

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE

Civil Engineering – Drainage and erosion protection

92CD – Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 2 – Kam Tin and Ngau Tam Mei

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **92CD**, entitled “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 2A – Kam Tin and Ngau Tam Mei”, to Category A at an estimated cost of \$139.3 million in money-of-the-day prices; and
- (b) the retention of the remainder of **92CD**, re-titled “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 2B – Kam Tin”, in Category B.

PROBLEM

Many areas in Kam Tin and Ngau Tam Mei in Yuen Long are low-lying and susceptible to frequent flooding during heavy rainstorms.

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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 **92CD** to Category A at an estimated cost of \$139.3 million in money-of-the-day (MOD) prices for construction of secondary drainage channels at Cheung Kong, Tai Kong Po, Tsat Sing Kong and Ha Che of Kam Tin and at San Wai Tsuen of Ngau Tam Mei.

PROJECT SCOPE AND NATURE

3. The part of **92CD** we now propose to upgrade to Category A comprises –

- (a) construction of about 3.2 kilometres (km) of secondary drainage channels;
- (b) construction of about 1.6 km of maintenance access and 3 km of footpaths along the drainage channels; and
- (c) reprovision of eight pedestrian crossings and three vehicular crossings.

The proposed drainage works are shown on the plan at Enclosure 1. We plan to commence construction in November 2003 for completion in June 2006.

4. The remainder of **92CD**, comprising the construction of secondary drainage channels at Cheung Chun San Tsuen, Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Kam Tsin Wai of Kam Tin will be retained in Category B.

JUSTIFICATION

5. Owing to the low-lying nature and the inadequate capacity of the existing streamcourses, Cheung Kong, Tai Kong Po, Tsat Sing Kong and Ha Che of Kam Tin and San Wai Tsuen of Ngau Tam Mei are susceptible to frequent flooding during heavy rainstorms. Moreover, changes in land use in the areas over the years have resulted in paving of tracts of natural ground and this has made them impermeable. Rainwater which would previously dissipate naturally

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through ground infiltration can no longer do so. This has led to an increase in surface run-off and aggravated the extent of flooding in the areas.

6. To provide the required flood protection standard and to reduce the risk of flooding, we propose to construct drainage channels at the above locations to improve the hydraulic capacity of the drainage systems for the areas. We have designed the proposed drainage channels with a capacity to withstand rainstorms with a 50-year return period¹ which is the desired standard adopted by the Government for new drainage facilities in rural areas. It is derived to achieve cost effectiveness based on land requirement considerations as well as social and economic impacts of flooding.

7. We also propose to construct maintenance access to facilitate future maintenance to the proposed drainage channels and to provide footpaths along the channels for the use of the local residents. Moreover, the proposed works will affect the existing three vehicular crossings and eight pedestrian crossings. We need to re-provision these crossings under the project.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be \$139.3 million in MOD prices (see paragraph 9 below), made up as follows –

	\$ million
(a) Construction of secondary drainage channels	94.5
(b) Maintenance access	9.1
(c) Footpaths	14.9
(d) Vehicular and pedestrian crossings	2.8

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¹ “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.

		\$ million	
(e)	Environmental mitigation measures	1.0	
(f)	Consultants' fees for construction stage	13.9	
	(i) contract administration	0.9	
	(ii) site supervision	13.0	
(g)	Contingencies	13.4	
	Sub-total	149.6	(in September 2002 prices)
(h)	Provision for price adjustment	(10.3)	
	Total	139.3	(in MOD prices)

Due to a lack of in-house staff resources, D of DS proposes to employ consultants to carry out the construction supervision for the proposed works. 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 –

Year	\$ million (Sept 2002)	Price adjustment factor	\$ million (MOD)
2003 – 2004	7.1	0.94300	6.7
2004 – 2005	35.0	0.93003	32.6
2005 – 2006	40.0	0.93003	37.2
2006 – 2007	40.0	0.93003	37.2
2007 – 2008	27.5	0.93003	25.6
	149.6		139.3

10. 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 works under a standard re-measurement contract because of the uncertainties of the existence and alignment of the utilities and the ground condition. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract.

11. We estimate the annual recurrent expenditure arising from this project to be \$0.9 million.

PUBLIC CONSULTATION

12. We consulted the San Tin Rural Committee, the Pat Heung Rural Committee and the Town Planning and Development Sub-committee of the Yuen Long District Council on 24 January 2002, 26 January 2002 and 13 March 2002 respectively. All supported implementation of the proposed works.

13. We gazetted the proposed drainage works under Roads (Works, Use and Compensation) Ordinance and Foreshore and Sea-bed (Reclamations) Ordinance on 5 July 2002 and 25 October 2002 respectively. We received one objection from the World Wide Fund for Nature Hong Kong (WWF) under the Roads (Works, Use and Compensation) Ordinance regarding the environmental consideration under the project. After our advice on the mitigation measures to be adopted for the project, WWF unconditionally withdrew the objection in November 2002. We did not receive any objection to the works under the Foreshore and Sea-bed (Reclamations) Ordinance.

14. We informed the Legislative Council Panel on Planning, Lands and Works on the proposed part upgrading of **92CD** by circulation on 22 April 2003. Members had no objection to the proposal.

LAND ACQUISITION

15. We will resume about 52 000 square metres (m²) of private agricultural land and clear 35 300 m² of government land for the proposed works. The land resumption will affect three families comprising 12 persons. The Director of Housing will arrange re-housing for the affected families in accordance with the current policy. We will charge the land resumption and

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clearance costs estimated to be about \$89 million, comprising \$87 million for land resumption and \$2 million for clearance, to **Head 701 - Land Acquisition**.

ENVIRONMENTAL IMPLICATIONS

16. The proposed drainage improvement works is not a designated project under Environmental Impact Assessment Ordinance. We completed the Environmental Study (ES) for the proposed works in February 2003. The ES concluded that the works would have no long-term environmental impacts. For short term impacts caused by excavation works during construction, we will control noise, dust, and site run-off within the 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 stream flows in the works contract. We estimate the cost of implementing the environmental mitigation measures to be \$1 million (in September 2002 prices). We have included this in the project estimate.

17. We have considered at the planning and design stages ways of minimising the generation of construction and demolition (C&D) materials by giving due consideration to designing the type and alignment of the proposed drainage channels. Rectangular channels instead of trapezoidal channels have been adopted at locations of less environmental sensitive areas to reduce excavation. Moreover, typical sections of reinforced concrete structures have been adopted to maximise the reuse of formwork. We estimate that the proposed works will generate about 161 000 cubic metres (m³) of construction and demolition (C&D) materials. Of these, we will reuse about 19 000 m³ (12%) on site, 134 400 m³ (83%) as fill in public filling areas² and dispose of 7 600 m³ (5%) at landfills. The notional cost of accommodating C&D waste at landfill site is estimated to be \$950,000 for this project (based on a notional unit cost³ of \$125/m³).

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² 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.

³ 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/m³), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

18. The project will generate about 13 000 m³ of contaminated mud to be excavated from the watercourse. We will deliver the contaminated mud by barges to the disposal facility at East Sha Chau.

19. We will require the contractor to submit a waste management plan (WMP) to the Engineer 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 require the contractor to reuse the excavated materials on site or on other construction sites as filling materials as far as possible to minimise the disposal of public fill. To further minimise the generation of C&D materials, we will encourage the contractor to use steel instead of timber in formwork and temporary works. We will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

BACKGROUND INFORMATION

20. We commissioned **83CD** “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage master plan study” in January 1996 to assess the adequacy of the existing drainage systems and tributaries in the areas. The final study was completed in December 1998 and has identified a series of drainage improvement works.

21. In September 1998, we included **92CD** “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1” in Category B.

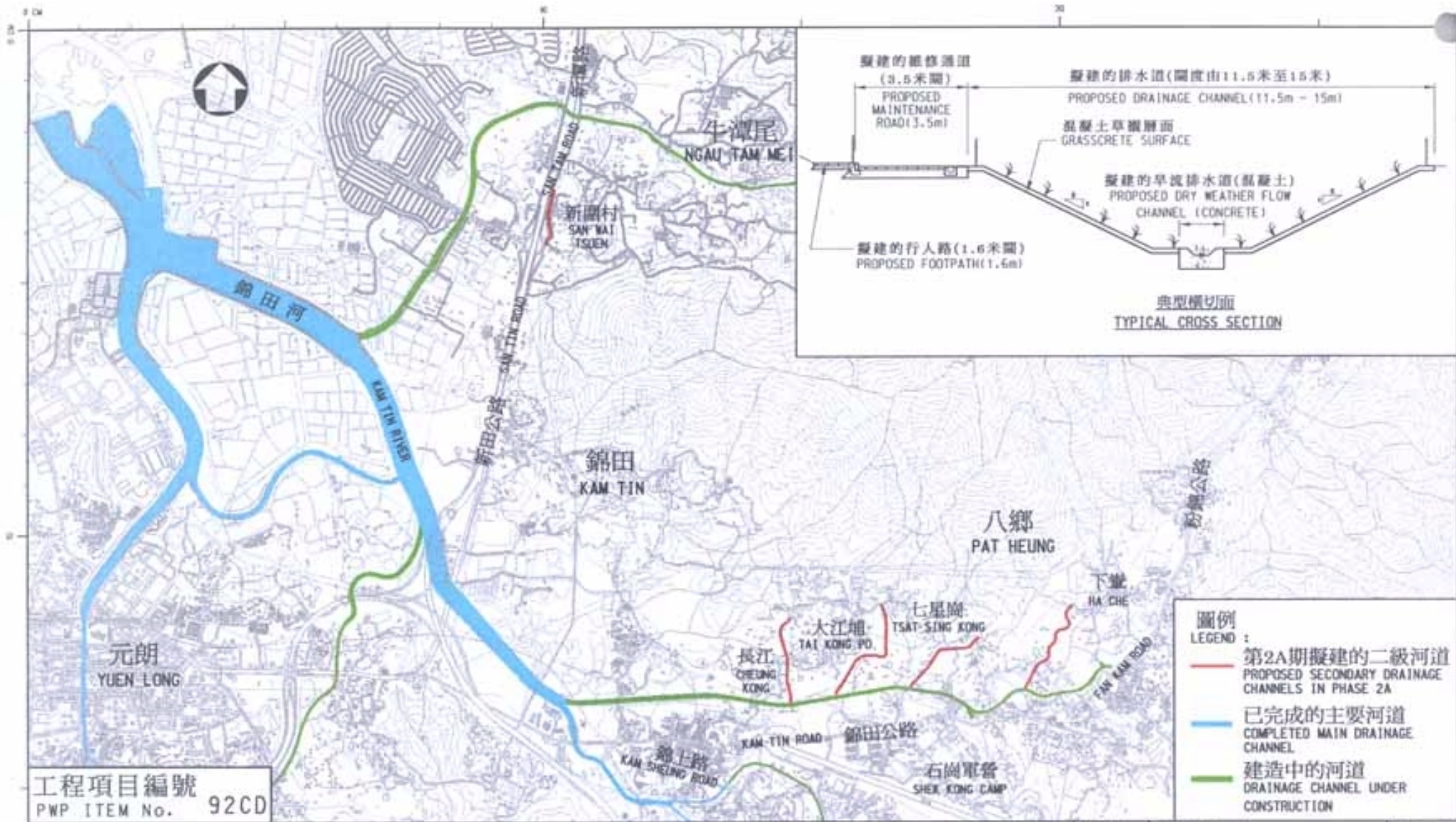
22. In March 1999, we upgraded part of **92CD** to Category A as **96CD** “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1 – consultants’ fees and site investigations” at an estimated cost of \$20.6 million in MOD prices for engaging consultants to carry out impact assessments, site investigations and detailed design for the stage 1 drainage improvement works.

23. In June 2001, we further upgraded part of **92CD** to Category A as **114CD** “Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 1 – Yuen Long and Tin Shui Wai” at an estimated cost of \$210.7 million in MOD prices. We started the works in December 2001 for completion in May 2005.

24. We plan to implement the phase 2 works in two sub-phases so that the improvement works in areas with more severe flooding can be carried out under phase 2A to bring about early improvement. We will start the phase 2A works, as described in paragraph 3 above, in November 2003 for completion in June 2006.

25. We estimate that the proposed works will create some 70 jobs comprising 13 professional/technical staff and 57 labourers, totalling 2 000 man-months.

Environment, Transport and Works Bureau
May 2003



工程項目編號
PWP ITEM No. 92CD

圖名 drawing title

元朗、錦田、牛潭尾及天水圍雨水排放系統改善計劃
第1階段第2期 - 錦田及牛潭尾
YUEN LONG, KAM TIN, NGAU TAM MEI AND TIN SHUI WAI
DRAINAGE IMPROVEMENT, STAGE 1 PHASE 2 -
KAM TIN AND NGAU TAM MEI

繪圖 drawn	SIGNED P. S. LAM	日期 date	APR. 03
核對 checked	SIGNED C. S. CHENG	日期 date	APR. 03
批准 approved	SIGNED Y. K. HO	日期 date	APR. 03

部門 office 工程管理部
PROJECT MANAGEMENT DIVISION

圖則編號 drawing no.	比例 scale
DPM 0130	N.T.S. 不按比例
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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	

**92CD – Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai
drainage improvements, stage 1, phase 2 – Kam Tin and
Ngau Tam Mei**

Breakdown of the estimates for the consultants' fees

Consultants' staff costs (note 2)		Estimated man-months	Average MPS* salary point	Multiplier (note 1)	Estimated fee (\$ million)	
(a)	Contract administration					
	Professional	–	–	–	0.6	
	Technical	–	–	–	0.3	
(b)	Site supervision by resident site staff employed by the consultants	Professional	61	38	1.6	5.6
		Technical	240	14	1.6	7.4
Total consultants' staff costs					13.9	

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 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' fees for construction stage are based on the lump sum fees calculated in accordance with the consultancy agreement the Director of Drainage Services has with the consultants undertaking the design and investigation of the project. The costs of resident site staff are based on estimates prepared by the Director of Drainage Services. We will only know the actual man-months and actual costs when the construction works have completed.