

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment 359DS – North District sewerage, stage 1 phase 2B

Members are invited to recommend to Finance Committee to increase the approved project estimate of **359DS** by \$55.0 million from \$130.0 million to \$185.0 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **359DS** is not sufficient to cover the costs of the works under the project.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to increase the APE of **359DS** by \$55.0 million from \$130.0 million to \$185.0 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. On 26 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 for implementing the North District sewerage, stage 1 phase 2B works. The approved scope of works under **359DS** comprises the construction of –

/ (a)

- (a) about 11 kilometres (km) of sewers, ranging from 150 millimetres (mm) to 400 mm in diameter for 12 unsewered areas¹ 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.

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

4. We started the construction works in March 2007 and originally planned to complete the works in November 2010. 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. Subject to funding approval of the FC in April 2010 and taking into account the time required for additional works to be performed under the project, we anticipate that the project will be completed in July 2011.

JUSTIFICATION

5. We propose to increase the APE of **359DS** by \$55.0 million in MOD prices to cover the additional costs due to new demand for sewers to serve new village houses, site constraints, higher-than-expected tender prices, increase in site supervision cost, and increase in contract price fluctuation (CPF) payment over the duration of the contract.

Additional costs for sewers serving new village houses

6. When we sought FC's approval for upgrading **359DS** to Category A in January 2007, our original design covered about 800 buildings in the 12 unsewered areas. Since then, about 100 new buildings (mostly village houses) have been planned or erected within these unsewered areas. The owners

/concerned

¹ The 12 areas covered by the proposed works are 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.

concerned have reflected their wish for the Administration to lay additional branch sewers for their new buildings to connect to the public sewerage. After review, we consider 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**. This would involve extending the total length of branch sewers by 1.8 km, i.e. from 11.0 km to 12.8 km, at an additional cost of about \$10.0 million in MOD prices.

Additional costs due to increase in piling works for pumping stations

7. 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 additional length of piles required for the two sewage pumping stations is about 220 metres (m) at a cost of \$3.1 million in MOD prices.

Additional costs due to technical and on-site constraints

8. The actual situations in several sites where branch sewers would be laid are more constrained than originally envisaged, largely due to the presence of uncharted utilities and narrow pedestrian alleys between buildings. Despite extensive consultation prior to commencement of the works in March 2007, some residents have expressed concerns, in the course of ongoing liaison with the local community, on the temporary obstruction of some access roads and suggested that we adopt improvement measures for minimising the traffic impacts. Around 0.9 km of the sewers was found to be particularly problematic.

9. We have explored, on a limited scale, the use of trenchless construction instead of open excavation for about 0.3 km of sewers for overcoming these issues. The trenchless method has proven to be an effective solution. We therefore propose switching over to trenchless construction for the remaining 0.6 km of the problematic sewer section. Adopting trenchless construction for 0.9 km of sewer sections would incur an additional cost of about \$11.0 million in MOD prices.

Higher-than-expected tender prices

10. We implement **359DS** under one contract for civil engineering works and another contract for electrical and mechanical (E&M) works. The contracts were the lowest bids procured through a competitive and open tendering

process. Compared with the original sum allowed in the APE, the tender prices for the works were 9.2% higher, giving rise to an increase in project cost by about \$9.1 million in MOD prices.

Higher-than-expected CPF payment

11. The civil engineering works contract under **359DS** is subject to CPF adjustment determined on the basis of “Index Numbers of the Costs of Labour and Materials used in Public Sector Construction Projects”. The CPF payment rose sharply in late 2007, and started to decline after the financial crisis in late 2008. With reference to actual payments disbursed so far and the anticipated payment on price fluctuation for the remaining works, we anticipate a shortfall of \$18.8 million in MOD prices between the latest estimated total CPF adjustment of \$23.8 million and the corresponding sum of \$5.0 million allowed in the APE. A chart showing the trend of relevant labour and material costs is at Enclosure 2. Detailed justification for the increase in provision for price adjustment is at Enclosure 3.

Increase in site supervision cost

12. As construction works progressed, it became clear that additional site supervision efforts were required to satisfy the closer supervision needs for confined space works associated with trenchless construction and to handle the numerous demands from villagers on changes to programme and construction details to suit individual needs. Therefore, we have strengthened the site supervisory team by employing additional experienced resident site staff (RSS) to handle these additional workloads at an additional cost of \$1.8 million. The remuneration for RSS employed for the project also turns out to be higher than expected. Together with salary adjustments made since 2007 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. As a result, there would be a total increase of \$8.0 million in MOD prices in the cost of site supervision by the consultants.

Offset by project contingencies

13. The increase in cost due to reasons explained in paragraphs 6 to 12 above is partly offset by a sum of \$5.0 million to be released from the project contingencies. We expect to complete the works in July 2011. We consider it necessary to retain \$4.0 million as contingencies to cater for further variations as necessary, possible claims and valuation of works during finalization of the project account.

/Review

Review of financial position

14. Having reviewed the financial position of the project, we consider it necessary to increase the APE of **359DS** by \$55.0 million from \$130.0 million to \$185.0 million in MOD prices in order to cover the total costs of the works under the project. A summary of the proposed increase of \$55.0 million is as follows –

Factor	Proposed increased amount/ savings in MOD prices (\$ million)	% of the total increased amount / savings
Increase due to –		
(a) Additional cost of works	24.1	40
(i) sewers serving new village houses	10.0	
(ii) increase in piling works for pumping stations	3.1	
(iii) variations to the works for overcoming technical and on-site constraints	11.0	
(b) Higher-than-expected tender prices	9.1	15
(c) Higher-than-expected CPF payment	18.8	32
(d) Increase in site supervision cost	8.0	13
(e) Total cost increase (e = a + b + c + d)	60.0	100
Partly offset by –		
(f) Contingencies	5.0	100
(g) Total savings (g = f)	5.0	100
(h) Proposed increase (h = e – g)	55.0	

/A

A comparison of the cost breakdown of the APE and the revised project estimate in MOD prices is at Enclosure 4.

FINANCIAL IMPLICATIONS

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

Year	\$ million (MOD)
Up to 31 March 2009	70.5
2009 – 2010	59.0
2010 – 2011	31.6
2011 – 2012	14.5
2012 – 2013	7.9
2013 – 2014	1.5
	<hr/> 185.0 <hr/>

16. We estimate that the annual recurrent expenditure arising from **359DS** will increase slightly by \$0.2 million, i.e. from \$2.5 million to \$2.7 million.

PUBLIC CONSULTATION

17. For **359DS**, the proposed increase in the APE does not involve any change in the scope of the project. Therefore, further public consultation is not necessary. Nevertheless, we will maintain close liaison with the local community.

18. We consulted the Legislative Council Panel on Environmental Affairs on the proposed increase in the APE on 25 January 2010. Members raised no objection to the submission of the proposal to the Public Works Subcommittee. Nevertheless, some Members requested the Administration to provide supplementary information on the details of the connecting works in respect of village sewerage projects. We submitted a follow-up reply to Panel Members on 2 February 2010.

/ENVIRONMENTAL

ENVIRONMENTAL IMPLICATIONS

19. The proposed increase in the APE will not give rise to any adverse environmental implications.

HERITAGE IMPLICATIONS

20. The proposed increase in the APE will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

21. The proposed increase in the APE will not involve any land acquisition.

BACKGROUND INFORMATION

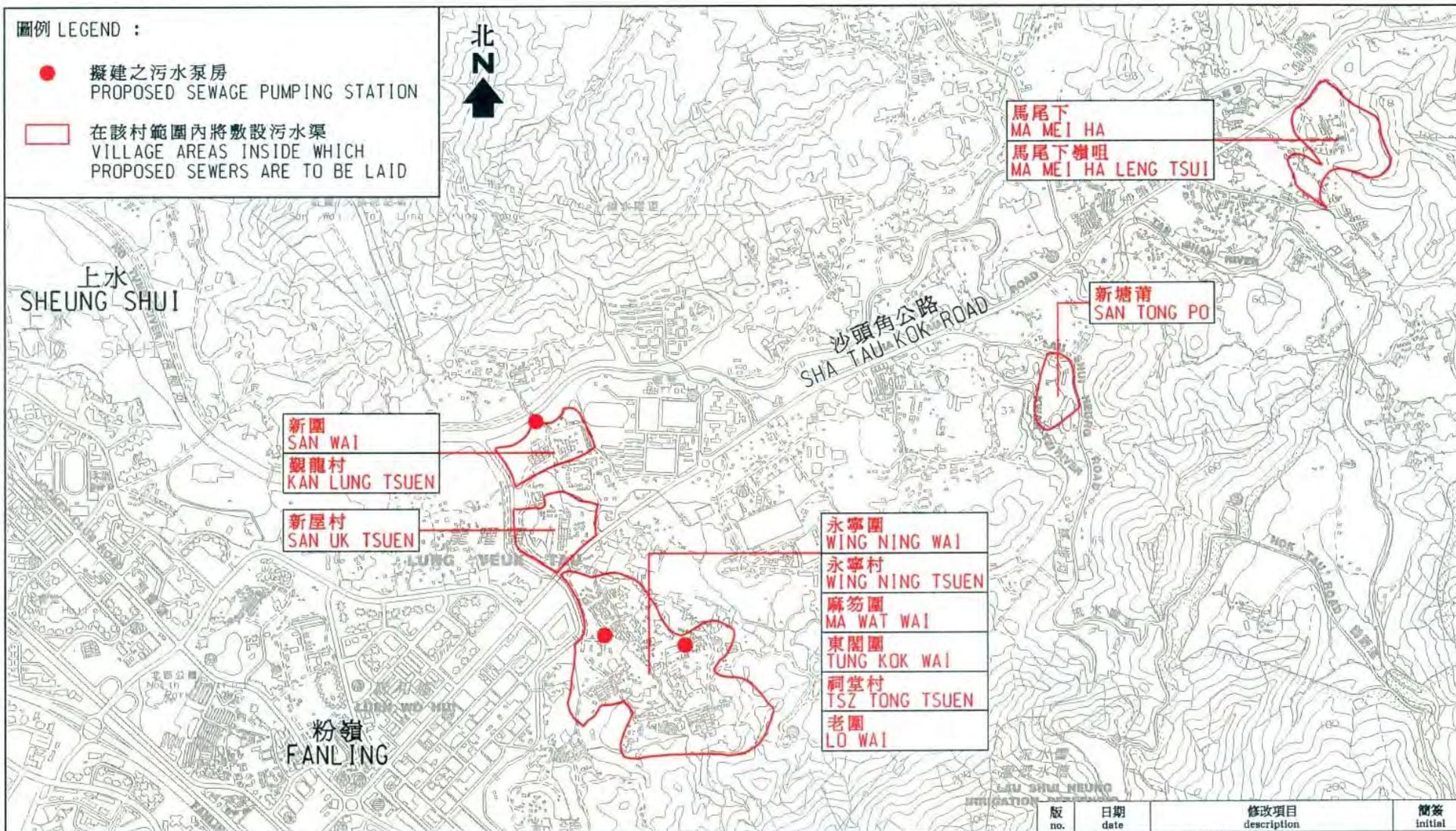
22. In January 2007, the FC approved the upgrading of part of **339DS** “North District sewerage, stage 1 phases 2B and 2C and stage 2 phase 1” to Category A as **359DS** at an estimated cost of \$130.0 million in MOD prices for the construction of North District sewerage, stage 1 phase 2B.

23. The proposed increase in the APE will not involve any additional tree removal or planting proposals.

24. For **359DS**, we estimate that the proposed increase in APE will create about 19 jobs (14 for labourers and another 5 for professional / technical staff) providing a total employment of 230 man-months.

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

版 no.

日期 date

修改項目 description

簡簽 initial

圖則編號 drawing no.

比例 scale

DCM/2009/034

1 : 20000

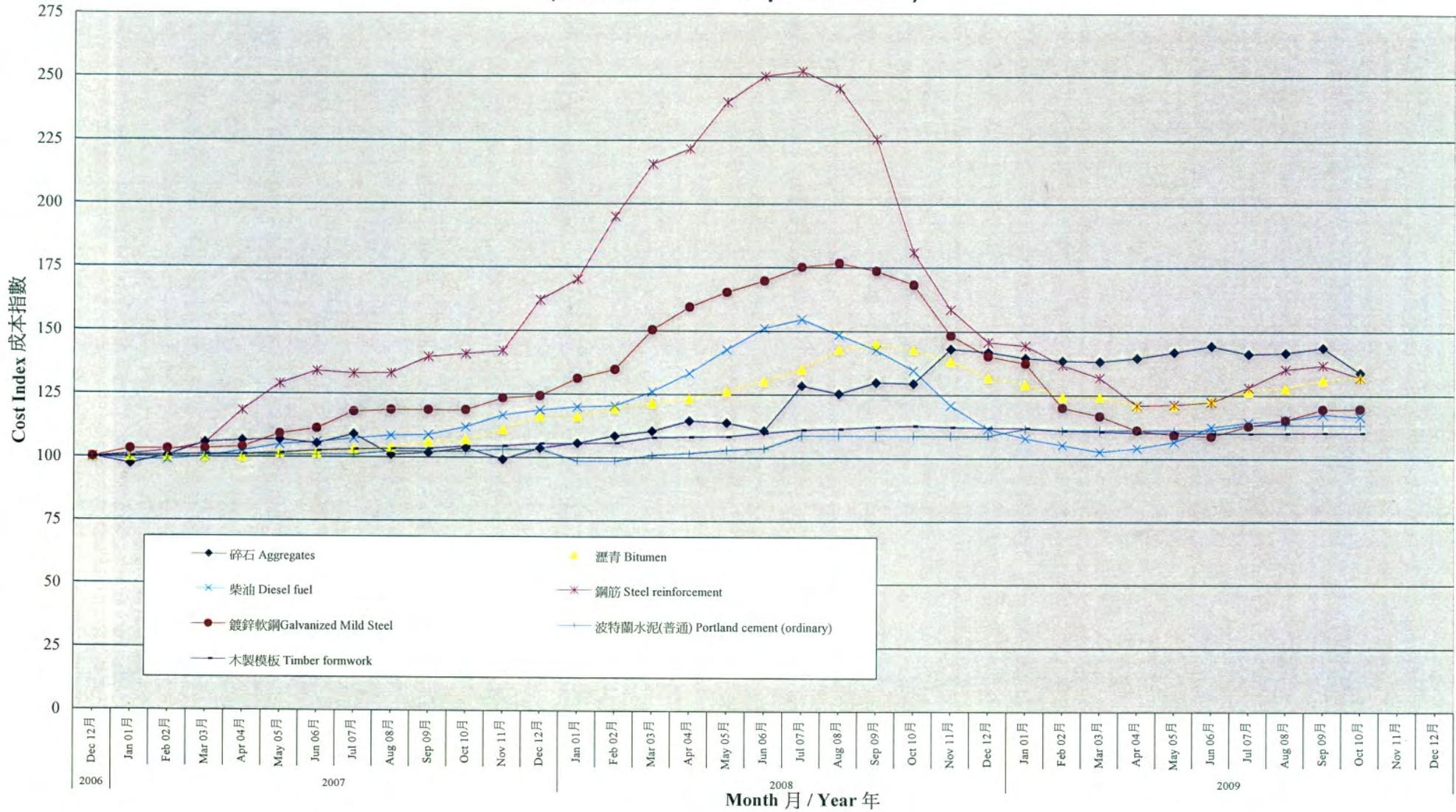
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香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

附件 1 ENCLOSURE 1

工資及材料成本指數 (2006年12月=100)
 (2006年12月至2009年9月)
 Cost of Labour and Material Index (December 2006 = 100)
 (December 2006 - September 2009)



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

Table 1 – Cash flow and provisions for price adjustment in original PWSC paper

Year	Original project estimate (\$ million, in Sept 2006 prices)	Original price adjustment factor #	Approved project estimate (\$ million, in MOD prices)	Provision for price adjustment (\$ million)
	X	Y	Z	A=Z - X
2007 - 2008	24.7	1.01250	25.0	0.3
2008 - 2009	31.4	1.02769	32.3	0.9
2009 - 2010	37.6	1.04310	39.2	1.6
2010 - 2011	18.8	1.05875	19.9	1.1
2011 - 2012	10.0	1.08257	10.8	0.8
2012 - 2013	2.5	1.10964	2.8	0.3
Total	125.0		130.0	5.0

Table 2 – Revised cash flow and provision for price adjustment due to revised project estimate (PE) and latest adjustment factor

Year	Revised PE (\$ million, in Sept 2006 prices)	Revised PE (\$ million, in Sept 2009 prices) *	Latest price adjustment factor **	Revised PE (\$ million, in MOD prices)	Revised provision for price adjustment (\$ million)	Net increase in provision for price adjustment (\$ million)
	a	b	c	d	e	f
2007 - 2008	23.1	26.2 [^]	1.00000	26.2	e = (d - a)	f = (e - A)
2008 - 2009	39.0	44.3 [^]	1.00000	44.3		
2009 - 2010	51.9	59.0	1.00000	59.0		
2010 - 2011	27.3	31.0	1.02000	31.6		
2011 - 2012	12.2	13.9	1.04040	14.5		
2012 - 2013	6.5	7.4	1.06121	7.9		
2013 - 2014	1.2	1.4	1.08243	1.5		
Total	161.2	183.2		185.0	23.8	18.8

Notes:

Price adjustment factors adopted in October 2006 are based on the projection of prices for public sector building and construction output, and are assumed to increase by 1.5% per annum over the period from 2007 to 2010 and by 2.5% per annum over the period from 2011 to 2012.

* Revised PE (in September 2006 prices) is multiplied by 1.13665 for conversion to September 2009 prices. The figure of 1.13665 represents the changes in price movement for public sector building and construction output between September 2006 and September 2009.

** The price adjustment factors adopted in November 2009 are based on the latest movement of prices for public sector building and construction output which are assumed to increase by 2.0% per annum over the period from 2009 to 2013 and by 3.0% per annum over the period from 2014 to 2019.

[^] \$26.2 million and \$44.3 million for 2007-08 and 2008-09 respectively are actual expenditures.

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

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

	(A)	(B)	(C)	(C)–(A)
	Approved Project Estimate	Revised Project Estimate²	Latest Project Estimate	Difference
	\$ million	\$ million	\$ million	\$ million
(a) Sewers and rising mains	65.0	72.1	93.1	28.1
(b) Sewage pumping stations	29.6	33.6	36.7	7.1
(i) civil engineering works	21.0	26.0	29.1	8.1
(ii) electrical and mechanical works	8.6	7.6	7.6	(1.0)
(c) Environmental mitigation measures	4.0	2.0	2.0	(2.0)
(d) Consultants' fees for	17.4	17.4	25.4	8.0
(i) contract administration	1.8	1.8	1.8	0.0
(ii) site supervision	15.6	15.6	23.6	8.0
(e) Contingencies	9.0	0.0	4.0	(5.0)
(f) Provision for price adjustment	5.0	4.9	23.8	18.8
Total	130.0	130.0	185.0	55.0

² Revised project estimate after the award of the contract.

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

- (i) \$7.1 million due to the higher-than-expected tender prices for these works under the two awarded contracts;
- (ii) \$11.0 million due to the use of 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 comprises –

- (i) \$5.0 million due to the higher-than-expected tender 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 tender 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 tender 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 comprises –

- (i) \$6.2 million due to the higher-than-expected remuneration and salary adjustments 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)**, after review we consider that a smaller contingency of \$4.0 million (adjusted from \$9.0 million) would be adequate to cater for further variations as necessary, possible claims and valuation of works during finalization of the project account.

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