

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 704 – DRAINAGE

#### Civil Engineering – Drainage and erosion protection

#### 102CD – Drainage improvement in Tuen Mun and Sham Tseng - package B

Members are invited to recommend to Finance Committee the upgrading of **102CD** to Category A at an estimated cost of \$76.5 million in money-of-the-day prices for drainage improvement works in Nai Wai and So Kwun Wat.

### PROBLEM

Due to the low-lying nature and inadequate capacity of the existing drainage system, some areas in Nai Wai and So Kwun Wat are susceptible to flooding during heavy rainstorms.

### PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **102CD** to Category A at an estimated cost of \$76.5 million in money-of-the-day (MOD) prices for improving the flow capacity of the drainage system in Nai Wai and So Kwun Wat.

### PROJECT SCOPE AND NATURE

3. The scope of works under **102CD** comprises -

/(a). .....

- (a) construction of about 1 100 metres (m) of drainage channel with width ranging from 14 m to 20 m and provision of ancillary works in So Kwun Wat; and
- (b) construction of about 30 m of drainage channel with width of 3.8 m, 420 m of box culvert with width ranging from 4.8 m to 5.3 m, and 300 m of drainage pipeline with diameter ranging from 450 millimetres (mm) to 1 800 mm and provision of ancillary works in Nai Wai.

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

4. We plan to commence construction in May 2007 for completion in November 2009.

## JUSTIFICATION

5. Due to extensive urbanisation and rapid development in Tuen Mun and Sham Tseng, changes in land use in the areas over the years have resulted in tracts of natural ground being replaced by impermeable pavings. Rainwater which would previously dissipate naturally through ground infiltration can no longer do so. In March 1997, we commissioned **78CD** “Stormwater drainage master plan study in Tuen Mun and Sham Tseng” to assess the adequacy of the existing drainage systems and tributaries in the areas. The study identified that the existing drainage systems in Nai Wai and So Kwun Wat are insufficient to provide the required protection standard, resulting in flooding during heavy rainstorms. Flood incidents were recorded during the period from 1999 to 2005.

6. We propose to carry out drainage improvement works in Nai Wai and So Kwun Wat as set out in paragraph 3 above to alleviate the risks of flooding. Upon completion of the proposed works, the standard of flood protection in Nai Wai and So Kwun Wat will be improved to withstand rainstorms with a return period<sup>1</sup> of one in 50 years.

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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.

## /FINANCIAL .....

**FINANCIAL IMPLICATIONS**

7. We estimate the cost of the proposed works to be \$76.5 million in MOD prices (see paragraph 8 below), made up as follows –

	<b>\$ million</b>	
(a) Construction of drainage and ancillary works in	68.7	
(i) So Kwun Wat	49.5	
(ii) Nai Wai	19.2	
(b) Environmental mitigation measures	2.4	
(c) Contingencies	4.2	
Sub-total	75.3	(in September 2006 prices)
(d) Provision for price adjustment	1.2	
Total	76.5	(in MOD prices)

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

<b>Year</b>	<b>\$ million (Sept 2006)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2007 - 2008	7.1	0.99900	7.1
2008 - 2009	26.2	1.00649	26.4
2009 - 2010	27.4	1.01656	27.9
2010 - 2011	10.3	1.02672	10.6
2011 - 2012	4.3	1.03699	4.5
	75.3		76.5

/9. ....

9. We have derived the MOD estimates 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 from 2007 to 2012. We will tender the proposed works under a standard re-measurement contract because of the uncertainties of the existence and alignment of the underground utilities and the ground conditions. The contract will provide for price adjustments because the contract period will exceed 21 months.

10. We estimate that the annual recurrent expenditure arising from this project to be about \$0.4 million.

### **PUBLIC CONSULTATION**

11. We consulted the Environmental, Hygiene and District Development Committee of the Tuen Mun District Council on 20 May 2005 on the proposed drainage improvement works. Members of the Committee supported the proposed works.

12. We consulted the Legislative Council Panel on Planning, Lands and Works on the proposed works by circulation of an information paper on 16 January 2007. Members had no objection to the proposed works.

### **ENVIRONMENTAL IMPLICATIONS**

13. The project is not a designated project under the Environmental Impact Assessment Ordinance. We completed an Environmental Study (ES) for the project in June 2004, which concluded that with full implementation of the recommended mitigation measures and environmental monitoring and audit programme, there would not be any long term adverse environmental impacts arising from the proposed works. We would incorporate the recommendations of the ES into the works contract for implementation.

14. For short-term impacts caused by the works during construction, we will control noise, dust and site run-off within the 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. We have included \$2.4 million (in September 2006 prices) in the project estimate for implementing

the environmental mitigation measures.

/15. ....

15. 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 adopted the alignments of the proposed drainage channels in such a manner that excavation and demolition of existing structures would be minimised, and adopted standardised sections of reinforced concrete structures to minimise the use of formwork. We have adopted environment friendly design such as gabion and rip-rap for most of the channel construction. 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 or recyclable materials 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<sup>2</sup>. We will encourage the contractor to maximise the use of recycled and recyclable C&D materials to further minimise the generation of construction waste.

16. 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 WMP. We will control disposal of public fill and C&D waste to public fill 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.

17. We estimate that the project will generate about 82 900 tonnes of C&D materials. Of these, we will reuse about 13 400 tonnes (16%) on site and deliver 66 100 tonnes (80%) to public fill reception facilities for subsequent reuse. In addition, we will dispose of 3 400 tonnes (4%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about \$2.2 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne at landfills<sup>3</sup>).

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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 public fill in public fill reception facilities requires a license issued by the Director of Civil Engineering and Development.

3 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<sup>3</sup>), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

/18. ....

18. 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

19. We will resume about 20 263 square metres (m<sup>2</sup>) of private land and clear 28 142 m<sup>2</sup> of government land for the proposed works. The land resumption will affect three households involving 12 persons. 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 \$78.5 million, comprising \$73.8 million for land resumption and \$4.7 million for clearance, to **Head 701 – Land Acquisition**.

## BACKGROUND INFORMATION

20. In October 2003, we included **102CD** “Drainage improvement in Tuen Mun and Sham Tseng – package B” in Category B for alleviating the flooding problems in Nai Wai and So Kwun Wat.

21. Of the 215 trees within the project boundary, 69 trees will be preserved. The proposed works will involve the removal of 146 common trees including 141 trees to be felled and five trees to be replanted within the project site. All trees to be removed are not important trees<sup>4</sup>. We will incorporate planting proposal as part of the project, including estimated quantities of 4 672 trees, 11 465 shrubs and 10 622 m<sup>2</sup> of grassed area.

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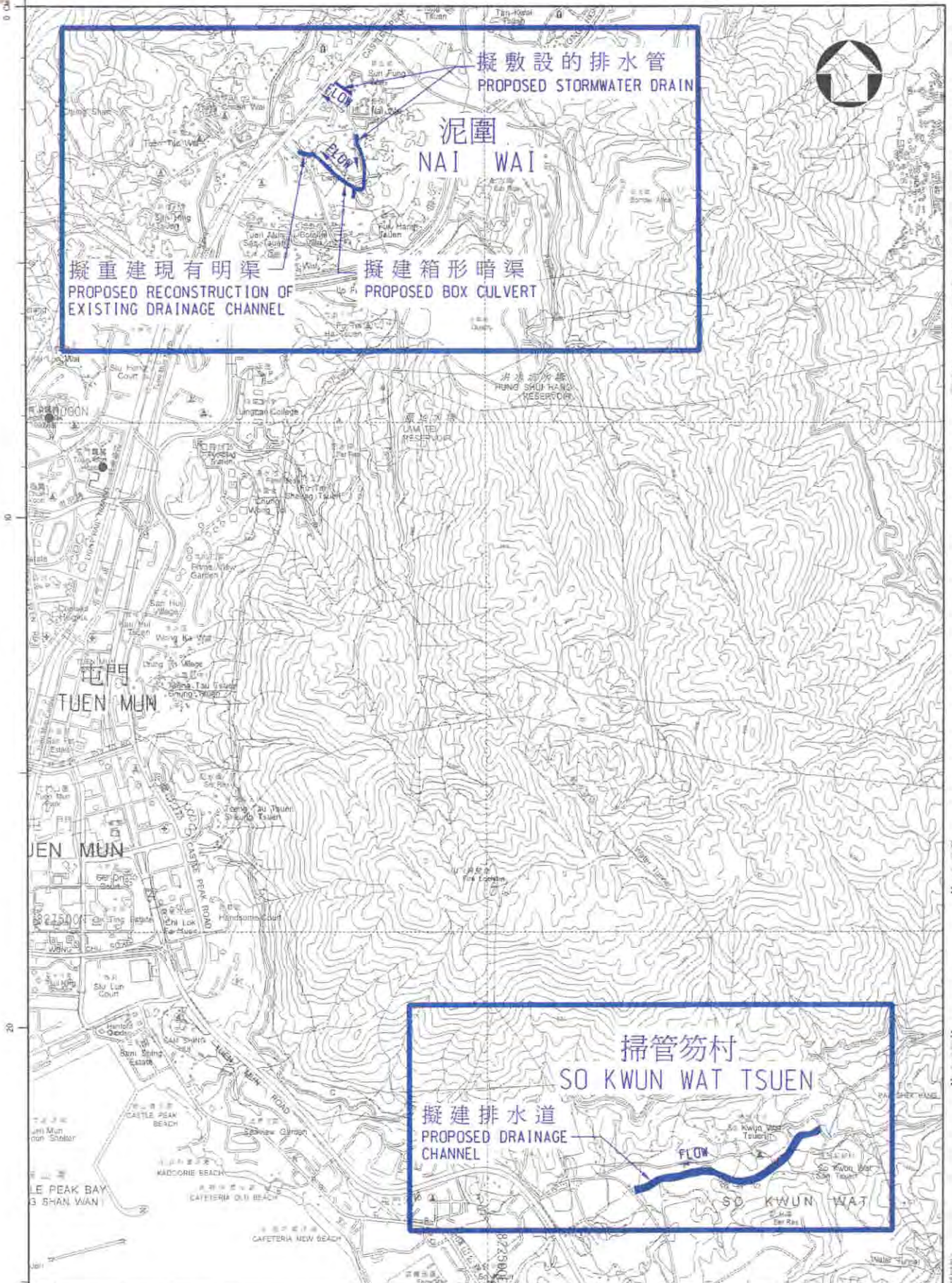
4 “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (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 an important person 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.

22. We estimate that the proposed works will create about 52 jobs (45 for labourers and another seven for professional/technical staff) providing a total employment of 1 300 man-months.

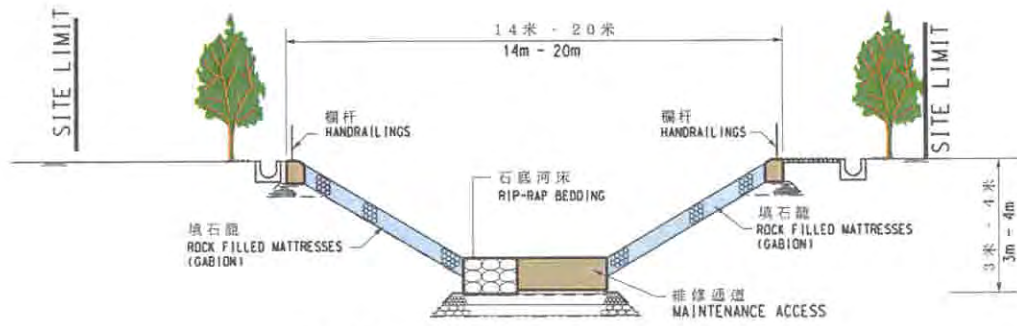
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Environment, Transport and Works Bureau  
April 2007

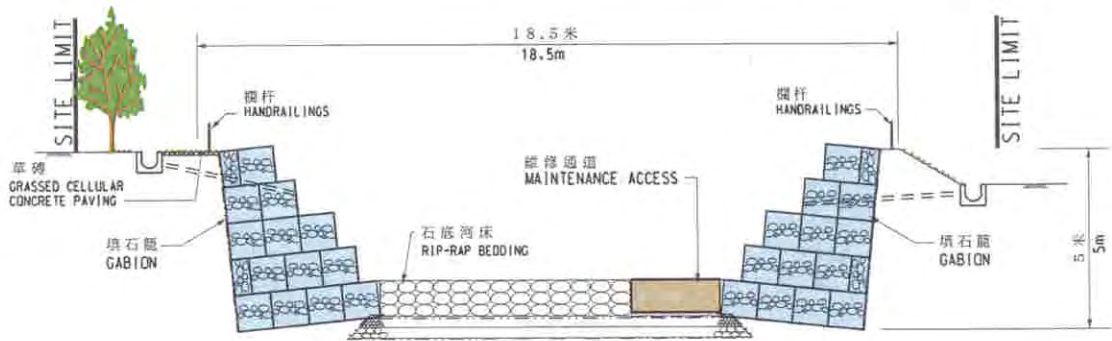


圖則名稱 drawing title 工程編號第 4102CD 屯門及深井排水改善工程 (組合乙) (頁一之二) PROJECT No. 4102CD DRAINAGE IMPROVEMENT IN TUEN MUN AND SHAM TSENG - PACKAGE B (SHEET 1 OF 2)	繪畫 drawn	S. C. TAM	日期 date	圖則編號 drawing no.	比例 scale
	核對 checked	Y. C. NG	日期 date	DDN/102CD/6938	1:25000
	批核 approved	M. L. WONG	日期 date	保留版權 COPYRIGHT RESERVED	
	部門 office	排水工程部 DRAINAGE PROJECTS DIVISION		 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	

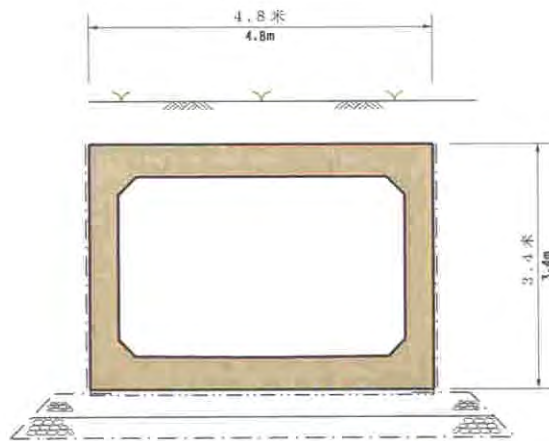




掃管笏梯形排水道典型橫切面  
TYPICAL SECTION OF TRAPEZOIDAL CHANNEL IN SO KWUN WAT



掃管笏填石籠排水道典型橫切面  
TYPICAL SECTION OF CHANNEL WITH GABION BLOCK IN SO KWUN WAT



泥圍單管箱形暗渠典型橫切面  
TYPICAL SECTION OF  
SINGLE CELL BOX CULVERT IN NAI WAI

圖則名稱 drawing title 工程編號第 4102CD 屯門及深井排水改善工程 (組合乙) (頁二之二) PROJECT No. 4102CD DRAINAGE IMPROVEMENT IN TUEN MUN AND SHAM TSENG - PACKAGE B (SHEET 2 OF 2)	繪畫 drawn	S. C. TAM	日期 date	19.3.2007	圖則編號 drawing no.	DDN/102CD/6939	比例 scale	N.T.S.
	核對 checked	Y. C. NG	日期 date	19.3.2007				
	批核 approved	M. L. WONG	日期 date	19.3.2007	保留版權 COPYRIGHT RESERVED			
	部門 office	排水工程處 DRAINAGE PROJECTS DIVISION			 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION			