

For discussion  
on 25 January 2010

**Legislative Council  
Panel on Environmental Affairs**

**359DS – North District sewerage, stage 1 phase 2B**

**PURPOSE**

This paper seeks Members' support for our proposal to increase the approved project estimate (APE) of **359DS** (a Category A project) by \$55.0 million from \$130.0 million to \$185.0 million in money-of-the-day (MOD) prices.

**BACKGROUND**

2. In January 2007, the Finance Committee (FC) approved the upgrading of *part of 339DS – North District sewerage, stage 1 phases 2B and 2C and stage 2 phase 1* to Category A as **359DS** at an estimated cost of \$130.0 million in MOD prices. The approved scope of works under **359DS** comprises the construction of –

- (a) about 11 kilometres (km) of sewers, ranging from 150 millimetres (mm) to 400 mm in diameter for 12 unsewered areas<sup>1</sup> in North District;
- (b) three sewage pumping stations, respectively in San Wai, Tung Kok Wai and Wing Ning Tsuen; and
- (c) about 1.4 km of rising mains, ranging from 100 mm to 250 mm in diameter, in association with the construction of the three sewage pumping stations in (b) above.

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A location plan showing the works is at **Enclosure 1**.

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<sup>1</sup> The villages covered include San Tong Po, Kan Lung Tsuen, San Wai, San Uk Tsuen, Ma Mei Ha, Ma Mei Ha Leng Tsui, Tung Kok Wai, Lo Wai, Tsz Tong Tsuen, Wing Ning Tsuen, Wing Ning Wai and Ma Wat Wai.

3. We consulted the Panel on Environmental Affairs (EA Panel) in November 2006 prior to seeking FC's approval. Members raised no objection at the meeting. Please refer to the EA Panel paper CB(1)331/06-07(14) for details.

4. By implementing **359DS**, we would be possible to provide proper treatment to the sewage generated from the 12 unsewered areas before discharge, thereby reducing the pollution to watercourses in the vicinity. The Environmental Protection Department has supported this sewerage project as part of the Government's endeavour for implementing the recommendations of the North District Sewerage Master Plan Study completed in 1994.

### **POSITION AS AT COMMENCEMENT OF THE PROJECT**

5. The Drainage Services Department (DSD) implements **359DS** under one contract for civil engineering works and another contract for electrical and mechanical (E&M) works. Despite both contracts were procured through a competitive and open tendering process, the lowest returned tenders for both contracts have indicated that their costs would potentially be \$9.1 million (in MOD prices) higher than expected, equivalent to 9.2% of the corresponding sum allowed in the APE.

6. The project employs a remeasurement type of contract, under which the contract values would vary according to the actual quantities of works done instead of a fixed lump sum. Having in mind the benefits of commencing the works of **359DS** at the soonest, DSD has temporarily earmarked all \$9.0 million from the project contingencies and another \$0.1 million (out of \$5.0 million) from the provision for price adjustment for balancing this potential shortfall. We would only need to consider increasing the APE at a later stage if the updated information on the project points further to the scenario with higher-than-expected project costs. Consequently, both contracts were awarded at the earliest opportunity and DSD commenced the works of **359DS** in March 2007.

### **LATEST POSITION**

7. By December 2009, around 8 km (out of 11 km) of sewers and the civil engineering works for the three sewage pumping stations have been completed.

8. After a recent review on all updated information including site constraints, contract price fluctuation (CPF) adjustment and remuneration for resident site staff (RSS), DSD has confirmed that the original estimate of \$130.0 million in MOD prices as approved by FC would be insufficient for meeting the higher-than-expected project costs. They have also identified additional works suitable for implementation under **359DS**. The details are set out in paragraphs 9 to 16 below.

## **HIGHER-THAN-EXPECTED PROJECT COSTS**

### *Tendered prices*

9. DSD has reviewed the temporary arrangement set out in paragraph 6 and confirmed the anticipated shortfall of \$9.1 million for contract expenditure (in MOD prices). We therefore wish to seek an increase in the APE for **359DS** accordingly.

### *Remuneration for RSS*

10. The project consultants have recruited RSS directly from the market to conduct on-site supervision. Based on their actual employment terms and conditions, the remuneration for RSS employed for the project would be higher than expected. Together with salary adjustments and projecting towards the anticipated project completion date, we estimate that the additional remuneration for the RSS under **359DS** would amount to \$6.2 million in MOD prices.

### *CPF adjustment*

11. The civil engineering works contract of **359DS** has provided for CPF adjustment<sup>2</sup>. The CPF rose sharply in late 2007, started to decline after the financial crisis in late 2008 and picked up once again in mid 2009. With reference to actual payments disbursed so far and the anticipated payment on price fluctuation up to 2011, DSD anticipates a shortfall of \$18.8 million in MOD prices between the latest estimated total CPF adjustment of \$23.8 million and the corresponding sum allowed in the APE (i.e. \$5.0 million).

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<sup>2</sup> The CPF adjustment mechanism is based on the *Index Numbers of the Costs of Labour and Materials used in Public Sector Construction Projects* published by the Census and Statistics Department.

## **ADDITIONAL WORKS AND JUSTIFICATIONS**

### *Increase in local demand*

12. When we sought FC's approval for the upgrading of **359DS** to Category A in January 2007, our studies indicated that about 800 buildings in the 12 unsewered areas would need to be served. Since then, about 100 new buildings (mostly village houses) have been planned or erected within these unsewered areas. The owners concerned have reflected their wish for DSD to lay additional branch sewers for their new buildings to connect to the communal sewerage. After review, we considered that extending the sewer network to cover these new buildings would be environmentally desirable. It would also be technically feasible to implement the extension as additional works under **359DS**, which would involve extending the total length of branch sewers to be laid by 1.8 km (i.e. from 11 km to 12.8 km) at an additional cost of \$10.0 million in MOD prices.

### *Technical and on-site constraints*

13. Construction work at the sites for two sewage pumping stations has revealed that the actual profile of underground rock stratum is considerably more varied than that observed in earlier investigations. The total length of piles for the two sewage pumping stations has therefore been increased by about 220 metres (m).

14. In addition, the situations in several sites where branch sewers would be laid are more constrained than originally envisaged. This is largely due to the presence of uncharted utilities and insufficient width of pedestrian alleys between buildings. Separately, in the course of ongoing liaison with the local community, a few residents have expressed concerns on the temporary obstruction of some access roads and suggested that DSD adopt alternative solutions for minimising the traffic impacts. Around 0.9 km of the sewers was found to be particularly problematic.

15. DSD has explored, on a limited scale, the use of trenchless construction for about 0.3 km of sewers instead of open excavation for overcoming these issues. The change in construction method has proven to be an effective solution. DSD has therefore recommended switching over to trenchless construction for the remaining 0.6 km of the problematic sewer section.

16. The additional works for addressing technical and on-site constraints as mentioned in paragraphs 13 to 15 above (i.e. increasing the total length of piles for the two sewage pumping stations by 220 m and adopting trenchless construction for 0.9 km of sewer sections) would incur an additional cost of \$14.1 million altogether (in MOD prices). As a result of switching over to trenchless construction for some sections of the branch sewers, the project consultants would also need to engage additional 74 man-months of RSS (at an additional cost of \$1.8 million in MOD prices) for liaising with the community, and for satisfying the additional supervisory efforts required for confined space works associated with trenchless construction.

## FINANCIAL IMPLICATIONS

17. Having reviewed the position of the project, we propose to increase the APE of **359DS** by \$55.0 million, i.e. from \$130.0 million to \$185.0 million in MOD prices as follows –

<b>Factors</b>	<b>Increase in estimates in MOD prices (\$ million)</b>
<i>Increase due to –</i>	
(a) Higher-than-expected tendered prices	9.1
(b) Increase in remuneration for RSS	8.0*
(c) Higher-than-expected CPF	18.8
<b>Sub-total for <i>Higher-than-expected project costs</i></b>	<b>35.9</b>
(d) Increase in local demand	10.0
(e) Technical and on-site constraints	14.1
<b>Sub-total for <i>Additional works</i></b>	<b>24.1</b>
(f) Contingencies	(5.0)
<b>Total</b>	<b>55.0</b>

\* Comprises \$6.2 million due to higher-than-expected remuneration for RSS and \$1.8 million due to the remuneration for additional RSS required for liaison work and confined space works associated with trenchless construction.

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A comparison of the cost breakdown of the APE and the revised project estimate in MOD prices is at **Enclosure 2**.

18. We estimate that the annual recurrent expenditure arising from **359DS** would increase slightly by \$0.2 million, i.e. from \$2.5 million to \$2.7 million. This would be met by existing resources of DSD.

## **LAND ACQUISITION**

19. The proposed increase in APE would not incur any land acquisition.

## **WAY FORWARD**

20. DSD would optimise the interfacing of additional works with existing works with a view to minimising the disruption to project schedule. The additional works would require eight months for completion even after implementing the rearrangements. Hence, subject to funding approval of the FC in April 2010, the anticipated project completion date would be July 2011 (as compared with the original target of November 2010) after incorporating the additional works and rearranging the construction sequences.

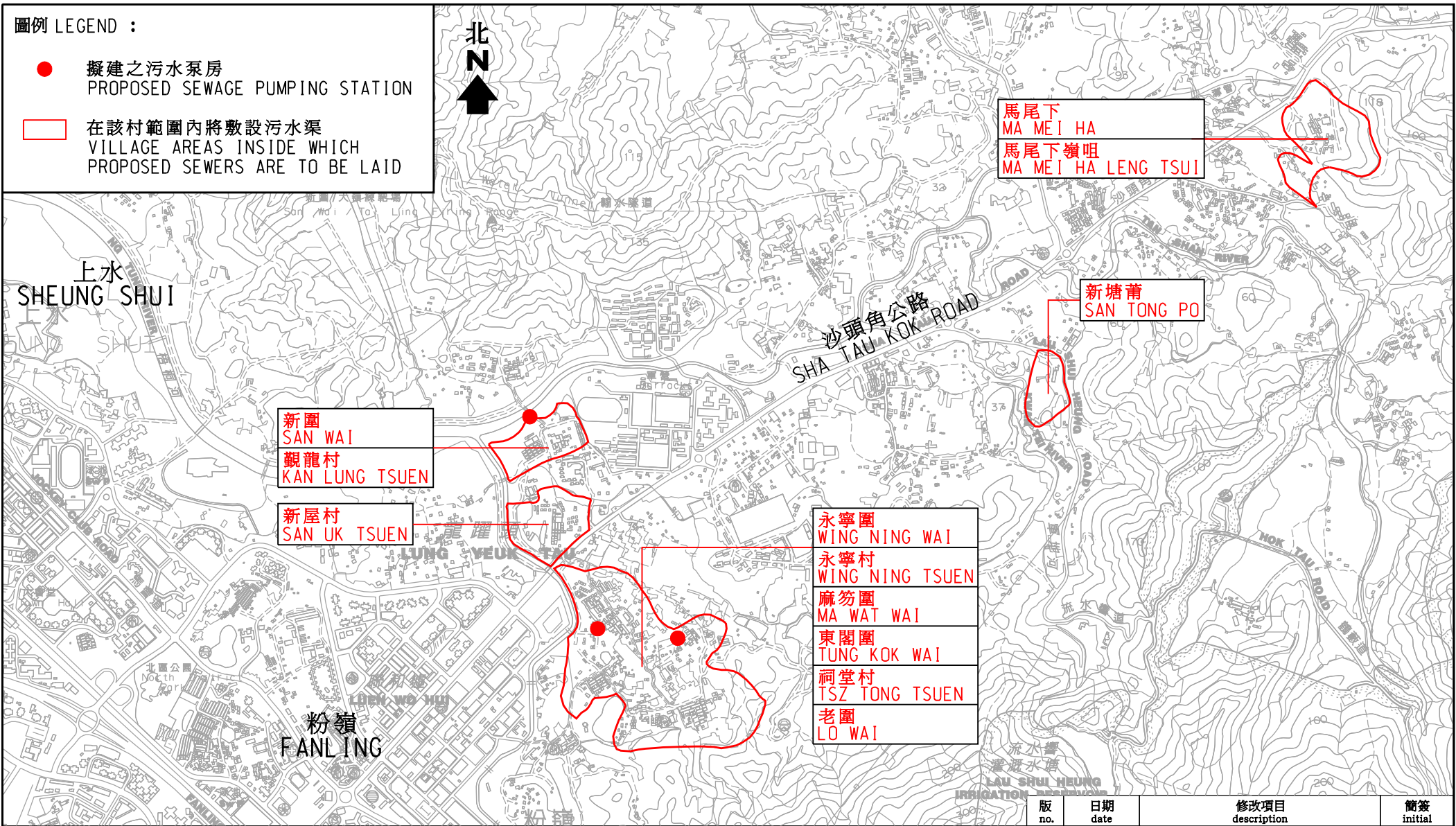
## **ADVICE SOUGHT**

21. Members are invited to support our proposal for seeking an increase in the APE of **359DS** by \$55.0 million from \$130.0 million to \$185.0 million in MOD prices. Subject to Members' advice, we plan to submit the proposal to the Public Works Subcommittee for consideration in February 2010 with a view to seeking FC's approval in April 2010.

**Environmental Protection Department**  
**Drainage Services Department**  
**January 2010**

圖例 LEGEND :

- 擬建之污水泵房  
PROPOSED SEWAGE PUMPING STATION
- 在該村範圍內將敷設污水渠  
VILLAGE AREAS INSIDE WHICH  
PROPOSED SEWERS ARE TO BE LAID



圖則名稱 drawing title  
 工務計劃項目第359DS號 -  
 北區污水收集系統第1階段第2B期  
 PWP ITEM NO.359DS -  
 NORTH DISTRICT SEWERAGE, STAGE 1 PHASE 2B

繪畫 drawn	W. Y. HUI	日期 date
核對 checked	C. M. CHAN	日期 date
批核 approved	S. S. LAM	日期 date
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

修改項目 description	圖則編號 drawing no.	簡簽 initial
	DCM/2009/034	比例 scale 1 : 20000
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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		

附件1 ENCLOSURE 1

**359DS – North District sewerage, stage 1 phase 2B**

A comparison of the cost breakdown of the APE and revised project estimate in MOD prices is as follows –

	<b>(A)</b>	<b>(B)</b>	<b>(C)</b>	<b>(C) – (A)</b>
	<b>Approved Project Estimate</b>	<b>Revised Project Estimate<sup>1</sup></b>	<b>Revised Project Estimate</b>	<b>Difference</b>
	<b>\$ million</b>	<b>\$ million</b>	<b>\$ million</b>	<b>\$ million</b>
(a) Sewers and rising mains	<b>65.0</b>	<b>72.1</b>	<b>93.1</b>	<b>28.1</b>
(b) Sewage pumping stations –	<b>29.6</b>	<b>33.6</b>	<b>36.7</b>	<b>7.1</b>
(i) civil works	21.0	26.0	29.1	8.1
(ii) E&M works	8.6	7.6	7.6	(1.0)
(c) Environmental mitigation measures	<b>4.0</b>	<b>2.0</b>	<b>2.0</b>	<b>(2.0)</b>
(d) Consultants’ fees for –	<b>17.4</b>	<b>17.4</b>	<b>25.4</b>	<b>8.0</b>
(i) contract administration	1.8	1.8	1.8	0.0
(ii) site supervision	15.6	15.6	23.6	8.0
(e) Contingencies	<b>9.0</b>	<b>0<sup>2</sup></b>	<b>4.0</b>	<b>(5.0)</b>
(f) Provision for price adjustment	<b>5.0</b>	<b>4.9<sup>2</sup></b>	<b>23.8</b>	<b>18.8</b>
<b>Total</b>	<b><u>130.0</u></b>	<b><u>130.0</u></b>	<b><u>185.0</u></b>	<b><u>55.0</u></b>

<sup>1</sup> Revised project estimate after the award of the contract.

<sup>2</sup> DSD has temporarily earmarked all \$9.0 million from the project contingencies and another \$0.1 million (out of \$5.0 million) from the provision for price adjustment for balancing this potential shortfall. Please refer to paragraph 6 of the paper for details.



2. **As regards 1(a) (Sewers and rising mains), the increase of \$28.1 million includes –**

- (i) \$7.1 million due to the higher-than-expected tendered prices for these works under the two awarded contracts;
- (ii) \$11.0 million due to the cost of using trenchless method instead of open excavation to construct the sewers of about 0.9 km long; and
- (iii) \$10.0 million due to the cost of laying additional branch sewers of about 1.8 km long.

3. **As regards 1(b) (Sewage pumping stations), the increase of \$7.1 million includes –**

- (i) \$5.0 million due to the higher-than-expected tendered prices for these works under the awarded civil works contract;
- (ii) \$3.1 million due to the cost of increased pile length of about 220 m in the pumping station foundation works; and
- (iii) \$1.0 million (minus) due to lower-than-expected tendered prices for these works under the awarded E&M works contract.

4. **As regards 1(c) (Environmental mitigation measures), the decrease of \$2.0 million is due to the lower-than-expected tendered prices for these works under the two awarded contracts.**

5. **As regards 1(d) (ii) (Consultants' fees for site supervision), the increase of \$8.0 million includes –**

- (i) \$6.2 million due to higher-than-expected remuneration for the RSS directly employed by the project consultants; and
- (ii) \$1.8 million due to additional site supervision staff recruited.

6. **As regards 1(e) (Contingencies), we retain \$4.0 million as the contingencies to cater for further variations as necessary, claims and valuation of works during finalisation of the project account.**

7. As regards 1(f) (Provision for price adjustment), the increase of \$18.8 million is due to an increase in payment for actual/predicated contract price fluctuation.

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