

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 706 – HIGHWAYS

Transport – Roads

788TH – New boundary bridge between Lok Ma Chau and Huanggang

Members are invited to recommend to Finance Committee the upgrading of **788TH** to Category A at an estimated cost of \$330.4 million in money-of-the-day prices for the design and construction of a new boundary bridge between Lok Ma Chau and Huanggang.

PROBLEM

The capacity of the existing Lok Ma Chau boundary bridge between the Hong Kong Special Administrative Region (HKSAR) and Shenzhen is insufficient to cope with the present and future cross-boundary traffic between the two places.

PROPOSAL

2. The Director of Highways (D of Hy), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **788TH** to Category A at an estimated cost of \$330.4 million in money-of-the-day (MOD) prices for the design and construction of a new boundary bridge between the Lok Ma Chau (LMC) and Huanggang (HG) Control Points.

PROJECT SCOPE AND NATURE

3. The scope of **788TH** includes –

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- (a) construction of a dual two-lane vehicular bridge between the LMC and HG Control Points, which comprises –
 - (i) a 90-metre (m) section of bridge (the HKSAR bridge section) over the Shenzhen River up to the boundary of the HKSAR ; and
 - (ii) a 250-m long approach viaduct;
- (b) construction of road connections between the proposed and existing boundary bridges and the LMC Control Point including ramps, ground level roads and an overbridge;
- (c) diversion of the existing Ha Wan Nullah;
- (d) reprovisioning works including the reprovisioning of an access road which serves, amongst others, a works site for the Sheung Shui to Lok Ma Chau Spur Line;
- (e) ancillary works including civil, structural, landscaping and drainage, street lighting, traffic control and surveillance system (TCSS) and electrical and mechanical (E&M) works; and
- (f) provision of lane change-over facilities to accommodate the different traffic configurations in the HKSAR and the Mainland.

A site plan with cross-section of the new bridge is at the Enclosure.

4. We have substantially completed the tender documents for the project. We plan to invite tenders in July 2003 and aim to commence construction in November 2003 for completion by December 2004.

JUSTIFICATION

5. Centrally located on the HKSAR/Shenzhen boundary, the LMC boundary crossing is the most popular vehicular link between the two places. The

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cross-boundary traffic through the LMC boundary crossing has increased drastically over the past five years. The average daily goods vehicle trips have increased by 28% from 14 180 in 1997 to 18 120 in 2002 and could go up to 24 500 on busy days. The average daily private car trips have scored a threefold increase from 1 001 in 1997 to 4 400 in 2002. We expect that cross-boundary traffic will continue to grow in the future in view of the ever-growing economic ties between the HKSAR and the Pearl River Delta region.

6. The existing boundary bridge between the LMC and HG Control Points has two traffic lanes in each direction with one designated for goods vehicles and the other for passenger traffic. At present, the boundary bridge is operating near its capacity. Congestion often occurs at the goods vehicle lane during peak hours. As a short-term mitigation measure, the goods vehicles are allowed to use the passenger vehicle lane on an ad-hoc basis to relieve congestion. However, such a measure is undesirable and has caused considerable delays and inconvenience to the traffic of passenger vehicles. We expect that the traffic conditions at the LMC Control Point during peak hours will deteriorate before the opening of the fourth vehicular land boundary crossing, the Shenzhen Western Corridor (SWC)¹ at Deep Bay. Even after the SWC is commissioned for use, the vehicular traffic through the LMC boundary crossing will likely remain at a relatively high level due to its central location on the HKSAR/Shenzhen boundary. Our statistics show that around 50% of the goods vehicles have destinations in Shenzhen, many of which are likely to continue to use the LMC crossing after the opening of the SWC.

7. To meet the present and future traffic demand of the cross-boundary traffic at the LMC boundary crossing, we intend to build a new bridge alongside the existing one jointly with the Shenzhen Municipal People's Government (SMPG). The new bridge will accommodate four traffic lanes, with two lanes in each direction. To enhance traffic management, we will designate the new bridge for use by goods vehicles and the existing one for passenger vehicles, thereby allowing a total segregation of freight and passenger traffic.

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¹ We upgraded **759TH** "Shenzhen Western Corridor" and **736TH** "Deep Bay Link" to Category A in February 2003 at an estimated cost of \$3,188.0 million and \$4,594.6 million in MOD prices respectively for the construction of the Shenzhen Western Corridor and Deep Bay Link. We plan to commence construction of both projects in August 2003 for completion in December 2005.

8. The projected volume to capacity ratio (v/c ratio)² of the goods vehicles lane during peak hours in 2003 and 2006, with and without the proposed new bridge, is as follows -

v/c ratio	Year	
	2003	2006 (After opening of SWC)
without the new bridge	1.10	1.30
with the new bridge	-	0.76

ENTRUSTMENT OF PART OF THE WORKS TO SMPG

9. We intend to entrust the design of the HKSAR bridge section to the SMPG to be done in conjunction with the Shenzhen portion of the new bridge (the Shenzhen bridge section) to ensure compatibility of design. We will ensure that the design meets our established standards. As the Shenzhen River is under the management of the Shenzhen authorities, and frequent access to the River is necessary for site investigations and design, not entrusting the design to the SMPG would likely lead to delay in the design process, which in turn would delay the finalisation of the contract as well as the commencement of the construction works.

10. The new bridge will span the Shenzhen River where marine traffic has to be maintained at all times. As the foundations and associated temporary cofferdams of both the HKSAR bridge section and Shenzhen bridge section have to be built into the river beds during the dry season from November to March, construction of the two bridge sections has to be carried out by a single party in order to exercise better control over the phasing of the construction works and the number of piling plants and associated vessels in the River, thereby minimising the disruption to navigation on the Shenzhen River. The narrow width of the River severely restricts the possibility of two separate teams carrying out works at the same time. To do so would give rise to serious interface problems such as the

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² Volume to capacity ratio (v/c ratio) is an indicator which reflects the performance of a road. A v/c ratio equal to or less than 1.0 means that a road has sufficient capacity to cope with the volume of vehicular traffic under consideration and the resultant traffic will flow smoothly; a ratio above 1.0 indicates the onset of congestion; a ratio above 1.2 indicates more serious congestion with traffic speeds deteriorating progressively with further increase in traffic.

need to agree on access arrangements, problems in coordinating construction programmes, restrictions on construction techniques, and increased difficulties in achieving compatibility of overall appearance of materials and concrete finishes. There could also be claims from both contractors for costs and extension of time due to interference in the works. Having carefully considered the issues of site accessibility and management of the Shenzhen River which is undertaken by the Shenzhen side, we intend to entrust the construction of the HKSAR bridge section to the SMPG.

11. If the arrangement of having two contractors were to be adopted, the works would have to be staggered to ensure safety and avoid contractual disputes. Given the need to complete all works over the River body within the dry season to minimise impact on the hydrology of the River, it is expected that such a staggered work programme would necessitate spreading the works over two dry seasons, which would mean that the completion of the bridge would have to be pushed back to at least the third quarter of 2005. The traffic situation at LMC would by then be severely congested which would have serious implications on cross-boundary freight traffic. Cross-boundary traffic could tail-back onto the San Tin Interchange, seriously disrupting local traffic in the vicinity of the Control Point.

12. At the meeting of the Legislative Council Panel on Transport on 23 May 2003, some Panel Members expressed concern over the impact on job opportunities for local workers under the proposed entrustment arrangement. It should be noted that the 90-m HKSAR bridge section to be entrusted to the SMPG constitutes only a small part of the project. The majority of the works will be undertaken by the HKSAR Government. The SMPG has undertaken that the tender exercise will be open to qualified contractors from both the HKSAR and the Mainland. In addition, we will require HKSAR consultant companies to be employed to audit the design and construction works to ensure compliance with the relevant HKSAR standards.

LANE CHANGE-OVER FACILITIES

13. We have included in the proposed scope of the project a provision for lane change-over facilities in view of the different traffic configurations in the HKSAR and the Mainland. Owing to site constraints on the HKSAR side, we have agreed with the SMPG that the lane change-over facilities, in the form of viaducts, will be provided at Huanggang. As the facilities are essential features serving the needs of both the HKSAR and Shenzhen, the cost will be shared

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between the two sides. Pending further discussion with the SMPG over the layout design and the detailed cost sharing arrangement, we have included an estimate of HK\$58.1 million in the total project cost, which is about half of the cost of the lane change-over facilities as estimated by the SMPG.

FINANCIAL IMPLICATIONS

14. We estimate the cost of the project to be \$330.4 million in MOD prices (see paragraph 15 below), made up as follows –

	\$ million	
I. Works to be undertaken by the HKSAR Government		
(a) Approach viaduct	86.9	
(b) Road connections	73.5	
(c) Nullah diversion	21.5	
(d) Reprovisioning works	20.0	
(e) Ancillary works	16.5	
(f) Electrical and Mechanical Services Trading Fund (EMSTF) charges ³	0.6	
(g) Contingencies	21.7	
	Sub-total	240.7 (in September 2002 prices)
(h) Provision for price adjustment	(16.2)	
	Total	224.5 (in MOD prices)

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³ Since its establishment on 1 August 1996 under the Trading Funds Ordinance, the EMSTF charges government departments for design and technical consultancy services for E&M installations provided by the Electrical and Mechanical Services Department (EMSD). The services rendered for this project include checking contractor's submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the project.

II. Works to be undertaken by the SMPG

(a)	HKSAR bridge section (to be entrusted to the SMPG)	32.7	
(b)	On-cost ⁴ payable to the SMPG	2.9	
(c)	Lane change-over facilities	58.1	
(d)	Contingencies	9.3	
	Sub-total	103.0	(latest available estimates)
(e)	Provision for price adjustment	2.9	
	Total:	105.9	(in MOD prices)
Total for parts I and II :		330.4	(in MOD prices)

15. Subject to approval and taking into account the provisions for price adjustments for parts I and II in paragraph 14 above, we will phase the expenditure as follows –

Year	\$ million (Sept 2002 for part I and latest available estimates for part II)	\$ million (MOD)
2003 – 2004	61.7	59.0
2004 – 2005	214.0	207.3
2005 – 2006	38.0	36.2
2006 – 2007	20.0	18.6
2007 – 2008	10.0	9.3
	343.7	330.4

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⁴ Subject to further negotiation with the SMPG, an on-cost estimated at 9% of the project base cost (i.e. item II (a) of paragraph 14), will be payable to the SMPG for project management and construction supervision of the entrusted works.

16. We have derived the MOD estimates on the basis that there will be a 3% inflation annually in Shenzhen for labour and construction prices for the period from 2003 to 2006 for the bridge works to be entrusted to the SMPG and the lane change-over facilities; and on the basis of the Government's latest forecast of trend labour and construction prices for the period from 2003 to 2008 for the remaining works.

17. To meet the target completion date of end 2004, we will tender the approach viaduct, road connections as well as ancillary works undertaken by the HKSAR Government under a design-and-build contract in order to minimise the time required for detailed design and construction. The contract will not provide for price adjustment as the construction period will not exceed 21 months.

18. We estimate that the annual recurrent expenditure arising from this project to be \$1.52 million.

PUBLIC CONSULTATION

19. We issued an information paper to the Traffic and Transport Committee of the Yuen Long District Council on 13 May 2003 and have not received any adverse comments. In response to a letter from the San Tin Rural Committee, we briefed the Committee on the project on 6 May 2003 to address Members' concerns, which focused mainly on the possible environmental impact of the project.

20. We gazetted the project under the Roads (Works, Use and Compensation) Ordinance on 11 April 2003 and received three objections. All of them have been withdrawn unconditionally after the Administration met with the objectors and explained the details of the project to them. The Acting Permanent Secretary for the Environment, Transport and Works (Environment and Transport), under the delegated authority from the Secretary for the Environment, Transport and Works, authorised **788TH** under the Roads (Works, Use and Compensation) Ordinance on 13 June 2003. The notice of authorisation will be gazetted on 20 June 2003.

21. We consulted the Legislative Council Panel on Transport on 23 May 2003. Members in general supported the project. However, some Members expressed concern over the impact on job opportunities for local workers under the proposed entrustment arrangement.

/ENVIRONMENTAL

ENVIRONMENTAL IMPLICATIONS

22. The project is a designated project under Schedule 2 to the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). We have completed a project profile in April 2003 for the Director of Environmental Protection's (DEP) consideration. The project profile concludes that the environmental impact of this project is minimal. The DEP granted permission to the D of Hy to directly apply for an environmental permit for the project under the EIA Ordinance on 14 May 2003 and issued the environmental permit on 10 June 2003.

23. On air quality, proper site management practices will be adopted to minimise the generation of dust from construction activities and keep it within statutory limit. We have conducted an air quality impact assessment which reveals that the level of pollutants will remain below the statutory limit when the new bridge is open to traffic.

24. On noise impact, we will use quiet construction plants and temporary movable noise barriers during construction. As part of the design of the new bridge, we will install concrete parapets at the edges of the new bridge and the approach ramps as a measure to further lower traffic noise. We have carried out a road traffic noise assessment to assess the noise level after the commissioning of the new bridge. The results show that the noise levels at the representative noise sensitive receivers will meet the established standards and guidelines stipulated in the Technical Memorandum on EIA Process.

25. We will use cofferdams to construct bridge foundation and piers within the Shenzhen River. This method provides a confined environment to facilitate dredging operation and minimise impact on water quality. We will provide proper drainage and sewerage treatment facilities to dispose of site run-offs. We will carry out all sub-structural works during the dry season to minimise the effect on the hydrology of the Shenzhen River. As the piers of the new bridge will be of similar size, form and location as those of the existing bridge at the immediate downstream, we expect no long-term effect on the hydrology of the Shenzhen River.

26. We estimate that the project will generate about 2 300 cubic metres

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(m³) of construction and demolition (C&D) materials. Of these, we will reuse 2 280 m³ (99%) as fill in public filling areas⁵ and dispose of 20 m³ (1%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$2,500 for this project (based on a notional⁶ unit cost of \$125/m³).

27. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to minimise, reuse and recycle the C&D materials. We will require the contractor to ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste to designated public

filling facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable materials for temporary works. We will also maximise the use of recycled aggregates and rock products in the permanent works.

LAND ACQUISITION

28. The project does not require land resumption. We will clear about eight hectares of Government land. We will charge the land clearance cost, estimated to be \$570,000, to **Head 701 "Land Acquisition" Subhead 1100CA** "Compensation and ex-gratia allowances in respect of projects in the Public Works Programme".

BACKGROUND INFORMATION

29. We upgraded **788TH** to Category B in May 2003.

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⁵ A public filling area is a designated part of a development project that accepts public fill for reclamation purpose. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

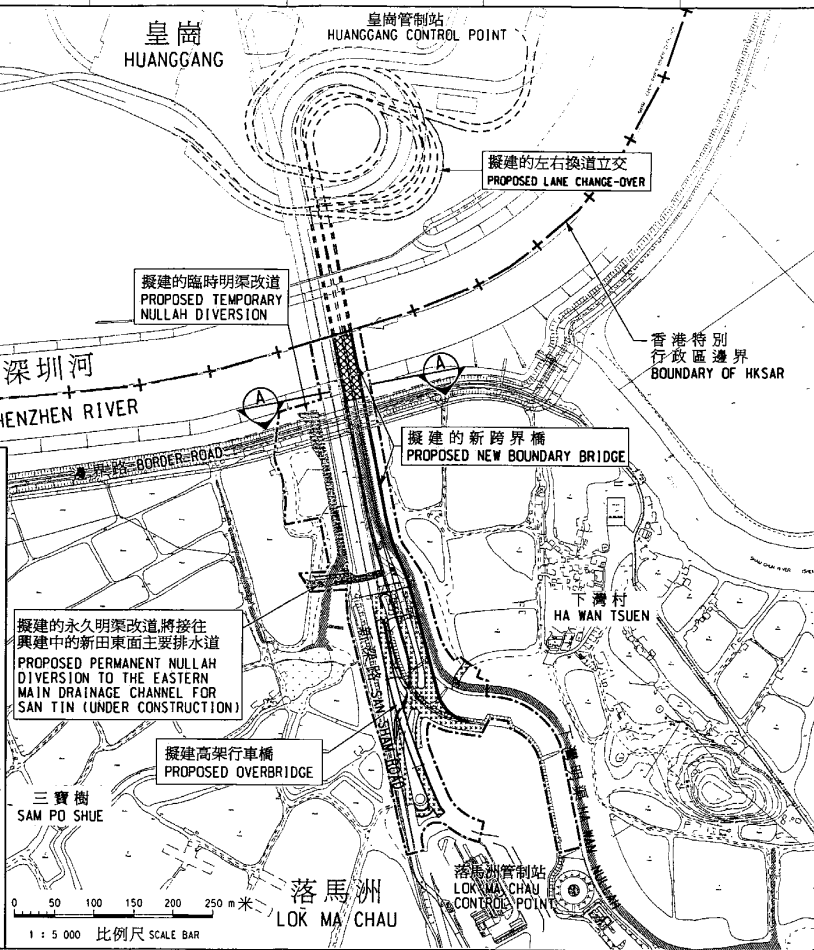
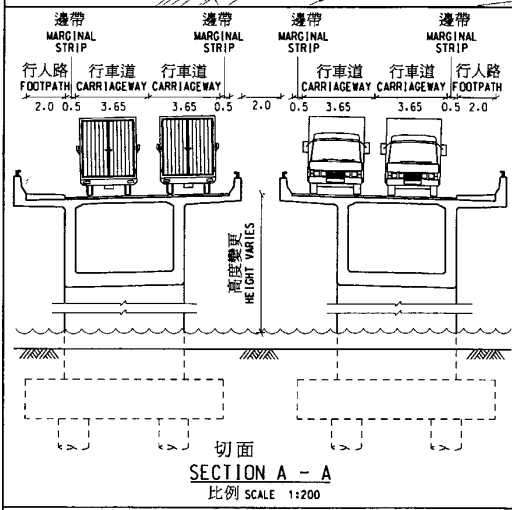
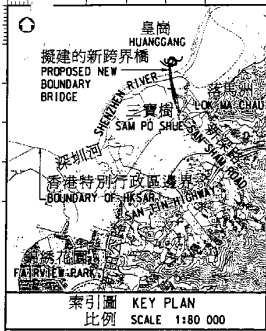
⁶ This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

30. In May 2003, we included an item under **Subhead 6100TX** “Highway works, studies and investigations for items in Category D of the Public Works Programme” at an estimated cost of \$7.53 million in MOD prices for impact studies, ground investigations and design of the project. We have commenced the impact studies and ground investigation works in June 2003.

31. To meet the project completion date of December 2004, we have to obtain funding approval for **788TH** from Finance Committee in July 2003 in order to commence construction works at the onset of the dry season in early November 2003.

32. We estimate that the project will generate 360 jobs, comprising 50 professional/technical staff and 310 labourers, totalling about 4 550 man-months.

Environment, Transport and Works Bureau
June 2003



註釋 NOTES:
1. 除在其他方面指定外, 全部以米為量度單位。
ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.

圖例 LEGEND:
 現有明渠 EXISTING NULLAH
 工地界限 LIMIT OF WORKS AREA
 擬建高架引橋/行車天橋 PROPOSED APPROACH VIADUCT/OVERBRIDGE
 擬建斜路/地面道路 PROPOSED RAMP/GROUND LEVEL ROAD
 擬委託深圳市人民政府興建的香港特區橋段 PROPOSED HKSAR BRIDGE SECTION TO BE ENTRUSTED TO THE SHENZHEN MUNICIPAL PEOPLE'S GOVERNMENT FOR DESIGN AND CONSTRUCTION

D	19/06/03	GENERAL REVISION	S.C.LOK
C	07/06/03	GENERAL REVISION	S.C.LOK
B	02/06/03	GENERAL REVISION	S.C.LOK
A	30/05/03	GENERAL REVISION	S.C.LOK
no.	date	description	initial
圖則編號 plan no.		比例 scale	
HMWP033TH-SPO001-D		1:5 000	
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		S.H.CHENG	19/05/03
		批准 approved	SIGNED
		P.K.LEE	19/05/03
		主要工程管理處 MAJOR WORKS PROJECT MANAGEMENT OFFICE	
		HIGHWAYS DEPARTMENT HONG KONG	路政署

圖則名稱 plan title
 工務計劃項目第788TH號
 落馬洲至皇崗的新跨界橋 - 工地平面圖
 PWP ITEM NO. 788TH
 NEW BOUNDARY BRIDGE BETWEEN LOK MA CHAU AND HUANGGANG - SITE PLAN

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