

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### Head 704 – DRAINAGE

#### Civil Engineering – Drainage and erosion protection

#### 120CD – Drainage Improvement in Sai Kung

Members are invited to recommend to Finance Committee the upgrading of **120CD** to Category A at an estimated cost of \$158.0 million in money-of-the-day prices for drainage improvement works at Ho Chung River, Sai Kung River and Pak Kong River in Sai Kung.

### PROBLEM

Due to inadequate capacity of the existing drainage systems, a number of areas in Sai Kung are susceptible to flooding during heavy rainstorms.

### PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **120CD** to Category A at an estimated cost of \$158.0 million in money-of-the-day (MOD) prices for the drainage improvement works at Ho Chung River, Sai Kung River and Pak Kong River in Sai Kung.

### PROJECT SCOPE AND NATURE

3. The scope of **120CD** comprises –

/(a) .....

- (a) construction of about 700 metres (m) of drainage channels with width ranging from 17 m to 45 m and ancillary works at Ho Chung River;
- (b) construction of about 150 m of drainage channels with width of 23 m, 300 m of box culverts with width of 11 m and ancillary works at Sai Kung River; and
- (c) improvement of two bottlenecks and ancillary works at Pak Kong River.

— A site plan and typical sections showing the proposed drainage works are at Enclosure 1.

4. We plan to commence construction in April 2007 for completion in December 2009.

## JUSTIFICATION

5. Owing to urban developments in Sai Kung over the past decade, more and more natural ground has been paved over and become impermeable. Rainwater which previously dissipated naturally through ground infiltration can no longer do so. This has led to significant increase in surface run-off and overloading of Ho Chung River, Sai Kung River and Pak Kong River. As a result, many areas in Sai Kung are susceptible to flooding during heavy rainstorms.

6. To alleviate the flooding risks in the areas concerned and to meet the community's increasing expectation for better flood protection, we propose to train Ho Chung River and Sai Kung River, raising their flood protection standard to generally withstand rainstorms with a return period<sup>1</sup> of one in 50 years.

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

7. A similar river training proposal at Pak Kong River, however, met with strong objections from villagers during consultation. In order to address villagers' requests in minimising land resumption, we propose to remove two bottlenecks by re-construction of two existing crossings. The proposed design will only protect the area around Pak Kong River from rainstorms with a return period of one in two years. This flood protection level was highlighted in our consultation paper discussed at the meeting of the Tai Chung Hau Village Mutual Committee on 17 February 2004. Members of the Tai Chung Hau Village Mutual Committee unanimously accepted the lower flood protection level and agreed to the design.

### FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be \$158.0 million in MOD prices (see paragraph 9 below), made up as follows –

	<b>\$ million</b>	
(a) Drainage improvement works and ancillary works at –	121.6	
(i) Ho Chung River	64.9	
(ii) Sai Kung River	47.6	
(iii) Pak Kong River	9.1	
(b) Consultants' fees for	14.0	
(i) contract administration	1.5	
(ii) site supervision	12.5	
(c) Environmental mitigation measures	3.4	
(d) Contingencies	12.3	
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Sub-total	151.3	(in September 2006 prices)
(e) Provision for price adjustment	6.7	
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Total	158.0	(in MOD prices)
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A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

<b>Year</b>	<b>\$ million (Sept 2006)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2007 – 2008	20.2	1.01250	20.5
2008 – 2009	39.3	1.02769	40.4
2009 – 2010	39.3	1.04310	41.0
2010 – 2011	31.8	1.05875	33.7
2011 – 2012	20.7	1.08257	22.4
	151.3		158.0

10. We have derived the MOD estimate on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2007 to 2012. We will tender the proposed works under a standard re-measurement contract because of the uncertainties of the existence and alignment of the utilities and the ground condition. The contract will provide for price adjustments because the contract period will exceed 21 months.

11. We estimate the annually recurrent expenditure arising from this project to be \$470,000.

## **PUBLIC CONSULTATION**

12. We consulted the Sai Kung Rural Committee and the Sai Kung District Council on 8 December 2003 and 24 February 2004 respectively. Both supported the implementation of the proposed works.

13. We gazetted the proposed works for Pak Kong River and Ho Chung River under the Foreshore and Seabed (Reclamations) Ordinance on 18 February and 13 May 2005 respectively. We received two objections for the proposed works at Ho Chung River. After our clarification, the objectors withdrew their objections unconditionally.

14. We gazetted the proposed works for Pak Kong River and Sai Kung River and for Ho Chung River under the Roads (Works, Use and Compensation) Ordinance on 6 May and 10 June 2005 respectively. We received one objection for the proposed works at Sai Kung River and three objections for Ho Chung River. One objector expressed concern about the resumption limit and withdrew the objection unconditionally after our clarification. The other three objectors requested us to revise the land resumption limit so as to avoid clearance of their squatter structures or reduce resumption of their land. After our revision of the land resumption limit, the objectors withdrew their objections unconditionally. We then gazetted the amended land resumption plan on 13 April 2006 and received no further objection.

15. We consulted the Legislative Council Panel on Planning, Lands and Works on the proposed works by circulation of an information paper on 20 November 2006. On the advice of the Panel Chairman, we also provided supplementary information on the details of the estimated annual recurrent expenditures arising from the project and the reasons for not using underground tunnelling method in the proposed works by circulation of a Supplementary Note on 13 December 2006. Panel Members did not raise any objection to the proposed works.

## **ENVIRONMENTAL IMPLICATIONS**

16. The proposed drainage works are classified as a designated project under the Environmental Impact Assessment (EIA) Ordinance (Cap 499). We completed the EIA Report and obtained the environmental permit in May 2005. The EIA report concluded that the environmental impacts of the proposed works could be controlled to comply with the criteria under the EIA Ordinance and the Technical Memorandum on EIA Process. We will implement the recommendations of the EIA Report in the construction and operation stages of the project.

17. For short-term impacts during construction, we will control noise, dust, and site run-off within the standards and guidelines through implementation of mitigation measures in the works contract, such as the use of temporary noise barriers and silenced construction plants to reduce noise generation, water-spraying to reduce emission of fugitive dust and strict control on diversion of stream flows. We will also adopt environmental friendly designs such as gabion walls, natural substrates on riverbed, fish ladder and ecological planting. We have included \$3.4 million (in September 2006 prices) in the project estimate for implementation of the environmental mitigation measures.

18. We have considered ways in the planning and design stages to reduce the generation of construction and demolition (C&D) materials. In addition, we will require the contractor to reuse insert C&D materials on site or in other suitable construction sites as far as possible, in order to minimise the disposal of C&D materials to public fill reception facilities<sup>2</sup>. We will encourage the contractors to maximise the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimise the generation of construction waste.

19. We will also require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste to public fill reception facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

20. We estimate that the project will generate about 179 600 tonnes of C&D materials. Of these, we will reuse about 23 300 tonnes (13%) on site, deliver 127 300 tonnes (71%) to public fill reception facilities for subsequent reuse and dispose of 29 000 tonnes (16%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites

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<sup>2</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

is estimated to be about \$7.1 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>3</sup> at the landfill).

21. We have carried out traffic impact assessment for the proposed works which concluded that the proposed works would not cause unacceptable traffic impact.

## LAND ACQUISITION

22. We will resume about 17 938 square metres (m<sup>2</sup>) of private agricultural land, temporarily occupy 594 m<sup>2</sup> of private agricultural land and clear 36 484 m<sup>2</sup> of government land for the proposed works. The land resumption will affect 19 families comprising 35 persons. The Director of Housing will offer eligible families with public housing under the prevailing Government policy. We will charge the land resumption and clearance costs, estimated to be about \$51.9 million, to **Head 701 - Land Acquisition**.

## BACKGROUND INFORMATION

23. In December 2001, we included **120CD** “Drainage improvements in Sai Kung” in Category B for the improvement of drainage systems in Sai Kung.

24. In April 2002, we upgraded part of **120CD** to Category A as **124CD** “Drainage improvement in Sai Kung – consultants’ fees, investigations and advance works”, at an estimated cost of \$30.5 million in MOD prices for engaging consultants to carry out detailed design for the drainage improvement works and construction of a section of box culvert at the downstream of Sai Kung River (advance works). We started the advance works in September 2002 and completed them in March 2005.

25. Of the 1 105 trees within the project boundary, 639 trees will be preserved. The proposed works will involve the removal of 464 common trees

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<sup>3</sup> This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m<sup>3</sup>), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

including 386 trees to be felled and 78 trees to be replanted within the project site. Besides, two important trees<sup>4</sup> will be transplanted within the works site during the implementation of the project. A summary of two important trees affected is provided at Enclosure 3. We will incorporate planting proposal as part of the project, including estimated quantities of 442 trees and 1790 m<sup>2</sup> of grassed area.

26. We estimate that the proposed works will create about 85 jobs (68 for labourers and another 17 for professional/technical staff) providing a total employment of 2 400 man-months.

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Environment, Transport and Works Bureau  
December 2006

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<sup>4</sup> “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (a) trees over 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.



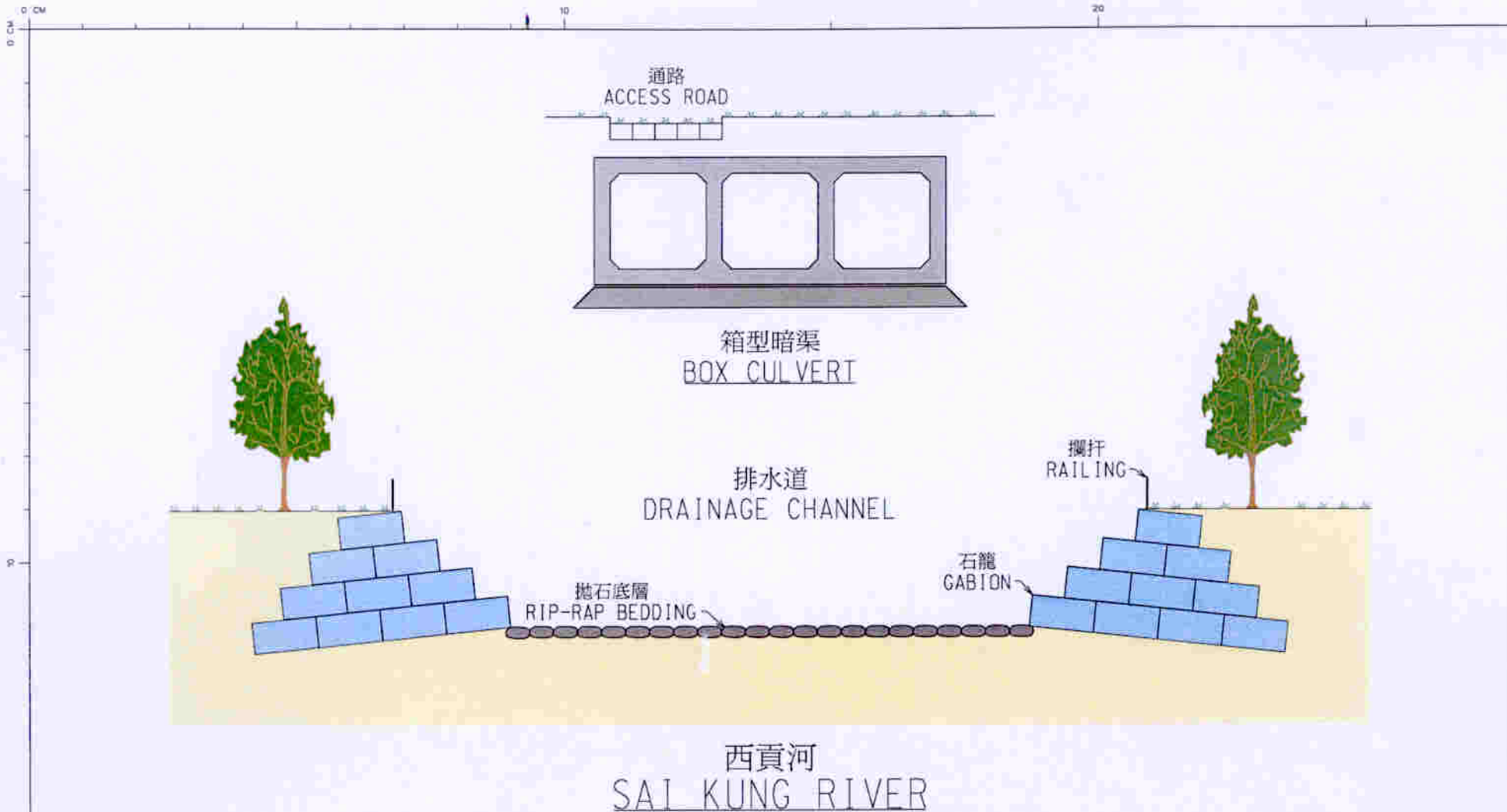


圖則名稱 drawing title  
**工務計劃項目第120CD - 西貢雨水排放系統改善計劃**  
**PWP ITEM No.120CD**  
**DRAINAGE IMPROVEMENT IN SAI KUNG**

繪畫 drawn	SIGNED C. K. LAM	日期 date	22.MAY.05
核對 checked	SIGNED F. K. PONG	日期 date	09.JUN.05
批核 approved		日期 date	
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

A	06.OCT.06	GENERAL REVISION	SIGNED
圖則編號 drawing no.		DPM/120CD0/0001A	
比例 scale		1 : 30000	
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附件一 (全三張其一) ENCLOSURE 1 (SHEET 1 OF 3)

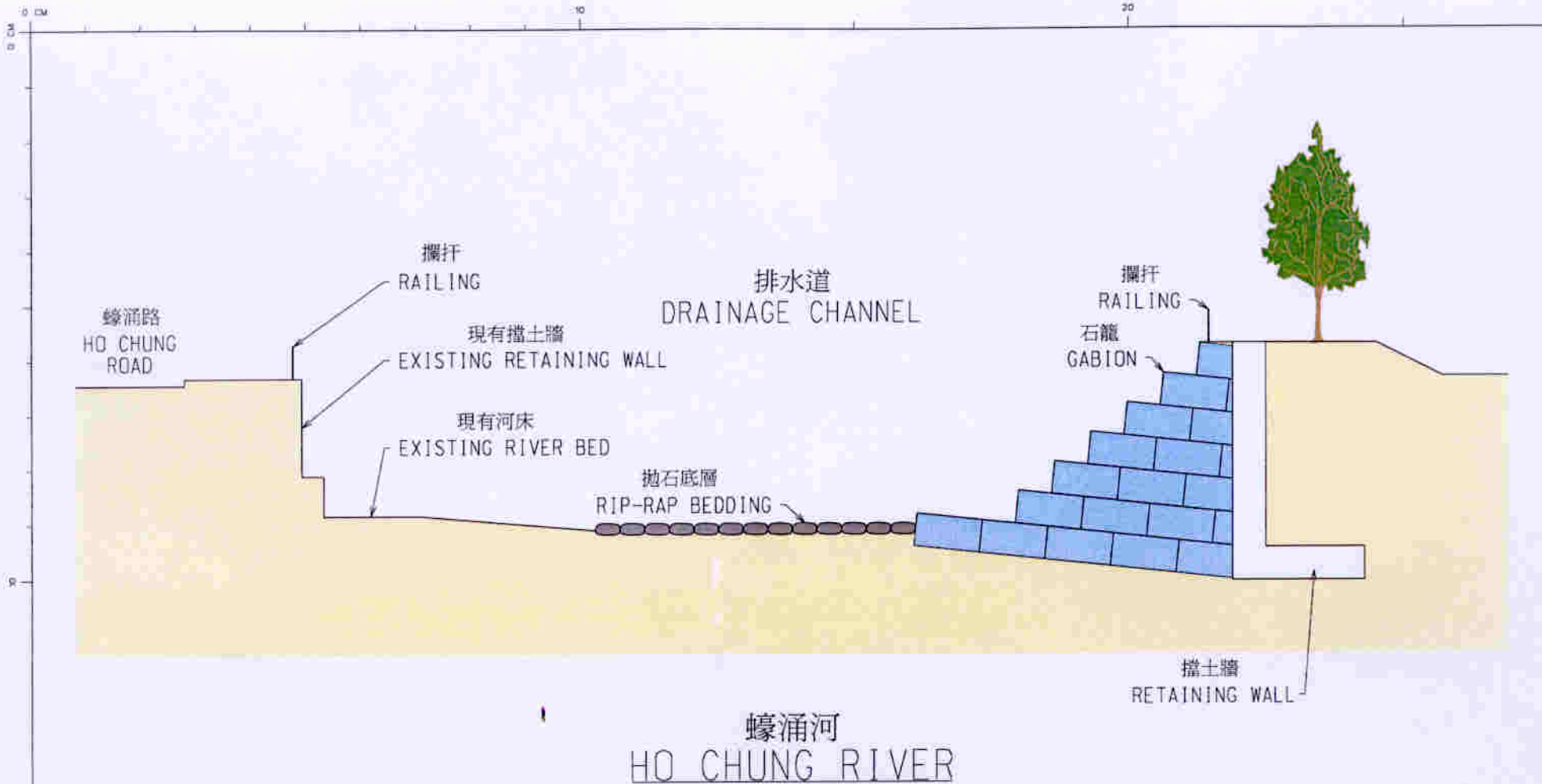


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 DRAINAGE IMPROVEMENT IN SAI KUNG

繪畫 drawn *SIGNED* C. K. LAM  
 日期 date 22.MAY.05  
 核對 checked *SIGNED* F. K. PONG  
 日期 date 09.JUN.05  
 批核 approved  
 日期 date  
 部門 office 工程管理部  
 PROJECT MANAGEMENT DIVISION

A	04.OCT.06	GENERAL REVISIONS	<i>SIGNED</i>
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附件一 (全三張其二) ENCLOSURE 1 (SHEET 2 OF 3)



圖則名稱 drawing title

工務計劃項目第120CD - 西貢雨水排放系統改善計劃  
 PWP ITEM No. 120CD  
 DRAINAGE IMPROVEMENT IN SAI KUNG

繪圖 drawn	SIGNED C. K. LAM	日期 date	04.OCT.06
核對 checked	SIGNED F. K. PONG	日期 date	11.OCT.06
批准 approved		日期 date	

圖則編號 drawing no.	DPM/120CD0/0003	比例 scale	N. T. S.
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附件一 (全三張其三) ENCLOSURE 1 (SHEET 3 OF 3)

**120CD – Drainage Improvement in Sai Kung****Breakdown of the estimates for consultants' fees**

Consultants' staff costs (note 2)		Estimated man-months	Average MPS* salary point	Multiplier (note 1)	Estimated fee (\$ million)
(a)	Contract administration	-	-	-	1.0
	(Note 2)	-	-	-	0.5
(b)	Site supervision by	73	38	1.6	6.3
	resident site staff of the consultants	215	14	1.6	6.2
(Note 3)					
<b>Total consultants' staff costs</b>					14.0

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of resident site staff supplied by consultants. (As at 1 January 2006, MPS point 38 = \$54,255 per month and MPS point 14 = \$18,010 per month.)
2. The consultants' fees for contract administration are based on the lump sum fees calculated in accordance with the consultancy agreement which the Director of Drainage Services has agreed with the consultants undertaking the design and construction of the project. The construction phase of the assignment for the proposed works will only be executed subject to Finance Committee's approval to upgrade the proposed works to Category A.
3. We will only know the actual man-months and actual costs after the completion of the construction works.

**Summary of “Important Trees” involved in  
120CD - Drainage Improvement in Sai Kung**

Tree ref no.	Tree species (Botanical names)	Tree size			Form <sup>(1)</sup> (Good/Fair/Poor)	Survival rate after transplanting (High/Medium/Low)	Amenity value (High/Medium/Low)	Recommendation (Retain/Transplant/Fell)	Remarks
		Overall height (m)	Trunk <sup>(2)</sup> diameter (mm)	Average crown spread (m)					
T234	Ehretia acuminata	8	200	4	Fair	High	High	Transplant within the site	1. Rare species 2. The tree is located in the middle of the proposed Ho Chung Channel and cannot be retained.
T235	Ehretia acuminata	3	100	1	Fair	High	High	Transplant within the site	1. Rare species 2. The tree is located in the middle of the proposed Ho Chung Channel and cannot be retained.

<sup>(1)</sup> Form of a tree will take account of the overall tree size, shape, and any special feature.

<sup>(2)</sup> Trunk diameter of a tree refers to its diameter at breast height (i.e. measured at 1 m above ground level).