation cost arising from the forfeited tunnel contracts	16.1		26.8
Prolongation cost for delays caused by an E&M interfacing contract	25.5		42.5
Reduction in cost for completion of buildings works	(9.5)		(15.8)
Contingency	10.0		16.7
Total	60.0	in MOD prices	100.0

Annex C

Comparison of the cost breakdown of the approved project estimate (APE) and the revised project estimate for 308DS – "Strategic Sewage Disposal Scheme Stage I: Stonecutters Island Sewage Treatment Works - pumping stations, buildings and site development"

Taking into account the actual expenditure of $299.8 million under the SSTF, the total approved funds and latest project estimate for **308DS** in MOD prices are $397.1 million and $457.1 million respectively. A comparison of the APE and the revised project estimate is as follows -

	Approved Estimate (MOD) $ million	**Revised Estimate (MOD) $ million**	**Difference $ million**
(a) Pumping stations	23.2 [154.2]	64.8 [195.8]	41.6
(b) Buildings	44.5 [128.0]	35.0 [118.5]	(9.5)
(c) Site development	14.6 [99.9]	32.5 [117.8]	17.9
(d) Contingencies	15.0 [15.0]	25.0 [25.0]	10.0
Total	97.3 [397.1]	157.3 [457.1]	60.0

[ ] - Total estimate including expenditure already incurred under the SSTF

2. On pumping stations, the total increase of $41.6 million is broken down as follows -

(a) $16.1 million is for the prolongation cost arising from delays caused by the forfeited tunnel contract; and

(b) $25.5 million is for the prolongation cost arising from delays caused by the E&M contract with respect to the construction of the SCIMPS.

3. On buildings, a sum of $9.5 million previously allowed for the buildings foundation works is no longer required and has been utilised to offset

the additional cost for the site development.

4. On site development, the total increase of $17.9 million is broken down as follows -

(a) $8.7 million is for the disruption cost arising from the IRP's recommendations in 1995; and

(b) $9.2 million is for modification works required for the process pipelines, roadworks and water supply system arising from the IRP's recommendations.

5. On contingencies, we retain $25.0 million to cover possible requirements for settlement of the final account of the completed contract and for resolution of claims from the contractor.

Annex D

Latest project estimate for the Strategic Sewage Disposal Scheme Stage I

PWP Item No.	Title	APE under CWRF (1) ($ million)	Expenditure under SSTF (2) ($ million)	Total Approved Funds (1)+(2) ($ million)	Latest Project Estimate ($ million)
142DS	Strategic Sewage Disposal Scheme Stage I : Kowloon System - consultants' fees and investigations	130.0	-	130.0	105.0
286DS	Strategic Sewage Disposal Scheme Stage I : completion of sewage tunnel system from Chai Wan and Tseung Kwan O to Kwun Tong and from Kwun Tong to Stonecutters Island	2,000.0	-	2,000.0	2,000.0
287DS	Strategic Sewage Disposal Scheme Stage I : principal collection and treatment system - advance works	31.1	531.3	562.4	555.8
288DS	Strategic Sewage Disposal Scheme Stage I : chemical dosing facilities	39.2	104.1	143.3	132.8
304DS	Strategic Sewage Disposal Scheme Stage I : sewer tunnel system from Chai Wan and Tseung Kwan O to Kwun Tong	36.3	306.1	342.4	306.4
305DS	Strategic Sewage Disposal Scheme Stage I : Stonecutters Island sewage treatment works - sludge treatment facilities	43.7	231.3	275.0	262.0

PWP Item No.	Title	APE under CWRF (1) ($ million)	Expenditure under SSTF (2) ($ million)	Total Approved Funds (1)+(2) ($ million)	Latest Project Estimate ($ million)
306DS	Strategic Sewage Disposal Scheme Stage I : Stonecutters Island sewage treatment works - sedimentation tanks (civil works)	24.5	347.6	372.1	365.1
307DS	Strategic Sewage Disposal Scheme Stage I : pumping stations E&M equipment	214.3	223.1	437.4	424.0
308DS	Strategic Sewage Disposal Scheme Stage I : Stonecutters Island sewage treatment works - pumping stations, buildings and site development	97.3	299.8	397.1	457.1 (Note 5)
309DS	Strategic Sewage Disposal Scheme Stage I : upgrading existing preliminary treatment works	234.1	607.6	841.7	812.8
310DS	Strategic Sewage Disposal Scheme Stage I : sedimentation tanks E&M equipment	125.1	276.4	401.5	392.0
311DS	Strategic Sewage Disposal Scheme Stage I : sewer tunnel system from Kwun Tong and Kwai Chung to Stonecutters Island	39.4	389.7	429.1	390.0
312DS	Strategic Sewage Disposal Scheme Stage I : construction supervision of the main works	217.0 (Note 1)	502.0	719.0	719.0
315DS	Strategic Sewage Disposal Scheme Stage I outfall	117.6	445.1	562.7	560.0

PWP Item No.	Title	APE under CWRF (1) ($ million)	Expenditure under SSTF (2) ($ million)	Total Approved Funds (1)+(2) ($ million)	Latest Project Estimate ($ million)
316DS	Strategic Sewage Disposal Scheme Stage I : construction of sludge transfer facilities and supply of sludge containers	23.7	28.7	52.4	46.0
A09DS	Strategic Sewage Disposal Scheme Stage I : pilot plant study on chemical dosing and disinfection	2.0	11.5	13.5	11.5
317DS	Strategic Sewage Disposal Scheme Stage I : baseline monitoring and performance verification	27.0	9.8	36.8	36.8
318DS	Strategic Sewage Disposal Scheme Stage I : environmental impact assessment study	24.9 (Note 2)	43.4	68.3	68.3
320DS	Strategic Sewage Disposal Scheme Stage I : completion of sewer tunnel system from Kwai Chung to Stonecutters Island	602.6	51.4	654.0	654.0 (Note 3)
	Total	**4,029.8**	**4,408.9**	**8,438.7** (Note 4)	**8,298.6**

Notes

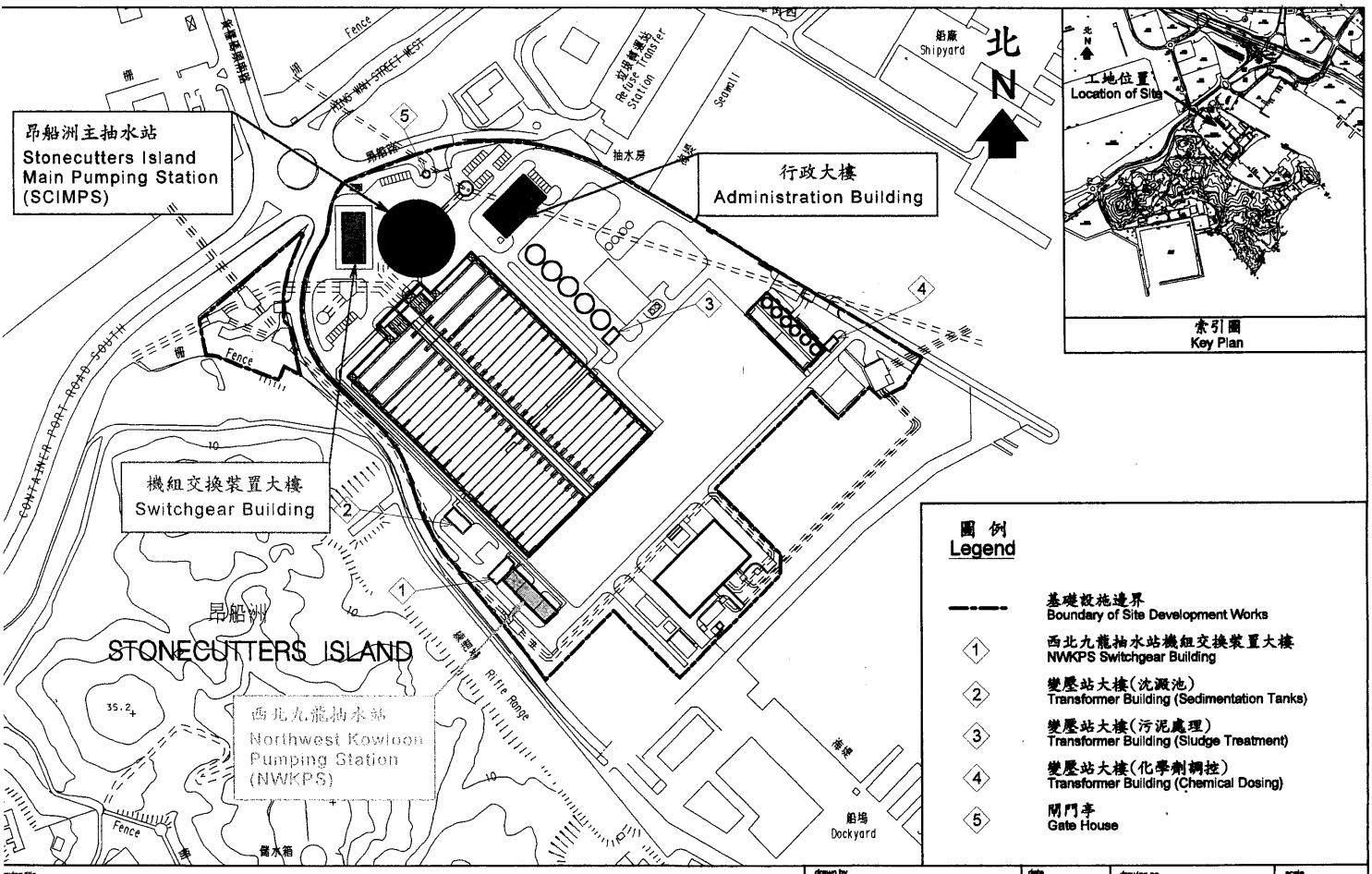
1. The original APE for **312DS** was $118.2 million by the time of closure of the SSTF in March 1998. On 25 June 1999, the Finance Committee raised this by $98.8 million, from $118.2 million to $217.0 million.

2. The original APE for **318DS** was $11.3 million by the time of closure of the SSTF in March 1998. On 20 August 1998, Secretary for the Treasury raised this by $13.6 million, from $11.3 million to $24.9 million.

3. The original APE for **320DS** was $487.6 million by the time of closure of the SSTF in March 1998. On 15 December 2000, the Finance Committee raised this from $487.6 million by $115.0 million to $602.6 million.

4. The original overall estimate for the 19 projects was $8,211.3 million by the time of closure of the SSTF in March 1998. As a result of the increases in the APE of **312DS, 318DS and 320DS** the overall APE for SSDS Stage I has increased from $8,211.3 million by $227.4 million to $8,438.7 million.

5. We are seeking approval under this submission to increase the APE of **308DS** from $97.3 million by $60.0 million to $157.3 million.



drawing title

策略性污水排放計劃-第一期工程昂船洲抽水站及相關建築物和基礎設施工程

SSDS STAGE I STONECUTTERS ISLAND STW PUMPING STATIONS, BUILDINGS AND SITE DEVELOPMENT

drawn by C.W. CHAN	date 14 - 12 - 2000	drawing no. DSS/2000/009	scale N.T.S.
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office 策略性污水排放計劃部 SSDS DIVISION		香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	

Annex A 附件 A