For discussion
on 20 June 2007

PWSC(2007-08)40

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE
Civil Engineering – Drainage and erosion protection
109CD – Drainage improvement works in Tai Po

Members are invited to recommend to Finance Committee –

(a) the upgrading of part of **109CD**, entitled "Drainage improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang", to Category A at an estimated cost of $426.3 million in money-of-the-day prices; and

(b) the retention of the remainder of **109CD**, retitled "Drainage improvement works in Shuen Wan, Tai Po" in Category B.

PROBLEM

Some areas in the vicinity of upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang are susceptible to flooding during heavy rainstorms due to the inadequate capacity of the existing drainage systems and natural streamcourses.

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PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **109CD** to Category A at an estimated cost of $426.3 million in money-of-the-day (MOD) prices for river improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang.

PROJECT SCOPE AND NATURE

3. The part of **109CD** which we now propose to upgrade to Category A comprises construction of –

(a) about 2.6 kilometres (km) of drainage channel with width ranging from 18 metres (m) to 29 m in upper Lam Tsuen River;

(b) about 1.1 km of drainage channel with width ranging from 8.5 m to 21.5 m in She Shan River;

(c) about 0.7 km of drainage channel with width ranging from 13 m to 20 m in upper Tai Po River;

(d) about 25 m of twin-cell box culvert with internal cell dimensions of 1 350 millimetres (mm) in height and 2 500 mm in width in Ping Long, and about 18 m of single-cell box culvert with internal cell dimensions of 2 150 mm in height and 3 000 mm in width in Kwun Hang; and

(e) ancillary road works.

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

4. We plan to commence the construction in September 2007 for completion in November 2011.

JUSTIFICATION

5. Owing to inadequate drainage capacity, some areas in the vicinity of the upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang are susceptible to flooding during heavy rainstorms. Moreover, owing to changes in land use in the areas over the years, tracts of natural ground have been

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paved over and become impermeable. Rainwater 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 improvements works in paragraph 3 above. Upon completion of the proposed works, the risk of flooding during heavy rainstorms in the areas concerned will be reduced. The main drainage systems comprising upper Lam Tsuen River, She Shan River and upper Tai Po River, and the box culverts in Ping Long and Kwun Hang will 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 about $426.3 million in MOD prices (see paragraph 8 below), made up as follows –

			$ million
(a)	Construction of drainage and ancillary works in		325.9
	(i) upper Lam Tsuen River	190.0	
	(ii) She Shan River	57.0	
	(iii) upper Tai Po River	76.0	
	(iv) Ping Long and Kwun Hang	2.9	
(b)	Consultants' fees for		34.0
	(i) contract administration	2.0	
	(ii) site supervision	32.0	

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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	
(c)	Environmental mitigation measures	20.5	
(d)	Contingencies	37.2	
	Sub-total	417.6	(in September 2006 prices)
(e)	Provision for price adjustment	8.7	
	Total	426.3	(in MOD prices)

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

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

Year	**$ million (Sept 2006)**	**Price adjustment factor**	**$ million (MOD)**
2007 – 2008	20.0	0.99900	20.0
2008 – 2009	94.9	1.00649	95.5
2009 – 2010	106.5	1.01656	108.3
2010 – 2011	116.6	1.02672	119.7
2011 – 2012	67.6	1.03699	70.1
2012 – 2013	12.0	1.05514	12.7
	417.6		426.3

9. We have derived the MOD estimate on the basis of 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 the uncertainties of the existence and alignment of underground utilities and ground condition. The contract will provide for price adjustments as the contract period will exceed 21 months.

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10. We estimate the annual recurrent expenditure arising from the proposed works to be about $1.4 million.

PUBLIC CONSULTATION

11. We consulted the Environment, Housing and Works Committee of Tai Po District Council on 23 July 2004 for the proposed works. The District Council members supported the proposed works.

12. We gazetted the proposed works in upper Lam Tsuen River, She Shan River and upper Tai Po River under the Roads (Works, Use and Compensation) Ordinance on 18 November 2005, and subsequently gazetted the Amendment Plans and the Amendment Scheme on 28 July 2006. Of the 19 objections received, six were withdrawn unconditionally after our clarification and ten were withdrawn with conditions[2] which we had agreed to meet. Three objections remained unresolved. One objector expressed concern about the resumption of her land and possible impact of dewatering during construction. The other two objectors were concerned about the increase in vehicular traffic through the existing narrow access and road safety. After considering the objections, the Chief Executive in Council authorised the proposed works on 5 June 2007.

13. We circulated to the Legislative Council Panel on Planning, Lands and Works an information paper on the proposed works on 14 May 2007. Members raised no objection to the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. The proposed training of upper Tai Po River is a designated project under the Environmental Impact Assessment (EIA) Ordinance due to the proximity of an archaeological site at Wun Yiu, Tai Po, namely the remnants of Wun Yiu Pottery Kilns at about 150 m from the works. Environmental studies have been carried out confirming that the project would not give rise to any undue impacts on the archaeological site, and we will closely monitor the conditions of the remnants of Wun Yiu Pottery Kiln during construction. Based on the outcome of the environment studies, we submitted the Project Profile (PP) for direct application of an environmental permit under the EIA Ordinance and obtained the permit on 31 August 2005.

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[2] The conditions include modifications of the ancillary road works and the land resumption and clearance limit of the Project to address the objectors' requests and concern. We implemented the modifications by gazetting the Amendment Plans and the Amendment Scheme and by amending the resumption and clearance limit for the Project under the Lands Resumption Ordinance.

15. The proposed drainage works in upper Lam Tsuen River, She Shan River, Ping Long and Kwun Hang are not designated projects. We have completed an Environmental Study (ES) for the proposed works at those locations. The ES concluded that the environmental impacts arising from the proposed works could be mitigated within established standards and guidelines upon implementation of the recommended mitigation measures. We will ensure that the mitigation measures will be properly implemented during construction.

16. For short-term impacts caused by the 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 equipment to reduce noise generation, water-spraying to reduce emission of dust and working in dry environment with barriers to control water pollution during excavation. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices will be properly implemented on site. We have included $20.5 million (in September 2006 prices) in the project estimate for implementing the environmental mitigation measures.

17. We have considered ways in the planning and design stages to reduce the generation of construction and demolition (C&D) materials where possible. For example, we have determined the alignments of the proposed drainage channels such that excavation and demolition of existing structures would be minimised. We will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We will also require the contractor to carry out on-site sorting to recover reusable/recyclable material from C&D materials and to reuse inert C&D materials (e.g. the excavated material as filling material) 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[3]. We will encourage the contractor to maximise the use of recycled and recyclable C&D materials to further minimise the generation of construction waste.

18. We will also require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures (e.g. allocation of an area for waste segregation) to avoid, reduce and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved plan. We will control disposal of public fill and C&D waste to public filling reception 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, reuse and recycling of C&D materials for monitoring purposes.

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[3] 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

19. We estimate that the project will generate about 472 000 tonnes of C&D materials. Of these, we will reuse about 160 500 tonnes (34%) on site and deliver 273 800 tonnes (58%) to public fill reception facilities for subsequent reuse. In addition, we will dispose of 37 700 tonnes (8%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about $12.1 million for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne at landfills[4]).

TRAFFIC IMPACTS

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

LAND ACQUISITION

21. We will clear about 112 604 square metres (m^2) of Government land and resume about 31 866 m^2 of private agricultural land. The land acquisition and clearance will affect 15 households involving 41 persons and 11 temporary domestic structures. Of these, 14 households involving 37 persons and ten temporary domestic structures are residing on Government land, and one household involving four persons and one temporary domestic structure are residing on private agricultural land. 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 $90 million, comprising about $81 million for land resumption and about $9 million for clearance, to **Head 701 – Land Acquisition**.

BACKGROUND INFORMATION

22. In October 1999, we completed a comprehensive review of the drainage systems in Sha Tin and Tai Po under **79CD** "Stormwater drainage master plan study in Sha Tin and Tai Po". The study identified that some of the existing drainage systems in Sha Tin and Tai Po were inadequate to meet the required flood protection standard and recommended a programme of drainage improvement works to tackle the flooding problems in the areas.

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[4] The 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.

23. In September 2000, we included **109CD** "Drainage improvement in Sha Tin and Tai Po" in Category B of the Public Works Programme.

24. In June 2001, we upgraded part of **109CD** to Category A as **115CD** entitled "Drainage improvement in Sha Tin and Tai Po – consultants' fees and investigations" at an estimated cost of $24 million for engaging consultants to undertake the site investigations, environmental impact assessment, traffic impact assessment and detailed design for **109CD**. The consultancy commenced in February 2002 for completion in June 2012.

25. In February 2005, we upgraded part of **109CD** to Category A as **136CD** "Drainage improvement works in Sha Tin" at an estimated cost of $72.4 million for carrying out the urban drainage improvement works in Sha Tin. The construction works commenced in March 2005 for completion in December 2007.

26. In November 2005, we upgraded part of **109CD** to Category A as **141CD** "Drainage improvement works in Tai Po town area" at an estimated cost of $82.5 million for carrying out the urban drainage improvement works in the town areas of Tai Po. The construction works commenced in December 2005 for completion in August 2008.

27. We have substantially completed the detailed design for the proposed drainage improvement works. The planning and design of the remaining drainage improvement works for Wai Ha River in Shuen Wan is underway.

28. Of the 1 103 trees within the project boundary, 529 trees will be preserved. The proposed works will involve the removal of 571 common trees including 495 trees to be felled and 76 trees to be replanted within the project site. Besides, three important trees[5] will be affected during the implementation of the project. A summary of important trees affected is provided at Enclosure 3. We will incorporate planting proposals as part of the project, including estimated quantities of 1 190 trees, 25 000 shrubs and 10 000 m^2 of grassed area.

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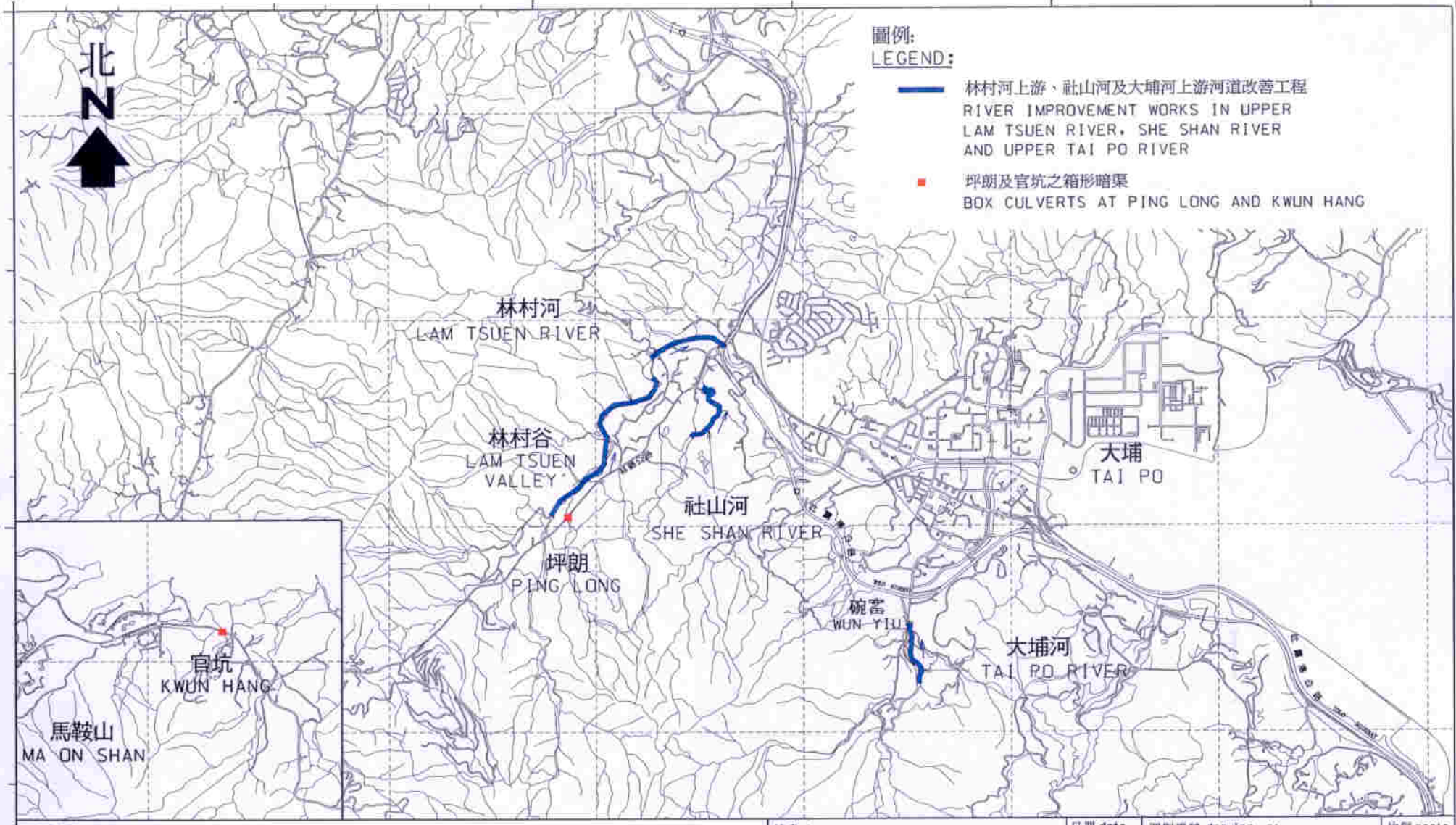
[5] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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 190 jobs (145 for labourers and 45 for professional/technical staff) providing a total employment of 6 800 man-months.

Environment, Transport and Works Bureau
June 2007



圖則名稱 drawing title

工務計劃項目第4109CD號
大埔雨水排放系統改善計劃

PWP ITEM NO. 4109CD
DRAINAGE IMPROVEMENT WORKS IN TAI PO

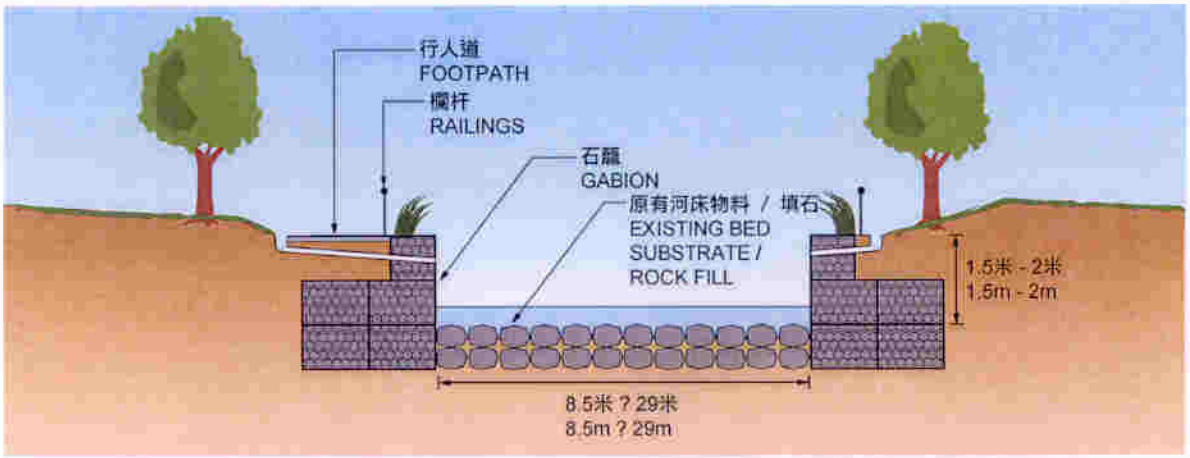
繪畫 drawn	T.M. LEE	日期 date
核對 checked	S.Y. WONG	日期 date
審核 vetted	S.K. CHUI	日期 date
部門 office	排水工程部 DRAINAGE PROJECTS DIVISION	

圖則編號 drawing no. DDN/109CD1/8005

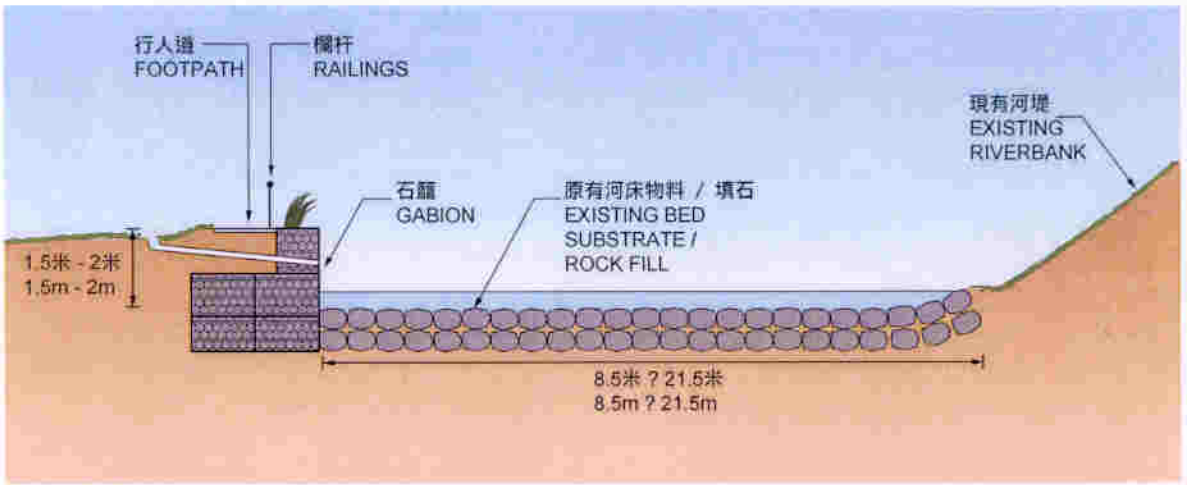
比例 scale 1:50 000

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

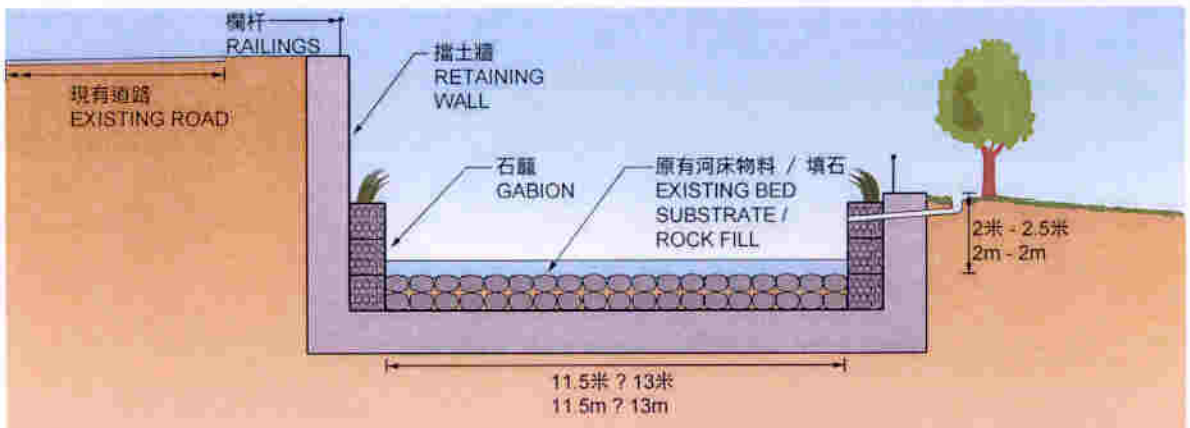
附件一(全三張其一) ENCLOSURE 1 (SHEET 1 OF 3)



類型一（超過2.7公里沿林村河上游、社山河及大埔河上游之主要典型切面）
TYPE 1（Main typical section for over 2.7km along Upper Lam Tsuen River, She Shan River and Upper Tai Po River）



類型二（約0.45公里沿林村河上游、社山河及大埔河上游之典型切面）
TYPE 2（Typical section for approximately 0.45km along Upper Lam Tsuen River, She Shan River and Upper Tai Po River）



類型三（約0.4公里沿社山河及大埔河上游之典型切面）
TYPE 3（Typical section for approximately 0.4km along She Shan River and Upper Tai Po River）

圖則名稱 drawing title 工務計劃項目第4109CD號 大埔雨水排放系統改善計劃 PWP ITEM NO. 4109CD DRAINAGE IMPROVEMENT WORKS IN TAI PO 排水道典型切面圖 TYPICAL CROSS-SECTION OF DRAINAGE CHANNELS	繪畫 drawn	C. H. HO	日期 date 23 MAR 07
	核對 checked	C. C. TAM	日期 date 23 MAR 07
	批核 approved	S. K. CHUI	日期 date 23 MAR 07
	部門 office 排水工程部 DRAINAGE PROJECTS DIVISION		

圖則編號 drawing no.	比例 scale
DDN/109CD1/8006	N.T.S.
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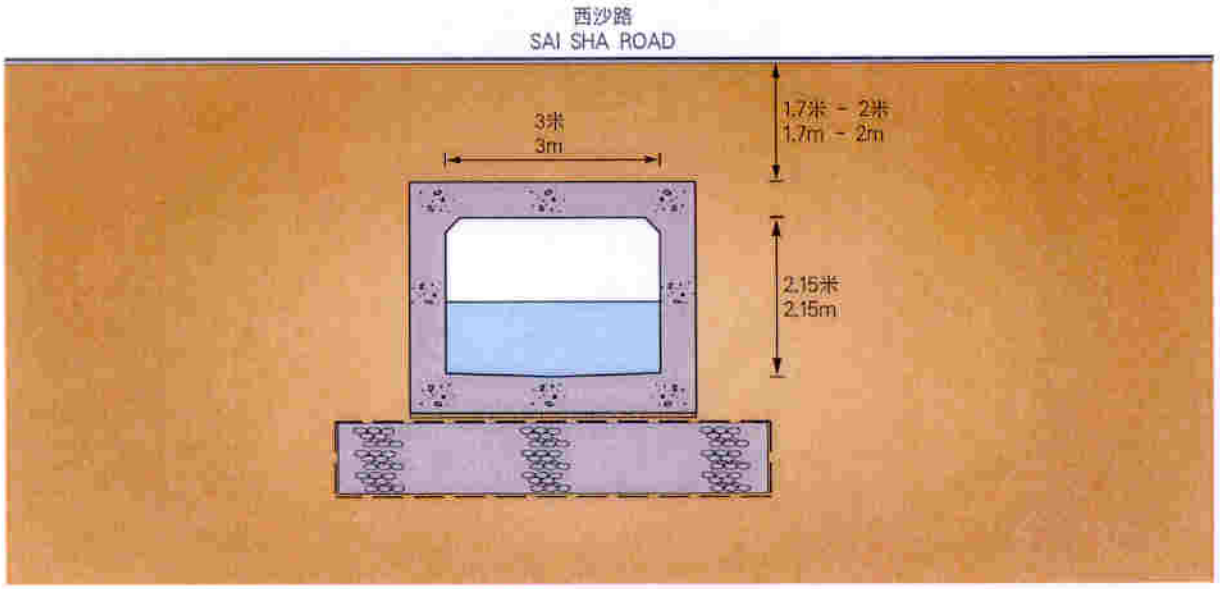
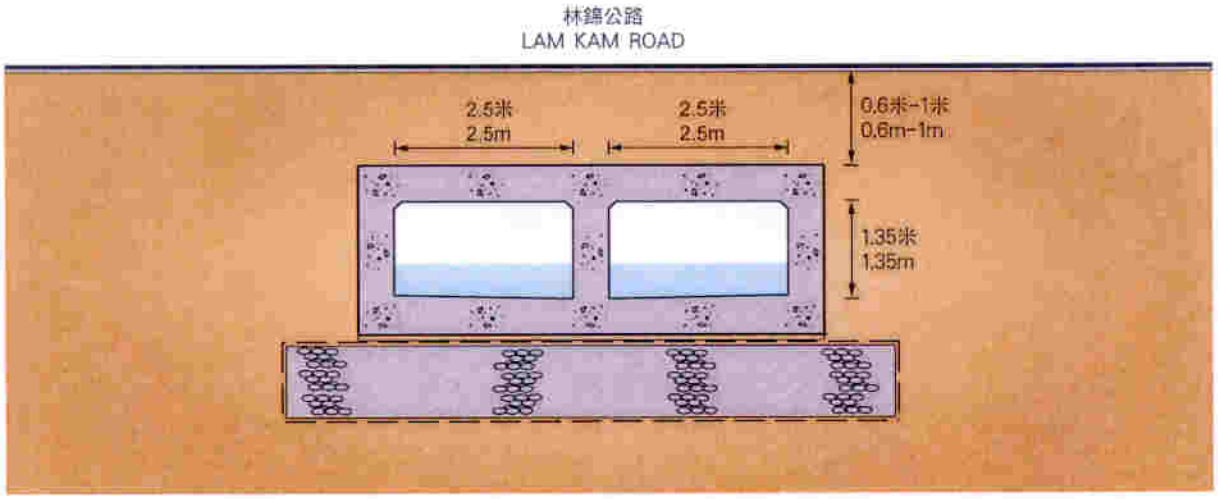


類型四（位於官坑的箱形暗渠之典型切面）
TYPE 4（Typical section for box culvert at Kwun Hang）



類型五（位於坪朗的箱形暗渠之典型切面）
TYPE 5（Typical section for box culvert at Ping Long）

圖則名稱 drawing title 工務計劃項目第4109CD號 大埔雨水排放系統改善計劃 PWP ITEM NO. 4109CD DRAINAGE IMPROVEMENT WORKS IN TAI PO 箱形暗渠典型切面圖 TYPICAL CROSS-SECTION OF BOX CULVERTS	繪畫 drawn C. H. HO	日期 date 23 MAR. 07	圖則編號 drawing no. DDN/109CD1/8007
	核對 checked C. C. TAM	日期 date 23 MAR. 07	比例 scale N.T.S.
	批核 approved S. K. CHUI	日期 date 23 MAR. 07	保留版權 COPYRIGHT RESERVED
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109CD – Drainage improvement in Tai Po

Breakdown of the estimates for consultant's fees

	Consultants' staff costs		**Estimated man-months**	**Average MPS* salary point**	**Multiplier** (Note 1)	**Estimated fee ($ million)**
(a)	Contract administration (Note 2)	Professional	—	—	—	1.8
		Technical	—	—	—	0.2
(b)	Site supervision by resident site staff of the consultants (Note 3)	Professional	220	38	1.6	19.1
		Technical	448	14	1.6	12.9
					Total	34.0

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied in the case of site staff supplied by the consultants. (As at 1 January 2007, MPS Pt. 38 = $54,255 per month and MPS Pt. 14 = $18,010 per month.)

2. The consultants' fees for contract administration are estimated in accordance with the existing consultancy agreement for 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 for site supervision after completion of the works.

Enclosure 3 to PWSC(2007-08)40

Summary of "Important Trees" affected

109CD - Drainage improvement works in Tai Po

Tree ref. no.	Tree species (Botanical name)	Tree size			Form[2] (Good/ Fair/ Poor)	Health condition (Good/ Fair/ Poor)	Amenity value (High/ Med/ Low)	Survival rate after transplanting (High/ Med/ Low)	Recommendation (Retain/ Transplant/ Fell)	Remarks (including justification for proposed tree removal/ecological and historical significance (if any) of affected trees, etc)
		Overall height (metres)	Trunk[1] diameter (mm)	Average crown spread (metres)						
She Shan River										
A139	Cinnamomum camphora	10	1000	6	Poor	Fair	Low	Low	Fell	The slope on which tree A139 is located will be cut for the construction of channel wall and formation of footpath. Retention of tree A139 at its original location would require substantial shifting of the channel and footpath alignment away from the slope concerned and thus leading to partial demolition of two village houses in the vicinity. Due to site constraint and the tree size, no practical means of transportation would be available to enable transplantation.
Upper Lam Tsuen River										
T77	Ficus microcarpa	10	1200	8	Fair	Fair	Low	Low	Transplant	Trees T77 and T87 fall within the future drainage channel and will affect the hydraulic performance if they are to be retained. Retention of these two trees at the original location would require substantial shifting of the channel alignment or local widening of channel width and thus leading to the need of partial demolition of two village houses in the vicinity.
T87	Bischofia trifoliata	12	1000	8	Poor	Fair	Low	Low	Transplant	

Note:

(1) Trunk diameter of a tree refers to its diameter at breast height (i.e. measured at 1.3 m above ground level).

(2) Form of a tree will take account of the overall tree size, shape, and any special feature.