For discussion **PWSC(2000-01)61**
on 8 November 2000

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE
Environmental Protection - Sewerage and sewage treatment
320DS - Strategic Sewage Disposal Scheme Stage I : completion of sewer tunnel system from Kwai Chung to Stonecutters Island

Members are invited to recommend to Finance Committee an increase in the approved project estimate of **320DS** from $487.6 million by $115.0 million to $602.6 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) for **320DS** is insufficient to cover the cost of remaining works under the project. Additional funding is needed by December 2000 to continue and complete the works.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment and Food, proposes to increase the APE for **320DS** from $487.6 million by $115.0 million to $602.6 million in money-of-the-day (MOD) prices. The additional funding is required -

(a) to enable the shaft works at Stonecutters Island and other ancillary site works under Stage I of the Strategic Sewage Disposal Scheme (SSDS) to be completed;

(b) to replenish the contingency provision for **320DS** which has been consumed in dealing with the faulty mucking system and exceptionally poor ground conditions; and

(c) to cover the additional cost of undertaking tunnel lining works and ancillary works in Tunnel F.

PROJECT SCOPE AND NATURE

3. **320DS** covers the completion of two western sewage tunnels, i.e. Tunnels F and G, under SSDS Stage I. More specifically, the scope of works approved by Finance Committee on 27 February 1998 includes -

(a) completion of a 3.6 kilometre-long sewer tunnel from Tsing Yi to Stonecutters Island (Tunnel F), 0.5 kilometre of which had already been excavated by the previous contractor for Contract DC/93/14;

(b) completion of a 0.8 kilometre-long sewer tunnel from Kwai Chung to Tsing Yi (Tunnel G), 0.1 kilometre of which had already been excavated by the previous contractor for Contract DC/93/14; and

(c) completion of shafts and ancillary site works including -

(i) works for the drop shaft at Kwai Chung Preliminary Treatment Works;

(ii) finishing works for the production/riser shaft at Stonecutters Island and the production/drop shaft at Tsing Yi built under separate advance works contracts; and

(iii) ancillary site works at the above sites.

A plan showing the location of the two tunnels is at Enclosure 1.

4. **320DS** is one of 19 projects making up the SSDS Stage I programme that were transferred to the Capital Works Reserve Fund in April 1998 after closure of the Sewage Services Trading Fund. The overall approved project estimate for the Stage I programme is $8,323.7 million (including $4,408.9 million spent during the existence of the Sewage Services Trading

Fund).

5. Tunnels F and G under **320DS** are designed to collect sewage from the Tsuen Wan, Kwai Chung and Tsing Yi areas. This area produces 25% of the sewage to be treated under SSDS Stage I.

6. The original contract for constructing Tunnels F and G and associated works was let at the end of 1994. The contractor unilaterally suspended work in mid 1996 after excavating 0.5 kilometres of Tunnel F and 0.1 kilometres of Tunnel G. Government re-entered the sites in December 1996. Works for the western tunnels were subsequently re-tendered. The completion contract began in July 1997 with an original contract completion date of August 1999.

7. Excavation works for Tunnels F and G were completed in November 2000 and January 1999 respectively. The tunnel lining works for Tunnel G were completed in June 2000. We expect all the works covered under **320DS** to be substantially completed in the last quarter of 2001.

JUSTIFICATION

Problems encountered

8. The progress of the tunnelling works under the completion contract encountered significant delays due to:

(a) replacement of a faulty mucking system (used for removing spoil excavated from tunnels) in 1998; and

(b) additional ground strengthening and stabilization works required to deal with the exceptionally poor ground conditions encountered.

As a result, completion of Tunnels F and G is expected to be delayed by about 26 months. Details are given in Enclosure 2.

Funding still required

9. The uncommitted funds under **320DS** will be reduced to about $8 million by this December. Following a review of the financial position, we consider it necessary to increase the APE for **320DS** from $487.6 million by $115.0 million to $602.6 million in MOD prices. The detailed justifications are set out in Enclosure 3.

10. A summary of the disbursement of the proposed increase of $115.0 million is as follows -

Factor		Increase/ (Decrease) in MOD prices ($ million)		%
(a)	Cost for replacement of defective mucking system	45.0		39.1
	(i) Direct cost	25.0		
	(ii) Prolongation cost	20.0		
(b)	Cost for additional works (including the ground strengthening and stabilisation works for weak grounds) in Tunnel F	59.0		51.3
	(i) Direct cost	27.0		
	(ii) Prolongation cost	32.0		
(c)	Cost for additional works to deal with weak grounds (including the tunnel lining and ancillary works) incidental to remaining works of Tunnel F	44.0		38.3
(d)	Reduction in cost for completion of Kwai Chung/ Stonecutters Island shaft, ancillary site works and Tunnel G due to better-than-expected ground conditions	(44.0)		(38.3)
(e)	Contingencies	11.0		9.6
	Total	115.0	in MOD prices	100.0

A comparison of the cost breakdown of the approved project estimate and the revised project estimate is at Enclosure 4.

Consequences if increase in APE is not approved

11. The APE remaining under **320DS** is now at a low level and the proposed increase in APE is urgently required. If extra funding is not available by mid December, we will not be able to settle payments for claims as they are certified by the Consulting Engineer. We will also not be able to proceed with the necessary additional works to complete the lining of Tunnel F. As a result, we would have to abandon the works under **320DS**. This would lead to claims from the contractor against Government for breach of contract.

12. One of the remaining works under **320DS** is to complete the riser shaft at the Stonecutters Island Sewage Treatment Works (SCISTW), which will serve the four eastern tunnels under SSDS as well as the two western tunnels. If works were abandoned under **320DS,** sewage from the entire catchment of the six tunnels would not be treated even when the eastern tunnels were completed. The SCISTW, which have been completed, would then continue to treat sewage generated in the West Kowloon area only. As this represents only 25% of the sewage in the SSDS Stage I catchment area, 75% of SCISTW will be under-utilised.

FINANCIAL IMPLICATIONS

320DS

13. Subject to approval, we will phase the expenditure as follows -

Year	$ million (Sept 2000)	Price adjustment factor	$ million (MOD)
Up to 31 March 2000	258.0	-	258.0
2000 - 2001	120.0	1.00000	120.0
2001 - 2002	102.4	1.02550	105.0
2002 - 2003	89.9	1.05627	95.0
2003 - 2004	22.6	1.08795	24.6
	592.9		602.6

14. We have derived the MOD estimates on the basis of the Government's latest forecasts of trend labour and construction prices for the period 2000 to 2004.

15. The proposed increase in the APE will not give rise to additional recurrent expenditure.

SSDS Stage I

16. Up to end September 2000, the total expenditure on SSDS Stage I was $6.8 billion.

17. If the proposed increase in the APE for **320DS** is approved, the overall estimate for the completion of SSDS Stage I is forecast to be $8,252.0 million, which is $72 million less than the overall APE. This is due to savings of $187 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 **320DS**, are shown at Enclosure 5.

PUBLIC CONSULTATION

18. 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.

19. The LegCo Panel on Environmental Affairs discussed our current proposal on 25 October and 1 November 2000. Members had no objection to the Administration submitting this proposal to the Public Works Subcommittee and Finance Committee for consideration on 8 November and 1 December 2000 respectively.

ENVIRONMENTAL IMPLICATIONS

20. The proposed increase in APE does not have any environmental implications.

LAND ACQUISTION

21. The proposed increase in APE does not require any land acquisition.

BACKGROUND INFORMATION

SSDS Stage I

22. SSDS is an overall sewage collection, treatment and disposal strategy for areas on both sides of Victoria Harbour. There are altogether seven deep tunnels which have a total length of 25.3 km under SSDS Stage I. A location plan of the SSDS Stage I sewage tunnel system is at Enclosure 6. The interim outfall tunnel, which is 1.7 km in length and about 100 m below the harbour, has already been completed and is now in operation. The other six sewage collection tunnels comprise two western tunnels from Tsing Yi to Stonecutters Island and from Kwai Chung to Tsing Yi (i.e. Tunnels F and G) and four eastern tunnels from Chai Wan to Kwun Tong, from Tseung Kwan O to Kwun Tong, from Kwun Tong to To Kwa Wan, and from To Kwa Wan to Stonecutters Island (i.e. Tunnels AB, C, D and E). The depths of these tunnels are up to 150m below ground surface.

23. Works for the six sewage collection tunnels were originally grouped under two contracts and scheduled for completion in mid 1997. The two contracts were awarded to the same contractor in end 1994. In mid 1996, the contractor unilaterally suspended works in all six tunnels, claiming impossibility in complying with the contract specification. This finally led to the forfeiture of the two contracts in December 1996 and re-tendering of the works.

24. In February and June 1997, we re-tendered the works under three separate completion contracts. The completion contract for the two western tunnels (i.e. Tunnels F and G) commenced in July 1997 and the other two completion contracts for the four eastern tunnels (i.e. Tunnels AB, C, D and E) commenced in January 1998.

25. As at 1 November 2000, excavation work on three of the four eastern tunnels (Tunnels AB, C, D and E) had been completed. Tunnel E, which connects the other three from To Kwa Wan to the SCISTW was 98.8% excavated. It is expected to be fully excavated within the next few weeks. Details on the latest progress of the excavation works for each of the six sewage collection tunnels are tabulated as follows -

Tunnel	Total Length	Length excavated by previous contractor before forfeiture		Length excavated by new contractors up to 1.Nov.00		Total length excavated up to 1.Nov.00	
	(m)	(m)	(%)	(m)	(%)	(m)	(%)
AB : Chai Wan to Kwun Tong	4,830	625	12.9%	4,205.0	87.1%	4,830.0	100%
C : Tseung Kwan O to Kwun Tong	5,332	188	3.5%	5,144.0	96.5%	5,332.0	100%
D : Kwun Tong to To Kwa Wan	3,572	283	7.9%	3,289.0	92.1%	3,572.0	100%
E : To Kwa Wan to Stonecutters Island	5,495	123.6	2.2%	5,308.4	96.6%	5,432.0	98.8%
F : Tsing Yi to Stonecutters Island	3,580	481.2	13.4%	3,098.8	86.6%	3,580.0	100%
G : Kwai Chung to Tsing Yi	779	112.5	14.4%	666.5	85.6%	779.0	100%
Total length in metres	23,588	1,813.3	7.7%	21,711.7	92.0%	23,525.0	99.7%

26. Apart from excavation works, we have already completed the permanent tunnel linings for Tunnels D and G. The works for permanent lining of Tunnel AB will commence shortly while those for Tunnel C are in steady progress. Based on current progress, we forecast that the full SSDS Stage I will be commissioned in stages within the last two quarters of 2001.

Review

27. 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 Stage I of SSDS and developments in technology. The Panel was also asked to give early advice as to whether its likely recommendations might have any bearing on the works underway on Stage I. In September, the Panel advised that, having obtained information on tunnel progress and geological conditions, it was satisfied that the works could be completed and would not be affected by recommendations it was likely to make on future development. A copy of the IRP's letter is at Enclosure 7. [Note: We expect the IRP to present its full recommendations at the end of November.]

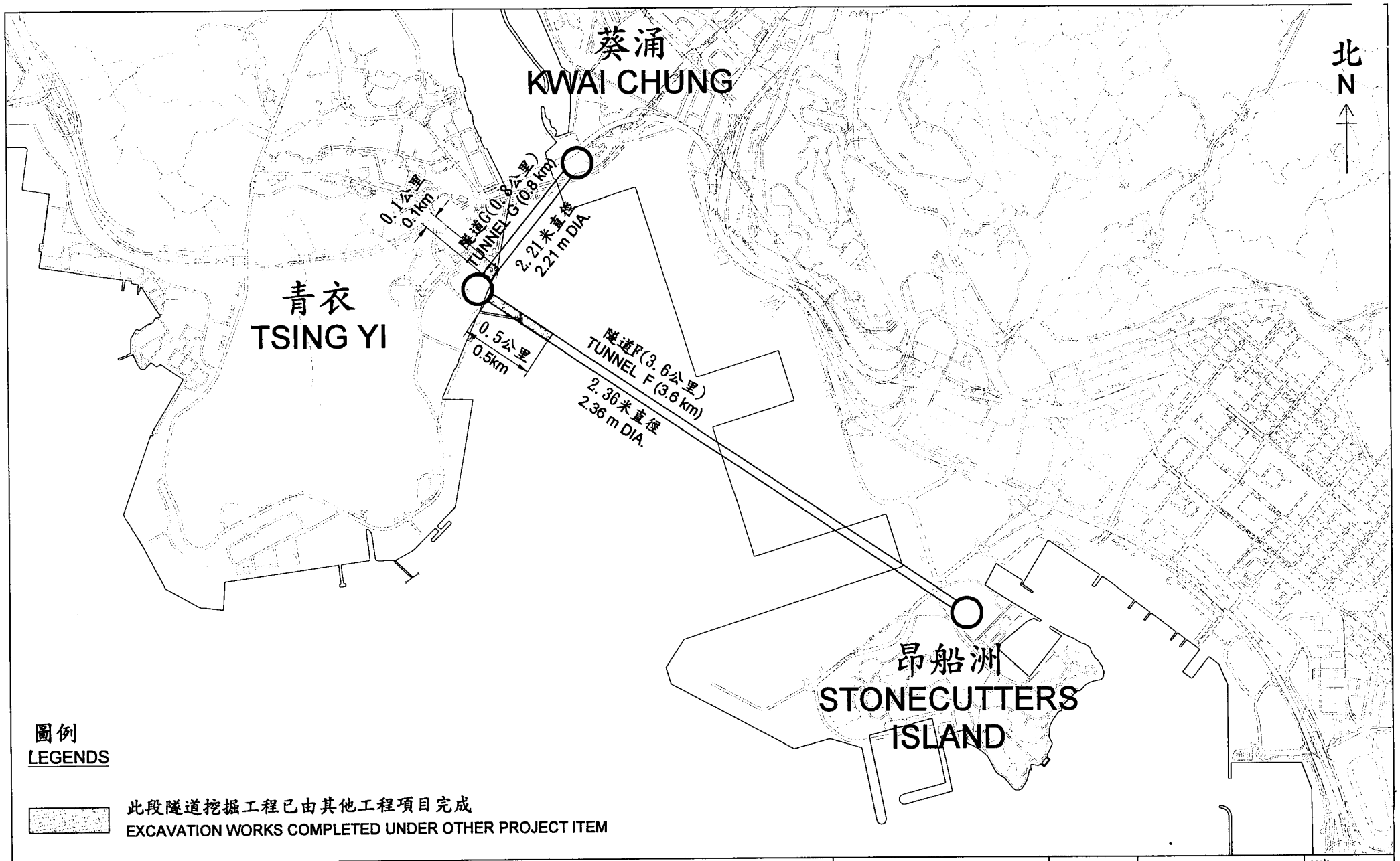
320DS

28. In January 1997, the SSTF Works Committee approved the creation and direct inclusion of **028SS** "Strategic Sewage Disposal Scheme Stage I : completion of sewer tunnel system from Kwai Chung to Stonecutters Island" in Category A(TF) at an estimated cost of $550.0 million in MOD prices for completion of the two western sewage tunnels (i.e. Tunnels F and G).

29. In February 1998, the Finance Committee approved the creation and direct inclusion of **320DS** "Strategic Sewage Disposal Scheme Stage I : completion of sewer tunnel system from Kwai Chung to Stonecutters Island" in Category A at an estimated cost of $487.6 million in MOD prices for completion of the works under **028SS** upon closure of the SSTF.

30. The proposed increase in APE will allow about 190 posts (for 30 professional/technical staff and 160 labourers) to be retained under this project, involving some 4 560 man-months up to completion of the works in year 2001.

Environment and Food Bureau
November 2000



title

320DS - 策略性污水排放計劃第一階段:
完成葵涌至昂船洲污水隧道系統

320DS - STRATEGIC SEWAGE DISPOSAL SCHEME STAGE I
COMPLETION OF SEWER TUNNEL SYSTEM FROM KWAI CHUNG TO STONECUTTERS ISLAND

drawn by C. W. CHAN	date 09 - 10 - 2000	drawing no. DSS/2000/005A	scale 1 : 30 000
approved RAYMOND W. M. TAI	date 09 - 10 - 2000		
office 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	

ENCLOSURE 1 附件一

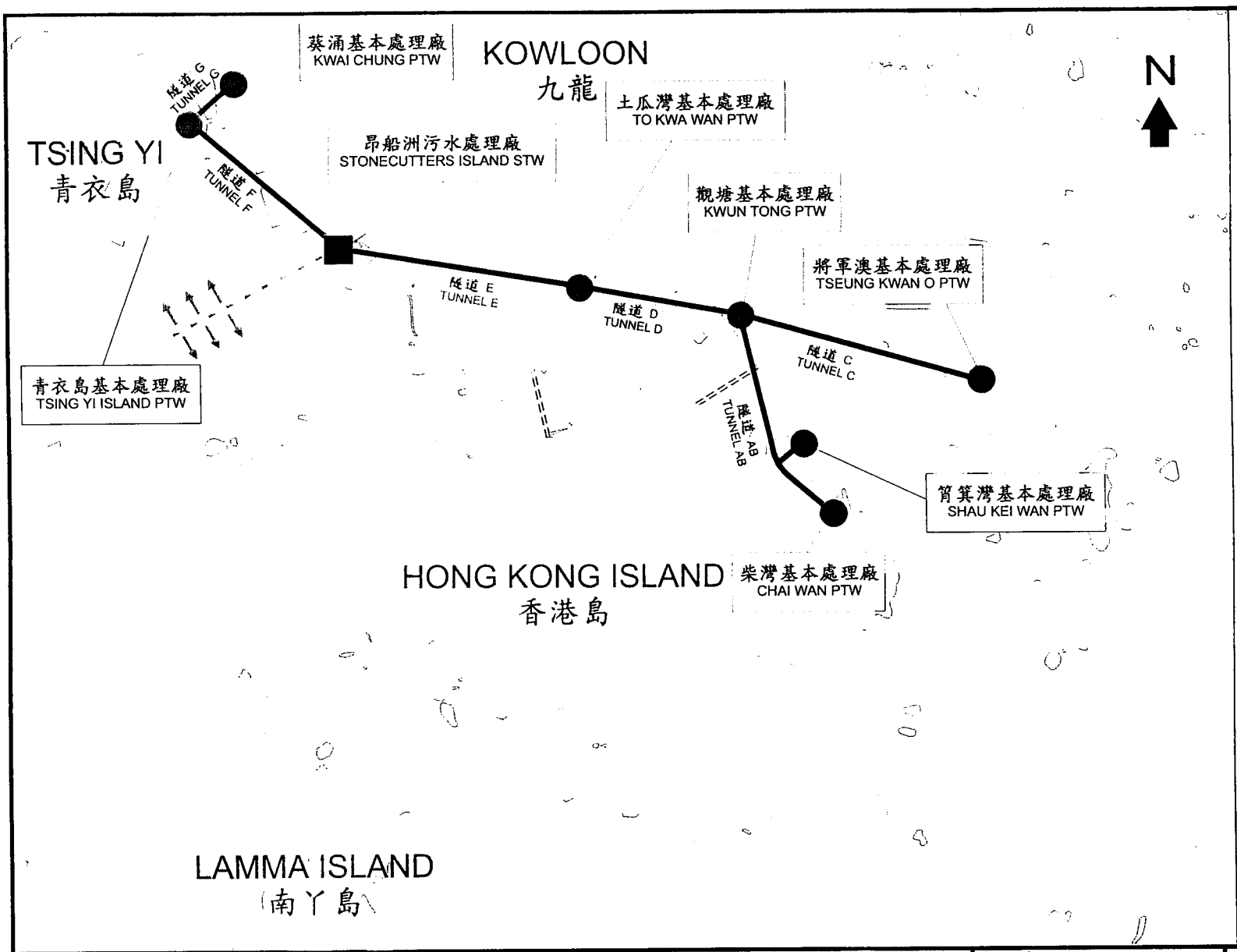


圖 例
LEGENDS:

擬建的污水隧道
PROPOSED SEWAGE TUNNEL

基本處理廠
PRELIMINARY TREATMENT WORKS (PTW)

污水處理廠
SEWAGE TREATMENT WORKS (STW)

海底污水排放口
SEWAGE SUBMARINE OUTFALL

title

策略性污水排放計劃 - 第一期主要工程
STRATEGIC SEWAGE DISPOSAL SCHEME - STAGE I MAIN WORKS

drawn by	C.W. CHAN	date	09 - 10 - 2000
approved by	RAYMOND W.M. TAI	date	09 - 10 - 2000
office	STRATEGIC SEWAGE DISPOSAL SCHEME DIVISION		

drawing no. DSS 0053B

scale 1 : 125 000

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

ENCLOSURE 6 附件六

Enclosure 2 to PWSC(2000-01)61

Problems encountered in excavation of Tunnels F and G

The progress of the tunnelling works under the completion contract encountered significant delays due to -

(a) replacement of a faulty mucking system (used for removing spoil excavated from tunnels) in 1998; and

(b) additional ground strengthening and stabilization works required to deal with the exceptionally poor ground conditions encountered.

Replacement of the faulty mucking system

2. The new contractor started excavation in Tunnels F and G in November and October 1997 respectively. The contractor later found that the mucking system, which was part of the forfeited plant from the previous tunnel contractor, could not operate effectively at full load. After receiving independent experts' recommendation, for the sake of safety and efficient operations, we instructed the contractor to effect replacement works. These were completed in June 1998.

3. The works for replacing the mucking system could not have been foreseen when the tender was called for and were not budgeted for in our original estimate. Since the mucking system replacement works were very time-consuming, we have received substantial claims from the contractor for the direct and prolongation costs. Based on the terms of the contract regarding risk allocation, the Consulting Engineer assessed that the claim should be resolved in favour of the contractor. Drainage Services Department then referred the Consulting Engineer's assessment to the Department of Justice (D of J) for advice. Given the particular background circumstances of the claim, D of J was of the opinion that if the claim from the contractor were to be pursued to arbitration, the contractor would have had a good case against the Government. The legal view was therefore that there was good justification for endorsing the recommendation of the Consulting Engineer that the claim should be resolved under the terms of the contract in favour of the contractor. As such, the cost arising from the additional works required, amounting to $45.0 million was settled by the Government under the terms of the contract.

Additional works to deal with weak grounds in Tunnel F

4. Before commencement of the project, best endeavours were made to assess the ground conditions of the works area. Boreholes were drilled along the tunnel alignments. As is the case with other tunnel excavation projects, such boreholes can only provide an indication of ground conditions. Precise information on the actual ground conditions at each location can only be ascertained during the course of the works.

5. Geological conditions for Tunnel F, however, were much worse than the pre-excavation investigation predicted. The major fault zones (Lead Mine Pass Fault, Tolo Channel Fault and an extensive zone of highly fractured rhyolite dykes) were more extensive than anticipated and were extremely difficult for tunnelling. To enable tunnel excavation to proceed safely in these areas, we instructed the contractor to undertake additional ground strengthening and stabilisation measures (including ground strengthening by grouting, as well as installation of reinforcement bars, steel casing tubes and steel support frames as ground supports). Since the additional works were very time-consuming and could not be foreseen when the tender was called for, we have also received substantial claims from the contractor for the direct and prolongation costs involved. The cost of the above-mentioned additional works to deal with weak grounds, amounting to $59.0 million, had been assessed by the Engineer and settled by the Government under the terms of the contract. The amount could only be fully identified during actual encounter with the poor ground.

6. Actual geological conditions for constructing Tunnel G, the Stonecutters Island shaft and the Kwai Chung shaft were found to be better than expected from pre-excavation assessments. The excavation works for Tunnel G, the Stonecutters Island and Kwai Chung shaft were completed between May 1998 and March 1999, resulting in a saving of $44.0 million from their original estimates.

Enclosure 3 to PWSC(2000-01)61

Justifications for Additional Funding

The uncommitted funds under **320DS** will be reduced to about $8 million by December. Additional funding is urgently required.

(a) To complete the shaft works at Stonecutters Island and other ancillary site works

2. To maintain works progress and for the sake of safety and the efficient operations of the contractors, it was necessary for us to have instructed the works for replacement of the mucking system, and the ground strengthening and stabilisation measures for traversing the weak grounds encountered in Tunnel F. As mentioned in Enclosure 2, the additional cost for these works exceeded our savings on Tunnel G and the two shafts, together with the amount we have allowed as contingencies. As an interim measure, funding earmarked for completing the shaft works at Stonecutters Island and other ancillary site works has been redeployed within the APE. However, we have now almost fully committed our budget and therefore need to secure additional funding to replenish the project item to complete the shaft works.

(b) To replenish the contingency provision

3. In addition to the additional payment which have been certified by the Engineer and settled by the Government as mentioned in Enclosure 2, we have received other substantial claims for additional payment from the contractor in relation to the prolonged construction period and the extensive difficult ground encountered. The Engineer has finished his assessment of some of these claims and would certify payment on them very soon. We will then be obliged to commit additional funding and settle such payments. Since we have almost depleted the contingency provision under **320DS** which is used for handling claims, we consider it necessary to secure additional funding under the project by December to cover the financial commitments that might arise imminently from claims settlement.

(c) To undertake additional tunnel lining works and ancillary works

4. Due to the poor ground conditions identified in Tunnel F, additional works for completing the tunnel linings in areas of weak grounds will be required. We estimate that additional funding of $44.0 million will be required for effecting these measures.

320DS - Strategic Sewage Disposal Scheme Stage I: completion of sewer tunnel system from Kwai Chung to Stonecutters Island

Taking into account the actual expenditure of $51.4 million under the SSTF, the total approved funds and latest project estimate for 320DS in MOD prices are $539.0 million and $654.0 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)	Completion of sewer tunnel from Tsing Yi to Stonecutters Island (Tunnel F)	251.8	[267.0]	354.8	[370.0]	103.0
(b)	Completion of sewer tunnel from Kwai Chung to Tsing Yi (Tunnel G)	60.3	[67.0]	31.8	[38.5]	(28.5)
(c)	Completion of shafts in Kwai Chung, Tsing Yi and Stonecutters Island and ancillary site works	136.5	[166.0]	121.0	[150.5]	(15.5)
(d)	Replacement of mucking system	0.0	[0.0]	45.0	[45.0]	45.0
(e)	Contingencies	39.0	[39.0]	50.0	[50.0]	11.0
	Total	487.6	[539.0]	602.6	[654.0]	115.0

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

2. **On completion of sewer tunnel from Tsing Yi to Stonecutters Island (Tunnel F)**, the total increase of $103.0 million is broken down as follows -

(a) $22.0 million is for the cost for additional ground stabilisation works to traverse through the fractured rhyolite dyke areas. This includes -

(i) $12 million for the contractor's prolongation cost due to the extended contract period for the additional works; and

(ii) $10 million for the direct cost of these additional works;

(b) $37.0 million is for the cost for additional ground stabilisation works to traverse through the Tolo Channel Fault zone. This includes -

(i) $20 million for the contractor's prolongation cost due to the extended contract period for the additional works; and

(ii) $17 million for the direct cost of these additional works; and

(c) $44.0 million is for the cost of additional works incidental to the remaining works (including both excavation and lining) for Tunnel F. This includes -

(i) $21 million for the contractor's prolongation cost due to the extended contract period for the additional works; and

(ii) $23 million for the direct cost of these additional works.

3. **On completion of sewer tunnel from Kwai Chung to Tsing Yi (Tunnel G)**, we found that the ground condition of this tunnel had been better than expected. The sum of $28.5 million previously allowed for additional ground stabilisation works in this tunnel is no longer required and has been utilised to offset the cost for additional ground stabilisation works in Tunnel F.

4. **On completion of shafts and ancillary site works**, we found that the ground condition for Kwai Chung drop shaft had been better than expected. The sum of $15.5 million previously allowed for additional ground stabilisation works in this shaft is no longer required and has been utilised to offset the additional cost due to replacement of the defective mucking system.

5. **On replacement of defective mucking system**, the increase of $45.0 million is for the additional cost (including the prolongation cost) for replacement of the defective mucking system in Tsing Yi production shaft.

6. **On contingencies**, we retain $50.0 million to cover possible requirements for the outstanding works, for settlement of the final accounts and for resolution of possible claims from the contractor.

Enclosure 5 to PWSC(2000-01)61

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	437.4
308DS	Strategic Sewage Disposal Scheme Stage I : Stonecutters Island sewage treatment works - pumping stations, buildings and site development	97.3	299.8	397.1	397.1
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	487.6	51.4	539.0	654.0 (Note 4)
	Total	**3,914.8**	**4,408.9**	**8,323.7** (Note 3)	**8,252.0**

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 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** and **318DS**, the overall APE for SSDS Stage I has increased from $8,211.3 million by $112.4 million to $8,323.7 million.

4. We are seeking approval under this submission to increase the APE of **320DS** from $487.6 million by $115.0 million to $602.6 million.

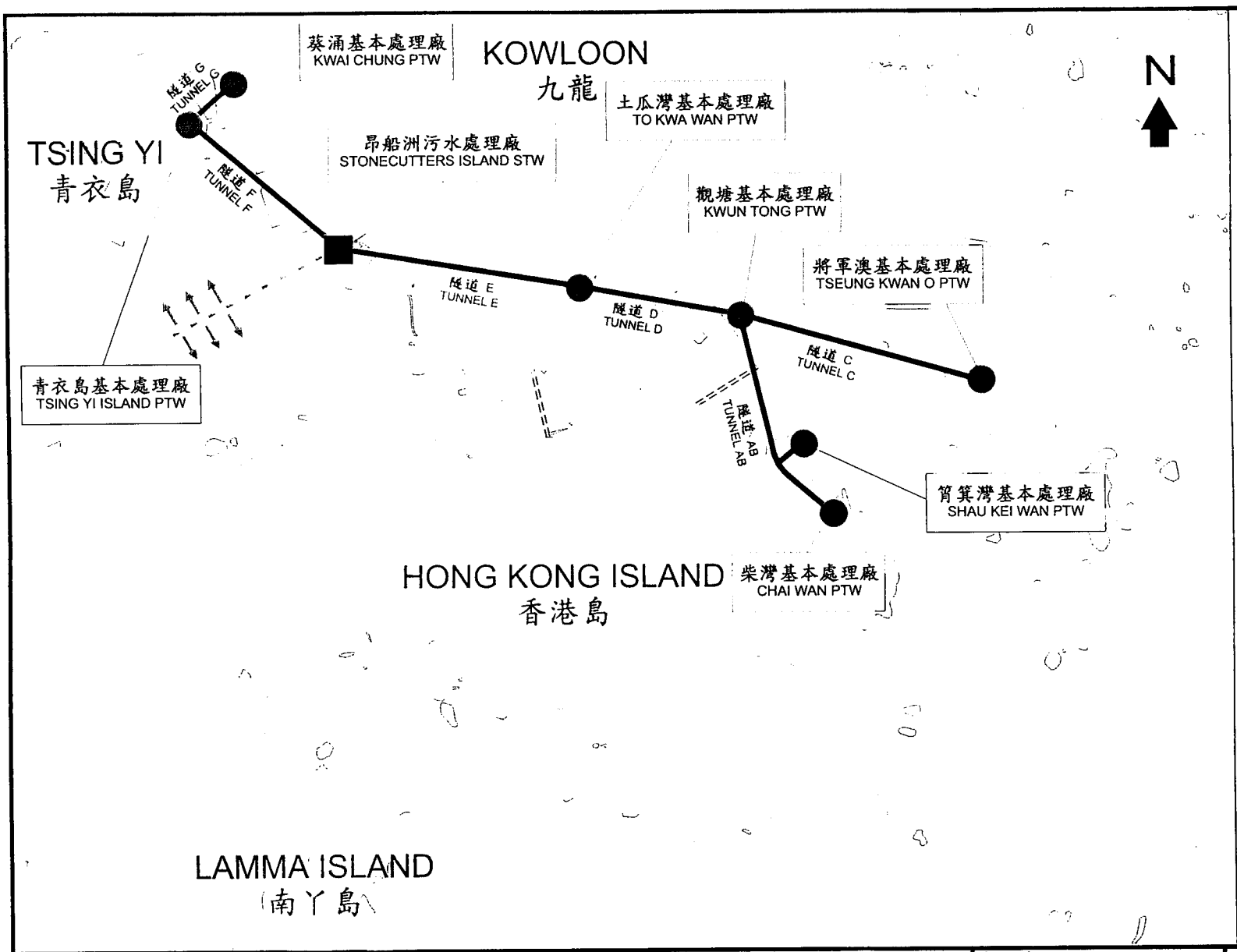


圖 例
LEGENDS:

擬建的污水隧道
PROPOSED SEWAGE TUNNEL

基本處理廠
PRELIMINARY TREATMENT WORKS (PTW)

污水處理廠
SEWAGE TREATMENT WORKS (STW)

海底污水排放口
SEWAGE SUBMARINE OUTFALL

title

策略性污水排放計劃 - 第一期主要工程
STRATEGIC SEWAGE DISPOSAL SCHEME - STAGE I MAIN WORKS

drawn by	C.W. CHAN	date	09 - 10 - 2000
approved by	RAYMOND W.M. TAI	date	09 - 10 - 2000
office	STRATEGIC SEWAGE DISPOSAL SCHEME DIVISION		

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

ENCLOSURE 6 附件六

September 15, 2000

Mr. Rob Law
Director
Environmental Protection Department
28/F., Southorn Centre
130 Hennessy Road
Wan Chai, Hong Kong.

Dear Mr. Law,

The International Review Panel has been asked to advise the Government of the HKSAR, as soon as possible, on whether any of our recommendations will have an impact upon the remaining Stage I works currently in progress, to the extent that it would be necessary to consider stopping or altering these works.

Stage I of SSDS involves a series of rock tunnels to transfer urban Kowloon and eastern Hong Kong Island sewage to Stonecutters Island for chemically enhanced primary treatment (CEPT).

IRP members have visited the Stonecutters Island CEPT plant and noted that it has been treating NW Kowloon flows since its completion in 1997. The low chemical dosage and high unit settling tank flow makes this facility the world's most efficient CEPT plant. We have full confidence that this plant will be capable of successfully treating the full Stage I flow when the transfer tunnels are completed.

The IRP has carefully reviewed the Stage I tunnel construction progress and the schedule for their completion. IRP members have visited the following tunnel construction sites A, B, C, E and F and have obtained direct information on tunnel progress, local geological conditions and rock mass quality. We are satisfied that all Stage I tunnels can be completed as now scheduled because the rock conditions for the remaining construction have been fully investigated.

We therefore recommend that all scheduled Stage I tunnels be completed as soon as possible. The IRP appreciates the many efforts to overcome the adverse geological conditions that have been encountered. This experience will be very valuable in the planning, design and construction of future sewage transfer tunnels in Hong Kong.

Respectfully submitted,

Prof. Leonard K. H. Cheng

Prof. Donald R. F. Harleman

Dr. Albert Koenig

Prof. Dr. Eng. Sebastiano Pelizza

Prof. Qian Yi

Prof. Rudolf S. S. Wu