For discussion **PWSC(2008-09)42**
on 7 November 2008

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

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

Members are invited to recommend to Finance Committee the upgrading of the remainder of **109CD**, entitled "Drainage improvement works in Shuen Wan, Tai Po", to Category A at an estimated cost of $252.7 million in money-of-the-day prices.

PROBLEM

The low-lying areas in the vicinity of Shuen Wan in Tai Po are susceptible to flooding during heavy rainstorms due to inadequate capacity of the existing natural streamcourses and associated drainage systems.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for Development, proposes to upgrade **109CD** to Category A at an estimated cost of $252.7 million in money-of-the-day (MOD) prices for drainage improvement works in Shuen Wan, Tai Po.

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PROJECT SCOPE AND NATURE

3. The scope of **109CD** comprises the construction of –

(a) about 1.0 kilometre (km) of twin-cell box culvert with internal cell dimensions of 3 metres (m) in width by 3 m in height along Tung Tsz Road;

(b) about 280 m of drainage pipe with diameter of 1.2 m near Wai Ha Village;

(c) about 260 m of drainage pipe with diameter of 1.8 m along Ting Kok Road, and an automatic mechanical penstock at the mouth of Wai Ha River;

(d) a stormwater pumping station near Ting Kok Road; and

(e) associated greening works.

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

4. We plan to commence construction in January 2009 for completion in January 2012.

JUSTIFICATION

5. Wai Ha River flows through a tract of low-lying areas as it discharges into the sea. Its existing capacity is not adequate and during heavy rainfall the low-lying areas including a section of Tung Tze Road and part of Wai Ha Village and San Tau Kok Village are susceptible to flooding. During severe rainstorm and at high tide, the high sea level will hinder the flow of the river into the sea and aggravate the flooding problem. Further changes in land use in Shuen Wan over the years have resulted in tracts of natural ground being replaced by impermeable pavings. Rainwater can no longer dissipate naturally through ground infiltration as in the past. This has also led to increase in surface run-off.

6. To alleviate the flooding problem, we propose a scheme comprising a box culvert and a rainwater pumping station at the down stream end of the river. The proposed box culvert will collect the flow from the catchment of Wai Ha River north of Tung Tsz Road and Tung Tsz Shan Road. The proposed alignment of the culvert is selected to avoid encroaching upon the existing conservation area as far

as possible in order to preserve its current ecology and to allow the area to continue serving as a flood storage during heavy rainstorm. We also propose to install an automatic mechanical penstock at the mouth of Wai Ha River to isolate the river from the tide and to construct a pumping station to pump away the flow from the catchment south of Tung Tsz Road and Tung Tsz Shan Road during severe rainstorm and high tide. Upon completion of the proposed works, the drainage system in Shuen Wan will generally be improved to withstand rainstorms with a return period[1] of one in 50 years, and the risk of flooding to these areas will be greatly reduced.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be about $252.7 million in MOD prices (see paragraph 8 below), made up as follows –

			$ million
(a)	Construction of drainage and ancillary works		180.2
	(i) box culvert along Tung Tsz Road	99.6	
	(ii) drainage pipes near Wai Ha Village	3.0	
	(iii) drainage pipes along Ting Kok Road and an automatic mechanical penstock at the mouth of Wai Ha River	8.7	
	(iv) stormwater pumping station near Ting Kok Road	65.8	

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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	
	(v)	associated greening works	3.1	
(b)	Environmental mitigation measures			9.7
(c)	Consultants' fees for			18.5
	(i)	contract administration	1.4	
	(ii)	site supervision	17.1	
(d)	Contingencies			20.8
		Sub-total		229.2 (in September 2008 prices)
(e)	Provision for price adjustment			23.5
		Total		252.7 (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 (Sep 2008)**	**Price adjustment factor**	**$ million (MOD)**
2008 – 2009	1.7	1.00000	1.7
2009 – 2010	63.4	1.04000	65.9

/2011 – 2012 .....

Year	$ million (Sep 2008)	Price adjustment factor	$ million (MOD)
2010 – 2011	66.7	1.08160	72.1
2011 – 2012	45.6	1.12486	51.3
2012 – 2013	27.2	1.16986	31.8
2013 – 2014	24.6	1.21665	29.9
	229.2		252.7

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 2008 to 2014. We will tender the proposed works under a standard re-measurement contract because of the uncertainties arising from underground utilities and ground condition. The contract will provide for price adjustments.

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 17 March 2006. Members supported the implementation of the proposed works. After completion of the detailed design, we consulted Tai Po Rural Committee on 10 June 2008. Members supported the implementation of the proposed works.

12. We gazetted the proposed works under the Foreshore and Sea-bed (Reclamations) Ordinance (the Ordinance) (Cap.127) on 17 August 2007 and did not receive any objection. During the course of detailed design, we gazetted the revised location of the mechanical penstock under the Ordinance on 25 January 2008 to take account of villagers' requests. We did not receive any objection. On completion of the detailed design, we gazetted the proposed works under the Ordinance on 30 May 2008. We did not receive any objection. The Chief Executive authorised the proposed works on 23 October 2008.

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13. We consulted the Legislative Council Panel on Development on the proposed works by circulation of an information paper on 17 October 2008. Members did not raise any objection to the proposal.

ENVIRONMENTAL IMPLICATIONS

14. The proposed works partly fall within a Conservation Area in Shuen Wan and is therefore a designated project under the Environmental Impact Assessment (EIA) Ordinance. We completed an EIA report for the proposed works and obtained the approval of the Director of Environmental Protection in August 2007. We also completed an environmental review for minor design changes and obtained the approval of the Director of Environmental Protection in January 2008. The EIA report and the environmental review concluded that, with appropriate mitigation measures in place, the environmental impacts of the proposed works could be controlled to within the standards set out in the EIA Ordinance and the associated Technical Memorandum. The key measures include enhancement of an existing fishpond of about 8 000 m^2 within the site boundary to provide moderate-high ecological value habitat as compensation of the loss of 3 000 m^2 of marsh habitat and 800 m^2 of secondary woodland. We will implement the measures recommended in the approved EIA report and the environmental review.

15. For short-term impacts 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 $9.7 million (in September 2008 prices) in the project estimate for implementing the environmental mitigation measures.

16. We have considered ways in the planning and design stages to reduce the generation of construction waste where possible. For example, while meeting conservation and hydraulic requirements, we have determined the alignments of the proposed culvert and drains such that excavation would be minimised. In addition, we will require the contractor to reuse inert construction waste including the excavated material as backfilling 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

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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.

recycled and 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 measures to avoid, reduce 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 in total about 257 600 tonnes of construction waste. Of these, we will reuse about 56 300 tonnes (22%) of inert construction waste on site and deliver about 185 800 tonnes (72%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of about 15 500 tonnes (6%) 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 $6.9 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).

HERITAGE IMPLICATIONS

19. This project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interests and Government historic sites identified by the Antiquities and Monuments Office.

TRAFFIC IMPLICATIONS

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

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[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.

LAND ACQUISITION

21. We will clear about 32 348 square metres (m^2) of Government land and resume about 5 890 m^2 of private agricultural land. No domestic structure will be affected. There are 22 non-domestic temporary structures on private land to be resumed. We will charge the land resumption and clearance costs estimated at $43.4 million, to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance cost is at Enclosure 3.

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) with an approved project estimate of $26.2 million. The Study has identified that some of the existing drainage systems in Sha Tin and Tai Po are inadequate to meet the required flood protection standard and recommended a programme of drainage improvement works to tackle the flooding problems in the areas.

23. In September 2000, we included **109CD** "Drainage improvement in Sha Tin and Tai Po" in Category B for implementing the drainage improvement works recommended under the Study.

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 in MOD prices 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 in MOD prices for carrying out the urban drainage improvement works in Sha Tin. The construction works commenced in March 2005 for completion in January 2009.

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 in MOD prices 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 February 2009.

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27. In July 2007, we upgraded part of **109CD** to Category A as **152CD** "Drainage improvement works in upper Lam Tsuen River, She Shan River, upper Tai Po River, Ping Long and Kwun Hang" at an estimated cost of $426.3 million in MOD prices for carrying out the drainage improvement works in Tai Po. The construction works commenced in September 2007 for completion in June 2011.

28. Of the 499 trees within the project boundary, our latest estimate is that about 376 trees will be preserved. The proposed works will involve the removal of 123 common trees including 89 trees to be felled and 34 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 200 trees, 19 000 shrubs and 2 000 m^2 of grassed area.

29. We estimate that the proposed works will create about 137 jobs (110 for labourers and 27 for professional/technical staff) providing a total employment of 3700 man-months.

Development Bureau
October 2008

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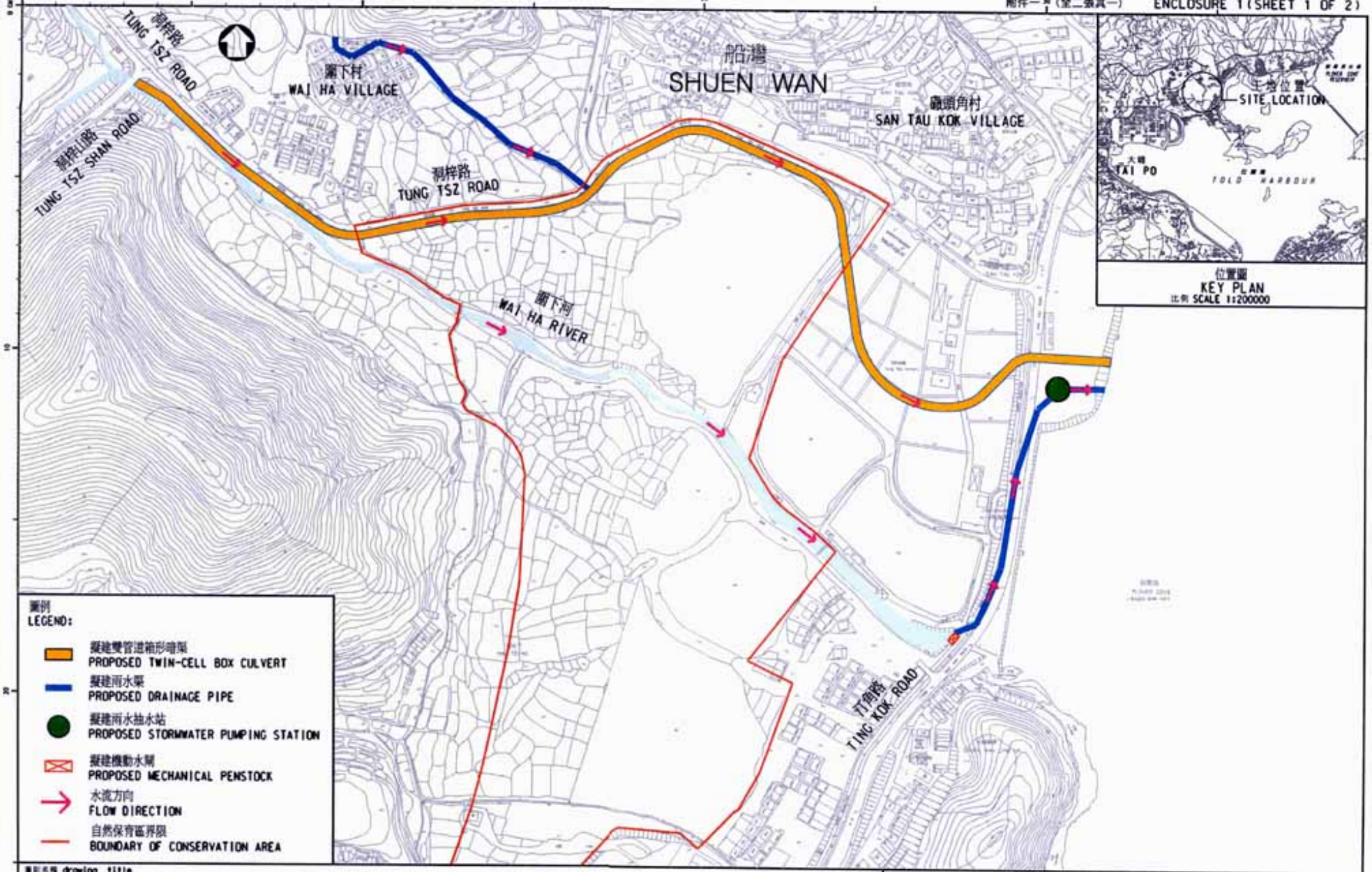
[4] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –
(a) trees over 100 years old or above;
(b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery 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 25m.



圖則名稱 drawing title

工務計劃項目第109CD號 - 大埔船灣雨水排放系統改善計劃

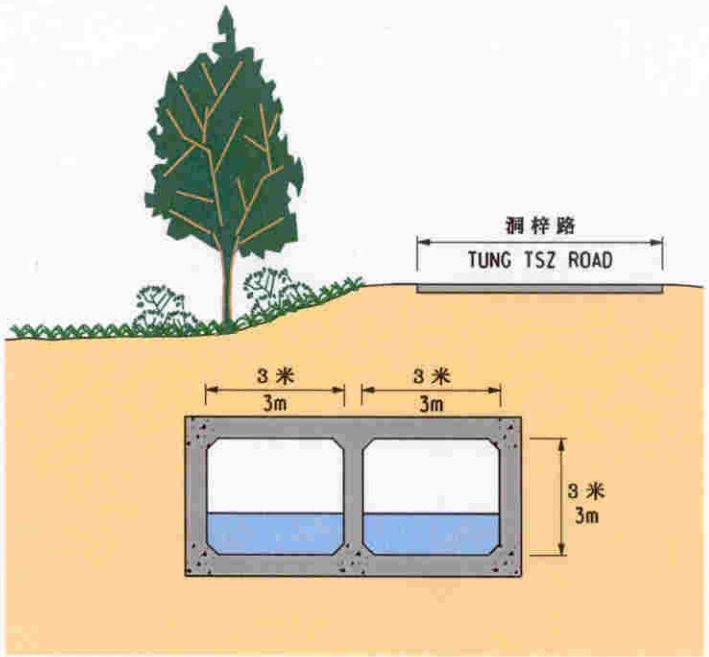
PWP ITEM NO. 109CD - DRAINAGE IMPROVEMENT WORKS IN SHUEN WAN, TAI PO

繪圖 drawn	T. M. LEE	日期 date 7 SEP 08	
核對 checked	W. C. SIU	日期 date 7 SEP 08	
授權 approved	B. S. ENGR	日期 date 7 SEP 08	
部門 office	排水工程部 DRAINAGE PROJECTS DIVISION		

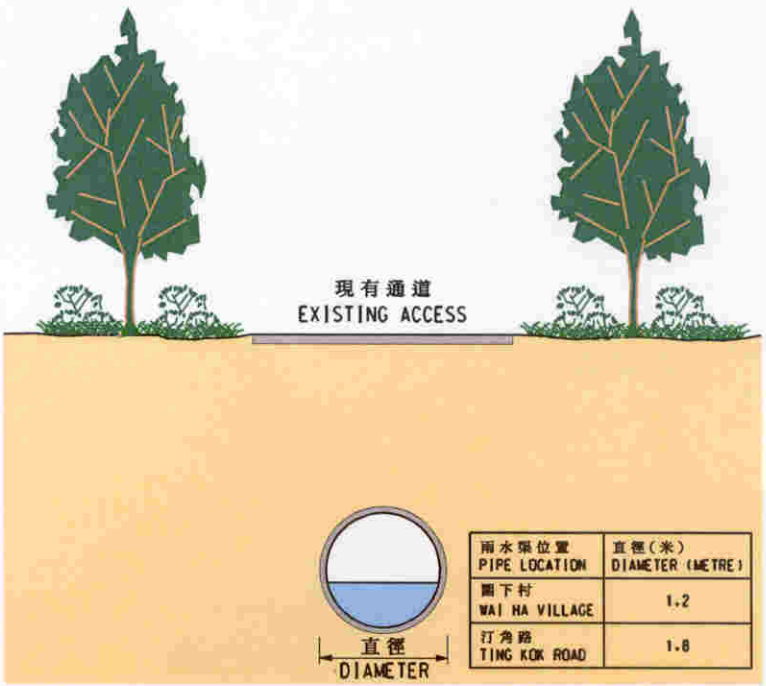
圖則編號 drawing no. DDN/109CD1/8013

比例 scale 1:3000

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



位於洞梓路的擬建箱形暗渠之典型切面
TYPICAL SECTION OF PROPOSED BOX CULVERT AT TUNG TSZ ROAD



雨水渠位置 PIPE LOCATION	直徑(米) DIAMETER (METRE)
圍下村 WAI HA VILLAGE	1.2
汀角路 TING KOK ROAD	1.8

擬建雨水渠之典型切面
TYPICAL SECTION OF PROPOSED DRAINAGE PIPE

LEGEND 圖例:

擬種植樹木及灌木 PROPOSED TREE AND SHRUBS PLANTING

圖則名稱 drawing title: 工務計劃項目第109CD號 大埔船灣雨水排放系統改善計劃 PWP ITEM NO. 109CD DRAINAGE IMPROVEMENT WORKS IN SHUEN WAN, TAI PO	繪畫 drawn	W. H. KO	日期 date 07 DEC 2007
	核對 checked	W. C. SIU	日期 date 07 DEC 2007
	批核 approved	B. K. KWOK	日期 date 07 DEC 2007
	部門 office 排水工程部 DRAINAGE PROJECTS DIVISION		

圖則編號 drawing no. DDN/109CD1/8014 | 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

109CD – Drainage improvement works in Shuen Wan, 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	—	—	—	1.2
		Technical	—	—	—	0.2
(b)	Site supervision by resident site staff of the consultants (Note 3)	Professional	107	38	1.6	10.4
		Technical	210	14	1.6	6.7
					Total	18.5

* 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 April 2008, MPS Pt. 38 = $60,535 per month and MPS Pt. 14 = $19,835 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.

109CD – Drainage improvement works in Shuen Wan, Tai Po

Breakdown of the land resumption and clearance costs

		$ million
(a)	Agricultural Land Ex-gratia Compensation and land resumption (including 41 lots of private land) 5 890m^2 @ \$6,520/ m^2 (Notes 1 and 2)	38.40
(b)	Compensation for crops	0.80
(c)	Ex-gratia compensation for miscellaneous permanent improvements to farms	0.12
(d)	"Tun Fu" ceremonial fees	0.04
(e)	Ex-gratia allowances for non-domestic structures and business undertakings	0.02
(f)	Interest payment on various ex-gratia compensations and contingencies	4.05
	Total costs	**43.43** **(say 43.4)**

Notes

1. The land to be resumed in the project **109CD** is agricultural land within Compensation Zone "A". As published in the Gazette, the ex-gratia compensation rate for this zone is \$606 per square foot (or \$6,520 per square metre). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 41 lots affected by the project **109CD** is \$6,520 per square metre.

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.