

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 –

- (a) the upgrading of part of **120CD**, entitled "Drainage improvement in Sai Kung – consultants' fees, investigations and advance works", to Category A at an estimated cost of \$30.5 million in money-of-day prices; and
- (b) the retention of the remainder of **120CD** in Category B.

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 (D of DS), with the support of the Secretary for Works, proposes to upgrade part of **120CD** to Category A for the following work –

/(a)

- (a) construction of a box culvert of about 280 metres (m) at Sha Ha in conjunction with **304CL** "Formation, roads and drains for package 6 remainder, Sai Kung" (advance works); and
- (b) engaging consultants to carry out site investigations and surveys, environmental impact assessment and detailed design for the works described in paragraphs 3(b) and (c) below, and the remaining 300 m-long box culvert (see paragraph 3(a) below).

PROJECT SCOPE AND NATURE

- 3. The scope of **120CD** comprises the construction of –
 - (a) a box culvert of about 580 m at Sha Ha (about 280 m to be constructed in advance in conjunction with **304CL** "Formation, roads and drains for package 6 remainder, Sai Kung"; the remaining 300 m to be constructed together with the works described in items (b) and (c) below); and
 - (b) river channels of –
 - (i) about 140 m at Sai Kung River,
 - (ii) about 620 m at Pak Kong River,
 - (iii) about 700 m at Ho Chung River, and
 - (c) the maintenance access roads and flood control devices (such as weirs) associated with items (a) and (b) above.

- 4. A site plan showing the proposed works is at Enclosure 1.

- 5. We plan to start the construction of the 280 m-long box culvert in July 2002 for completion in December 2004, and the proposed design consultancy in August 2002 for completion in December 2005.

/JUSTIFICATION

JUSTIFICATION

6. 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 would previously dissipate naturally through ground filtration can no longer do so. This has led to significant increase in surface run-off and overloading of Sai Kung River, Sha Ha River, Ho Chung River and Pak Kong River. As a result, many areas in Sai Kung are susceptible to flooding during heavy rainstorms.

7. The Stormwater Drainage Master Plan Study in Sai Kung, East Kowloon and Southern Lantau substantially completed recently reveals that the existing rivers in Sai Kung do not have adequate hydraulic capacity. The study recommends that we need to improve the hydraulic capacity of the Sai Kung River, Sha Ha River, Ho Chung River and Pak Kong River to alleviate flooding problem in Sai Kung.

8. Upon completion of the proposed drainage improvements, the flood protection level in Sai Kung area will generally be raised to withstand rainstorms with a return period of one in 50 years¹, and the chance of flooding during heavy rainstorms will be very small.

9. Due to the lack of in-house staff resources, D of DS proposes to employ consultants to carry out site investigations, environmental impact assessment and detailed design of engineering works to facilitate implementation of the proposed flood improvement project.

10. The downstream section of the proposed box culvert at Sha Ha under **120CD** falls within a new road project to be constructed under **304CL**, which is scheduled for commencement in July 2002. To avoid repeated opening and reinstatement of roads and minimise inconvenience to the public, we will advance and incorporate the construction of this part of the box culvert into the roadworks contract under **304CL**. Such arrangement will also bring about cost-savings.

/FINANCIAL

¹ "Return period" means 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.

FINANCIAL IMPLICATIONS

11. We estimate the cost of the proposed consultancy and the entrustment works to be \$30.5 million in MOD prices (see paragraph 12 below), made up as follows –

	\$ million	
(a) Site investigations and surveys	2.4	
(b) Consultants' fees –	4.7	
(i) supervision of site investigations and surveys	0.5	
(ii) environmental impact assessment	1.8	
(iii) detailed design including the preparation of tender documents	2.4	
(c) Construction of a box culvert of 280 m under 304CL²	20.1	
(d) Contingencies	3.0	

Sub-total	30.2	(in September 2001 prices)
(e) Provision for price adjustment	0.3	

Total	30.5	(in MOD prices)

_____ A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

/12.

² Design already completed by the Director of Civil Engineering using in-house resources (paragraph 21 refers).

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

Year	\$ million (Sept 2001)	Price adjustment factor	\$ million (MOD)
2002 – 2003	3.8	0.99700	3.8
2003 – 2004	14.3	1.00398	14.4
2004 – 2005	7.8	1.01101	7.9
2005 – 2006	3.1	1.01808	3.2
2006 – 2007	1.2	1.02521	1.2
	30.2		30.5

13. We have derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2002 to 2007. We will tender the proposed consultancy under a lump-sum contract with provision for price adjustment as the consultancy agreement will exceed 12 months. Since the scale of works involved is fairly small (costing \$1.5 million), we will arrange the term contractor of the Geotechnical Engineering Office to carry out site investigations and laboratory testing. We will also arrange the consultants to supervise the site investigations works. The advance works will form part of the roadworks contract under **304CL** to be carried out by the Director of Civil Engineering (DCE). DCE will tender the contract under a lump-sum contract with provision for price adjustment as the duration of the construction contract will exceed 21 months.

14. The proposed consultancy and investigation work will not give rise to any recurrent expenditure. We estimate that the annual recurrent expenditure arising from the proposed 280 m-long box culvert is \$83,000.

PUBLIC CONSULTATION

15. We presented the findings and recommendations of the study under Stormwater Drainage Master Plan Study in Sai Kung, East Kowloon and Southern Lantau to Sai Kung District Council on 20 November 2001. The Council supported implementation of the proposed works.

/ENVIRONMENTAL

ENVIRONMENTAL IMPLICATIONS

16. The proposed consultancy for site investigations, environmental impact assessment and design will generate only a minimal amount of construction and demolition (C&D) materials. We will require the consultants to fully consider measures to minimise the generation of C&D materials and to reuse/recycle C&D materials as much as possible in the future implementation of the construction projects. We completed a Preliminary Environmental Review in October 2001 and an environmental impact assessment is required for the whole project. We will carry out an environmental impact assessment under the Environmental Impact Assessment Ordinance (EIAO) and will implement all the mitigation measures recommended in the study in the detailed design and relevant works contract.

17. The proposed 280 m-long box culvert at Sha Ha, to be constructed by DCE, is not a Designated Project under EIAO and environmental impact assessment is therefore not required. For short-term impact during construction, DCE will control noise, dust and site run-off within established standards and guidelines through implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plant to reduce noise generation, water-spraying to reduce emission of fugitive dust and strict control on diversion of sewage flows in the works contracts. We estimate the cost of implementing the environmental mitigation measures to be \$100,000. We have included this in the overall project estimate.

18. At the planning and design stages for the entrustment works, DCE have given due consideration to the need to minimise the generation of C&D materials when designing level and layout of the proposed works. DCE will 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. DCE will ensure that the day-to-day operation on site comply with the approved WMP. DCE will control the disposal of C&D waste to designated landfills through a trip-ticket system. DCE will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. DCE will record the disposal, reuse and recycling of C&D materials for monitoring purposes. DCE estimates that the advance works will generate about 2 000 cubic metres (m³) of C&D materials. Of these, DCE will reuse about 1 900 m³ (95%) on site and dispose of 100 m³ (5%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$12,500 for this project (based on a notional unit cost³ of \$125/m³).

/LAND

LAND ACQUISITION

19. The proposed consultancy and advance works at Sha Ha as set out in paragraph 2 above do not require any land acquisition.

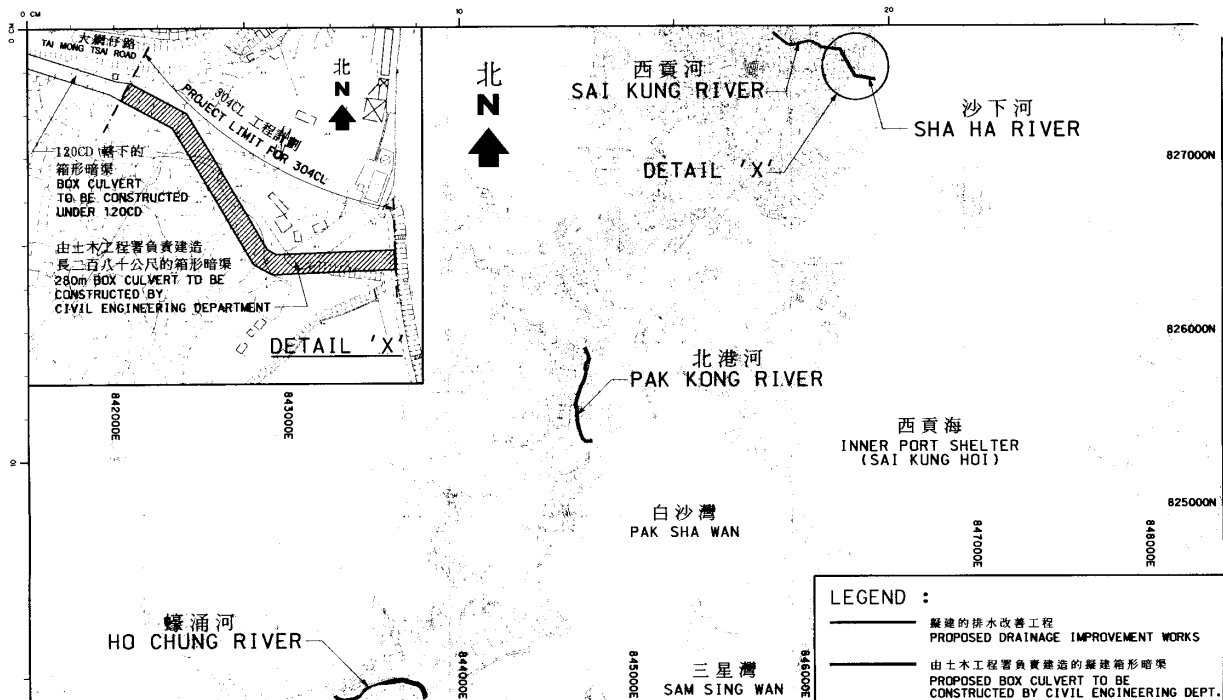
BACKGROUND INFORMATION

20. Based on the recommendations of the Stormwater Drainage Master Plan Study in Sai Kung, East Kowloon and Southern Lantau, we completed the Preliminary Project Feasibility Study Report on the drainage improvements in Sai Kung in November 2001. We included **120CD** in Category B of the Public Works Programme in December 2001. The estimated cost of **120CD** was \$159.7 million in September 2001 prices. We plan to start the construction works in December 2005 for completion in December 2008.

21. **304CL** was upgraded to Category A in July 2001 for the construction of roads and drains in Sai Kung Area 4. The works contract under **304CL** is scheduled for commencement in July 2002 and completion in December 2004. The detailed design for the 280 m-long box culvert at Sha Ha to be constructed in conjunction with **304CL** has been completed by DCE using in-house resources.

22. We estimate that the proposed design consultancy and the construction works will create some 25 jobs, comprising ten professional/technical staff and 15 labourers, totalling 550 man-months.

Works Bureau
February 2002



圖則名稱 drawing title
 工務計劃項目編號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	M. L. SO	日期 date	18.2.2002
校對 checked	M. TSANG	日期 date	18.2.2002
批准 approved	K. C. NG	日期 date	19.2.2002
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no.	DPM 0111	比例 scale	N.T.S.
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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			

Enclosure 1 附件 1

Enclosure 2 to PWSC(2001-02)104

120CD – Drainage improvement in Sai Kung

Breakdown of the estimates for the consultants' fees

		Estimated man- months	Average MPS* salary point	Multiplier	Estimated fee (\$ million)
Consultants' staff costs					
(a) Supervision of investigations and surveys	Professional	2.0	38	2.4	0.29
	Technical	3.8	14	2.4	0.18
(b) Environmental impact assessment	Professional	7.2	38	2.4	1.04
	Technical	16.0	14	2.4	0.75
(c) Detailed design including preparation of tender documents and assessment of tenders	Professional	9.0	38	2.4	1.30
	Technical	24.4	14	2.4	1.14
Total consultants' staff costs					4.70
Out-of-pocket expenses					
(a) Environmental surveys					0.80

* MPS = Master Pay Scale

Notes:

1. A multiplier of 2.4 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices. A multiplier of 1.7 is applied in case of resident site staff supplied by the consultants. (As at 1.4.2001, MPS pt. 38 = \$60,395 per month and MPS pt. 14 = \$19,510 per month).
2. Out-of-pocket expenses are actual costs incurred. The consultants are not entitled to any additional payment for overheads or profit in respect of these items.
3. The figures given above are based on estimates prepared by the Director of Drainage Services. We will only know the actual man-months and actual fees when we have selected the consultants through the usual competitive fee bid system.