For discussion **PWSC(2007-08)52**
on 22 November 2007

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 2B – remaining works

Members are invited to recommend to Finance Committee the upgrading of **92CD** to Category A at an estimated cost of $202.4 million in money-of-the-day prices for the drainage improvement works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen in Yuen Long.

PROBLEM

Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen in Yuen Long are low-lying areas which are susceptible to flooding during heavy rainstorms.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for Development, proposes to upgrade **92CD** to Category A at an estimated cost of $202.4 million in money-of-the-day (MOD) prices for the drainage improvement works in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen in Yuen Long.

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PROJECT SCOPE AND NATURE

3. The scope of **92CD** comprises the construction of –

(a) about 110 metres (m) of drainage channel with width ranging from 3.5 m to 14 m, 70 m of twin-cell box culvert with internal cell dimensions of 3 m in width by 2.2 m in height, and provision of ancillary works in Cheung Po;

(b) about 700 m of drainage channel with width ranging from 5 m to 18 m, 400 m of twin-cell box culvert with internal cell dimensions ranging from 2.5 m in width by 3.2 m in height to 3.7 m in width by 2.2 m in height, and provision of ancillary works in Ma On Kong;

(c) about 800 m of drainage channel with width ranging from 2.5 m to 6 m, 40 m of single-cell box culvert with internal cell dimensions of 2.5 m in width by 2 m in height, and provision of ancillary works in Yuen Kong San Tsuen; and

(d) about 150 m of drainage channel with width of 2.5 m and provision of ancillary works in Tin Sam Tsuen.

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

4. We plan to commence construction in February 2008 for completion in February 2011.

JUSTIFICATION

5. Owing to the inadequate capacity of existing streamcourses, the low-lying areas of Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen are susceptible to flooding during heavy rainstorms. Moreover, changes in land use in the areas over the years have resulted in tracts of natural ground being replaced by impermeable pavings. Rain water can no longer dissipate naturally through ground infiltration as in the past. This has led to an increase in surface run-off and aggravated the extent of flooding in the areas.

6. To alleviate the problem, we propose to carry out drainage improvement works as mentioned in paragraph 3 above. Upon completion of

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the proposed works, the risk of flooding during heavy rainstorm in the areas concerned will be reduced and the drainage systems could then withstand rainstorms with a return period [1] of one in 50 years.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $202.4 million in MOD prices (see paragraph 8 below), made up as follows –

		$ million		
(a)	Drainage improvement works and ancillary works at –		157.2	
	(i) Cheung Po	14.3		
	(ii) Ma On Kong	99.1		
	(iii) Yuen Kong San Tsuen	37.0		
	(iv) Tin Sam Tsuen	6.8		
(b)	Consultants' fees for		18.1	
	(i) contract administration	2.0		
	(ii) site supervision	16.1		
(c)	Environmental mitigation measures		4.0	
(d)	Contingencies		17.9	
	Sub-total		197.2	(in September 2007 prices)
(e)	Provision for price adjustment		5.2	
	Total		202.4	(in MOD prices)

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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.

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

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

Year	$ million (Sept 2007)	Price adjustment factor	$ million (MOD)
2007 – 2008	5.0	1.00000	5.0
2008 – 2009	33.0	1.00750	33.2
2009 – 2010	50.0	1.01758	50.9
2010 – 2011	50.0	1.02775	51.4
2011 – 2012	35.0	1.03803	36.3
2012 – 2013	24.2	1.05619	25.6
	197.2		202.4

9. 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 2013. We will tender the proposed works under a standard re-measurement contract because of 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.

10. We estimate the annual recurrent expenditure arising from the proposed project to be about $0.7 million.

PUBLIC CONSULTATION

11. We consulted the Kam Tin Rural Committee, the Town Planning and Development Committee under the Yuen Long District Council and the Pat Heung Rural Committee on 30 April, 14 July and 17 July 2004 respectively. All supported the implementation of the proposed works. We further conducted

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forums in the concerned villages in Cheung Po, Ma On Kong, Yuen Kong San Tsuen and Tin Sam Tsuen explaining the details of the proposed works to the villagers. They supported the proposed works.

12. We gazetted the proposed scheme under the Roads (Works, Use and Compensation) Ordinance on 17 November 2005, and the amendment scheme on 21 July 2006 to address some environmental requirements for the Ma On Kong drainage channel. We received three objections to the proposed scheme and no objection to the amendment scheme. After our clarifications, two of the objectors withdrew their objections unconditionally. The remaining objector requested resumption of some of the residual portions of his lots and provision of a vehicular access to these lots. After lengthy negotiations, the objector sold his lots to a new owner but declined to indicate whether he would withdraw his objection or not. The objection was therefore considered unresolved. After considering the objection, the Chief Executive in Council authorised the works without modifications on 30 January 2007.

13. We consulted the Legislative Council Panel on Planning, Lands and Works on the proposed works by circulation of an information paper on 17 July 2007. Members raised no objection to the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. The proposed drainage improvement works in Ma On Kong and Tin Sam Tsuen are designated projects under the Environmental Impact Assessment (EIA) Ordinance whereas the proposed works in Cheung Po and Yuen Kong San Tsuen are not designated projects. We completed an EIA for the proposed works in Ma On Kong and obtained an environmental permit on 13 February 2007. We prepared under the EIA Ordinance a Project Profile (PP) for the proposed works in Tin Sam Tsuen for permission to apply directly for an environmental permit and obtained an environmental permit on 22 November 2005. The PP also addressed the environmental impacts arising from the proposed works in Yuen Kong San Tsuen. We also completed an Environmental Study (ES) covering the proposed works in Cheung Po. The EIA, PP and ES concluded that the environmental impacts arising from the proposed works could be mitigated within established standards and guidelines with full implementation of the recommended mitigation measures. We will implement the mitigation measures as recommended.

15. 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

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barriers and silenced construction plant to reduce noise generation, water-spraying to reduce emission of fugitive dust, and temporary drains to dispose site run-off. We have included $4.0 million (in September 2007 prices) in the project estimates for implementing the environmental mitigation measures.

16. We have considered the drainage alignments in conjunction with the invert levels and existing ground conditions in the planning and design stages to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities[2]. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

17. We will also require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

18. We estimate that the project will generate about 181 900 tonnes of construction waste. Of these, we will reuse about 19 700 tonnes (11%) of inert construction waste on site and deliver about 153 200 tonnes (84%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of about 9 000 tonnes (5%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be about $5.3 million for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[3] at landfills).

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[2] Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

[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 $90/$m^3$), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

19. We estimate that the project will generate about 25 000 tonnes of uncontaminated mud and about 5 000 tonnes of contaminated mud to be excavated from the watercourses. We will deliver the uncontaminated mud by barges to the marine disposal areas and the contaminated mud by barges to the contaminated mud disposal area at East Sha Chau.

HERITAGE IMPLICATIONS

20. This project will not affect any heritage site, i.e. all declared monuments, graded historic buildings and sites of archaeological interests.

LAND ACQUISITION

21. We will resume about 25 180 square metres (m^2) of private agricultural land and clear 36 500 m^2 of government land for the proposed works. The land resumption and clearance will affect five households involving eight persons and 24 temporary domestic structures. These families will be offered ex-gratia allowances and, where eligible, accommodation in public housing in accordance with the established rehousing policy. We will charge the cost of land resumption and clearance estimated at $73.2 million to **Head 701 - Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3. We have reviewed the design of the project to minimise the land acquisition cost. The cost is considered justified as flooding risk will be mitigated.

BACKGROUND INFORMATION

22. 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.

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

24. 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.

25. In June 2001, we 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 and completed them in November 2005.

26. In June 2003, we upgraded part of **92CD** to Category A as **133CD** "Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 2A – Kam Tin and Ngau Tam Mei" at an estimated cost of $139.3 million in MOD prices. We started the works in June 2004 and completed them in June 2007.

27. In January 2007, we upgraded part of **92CD** to Category A as **149CD** "Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai drainage improvements, stage 1, phase 2B – Cheung Chun San Tsuen and Kam Tsin Wai" at an estimated cost of $155.6 million in MOD prices. We started the works in March 2007 for completion in December 2009.

28. Of the 366 trees within the project boundary, 185 trees will be preserved. The proposed works will involve the removal of 181 trees including 103 trees to be felled and 78 trees to be replanted within the project site. All trees to be removed are not important trees[4]. We will incorporate planting proposal as part of the project, including estimated quantities of 749 trees and 28 500 m^2 of grassed area.

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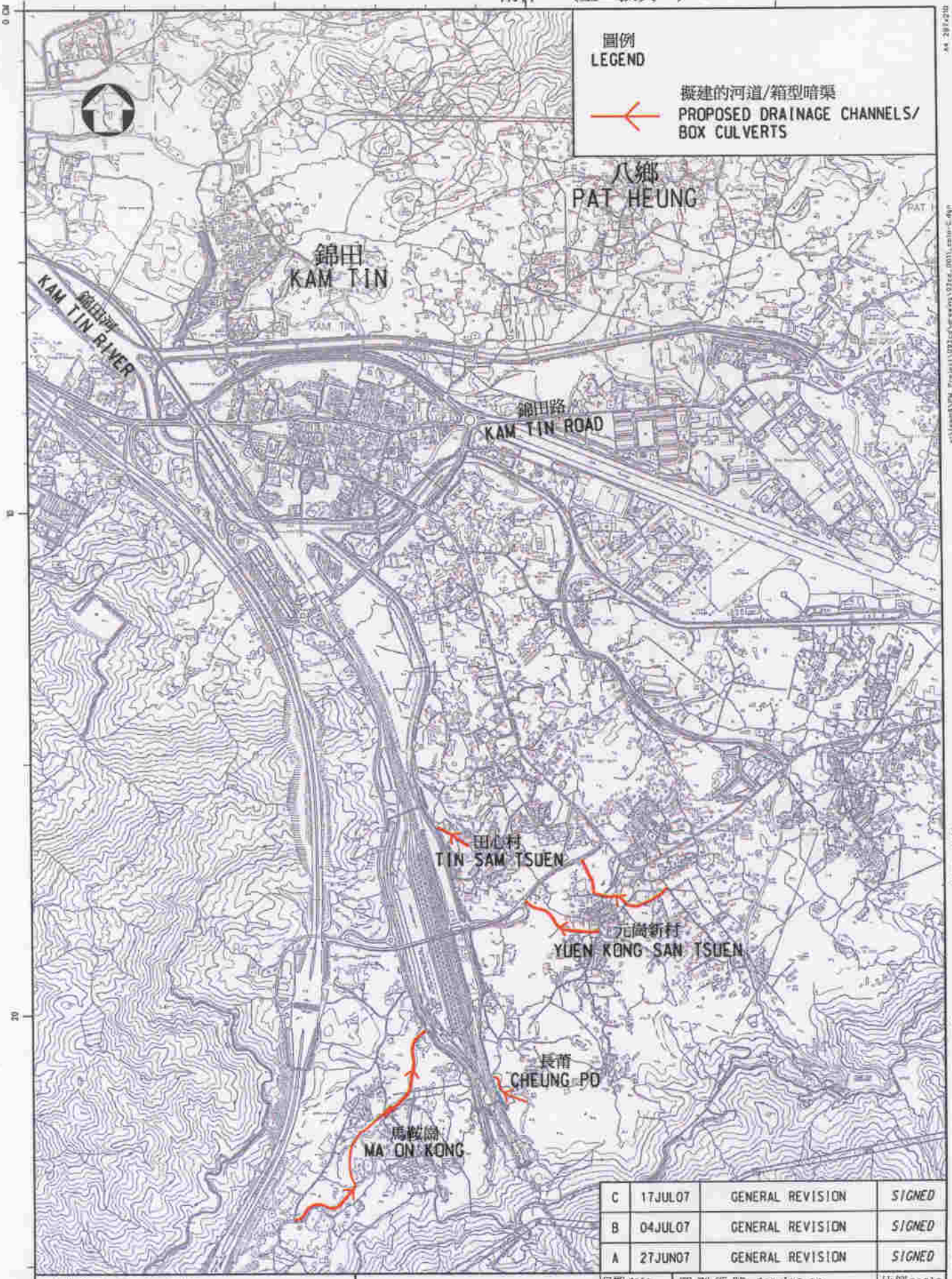
[4] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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 important persons 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.

29. We estimate that the proposed works will create about 112 jobs (90 for labourers and another 22 for professional/technical staff) providing a total employment of 3 200 man-months.

Development Bureau
November 2007



C	17JUL07	GENERAL REVISION	SIGNED
B	04JUL07	GENERAL REVISION	SIGNED
A	27JUN07	GENERAL REVISION	SIGNED

圖則名稱 drawing title

工務計劃項目第92CD號
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2B期 - 餘下工程

PWP ITEM No. 92CD
YUEN LONG, KAM TIN, NGAU TAM MEI AND
TIN SHUI WAI DRAINAGE IMPROVEMENTS,
STAGE 1, PHASE 2B-REMAINING WORKS

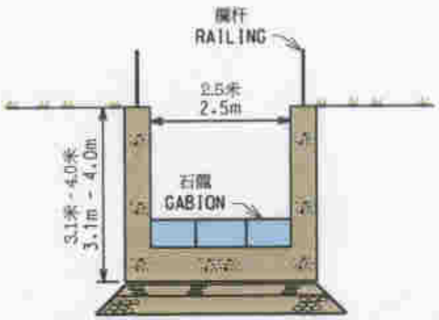
繪畫 drawn	SIGNED	C.K.LAM	日期 date 21MAY07
核對 checked	SIGNED	C.N.CHEUNG	日期 date 08JUN07
批核 approved	SIGNED	K.C.LO	日期 date 08JUN07
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no. DPM/92CD/0011C

比例 scale N. T. S.

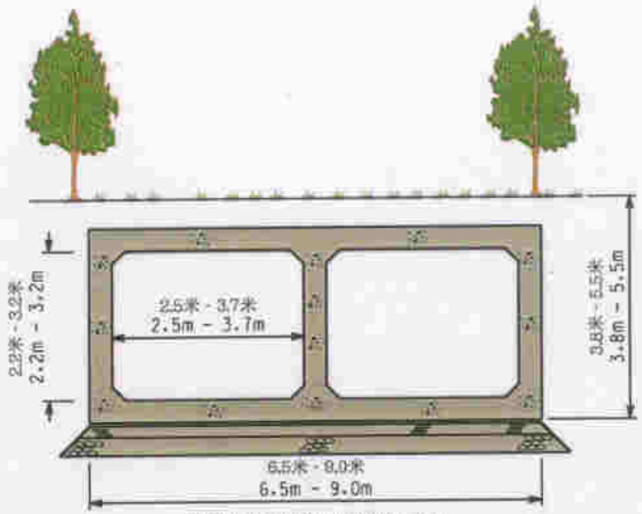
香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

附件一（全二張其二） ENCLOSURE 1 (SHEET 2 OF 2)



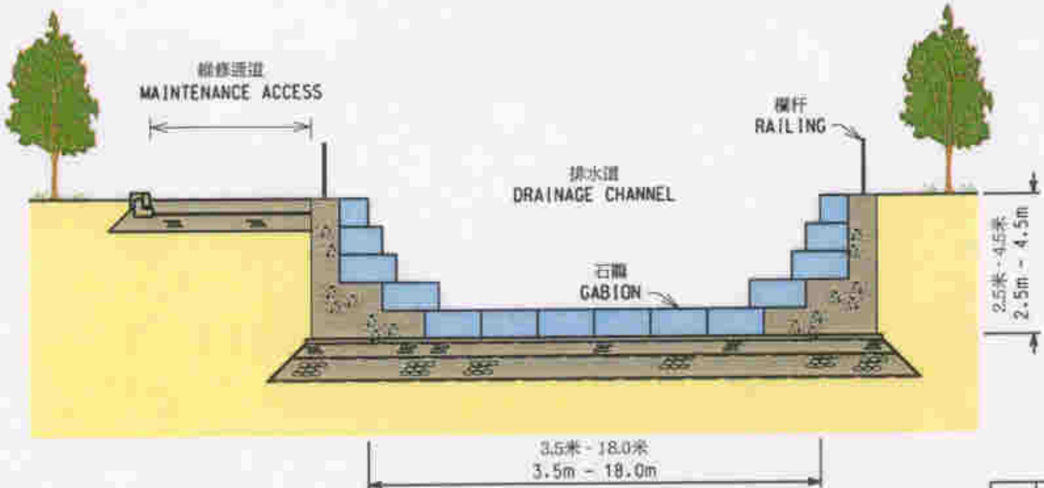
長方型排水道的典型橫切面

TYPICAL CROSS SECTION OF RECTANGULAR CHANNEL



箱型暗渠的典型橫切面

TYPICAL CROSS SECTION OF BOX CULVERT



梯型排水道的典型橫切面

TYPICAL CROSS SECTION OF TRAPEZOIDAL CHANNEL

B	17JUL07	GENERAL REVISION	SIGNED
A	04JUL07	GENERAL REVISION	SIGNED

圖則名稱 drawing title

工務計劃項目第92CD號

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2B期 - 餘下工程

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比例 scale N. T. S.

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

A4 297x210

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

Breakdown of the estimates for consultants' fees

Consultants' staff costs			**Estimated man-months**	**Average MPS* salary point**	**Multiplier** (note 1)	**Estimated fee ($ million)**
(a)	Contract administration (Note 2)	Professional	-	-	-	1.2
		Technical	-	-	-	0.8
(b)	Site supervision by resident site staff of the consultants (Note 3)	Professional	60	38	1.6	5.5
		Technical	350	14	1.6	10.6
					Total consultants' staff costs	18.1

* 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 April 2007, MPS point 38 = $56,945 per month and MPS point 14 = $18,840 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 upon 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.

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

Breakdown of the land resumption and clearance costs

			$ million
Estimated land resumption cost			54.614
(a)	Agricultural Land Ex-gratia Compensation (including 111 lots of private land) 25 180m^2 @ \$2,168.93/ m^2 (Note 1)	54.614	
Estimated clearance cost			18.623
(a)	Compensation for crops	9.846	
(b)	Ex-gratia compensation for miscellaneous permanent improvements to farms	0.575	
(c)	"Tun Fu" ceremonial fees	0.100	
(d)	Ex-gratia allowances for domestic occupiers and business undertakings	0.831	
(e)	Interest payment on various ex-gratia compensations for private land and contingency	7.271	
	Total costs		**73.237** **Say \$73.2 million**

Notes

1. All the land to be resumed in the project **92CD** is agricultural land within Compensation Zone "C". The ex-gratia compensation rate for this zone is 50% of the Basic Rate for agricultural land. The latest Basic Rate is \$403.00 per square foot (or \$4,337.86 per m^2) with effective from 1 October 2007.

2. There are four ex-gratia compensation zones, namely Zones A, B, C and D, for land resumption in the New Territories as approved by ExCo in 1985 and 1996. The boundaries of these zones are shown on the Zonal Plan for Calculation of Compensation Rates.