

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE

Civil Engineering – Drainage and erosion protection

152CD – Drainage improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang

Members are invited to recommend to Finance Committee to increase the approved project estimate of **152CD** by \$141.9 million from \$426.3 million to \$568.2 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **152CD** 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 Development, proposes to increase the APE of **152CD** by \$141.9 million from \$426.3 million to \$568.2 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In July 2007, the Finance Committee (FC) approved the upgrading of part of **109CD** – “Drainage improvement works in Tai Po” to Category A as **152CD** at an estimated cost of \$426.3 million in MOD prices. The approved scope of **152CD** comprises –

- (a) construction of about 2.6 kilometres (km) of drainage channel with width ranging from 18 metres (m) to 29 m in upper Lam Tsuen River;

/(b)

- (b) construction of about 1.1 km of drainage channel with width ranging from 8.5 m to 21.5 m in She Shan River;
- (c) construction of about 0.7 km of drainage channel with width ranging from 13 m to 20 m in upper Tai Po River;
- (d) construction of about 25 m of twin-cell box culvert with internal cell dimensions of 1 350 millimetres (mm) in height and 2 500 mm in width in Ping Long, and about 18 m of single-cell box culvert with internal cell dimensions of 2 150 mm in height and 3 000 mm in width in Kwun Hang; and
- (e) ancillary road works.

———— A site plan showing the location of the works and a typical landscaping design of the proposed channel works is at Enclosure 1.

4. We started the construction works in September 2007 and originally planned to complete the works in November 2011. However, the construction period has been prolonged due to the additional works as described in paragraphs 8 to 9 below. As at end November 2011, 70% of works were completed, and the remaining 30% of works are river channel and box culvert works, ancillary and landscaping works to be carried out at upper Lam Tsuen River (14%), She Shan River (4%) and upper Tai Po River (12%). We anticipate that the river channel and box culvert works will be substantially completed by April 2012, while the ancillary and landscaping works will be completed by December 2012.

JUSTIFICATION

5. Following a review of the financial position of the project, we consider it necessary to increase the APE of **152CD** by \$141.9 million in MOD prices to cover the additional costs arising from the following –

- (a) increase in provision for price adjustment;
- (b) additional works to overcome unforeseen site constraints and implement design enhancements; and
- (c) additional site supervision costs.

/Increase

Increase in provision for price adjustment

6. According to existing Government practice, monthly payments to contractors for most construction contracts are adjusted to cover market fluctuation in labour and material costs, which are known as Contract Price Fluctuation (CPF) payment. The payment for the works of **152CD** is subject to CPF, and the provision for price adjustment was allowed when FC's funding approval for **152CD** was sought in July 2007. At that time, on the basis of the forecast of trend rate of change in the prices of public sector building and construction output in March 2007, as well as the anticipated project cash flow, a provision of \$8.7 million was allowed for price adjustment in the original APE.

7. Construction material prices have increased sharply since mid-2007 before moderating in mid-2009. A chart showing the relevant trend of material costs is at Enclosure 2. For example, the July 2011 cost indices for steel reinforcement, galvanized mild steel and sand have risen by 34.5%, 17.7% and 48.8% respectively from the July 2007 prices when the funding for the project was approved. In the light of the sharp increase in subsequent forecast on the trend rate of change in the prices of public sector building and construction output (the latest forecast of October 2011 is that there will be an increase of 5.0% per annum in 2011 and 5.5% per annum from 2012 to 2015) and the actual price deflators between 2007 and 2010 (the actual price deflators for 2007, 2008, 2009 and 2010 were 2.9%, 8.7%, 3.1% and 2.9% respectively)¹, the CPF payments have been higher than expected. We anticipate that the provision for price adjustment will have to be increased by \$88.2 million from \$8.7 million to \$96.9 million. Details are at Enclosure 3.

Additional works to overcome unforeseen site constraints and implement design enhancements

8. There had been unforeseen site constraints including unexpected poor subsoil conditions and presence of uncharted utilities. To meet the geotechnical requirements and maintain flood protection standard, changes were made to the design of the channel works in upper Lam Tsuen River and She Shan River, which had entailed additional time and costs to the project. The costs of the additional works in upper Lam Tsuen River and She Shan River are \$20.3 million and \$3.3 million respectively.

/9.

¹ The price adjustment factors adopted for the original funding application approved by FC in July 2007 are 0.0% in 2007, 1.0% increase per annum between 2008 and 2011, and 2.0% increase from 2012 onwards.

9. Moreover, there was a severe rainstorm on 22 July 2010 which caused a flash flood at Sha Po Tsai Village in the upper Tai Po River. After the incident, apart from implementing immediate flood relief and improvement works including stabilization of river bank, we also enhanced the design of the works at upper Tai Po River based on the findings and recommendations of an independent review of the flash flood incident² with a view to further optimizing the hydraulic performance of the river. The enhanced design has incorporated additional flood protection measures including boulder trap, stilling basins and baffle blocks. The cost of implementing the enhanced design is \$50.8 million.

10. The total cost of the additional works due to unforeseen site constraints and design enhancements in paragraphs 8 and 9 above is estimated to be \$74.4 million.

Additional site supervision costs

11. We have included a sum of \$32.0 million in the project estimate for hiring consultants for contract administration and site supervision. Owing to the extended construction period to implement the additional works, as well as adjustments to salary pay scale and housing benefit of resident site staff employed by the consultants for site supervision, the site supervision costs are estimated to increase by \$13.0 million from \$32.0 million to \$45.0 million.

Offset by lower-than-expected tender prices and reduction in project contingencies

12. The increase in cost as mentioned in paragraphs 7 to 11 above can be partly offset by the lower-than-expected tender price for the drainage and ancillary works (\$28.5 million), and the drawdown of \$5.2 million from contingencies. We need to retain \$32.0 million in contingencies to cater for further variations and possible claims during construction of the remaining works, and valuation of works during finalisation of the project account.

Review of financial position

13. A summary of the proposed increase of \$141.9 million is as follows –

/Factors

² Following an investigation of the incident conducted by the Drainage Services Department, we commissioned a professor of a local university to carry out an independent study to review the investigation of the incident at Sha Po Tsai Village.

Factors		Proposed increased amount/ savings in MOD prices (\$ million)	% of the total increased amount/ savings
Increase due to -			
(a)	increase in provision for price adjustment	88.2	50.2
(b)	costs of additional works	74.4	42.4
(c)	additional site supervision costs	13.0	7.4
		<hr/>	<hr/>
(d)	Total increase	175.6	100
(d) = (a) + (b) + (c)		<hr/>	<hr/>
Partly offset by –			
(e)	lower-than-expected tender prices	28.5	84.6
(f)	contingencies (part)	5.2	15.4
		<hr/>	<hr/>
(g)	Total savings (g) = (e) + (f)	33.7	100
		<hr/>	<hr/>
(h)	Proposed increase (h) = (d) – (g)	141.9	
		<hr/>	

14. We have already included the cost of the remaining works in the latest project estimate. Also, we have stepped up time and cost control measures with a view to containing the total expenditure within the latest project estimate. Hence, we consider that the revised APE is sufficient to cover the costs of the project.

15. A comparison of the cost breakdown of the APE and the latest project estimate is given at Enclosure 4.

/FINANCIAL

FINANCIAL IMPLICATIONS

16. Subject to FC's approval, we will phase the expenditure as follows –

Year	\$ million (in MOD prices)
Up to 31 March 2011	217.7
2011 – 2012	122.4
2012 – 2013	121.8
2013 – 2014	101.1
2014 – 2015	5.2
Total	568.2

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

PUBLIC CONSULTATION

18. As the proposed increase in the APE does not involve any change in project scope, we consider further public consultation not required. Nevertheless, we will maintain close liaison with the local community.

19. We consulted the Legislative Council Panel on Development on the proposal to increase the APE on 16 January 2012. Members raised no objection to the proposal. As requested by Members, additional information on a typical landscaping design of the proposed channel works and the local tree species to be planted along the embankment is provided at Enclosure 1.

ENVIRONMENTAL IMPLICATIONS

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

HERITAGE IMPLICATION

21. The proposed increase in the APE does 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

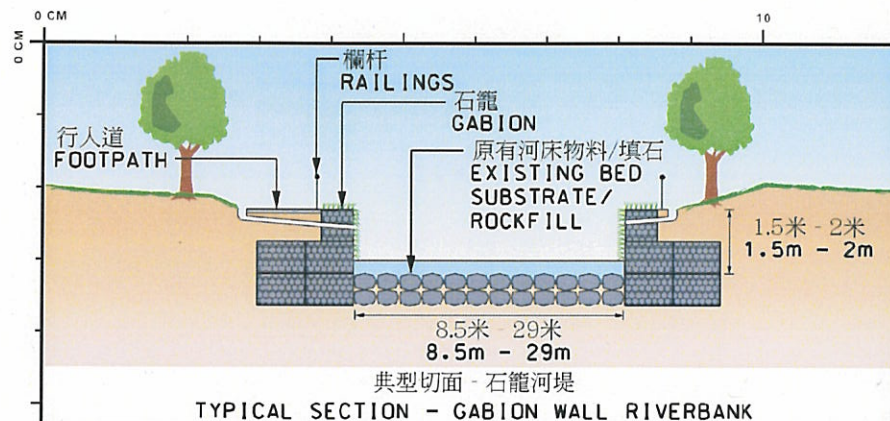
22. The proposed increase in the APE does not require any land acquisition.

BACKGROUND

23. In July 2007, we upgraded part of **109CD** to Category A as **152CD** at an estimated cost of \$426.3 million for the construction of drainage improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang. The construction works commenced in September 2007 and is expected to be substantially completed by December 2012.

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

25. The proposed increase in the APE will not create any new job.



TYPICAL SECTION - GABION WALL RIVERBANK

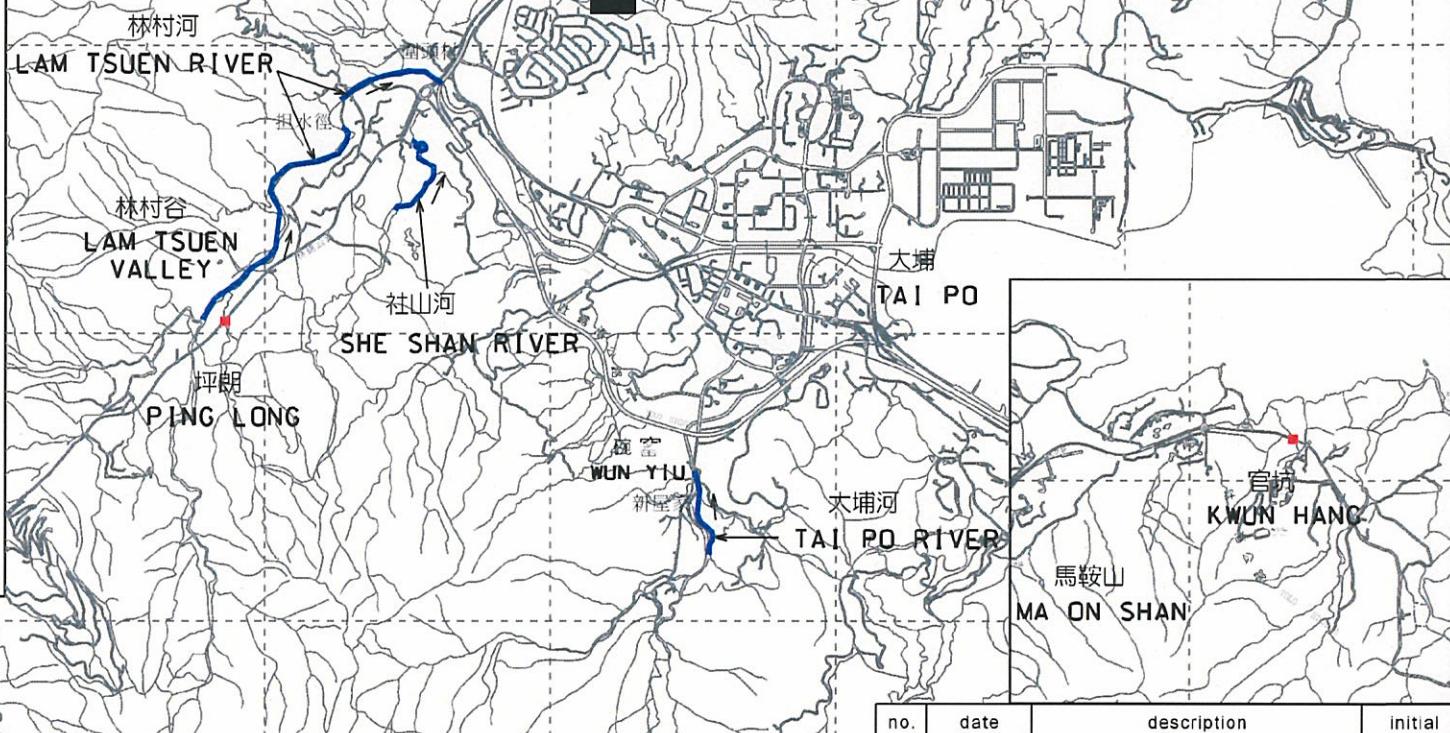
註釋:
NOTES

栽種於河堤上的當地樹木品種包括 -
THE LOCAL TREE SPECIES TO BE
PLANTED ALONG THE EMBANKMENT
INCLUDE -

- 1 細葉榕 FICUS MICROCARPA
- 2 黃槿 HIBISCUS TILIACEUS
- 3 青果榕 FICUS VARIEGATA CHLAROCARPA
- 4 大葉榕 FICUS VIRENS
- 5 血桐 MACARANGA TANARIUS
- 6 鴨腳木 SCHEFFLERA HEPTAPHYLLA
- 7 鐵刀木 CASSIA SIAMEA

圖例:
LEGEND:

- 林村河上游、社山河及大埔河上游河道改善工程
RIVER IMPROVEMENT WORKS IN UPPER
LAM TSUEN RIVER, SHE SHAN RIVER
AND UPPER TAI PO RIVER
- 坪朗及官坑之箱形暗渠
BOX CULVERTS AT PING LONG AND
KWUN HANG



drawing title

工務計劃項目第4152CD號
林村河上游, 社山河, 大埔河上游, 坪朗和官坑雨水排放系統改善工程
PWP ITEM NO. 4152CD
DRAINAGE IMPROVEMENT WORKS IN UPPER LAM TSUEN RIVER, SHE SHAN RIVER,
UPPER TAI PO RIVER, PING LONG AND KWUN HANG

drawn

C.W. LEE

date

checked

K.F. WONG

date

approved

T.C. HO

date

office

DRAINAGE PROJECTS DIVISION

description

drawing no.

DDP/152CD/01011

initial

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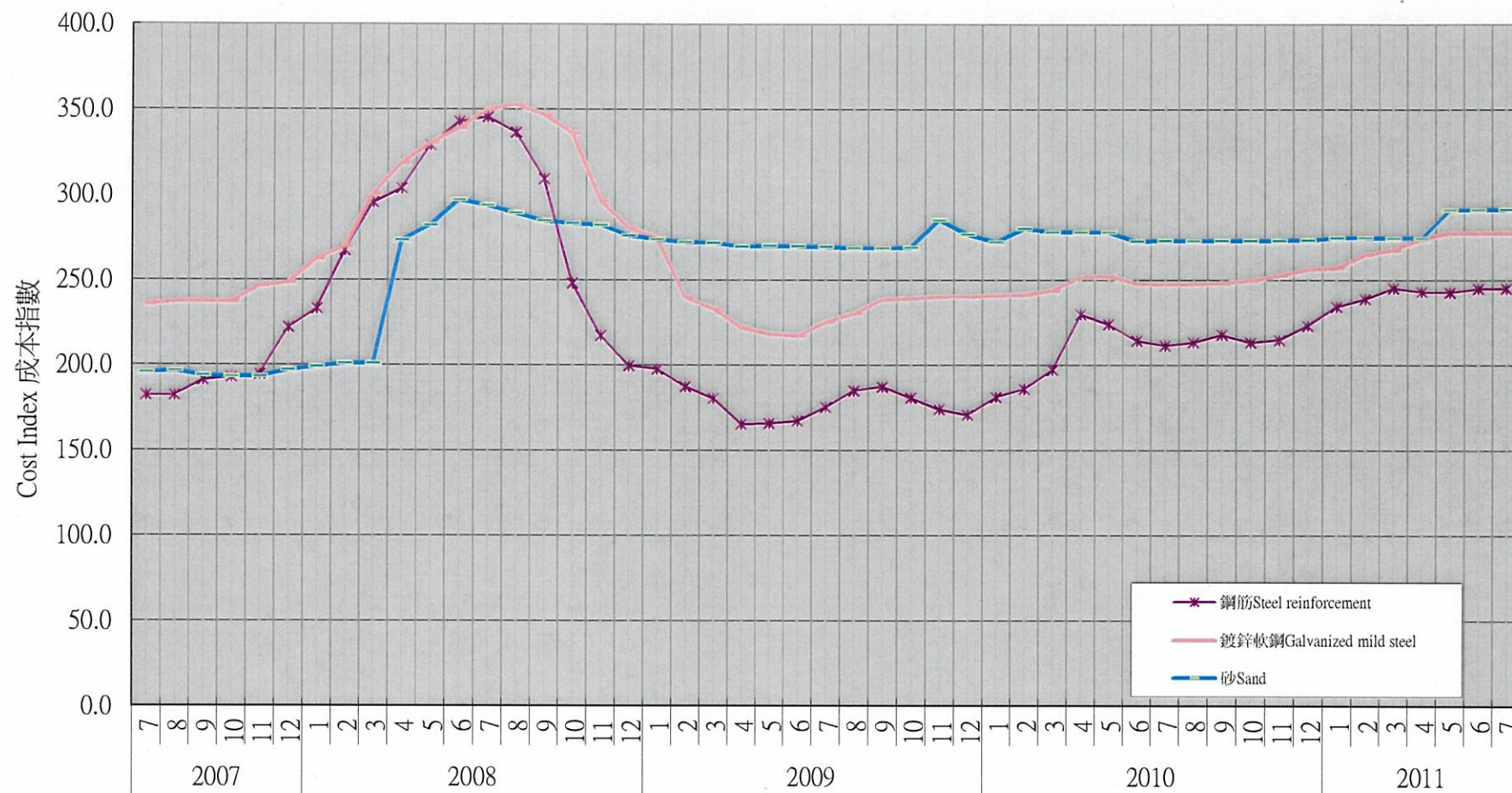
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

公營建築工程的材料成本指數 (2003年4月 = 100)

(2007年7月至2011年7月)

Index Numbers of Cost of Material used in Public Sector Construction Projects (April 2003 = 100)

(July 2007 - July 2011)



附件二 Enclosure 2

- Formulated from data of Census and Statistics Department, HKSAR Government
由香港政府統計處資料制定

Month/Year 年月

152CD – Drainage improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang

Table 1 – Cash flow and provisions for price adjustment in PWSC(2007-08)40

Year	Original project estimate (\$ million, in September 2006 prices) X	Original price adjustment factors (March 2007)# Y	Approved project estimate (\$ million, in MOD prices) Z	Provision for price adjustment (\$ million) A=Z – X
2007 - 2008	20.0	0.99900	20.0	0.0
2008 - 2009	94.9	1.00649	95.5	0.6
2009 - 2010	106.5	1.01656	108.3	1.8
2010 - 2011	116.6	1.02672	119.7	3.1
2011 - 2012	67.6	1.03699	70.1	2.5
2012 - 2013	12.0	1.05514	12.7	0.7
Total	417.6		426.3	8.7

Table 2 – Latest cash flow and provision for price adjustment due to latest project estimate (PE) and latest adjustment factors

Year	Latest PE (\$ million, in September 2006 prices) a	Latest PE (\$ million, in September 2011 prices)^ ^{^^} b	Latest price adjustment factors (October 2011) ## c	Latest PE (\$ million, in MOD prices) d	Latest provision for price adjustment (\$ million) e	Net increase in provision for price adjustment (\$ million) f
Up to March 2011	200.8	217.7 [^]	1.00000	217.7 [^]	e = d – a	f = e – A
2011 – 2012	99.3	122.4	1.00000	122.4		
2012 – 2013	93.8	115.6	1.05375	121.8		
2013 – 2014	73.8	90.9	1.11171	101.1		
2014 – 2015	3.6	4.4	1.17285	5.2		
Total	471.3	551.0		568.2	96.9	88.2

Notes:

Price adjustment factors adopted in March 2007 were based on the projected movement of prices for public sector building and construction output at that time, which were assumed to have no change in 2007 and increase by 1.0% per annum over the period from 2008 to 2011 and by 2.0% per annum from 2012 onwards.

Price adjustment factors adopted in October 2011 were based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 5.0% per annum in 2011 and by 5.5% per annum from 2012 onwards.

[^] \$217.7 million was the actual expenditure up to March 2011.

^{^^} The latest project estimate (in September 2006 prices) was multiplied by 1.23228 for conversion to September 2011 prices. The figure of 1.23228 represented the changes in price movement for public sector building and construction output between September 2006 and September 2011.

**152CD – Drainage improvement works in upper Lam Tsuen River,
She Shan River, upper Tai Po River, Ping Long and Kwun Hang**

**Comparison between Approved Project Estimate and
the Latest Project Estimate**

A comparison of the approved project estimate and the latest project estimate is as follows –

		(A) Approved Project Estimate (\$ million)	(B) Revised Project Estimate ³ (\$ million)	(C) Latest Project Estimate (\$ million)	(C) – (A) Difference (\$ million)
(a)	Construction of drainage and ancillary works in	325.9	297.4	371.8	45.9
(i)	Upper Lam Tsuen River	190.0	172.7	193.0	3.0
(ii)	She Shan River	57.0	58.6	61.9	4.9
(iii)	Upper Tai Po River	76.0	63.2	114.0	38.0
(iv)	Ping Long and Kwun Hang	2.9	2.9	2.9	0.0
(b)	Consultant's fees for	34.0	34.0	47.0	13.0
(i)	contract administration	2.0	2.0	2.0	0.0
(ii)	site supervision	32.0	32.0	45.0	13.0
(c)	Environmental mitigation measures	20.5	20.5	20.5	0.0
(d)	Contingencies	37.2	65.7	32.0	(5.2)
(e)	Provision for price adjustment	8.7	8.7	96.9	88.2
	Total	<u>426.3</u>	<u>426.3</u>	<u>568.2</u>	<u>141.9</u>

³ Revised project estimate after contract award.

2. As regards **(a) (Construction of drainage and ancillary works)**, there is a saving of \$28.5 million as a result of the lower-than-expected tender prices. However, there is a need to provide an additional \$74.4 million due to –

- i) an increase of \$20.3 million due to unforeseen site constraints in upper Lam Tsuen River;
- ii) an increase of \$3.3 million due to unforeseen site constraints in She Shan River; and
- iii) an increase of \$50.8 million due to implementation of design enhancements.

As such, the net increase of costs becomes \$45.9 million.

3. As regards **(b) (Site supervision costs)**, the total increase of \$13.0 million is due to adjustment to salary pay scale and housing benefit of resident site staff employed by the consultants for site supervision, and extended construction period.

4. As regards **(d) (Contingencies)**, we need to retain the remaining sum of \$32.0 million as contingencies to cater for further variations and possible claims during construction of remaining works, and valuation of works during finalisation of the project account.

5. As regards **(e) (Provision for price adjustment)**, the increase of \$88.2 million is due to unexpected increase in actual and projected payment for contract price fluctuation.