

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 704 – DRAINAGE**

#### **Civil Engineering – Drainage and erosion protection**

#### **64CD – Rural Drainage Rehabilitation Scheme**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **64CD**, entitled “Rural Drainage Rehabilitation Scheme – drainage rehabilitation works at Ping Yuen River and Mo Fan Heung Stream”, to Category A at an estimated cost of \$200.1 million in money-of-the-day prices; and
- (b) the retention of the remainder of **64CD**, retitled “Rural Drainage Rehabilitation Scheme – drainage rehabilitation works at Sha Po Tsuen Stream” in Category B.

### **PROBLEM**

The rural areas in North East and North West New Territories are susceptible to local flooding during heavy rainstorms.

**/PROPOSAL .....**

## PROPOSAL

2. The Director of Drainage Services (D of DS), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **64CD** to Category A at an estimated cost of \$200.1 million in money-of-the-day (MOD) prices for implementation of the proposed drainage rehabilitation works at Ping Yuen River and Mo Fan Heung Stream in North East and North West New Territories respectively.

## PROJECT SCOPE AND NATURE

3. The part of **64CD** we now propose to upgrade to Category A covers Ping Yuen River and Mo Fan Heung Stream. The scope of works is outlined below –

### Drainage rehabilitation works at Ping Yuen River

- (a) construction of a trapezoidal drainage channel of about 1.7 kilometres long;
- (b) reprovisioning of three vehicular bridges and one footbridge affected by the proposed drainage works;
- (c) reprovisioning of border security facilities (including security grilles, penstocks, surveillance equipment and fencing) affected by the proposed drainage works at Ta Kwu Ling;
- (d) ancillary works;
- (e) environmental mitigation measures;

### Drainage rehabilitation works at Mo Fan Heung Stream

- (f) construction of a rectangular drainage channel of about 355 metres long;
- (g) ancillary works; and
- (h) environmental mitigation measures.

/We .....

We plan to start the proposed works in April 2003 for completion in July 2005. Site plans showing the locations of the proposed works at Ping Yuen River and Mo Fan Heung Stream are at Enclosures 1 and 2 respectively.

4. The remainder of **64CD** for retention in Category B comprises drainage rehabilitation works at Sha Po Tsuen Stream.

## JUSTIFICATION

5. Many rural areas in the North East and North West New Territories are susceptible to flooding during heavy rainstorms due to their low-lying topography and the inadequate drainage capacity of the rivers and streamcourses. Furthermore, the conversion of farmland into open storage yards has increased the quantity of flow in the watercourses because rainwater which, in the past, dissipated mostly as groundwater in the farmland, now flows as stormwater on the surface of the paved areas. This has further overloaded the watercourses and aggravated the flooding problem during heavy rainstorms.

6. To tackle the flooding problem, we have planned and implemented a comprehensive drainage improvement programme in phases starting from the downstream end. With the progressive completion of the major river training works including the downstream of the Shenzhen River, River Indus and River Beas, we now propose to proceed with the drainage rehabilitation works at Ping Yuen River to upgrade its drainage capacity. The proposed works at Ping Yuen River will affect three vehicular bridges, a footbridge and the border security facilities at Ta Kwu Ling. We need to reconstruct these bridges and border security facilities.

7. Mo Fan Heung, situated south of Ngau Tam Mei, is a low-lying area with no proper stormwater drainage system. We propose to construct a drainage channel to increase the hydraulic capacity of the Mo Fan Heung Stream.

8. Upon completion of the proposed drainage rehabilitation works, the flood protection level in Chow Tin Tsuen, Lei Uk, Fung Wong Wu and Ping Che Road around Ping Yuen River and around the Mo Fan Heung area will generally be raised to withstand rainstorms with a return period of 50 years<sup>1</sup>, and the risk of flooding during heavy rainstorms will be substantially reduced.

## FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be \$200.1 million at MOD prices (see paragraph 10 below), made up as follows –

	<b>\$ million</b>	
(a) Construction cost for drainage rehabilitation works at Ping Yuen River	146.7	
(i) drainage channel works	80.5	
(ii) three vehicular bridges and a footbridge	39.2	
(iii) border security facilities	20.5	
– civil works	9.4	
– electrical and mechanical works	11.1	
(iv) ancillary works	6.5	
(b) Consultants' fees for drainage rehabilitation works at Ping Yuen River	19.3	
(i) contract administration	4.6	
(ii) site supervision	14.7	
(c) Construction cost for drainage rehabilitation works at Mo Fan Heung Stream	13.0	
		/(i) .....

---

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

		<b>\$ million</b>
(i)	drainage channel works	9.3
(ii)	ancillary works	3.7
(d)	Environmental mitigation measures for works mentioned in items (a) and (c) above	4.3
(e)	Contingencies	18.3
		<hr/>
	Sub-total	201.6 (in September 2002 prices)
(f)	Provision for price adjustment	(1.5)
		<hr/>
	Total	200.1 (in MOD prices)

\_\_\_\_\_ A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 3.

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

<b>Year</b>	<b>\$ million (Sept 2002)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2003 – 2004	53.7	0.99250	53.3
2004 – 2005	69.1	0.99250	68.6
2005 – 2006	40.5	0.99250	40.2
2006 – 2007	20.4	0.99250	20.2
2007 – 2008	17.9	0.99250	17.8
	<hr/>		<hr/>
	201.6		200.1
	<hr/>		<hr/>

11. We have derived the MOD estimate on the basis of the Government's latest forecasts of trend labour and construction prices for the period 2003 to 2008. We will tender the proposed works as standard re-measurement contracts because of the uncertainties of the existence and alignment of underground utilities and the ground conditions. The contracts will provide for price adjustments because the contract periods will exceed 21 months.

12. We estimate that the annual recurrent expenditure arising from this project to be about \$2.3 million.

### **PUBLIC CONSULTATION**

13. We consulted the North District Council and the Ta Kwu Ling Rural Committee in May 2001 on the proposed rehabilitation works at Ping Yuen River. Members of the District Council and Rural Committee supported implementation of the proposed works.

14. We gazetted the proposed rehabilitation works at Ping Yuen River under the Roads (Works, Use and Compensation) Ordinance and Foreshore and Sea-bed (Reclamations) Ordinance on 28 March 2002 and 3 May 2002 respectively and did not receive any objection.

15. We consulted the then Yuen Long District Board and Kam Tin Rural Committee in October 1996 and April 1997 respectively on the proposed rehabilitation works at Mo Fan Heung Stream. Members of the District Board and Rural Committee supported implementation of the proposed works.

16. We gazetted the proposed rehabilitation works at Mo Fan Heung Stream under the Roads (Works, Use and Compensation) Ordinance and Foreshore and Sea-bed (Reclamations) Ordinance on 26 July 1999 and 9 August 2002 respectively. We received one objection to the works under the Roads (Works, Use and Compensation) Ordinance. After discussion, the objector withdrew the objection unconditionally in August 2000. We did not receive any objection to the works under the Foreshore and Sea-bed (Reclamations) Ordinance.

**/ENVIRONMENTAL .....**

## ENVIRONMENTAL IMPLICATIONS

17. We completed an Environmental Impact Assessment (EIA) study for the Rural Drainage Rehabilitation Scheme in July 1996. The EIA concluded that with the implementation of the recommended mitigation measures, the environmental impacts arising from the project could be mitigated to within established standards and guidelines. The Advisory Council on the Environment endorsed the EIA report on 20 January 1997.

18. For short term impacts caused by excavation works during construction, we 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 dust and strict control on diversion of stream flows in the works contract. We estimate the cost of implementing the environmental mitigation measures to be \$4.3 million in September 2002 prices. We have included this in the project estimate.

19. We have considered in the planning and design stages ways of reducing the generation of construction and demolition (C&D) materials as far as possible. The alignment of the proposed drainage channel was determined where least excavation and demolition of existing structures were expected. Furthermore, typical sections of reinforced concrete structures were adopted to minimise the use of formwork. We will require the contractor under the contract to submit a waste management plan to the Engineer for approval, with appropriate mitigation measures, including the allocation of an area for waste segregation. We will ensure that the day-to-day operations on site comply with the waste management plan. We will require the contractor to re-use the excavated material as filling material on site or on other construction sites as far as possible to minimise the disposal of public fill to public filling facilities. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We will control disposal of public fill and C&D waste to public filling facilities and landfills respectively through a trip-ticket system. We will require the contractors to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal and reuse of C&D materials for monitoring purposes.

/Ping .....

**Ping Yuen River**

20. Ping Yuen River project is not a Designated Project under the Environmental Impact Assessment Ordinance (EIAO). A paper with the ecological design of the river was presented and discussed at the Advisory Council of the Environment meeting in September 2001. Members endorsed the proposed ecological mitigation measures such as reinforced grass embankment slopes, marginal planting areas, shallow pools and soft landscape works and supported the implementation of the works.

21. We estimate that about 207 400 cubic metres (m<sup>3</sup>) of C&D materials will be generated by the rehabilitation works at Ping Yuen River. Of these, about 19 300 m<sup>3</sup> (9.3%) will be reused on site, 180 400 m<sup>3</sup> (87.0%) will be reused as fill in public filling areas<sup>2</sup> and 7 700 m<sup>3</sup> (3.7%) will be disposed of at landfills. The notional cost<sup>3</sup> of accommodating C&D waste at landfill site is estimated to be \$962,500 for this project (based on a notional unit cost of \$125/m<sup>3</sup>).

22. The works will generate about 9 200 m<sup>3</sup> of uncontaminated mud and about 8 900 m<sup>3</sup> of contaminated mud. All the uncontaminated mud will be delivered by barges to the marine disposal site at South Cheung Chau whilst all the contaminated mud will be delivered to marine disposal facility at East Sha Chau.

23. We have drawn up a C&D material management plan (C&DMMP). We will monitor the implementation of the C&DMMP and prepare a half-yearly status report for submission to the Public Fill Committee in June and December.

/Mo .....

---

<sup>2</sup> A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

<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 are likely to be more expensive) when existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.



### Mo Fan Heung Stream

24. Mo Fan Heung project is Designated Project under the EIAO. An Environmental Permit was obtained on 27 August 1999. We estimate that about 9 600 m<sup>3</sup> of C&D materials will be generated by the rehabilitation works at Mo Fan Heung Stream. Of these, about 3 600 m<sup>3</sup> (37.5%) will be reused on site, 4 800 m<sup>3</sup> (50%) will be reused as fill in public filling areas and 1 200 m<sup>3</sup> (12.5%) will be disposed of at landfills. The notional cost of accommodating C&D waste at landfill site is estimated to be \$150,000 for this project (based on a notional unit cost of \$125/m<sup>3</sup>).

25. The works will generate about 4 200 m<sup>3</sup> of uncontaminated mud and about 1 200 m<sup>3</sup> of contaminated mud. All the uncontaminated mud will be delivered by barges to the marine disposal site at South Cheung Chau whilst all the contaminated mud will be delivered to marine disposal facility at East Sha Chau.

### LAND ACQUISITION

26. We will resume about 79 950 square metres (m<sup>2</sup>) of private agricultural land and clear 43 540 m<sup>2</sup> of government land for the proposed works. The land resumption and clearance cost for the project is estimated at \$148.42 million and will be charged to **Head 701 – Land Acquisition**.

### BACKGROUND INFORMATION

27. In March 1994, we upgraded **64CD** to Category B. The project comprises two stages – stage 1 works are for North East New Territories and stage 2 works are for North West New Territories.

28. In November 1994, we upgraded part of **64CD** to Category A as **67CD** “Rural drainage rehabilitation scheme – consultants’ fees and investigations” to engage consultants to conduct an EIA study for the whole project and carry out investigations and detailed design for the stage 1 works.

29. In August 1996, we included an item “Site investigation for rural drainage rehabilitation scheme in the North West New Territories” under the block allocation **Subhead 4100DX** “Drainage works, studies and investigations for items in Category D of Public Works Programme” at an approved project estimate of \$2.2 million for carrying out site investigation works for the stage 2 works.

30. In December 1997, we upgraded part of **64CD** to Category A as **91CD** “Rural drainage rehabilitation scheme, stage 1, phase 1A – rehabilitation works at Ng Tung River”. We started the works in November 1998 and completed them in December 2001.

31. In October 1998, we further upgraded part of **64CD** to Category A as **93CD** “Rural drainage rehabilitation scheme, stage 1, phase 1B – rehabilitation works at Sheung Yue River”. We started the works in April 1999 and completed them in December 2001.

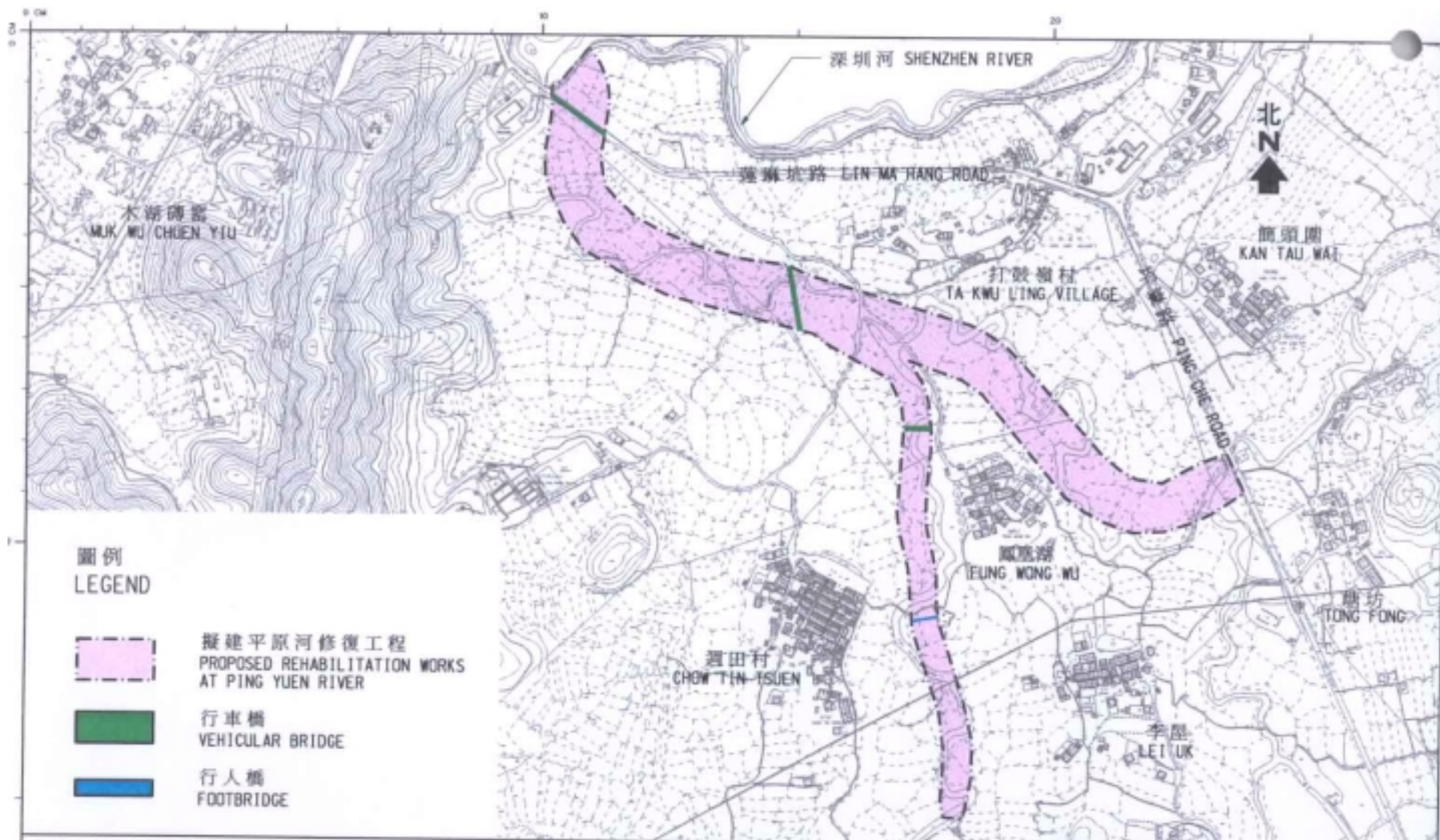
32. In December 1999, we upgraded part of **64CD** to Category A as **101CD** “Rural drainage rehabilitation scheme, stage 2, phase 1 – Nam Hang Drainage Improvement”. We started the works in July 2000 for completion in November 2002.

33. We plan to start the rehabilitation works at Ping Yuen River in April 2003 for completion in July 2005 and will engage consultants to supervise the works.

34. We plan to start the rehabilitation works at Mo Fan Heung Stream in June 2003 for completion in April 2005 and will deploy in-house resources to supervise the works.

35. We estimate that the proposed works will create some 120 jobs comprising 30 professional/technical staff and 90 labourers, totalling 3 150 man-months.

-----  
Environment, Transport and Works Bureau  
November 2002



圖則名稱 drawing title

工程計劃項第4064CD  
鄉郊排水系統修復計劃

PWP ITEM No. 4064CD

RURAL DRAINAGE REHABILITATION SCHEME

繪圖 drawn

SIGNED C. K. LAM

日期 date

15.11.02

核對 checked

SIGNED H. W. MA

日期 date

15.11.02

批准 approved

SIGNED C. M. CHUNG

日期 date

15.11.02

部門 office

工程管理部

PROJECT MANAGEMENT DIVISION

圖則編號 drawing no.

DPM 0128

比例 scale

N. T. S.

保留版權 COPYRIGHT RESERVED

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





**64CD – Rural Drainage Rehabilitation Scheme****Breakdown of estimates for consultants' fees (for the rehabilitation works at Ping Yuen River)**

Consultants' staff costs			Estimated man- months	Average MPS* salary point	Multiplier <sup>(Note 1)</sup>	Estimated fee (\$ million)
(a)	Contract administration <sup>(Note 2)</sup>	Professional	15	—	—	1.5
		Technical	94	—	—	3.1
(b)	Site supervision by resident site staff of the consultants <sup>(Note 3)</sup>	Professional	41	38	1.7	4.0
		Technical	328	14	1.7	10.7
Total consultants' staff costs						19.3

\*MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.7 is applied to the average MPS point to estimate the cost of resident site staff supplied by the consultants. (As at 1.10.2002, MPS pt. 38 = \$57,730 per month and MPS pt. 14 = \$19,195 per month.)
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement between the Director of Drainage Services and the consultants for the design and construction of part of the project **64CD** for Ping Yuen River.
3. The consultants' staff cost for site supervision is based on estimates prepared by the Director of Drainage Services. We will know the actual man-months and actual costs only after the completion of the construction works.