

**Discussion Paper for Legislative Council**  
**Panel on Planning, Lands and Works**  
**Meeting on 12 April 2002**

**53CD - River Training Works for the Upper River Indus**

**PURPOSE**

This paper briefs Members on the proposed increase in the approved project estimate of **53CD** from \$587.6 million by \$168.7 million to \$756.3 million in money-of-the-day (MOD) prices.

**BACKGROUND**

2. The river channels of the Upper River Indus are meandering and lack sufficient width and depth to allow the effective discharge of floodwaters into the Shenzhen River. As a result, the villages and farmland in the River Indus flood plain are prone to flooding during typhoons or heavy rainstorms. Flooding in the area has resulted in significant economic losses and disruption to traffic and social activities. This situation will be significantly improved when the river training works under **53CD** is completed.

3. On 11 June 1999, the Finance Committee (FC) approved the upgrading of **53CD** to Category A at an estimated cost of \$587.6 million in MOD prices for the river training works at the Upper River Indus. The contract works started in August 1999 and was originally scheduled for completion in mid-2002.

**PROJECT SCOPE AND NATURE**

4. The project **53CD** provides for the training of the Upper River Indus to ameliorate the flooding problems in the low-lying flood plain areas of

Fanling, Sheung Shui and hinterland. The scope of works approved by FC in June 1999 comprises -

- (a) widening, deepening and realigning the Upper River Indus and its tributaries;
- (b) construction of maintenance accesses with associated drainage works;
- (c) reprovisioning of four existing vehicular and five existing pedestrian river crossings, irrigation weirs and other facilities affected by the river training works described in paragraph (a) above;
- (d) environmental mitigation measures including landscape works, and creation of compensatory wetlands at river meanders; and
- (e) an environmental monitoring and audit programme for works mentioned in paragraphs (a) to (d) above.

A site plan showing the scope of works under **53CD** is at Enclosure 1. The proposed increase in the approved project estimate will not result in any change in the approved scope of works.

## **JUSTIFICATION**

5. Construction works for this project started in August 1999 for completion in mid-2002. In 2000, we noticed that the progress of the works started to slow down. As a result we had interviewed the contractor's senior management and repeatedly urged the contractor to increase the level of resources to mitigate the delay. While there was progress on site, it was not entirely satisfactory.

6. During the period from 5 to 13 June 2001, heavy rainstorms occurred in various areas of the territory. The prolonged rainstorms had saturated most of the soil in the catchment and effectively reduced the buffer capacity of the soil. As a result, the volume of flood water generated in the subsequent rainstorms was much higher. The rainfall was particularly intense in the North New Territories, recording a 24-hour total rainfall of 265 mm on 9 June 2001, over 10% of the average annual rainfall. The rainfall intensity on

that day was higher than a rainstorm with a return period of one in ten years<sup>1</sup>. The drainage capacity of the existing Upper River Indus was inadequate to cope with the flood water generated from the catchment by such intense rainfall.

7. As a direct sequel to the flooding incidents in June 2001, there was a strong public outcry for an early relief to the flooding in the New Territories including Fanling and Sheung Shui areas. Relevant flooding blackspots included Shek Wu San Tsuen, Tin Ping Shan and Fu Tei Au areas along the Upper River Indus. Immediately in June 2001, the Government set up a Task Force on Improvement of Drainage Systems, led by the Secretary for Works (S for W). The Task Force met twice in June to review comprehensively the overall programme of the major flood protection projects. Upon completion in 2003 of the current major flood prevention projects in the midstream and downstream sections of the main river channels, there will be much improvement to the flooding problem in the North and North West New Territories.

8. The LegCo also echoed and passed a motion at the meeting on 4 July 2001, urging the Government to expedite the river training projects. In response to the LegCo motion, and to provide early relief to the flooding problem in the North New Territories including Tin Ping Shan area, the Director of Territory Development (DTD) decided to excise part of the existing river training contract for the Upper River Indus and to employ a new contractor to carry out the works under a new contract. This arrangement aimed to complete the critical river training works before the 2002 wet season.

9. At the same time, S for W also instructed the Director of Drainage Services to conduct an investigation on the flooding in June 2001. The Investigation Report on Flooding in the New Territories and Tsuen Wan in June 2001 was completed in September 2001. The investigation showed that low-lying topography, inadequate drainage capacities of the existing river channels, prolonged heavy rainstorms and high tide were the principal causes to the flooding in the Northern New Territories. The investigation report had been forwarded to Professor Joseph Hun-wei Lee of the University of Hong Kong for his independent review of the investigation findings. Professor Lee completed his review in mid-September 2001 and found the conclusions acceptable. He said that in general the methodology and main findings of the report were scientifically-based and credible.

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1 "Return period" means the average number of years during which a certain severity of a flooding will occur once, statistically. A longer return period means a rarer chance of occurrence of a more severe flooding.

10. To mitigate the delay in the river training works in the Upper River Indus, and to expedite the remaining works under **53CD**, we had considered a number of options. DTD asked the Engineer in June 2001 the possibility of re-entering the contract. Re-entering the contract was not feasible under the contract as the Engineer at that time did not consider that there was clear evidence that the contractor had failed to proceed with the works with due diligence. Nevertheless we obtained the contractor's consent on 7 September 2001 to excise from the contract that part of the critical works downstream and including the bridge works at Man Kam To Road, which constituted about 30% of the works of the original contract.

11. Concurrently, we invited restricted tenders on 20 July 2001 for the excised works from those contractors with proven experience and good track record on similar works in Hong Kong. The new contract involved the completion of a reprovisioned Man Kam To Road bridge, two footbridges and three pipe bridges, three box-culverts, four retaining walls, river channel, and the construction of maintenance access and implementation of environmental mitigation measures. Three tenders were received and the tender sums were close to each other.

12. The contractor of the new contract commenced works on 14 September 2001. In order that the section of the Upper River Indus downstream of Man Kam To Road Bridge (including the Fu Tei Au area) can be upgraded to withstand a rainstorm with a return period of one in ten years during the rainy season of 2002, the new contract has prescribed the completion of the critical structural and channel works in this section by March 2002, while allowing the overall completion before the rainy season of 2003. The contractor has an extremely tight programme and is not allowed to work within the channel during the rainy season of 2002 lest its activities might obstruct the flow. Such stringent requirements have been reflected in the price of the new contract.

13. Our intention was that with the partial excision of the works, the original contractor could concentrate its resources and improve progress on the rest of the remaining works. Unfortunately, the contractor's performance further deteriorated in the period that followed and the necessary conditions for re-entry under the contract were reached. Government therefore expelled the contractor from the site and re-entered the contract on 20 December 2001.

14. In order to bring an early relief to the flooding in the flooding blackspots at Tin Ping Shan and Shek Wu San Tsuen areas within the remaining few months in the dry season, and to provide these two areas with a flow capacity of about one in ten years at the beginning of the 2002 wet season,

the Government executed a Supplemental Agreement on 21 December 2001 with the contractor for the excised works to undertake the critical bridge and channel works in the re-entered contract at rates comparable to the contract of the excised works.

15. Following a review of the financial position of the project, DTD considers that the approved project estimate of **53CD** is insufficient to fund the three contracts, namely, the original contract, the new contract for the works excised from the original contract, and the new contract for the rest of the uncompleted works. Moreover, there will be additional consultant fees for the preparation of the new tenders and tender assessment. Additional site staff costs will also be incurred due to the prolonged construction period and the splitting of the works into three contracts. We will recover from the contractor of the original contract the cost difference arising from the re-entry of the original contract in due course. A summary of the proposed increase of \$168.7 million is as follows –

<b>Factor</b>	<b>Increase/ (Decrease) (\$ million)</b>	<b>% of the total increased amount</b>
(a) Increase in cost of works	156.6	92.8
(b) Increase in Consultants' fees	3.8	2.2
(c) Increase in site staff costs	15.3	9.1
(d) Reduction in contingencies	(7.0)	(4.1)
Total (in MOD prices)	168.7	100

16. A comparison of the cost breakdowns of the approved and revised project estimates in money-of-the prices and the reasons for the increase are at Enclosure 2.

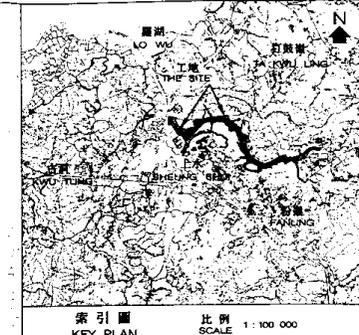
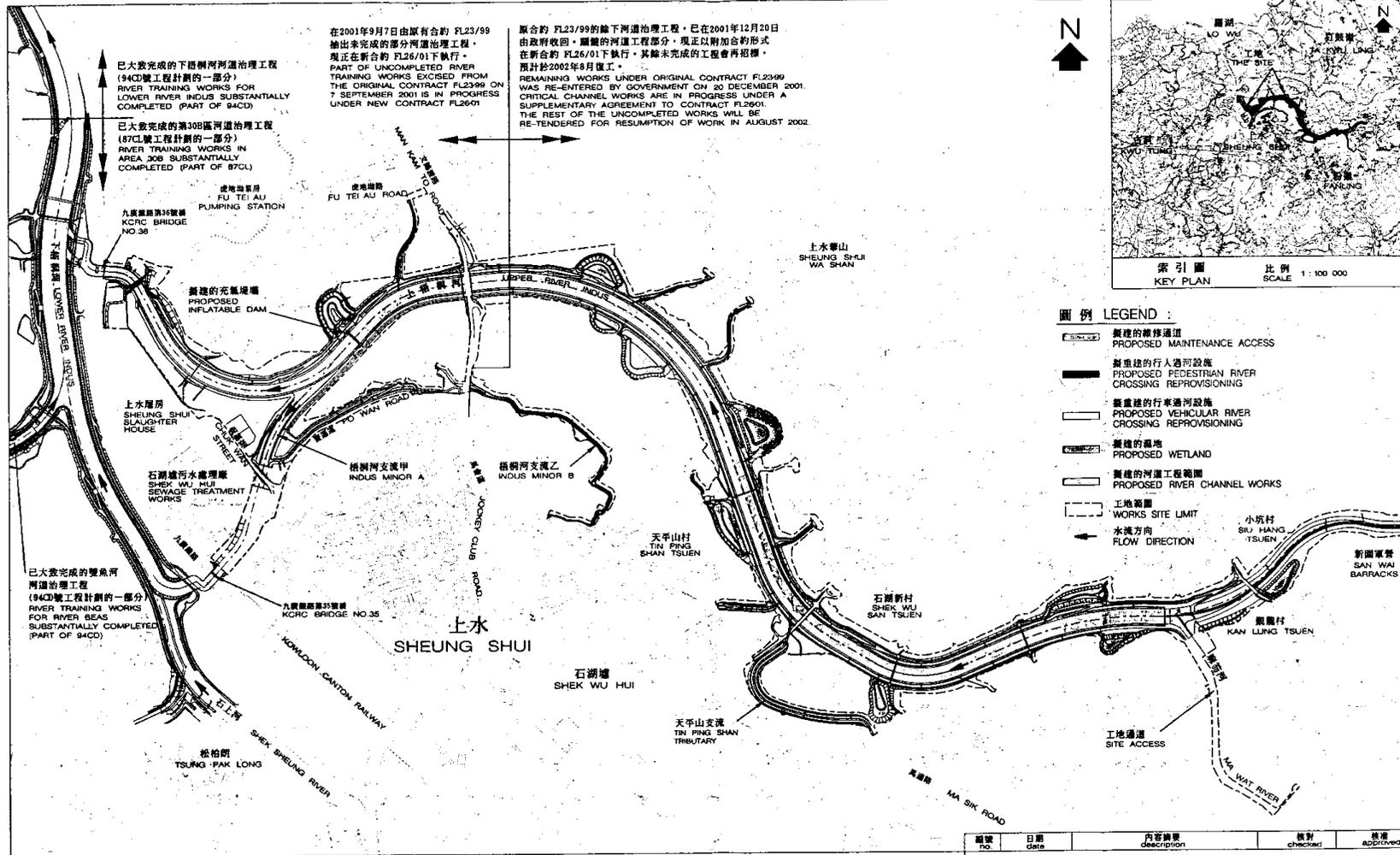
## **WAY FORWARD**

17. We target to commence these works in August 2002 for completion of the channel works before the rainy season of 2003 and overall completion by early 2004. Upon completion of the channel works in this

project, we will be able to ameliorate the flooding problems in the low-lying flood plain areas of Fanling, Sheung Shui and hinterland, in particular the flooding blackspots in Shek Wu San Tsuen, Tin Ping Shan and Fu Tei Au areas along the Upper River Indus.

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**Works Bureau**  
**April 2002**



圖例 LEGEND :

- 擬建的維修通道  
PROPOSED MAINTENANCE ACCESS
- 擬建的人行過河設施  
PROPOSED PEDESTRIAN RIVER CROSSING REPROVISIONING
- 擬建之行車過河設施  
PROPOSED VEHICULAR RIVER CROSSING REPROVISIONING
- 擬建的濕地  
PROPOSED WETLAND
- 擬建的河道工程範圍  
PROPOSED RIVER CHANNEL WORKS
- 工地範圍  
WORKS SITE LIMIT
- 水流方向  
FLOW DIRECTION

在2001年9月7日由原有合約 FL23/99 抽起未完成的部份河道治理工程，現正在新合約 FL26/01下執行。  
PART OF UNCOMPLETED RIVER TRAINING WORKS EXCISED FROM THE ORIGINAL CONTRACT FL23/99 ON 7 SEPTEMBER 2001 IS IN PROGRESS UNDER NEW CONTRACT FL26/01

原合約 FL23/99的餘下河道治理工程，已在2001年12月20日由政府收回，屬餘的河道工程部分，現正以附加合約形式在新合約 FL26/01下執行，其餘未完成的工程會再招標，預計於2002年8月復工。  
REMAINING WORKS UNDER ORIGINAL CONTRACT FL23/99 WAS RE-ENTERED BY GOVERNMENT ON 20 DECEMBER 2001. CRITICAL CHANNEL WORKS ARE IN PROGRESS UNDER A SUPPLEMENTARY AGREEMENT TO CONTRACT FL26/01. THE REST OF THE UNCOMPLETED WORKS WILL BE RE-TENDERED FOR RESUMPTION OF WORK IN AUGUST 2002.

已大致完成的下游桐河河道治理工程 (94CD工程計劃的一部分)  
RIVER TRAINING WORKS FOR LOWER RIVER INDUS SUBSTANTIALLY COMPLETED (PART OF 94CD)

已大致完成的第308區河道治理工程 (87CL工程計劃的一部分)  
RIVER TRAINING WORKS IN AREA 308 SUBSTANTIALLY COMPLETED (PART OF 87CL)

已大致完成的雙魚河河道治理工程 (94CD工程計劃的一部分)  
RIVER TRAINING WORKS FOR RIVER SEAS SUBSTANTIALLY COMPLETED (PART OF 94CD)

二〇〇二年至二〇〇三年年度工務小組委員會文件 P.W.S.C. SUBMISSION 2002/2003

圖則名稱 drawing title  
**上梧桐河河道治理工程**  
RIVER TRAINING WORKS FOR THE UPPER RIVER INDUS

編號 NO.	日期 DATE	內容摘要 description	核對 checked	簽署 approved
修訂 REVISION				
繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office NEW TERRITORIES NORTH DEVELOPMENT OFFICE
C CHUN	SIGNED	19.02.2002	53CDA	
核對 checked	簽署 initial	日期 date	比例 scale	拓展署 TERRITORY DEVELOPMENT DEPARTMENT
C Y CHAN	SIGNED	19.02.2002	1 : 10 000	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.	
C S LIU	SIGNED	27.03.2002	NTN 2124	

**53CD - River training works for the Upper River Indus**

A comparison of the approved and revised project estimates in money-of-the-day (MOD) prices is as follows -

	<b>Approved Estimate</b>	<b>Revised Estimate</b>	<b>Difference</b>
<b>\$ million (in MOD prices)</b>			
(a) Construction works, including environmental monitoring and audit programme	483.6	640.2	156.6
(b) Consultants' fees	7.3	11.1	3.8
(c) Site staff costs	47.7	63.0	15.3
(d) Contingencies	49.0	42.0	(7.0)
Total	<u>587.6</u>	<u>756.3</u>	<u>168.7</u>

2. As regards (a) (construction works), the increase of \$156.6 million is attributable to the following factors: -

- (a) Firstly, the programme of works under the new contracts is much more compressed than the original contract. In order to meet the tight programme, the contractors have to work simultaneously at more locations and overtime. This would reduce the opportunity for the re-use of temporary works, such as sheet piles and formwork. More substantial falsework for cross-river structures is also required so as to enable works to continue during the wet season of 2002 whilst minimising obstruction to flow;
- (b) Secondly, taking up of the uncompleted works by another contractor inevitably results in some additional works (e.g. mobilization of piling rigs). Additional protective works are also required for the partially completed river channels; and

- (c) Thirdly, there are additional preliminaries under the new contracts, including the contractor's temporary accommodation, insurance, and other general obligations such as maintenance of traffic and river flow. The cost of preliminaries further increases as a result of the prolonged construction period.

3. As regards (b) (consultants' fees), the increase of \$3.8 million is due to the preparation of Supplemental Agreement, tender documents for the two new contracts (including tender assessment) and other additional services relating to re-entry of the original contract.

4. As regards (c) (site staff costs), the increase of \$15.3 million is to cover the additional cost of increased site supervisory efforts due to splitting of contracts and lengthened construction period.

5. As regards (d) (contingencies), we are now able to reduce the allowance for contingencies from \$49 million by \$7 million to \$42 million because most of the works are already on-going with more accurate estimated contract sums.