For discussion **PWSC(2007-08)84**
on 20 February 2008

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Civil Engineering – Drainage and erosion protection
108CD – West Kowloon drainage improvement –
Lai Chi Kok Transfer Scheme

Members are invited to recommend to Finance Committee -

(a) the upgrading of part of **108CD** entitled "West Kowloon drainage improvement – Lai Chi Kok drainage tunnel" to Category A at an estimated cost of $1,669.1 million in money-of-the-day (MOD) prices; and

(b) retention of the remainder of **108CD**, retitled "West Kowloon drainage improvement – Inter-Reservoirs Transfer Scheme" in Category B.

PROBLEM

Due to inadequate capacity of the existing drainage systems, Sham Shui Po, Cheung Sha Wan and Lai Chi Kok areas are susceptible to flooding during heavy rainstorms.

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PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for Development, proposes to upgrade part of **108CD** to Category A at an estimated cost of $1,669.1 million in money-of-the-day (MOD) prices for the implementation of a drainage tunnel project in West Kowloon.

PROJECT SCOPE AND NATURE

3. The scope of the part of **108CD** which we propose to upgrade to Category A comprises the construction of -

(a) a drainage tunnel of about 3.7 kilometres in length and 4.9 metres (m) in diameter, from Chak On Estate to Victoria Harbour near Stonecutters Island;

(b) six intakes and about 270 m of connection adits;

(c) a stilling basin and an outfall structure;

(d) slope stabilisation works; and

(e) provision of ancillary works.

A layout plan showing the location of the proposed works is at Enclosure 1.

4. We plan to start construction in June 2008 for completion in April 2012.

JUSTIFICATION

5. Most of the existing drainage systems in the developed districts of Sham Shui Po, Cheung Sha Wan and Lai Chi Kok were built more than 40 years ago. Owing to rapid developments and changes in land use over the years, some natural ground and slopes have been paved over and become impermeable. Rainwater can no longer dissipate naturally through ground filtration as in the past. During heavy rainstorms, large quantity of surface run-off coming from the hinterland and the overflow from Kowloon group of reservoirs[1] will flow into the

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[1] The Kowloon group of reservoirs comprises Kowloon Reservoir, Shek Lei Pui Reservoir, Kowloon Reception Reservoir and Kowloon Byewash Reservoir.

urban areas downstream within a short period of time and overload the existing drainage systems. As a result, flooding often occurs during heavy rainstorms resulting in traffic disruption, property damages and safety risk to public.

6. To alleviate the problem, we have formulated the proposed Lai Chi Kok Transfer Scheme (LCKTS) which forms an integral part of the overall flood control strategy for West Kowloon. The proposed drainage tunnel, namely the Lai Chi Kok drainage tunnel (LCKDT), of the LCKTS will intercept surface run-off from the West Kowloon hinterland and potential overflow from the Kowloon group of reservoirs for discharge directly to Victoria Harbour near Stonecutters Island. By diverting the upland flow to the proposed drainage tunnel, the extent of drainage upgrading works required in the congested lower catchment urban areas will be significantly reduced. Upon completion of the proposed LCKTS, the standard of flood protection in Sham Shui Po, Cheung Sha Wan and Lai Chi Kok will be improved generally to withstand rainstorms with a return period[2] of one in 50 years.

FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the proposed works to be about $1,669.1 million in MOD prices (see paragraph 8 below), made up as follows

			$ million	
(a)	Construction works			1,355.0
	(i)	drainage tunnel	765.3	
	(ii)	intakes and adits	266.6	
	(iii)	stilling basin and outfall structure	319.7	
	(iv)	slope stabilisation and ancillary works	3.4	
(b)	Consultants' fees			113.4
	(i)	contract administration	4.4	
	(ii)	site supervision	109.0	

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[2] "Return period" means 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	13.8	
(d)	Contingencies	135.0	
	Sub-total	1,617.2	(in September 2007 prices)
(e)	Provision for price adjustment	51.9	
	Total	1,669.1	(in MOD prices)

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)**
2008 – 2009	165.9	1.00750	167.1
2009 – 2010	481.6	1.01758	490.1
2010 – 2011	481.6	1.02775	495.0
2011 – 2012	217.3	1.03803	225.6
2012 – 2013	106.0	1.05619	112.0
2013 – 2014	83.5	1.07732	90.0
2014 – 2015	81.3	1.09886	89.3
	1,617.2		1,669.1

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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 2008 to 2015. We will adopt design-and-build contract in order to shorten the time required by allowing part of the detailed design and construction to be carried out in parallel and with a view to achieving a cost-effective design by utilising contractors' specialist knowledge in tunnelling. The contract will provide for price adjustments as the contract period will exceed 21 months.

10. We estimate the annual recurrent expenditure arising from this project to be about $2.2 million.

PUBLIC CONSULTATION

11. We consulted the Sham Shui Po District Council (SSP DC) on 12 May 2005 and on 5 June 2007. Members welcomed the proposed drainage tunnel and supported the implementation of the project. In response to their concern on the greening, safety and hygienic aspects of the original open-channel design at the stilling basin, we also attended the Environment and Food Committee meeting of SSP DC on 5 July 2007 and provided details of a revised decking and landscaping design. Members of the Committee supported the proposal.

12. We gazetted the proposed works under the Foreshore and Sea-bed (Reclamations) Ordinance on 9 June 2006 and did not receive any objection. The Chief Executive in Council authorised the proposed works on 6 September 2006.

13. We briefed the Legislative Council Panel on Planning, Lands and Works at its meetings on 5 March 2001 and 4 January 2002 on the proposed drainage tunnel. We also circulated information papers to the Panel on 27 April 2004 and 13 July 2005 updating Members on the progress of the proposed LCKTS. We consulted the Panel on Development on the proposed LCKDT by circulation of an information paper on 15 October 2007. Members raised no objection to the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. The proposed LCKDT is not a designated project under the Environmental Impact Assessment Ordinance. We completed an Environmental Review Study in September 2005 which concluded that with the implementation

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of the recommended mitigation measures, the proposed works would not give rise to any long term adverse environmental impact and all construction impacts can be mitigated.

15. For short term impacts during construction, we will control noise, dust and site run-off within standards and guidelines through implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plants to reduce noise generation, water-spraying to reduce emission of fugitive dust, and strict control on diversion of stream flows in the works contracts. We will implement Environmental Monitoring and Auditing programme to ensure a satisfactory environmental performance of the construction and operation of the proposed works. We have included $13.8 million (in September 2007 prices) in the project estimates 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. We have considered optimising the tunnel diameter, tunnel alignment, the number and locations of intakes, as well as maximising the use of construction waste by reusing the excavated soil material for landscaping and the excavated rock for architectural finishes in the planning and design stages to reduce the generation of construction waste. In addition, we will require the contractor to reuse inert construction waste (e.g. the excavated soil as backfilling material) 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[3]. 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.

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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 inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

18. We estimate that the project will generate in total about 338 000 tonnes of construction waste. Of these, we will reuse about 162 000 tonnes (48%) of inert construction waste on site and deliver about 155 500 tonnes (46%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of about 20 500 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 $6.8 million for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[4] at landfills).

TRAFFIC IMPACTS

19. We have carried out a traffic impact assessment (TIA) for the proposed works. The TIA indicated that the construction and operation of the proposed LCKDT would not cause any significant traffic impact to the surrounding road network. We have drawn up preliminary temporary traffic management schemes for the proposed works and obtained agreement of the relevant authorities including Transport Department (TD) and Hong Kong Police Force (HKPF).

20. We will establish a Traffic Management Liaison Group (TMLG) under the works contract to discuss, scrutinise and agree on the proposed temporary traffic arrangements. We will invite representatives from TD, HKPF, Highways Department, the relevant District Offices, public transport operators and utility undertakings to attend the TMLG meetings, and every temporary traffic arrangement will have to be agreed by the TMLG before implementation. The TMLG will also take into account all relevant factors such as site restrictions, existing and future traffic conditions, pedestrian safety, access to building/shop fronts and provision of emergency vehicular access in considering the temporary traffic arrangements.

HERITAGE IMPLICATIONS

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

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[4] 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

22. The alignment of the proposed drainage tunnel has been carefully designed to minimise encroachment upon private land as far as possible and will mainly run along public road and government land. The proposed LCKDT will cross the existing MTR lines, i.e. West Rail Line, Tsuen Wan Line and Airport Railway at a level below them. The railway corporation has expressed no objection to the proposed LCKDT alignment. Due to site constraint, a section of the tunnel will encroach onto an underground stratum of a private lot adjacent to Ching Cheung Road. The owner has agreed to grant an easement to the Government at a nominal fee for the construction and maintenance of the proposed LCKDT within the private lot. The grant of an easement by the lot owner would obviate the need for acquiring the land by resumption. No land resumption is required for the project.

BACKGROUND INFORMATION

23. We included **108CD** in Category B in September 2000.

24. In March 2002, we upgraded part of **108CD** to Category A as **123CD** "Lai Chi Kok Transfer Scheme – preliminary design and investigations" at an estimated cost of $33.3 million in MOD prices for engaging consultants to carry out the preliminary design and investigations for the project.

25. In December 2005, we engaged consultants to carry out reference design, prepare contract documentation and assist in the tendering process under the design-and-build procurement approach for the proposed LCKDT under **108CD,** at an estimated cost of $12.4 million. We have charged the amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". The consultancy commenced in March 2006 for completion in May 2008.

26. In April 2007, we upgraded part of **108CD** to Category A as **150CD** "Inter-Reservoirs Transfer Scheme - environmental impact assessment, investigation and design" at an estimated cost of $26.0 million in MOD prices for engaging consultants to carry out the environmental impact assessment study, investigation and detailed design for the proposed Inter-Reservoirs Transfer Scheme.

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27. Of the 293 trees within the project boundary, 198 trees will be preserved. The proposed works will involve the removal of 95 common trees including 91 trees to be felled and four trees to be replanted within the project site. All trees to be removed are not important trees[5]. We will incorporate planting proposal as part of the project, including estimated quantities of 273 trees and 52 000 shrubs.

28. We estimate that the proposed works will create about 215 jobs (172 for labourers and another 43 for professional/technical staff) providing a total employment of 8 500 man-months.

Development Bureau
February 2008

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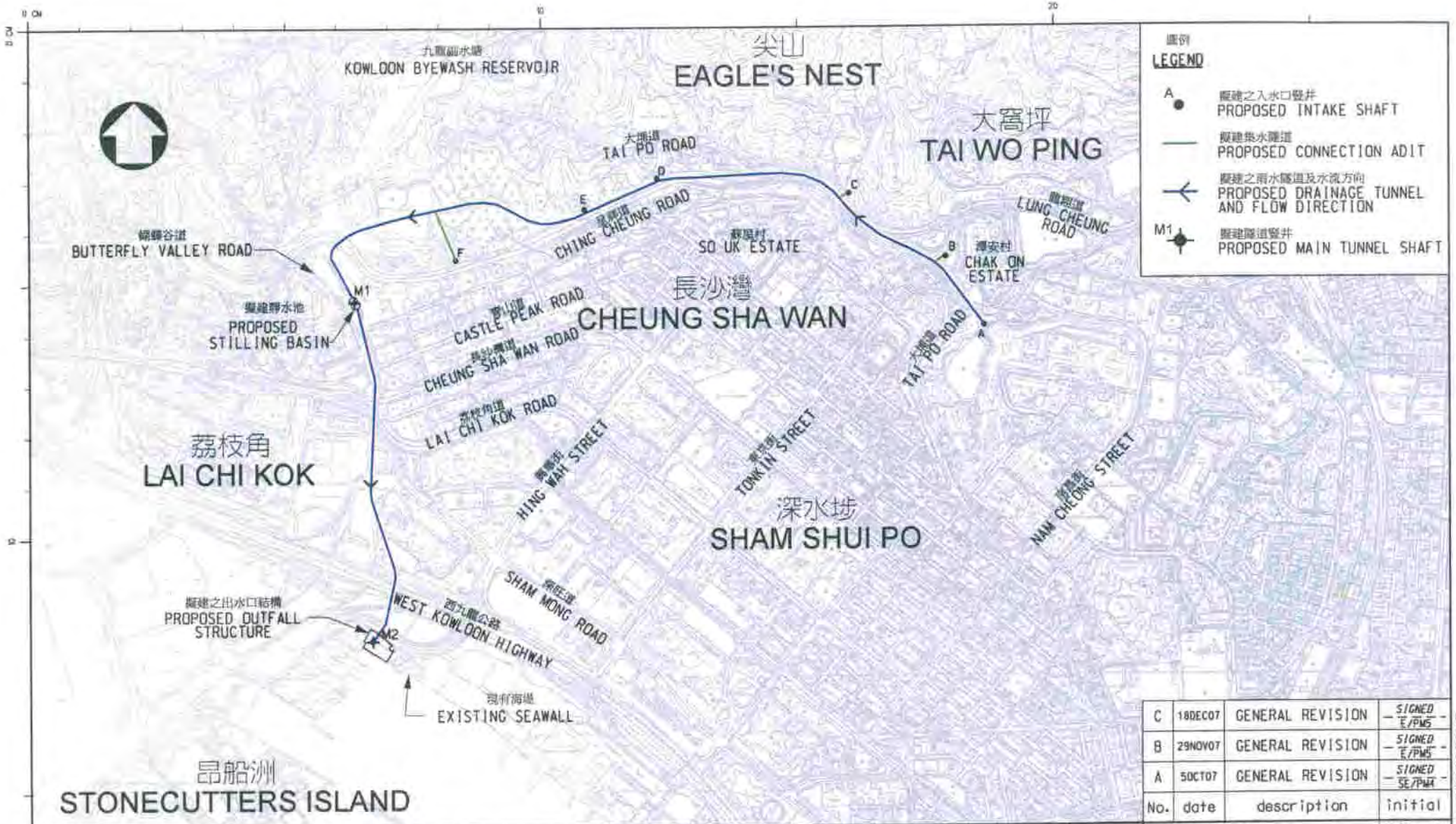
[5] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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.



No.	date	description	initial
C	18DEC07	GENERAL REVISION	SIGNED E/PWS
B	29NOV07	GENERAL REVISION	SIGNED E/PWS
A	5OCT07	GENERAL REVISION	SIGNED SE/PWA

圖則名稱 drawing title

工務計劃項目第4108CD號
西九龍雨水改善工程 - 荔枝角雨水轉運計劃
PWP ITEM No.4108CD
WEST KOWLOON DRAINAGE IMPROVEMENT
- LAI CHI KOK TRANSFER SCHEME

			日期 date
繪畫 drawn	SIGNED	C.K.LAM	28MAY07
核對 checked	SIGNED	C.W.CHEUNG	04JUN07
批核 approved	SIGNED	W.C.LAM	04JUN07
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no. DPM/108CD0/0002C

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

ENCLOSURE 1 附件一

Enclosure 2 to PWSC(2007-08)84

108CD – West Kowloon drainage improvement - Lai Chi Kok Transfer Scheme

Breakdown of the estimate 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	-	-	-	3.7
		Technical	-	-	-	0.7
(b)	Site supervision by resident site staff of the consultants (Note 3)	Professional	615	38	1.6	56.0
		Technical	1759	14	1.6	53.0
					Total consultants' staff costs	113.4

* 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 Pt. 38 = $56,945 per month and MPS Pt.14 = $18,840 per month.)
2. The consultants' staff cost for contract administration are based on the lump sum fees calculated in accordance with the existing 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 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.