

**For discussion  
on 24 April 2009**

**Legislative Council Panel on Transport**

**Hong Kong – Zhuhai – Macao Bridge :**

**Main Bridge and Hong Kong Boundary Crossing Facilities**

**PURPOSE**

This paper seeks Members' support for the funding applications to be made to the Public Works Subcommittee (PWSC) and the Finance Committee (FC):-

- (a) the funding support for the detailed design and construction of Hong Kong – Zhuhai – Macao Bridge (HZMB) Main Bridge; and
- (b) the detailed design and site investigation for the Hong Kong Boundary Crossing Facilities (HKBCF).

**BACKGROUND AND PROPOSAL**

2. The HZMB is one of the ten major infrastructure projects announced by the Chief Executive in his Policy Address in October 2007.

3. The Legislative Council (LegCo) Finance Committee has previously approved funding for various pre-construction works for the HZMB. The recent funding approvals included, amongst other things –

- (a) \$46.6 million in money-of-the-day (MOD) prices for funding the Hong Kong Special Administrative Region (HKSAR)'s share of the cost for preconstruction works for the HZMB (in June 2008);
- (b) \$233.5 million in MOD prices for funding the HKSAR's share of the cost for the preliminary design and site investigation for the HZMB Main Bridge (in February 2009); and

- (c) \$86.9 million in MOD prices for the engagement of consultants to undertake the investigation and preliminary design for the HKBCF (in June 2008).

4. It is the consensus of the governments of Guangdong, HKSAR and Macao Special Administrative Region to push forward the HZMB, which has significant strategic value in fostering further economic integration and development of Hong Kong, Macao and the Western Pearl River Delta region<sup>1</sup>.

5. We propose to seek the approval from the PWSC and FC for the following funding proposals to implement the HZMB project further –

- (a) \$9,046.5 million in MOD prices for funding the HKSAR's share of the cost for the detailed design and construction of the HZMB Main Bridge; and
- (b) \$621.9 million in MOD prices for the detailed design and site investigation for the HKBCF.

Detailed justifications for and background to the funding proposals above are set out in the respective draft PWSC paper at **Appendix I** and **Appendix II**.

## **VIEWS SOUGHT**

6. Members are invited to provide views on the proposed project funding applications.

Transport and Housing Bureau  
April 2009

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<sup>1</sup> The Panel discussed in detail these aspects. LC Paper No. CB(1)1520/07-08(01) dated 16 May 2008; letter to the Clerk to the Public Works Subcommittee dated 2 June 2008 and LC Paper No. CB(1)434/08-09(1) in December 2008 refer.

**For discussion  
on 6 May 2009**

**PWSC(2008-09)xx**

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT**

**Subventions – Miscellaneous**

**3QR – Hong Kong–Zhuhai–Macao Bridge – funding support for Main Bridge**

Members are invited to recommend to the Finance Committee the upgrading of **3QR** to Category A at an estimated cost of \$9,046.5 million in money-of-the-day prices to provide funding support for the detailed design and construction of the Hong Kong-Zhuhai-Macao Bridge Main Bridge.

### **PROBLEM**

We need to carry out jointly with the governments of Guangdong Province and the Macao Special Administrative Region (Macao SAR) the detailed design and construction of the Hong Kong–Zhuhai–Macao Bridge (HZMB) Main Bridge.

### **PROPOSAL**

2. The Director of Highways (D of Hy), with the support of the Secretary for Transport and Housing, proposes to upgrade **3QR** to Category A at an estimated cost of \$9,046.5 million in money-of-the-day (MOD) prices to fund the share of the Government of the Hong Kong Special Administrative Region (HKSAR) for the engagement of consultants and contractors to undertake the detailed design and construction of the HZMB Main Bridge.

### **PROJECT SCOPE AND NATURE**

3. The HZMB Main Bridge runs from the artificial island off Gongbei of Zhuhai and Macao to the eastern artificial island just west of the HKSAR boundary. The HZMB Main Bridge and other associated works are therefore all within the Mainland waters. The scope of 3QR (the Project) comprises a capital grant as the HKSAR Government's share of funding support to make the HZMB Main Bridge project financially viable and to fund part of the Project cost for –

- (a) detailed design and construction of a 29.6 kilometres (km) dual three-lane carriageway in the form of bridge-cum-tunnel structure comprising a tunnel of about 6.7 km;
- (b) detailed design and construction of two artificial islands for the tunnel landings west of the HKSAR boundary;
- (c) associated works including civil, structural, environmental mitigation measures, drainage, electrical and mechanical works, installation of traffic control surveillance system, signage, etc;
- (d) miscellaneous expenses including land provision for works area, conservation measures for Chinese White Dolphins, further topical studies and testing such as detailed geotechnical assessment, engagement of consultants to carry out site supervision, bank loan interests accrued during construction, etc.; and
- (e) operating cost of the management body of the HZMB Main Bridge<sup>1</sup>, which will be set up as a legal entity under the Mainland laws, from commencement of the detailed design until commissioning of the HZMB Main Bridge.

\_\_\_\_\_ A plan showing the indicative alignment of the HZMB Main Bridge is at the Enclosure.

4. The governments of Guangdong, HKSAR and Macao SAR are pushing forward earnestly the HZMB project and are working closely to commence construction of the HZMB within 2009. In order to further take

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<sup>1</sup> A management body of the HZMB Main Bridge will be set up under the command of the three governments for implementing the HZMB Main Bridge. It will be a legal entity to be set up under relevant Mainland law and it will be supervised by the three governments. The management body is responsible for preparing the design and construction plan, carrying out tendering and assessment, managing site supervision, conducting quality assurance and material testing as well as managing, operating and maintaining the HZMB Main Bridge upon its commissioning. The management body will enter into contractual relationships with the various agents/contractors carrying out the above works.

forward the HZMB project, a wide range of capital works and technical consultancies will need to begin soonest and in tandem and the management body will need to operate in full swing. All these will require capital commitments by the HKSAR Government, together with the other two governments, for contribution to the multiple project items arising very soon from the HZMB Main Bridge. Key components of these works include the detailed design and site investigation for the construction of the corresponding part of an artificial island off Gongbei of Zhuhai and Macao to accommodate, among other things, an interchange, a toll plaza, a maintenance depot and provision of area for the landing of the western end of the HZMB Main Bridge, and for the site formation for a dry dockyard for the tunnel work in mid-2009.

5. We plan to commence in phases the construction works of the HZMB Main Bridge and finalise the loan agreement with the lead bank by the end of 2009 for completion of the HZMB Main Bridge by 2015/2016 (please see paragraph 15 below for the loan facilities).

## **JUSTIFICATION**

### **Previous Legislative Council (LegCo) Approval**

6. The LegCo Finance Committee has previously approved funding related to various pre-construction preparatory works for the HZMB Main Bridge (please see paragraphs 38 to 41 below). For instance, in June 2008, the LegCo Finance Committee approved funding of \$46.6 million in MOD prices for funding the HKSAR's share of the cost for some preconstruction works for the HZMB, which included physical modelling studies and design refinement for the HZMB. In February 2009, the LegCo Finance Committee approved funding of \$233.5 million in MOD prices for funding the HKSAR's share of the cost for the preliminary design and site investigation works for the HZMB Main Bridge.

### **Strategic Value of HZMB**

7. The HZMB will be strategically important to the further economic development of Hong Kong, Macao and the Western Pearl River Delta region ("Western PRD"). It will significantly reduce transportation costs and time for travelers and goods on the road<sup>2</sup>, but the benefits go far beyond this. With the

<sup>2</sup> The HZMB will result in a significant reduction in relevant travelling time between Hong Kong and the Western Pearl River Delta (PRD). For instance, as illustrated by the table below, the travelling time between Zhuhai on the one hand, and the Kwai Chung Container Port and the Hong Kong International Airport on the other, will be reduced by more than 60% and 80% respectively.

Origin — Destinations	Current Distance and Travelling Time	Distance and Travelling Time with HZMB	Reduction in Distance and Travelling Time
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HZMB, the Western PRD will fall within a reachable three-hour commuting radius of Hong Kong. This would enhance the attractiveness of the Western PRD to external investment, which is conducive to the upgrading of its industry structure. Hong Kong will benefit from this new economic hinterland, with its vast human and land resources which will provide ample opportunities for Hong Kong businessmen to expand their operation in the Mainland. The connectivity brought about by the HZMB will also benefit various sectors in Hong Kong, such as tourism, finance and commerce. In particular, it will enhance Hong Kong's position as a trade and logistics hub as goods from the Western PRD and Western Guangdong, Guangxi, etc., can better make use of the airport and container ports in Hong Kong. Overall speaking, the HZMB will accelerate the economic integration of the PRD and its neighbouring provinces and enhance its competitiveness vis-à-vis countries of the Association of Southeast Asian Nations and other economic zones such as the Yangtze Delta region. Hong Kong will stand to gain in this process.

8. The HZMB Main Bridge will necessitate the Hong Kong Boundary Crossing Facilities (HKBCF) and the Hong Kong Link Road (HKLR). Together with the Tuen Mun Western Bypass (TMWB) and the Tuen Mun-Chek Lap Kok Link (TM-CLKL), the HZMB project will enable the formation of a strategic road network linking Hong Kong, Zhuhai, Macao and Shenzhen, thereby further enhancing the transportation and aviation hub status of Hong Kong. With its proximity to the Hong Kong International Airport, the HKBCF will serve as a strategic multi-modal transportation hub. The intention is to extend the existing Automated People Mover to connect the Airport Terminal with the HKBCF. It will be very convenient for passenger to switch to different modes of transport at the HKBCF.

9. Further details of the strategic value of HZMB (in particular its traffic projection and economic benefits) have been set out in various papers submitted to LegCo<sup>3</sup> before. All in all, the HZMB is estimated to have an Economic Internal Rate of Return (EIRR) of 8.8% over a 20-year period, or 12% over 40 years.

### **Financing Arrangement**

10. At the 8<sup>th</sup> Meeting of the HZMB Advance Work Coordination Group (AWCG) held on 28 February 2008, a consensus was reached on the financing arrangement and construction option for the HZMB Project. Each of the three governments of the HKSAR, Guangdong Province and the Macao SAR

Zhuhai — Kwai Chung Container Port	approx. 200km approx. 3.5hrs	approx. 65km approx. 75mins	> 60%
Zhuhai — Hong Kong International Airport	over 200km approx. 4hrs	approx. 40km approx. 45mins	> 80%

<sup>3</sup> LC Paper No. CB(1)1520/07-08(01) dated 16 May 2008; letter to the Clerk to the Public Works Subcommittee dated 2 June 2008 and LC Paper No. CB(1)434/08-09(1) in December 2008 refer.

will be responsible for the construction, operation and maintenance of the link roads and BCF within their respective territories and will, if necessary, contribute to the funding gap of the HZMB Main Bridge to be tendered under a Build, Operate and Transfer (BOT) franchise.

11. In August 2008, the three governments agreed to take up the responsibility for the construction of the HZMB Main Bridge, instead of seeking private investment to implement the project under a BOT franchise. To show its support to the HZMB project, the Central People's Government (CPG) also agreed to provide part of the funding. As a result, the Mainland, HKSAR and Macao SAR governments will contribute RMB ¥7.0 billion, RMB ¥6.75 billion and RMB ¥1.98 billion, respectively, to the HZMB Main Bridge project. The total contributions from the three sides will be RMB¥15.73 billion, which is about 42% of the project cost of the Main Bridge. The remaining 58% will be financed by bank loans (see paragraph 15 below).

12. The advantages of the financing arrangement set out in paragraph 11 above are as follows:

- (a) since there is no need to invite tenders from private investors and conduct negotiations on the franchise, the submission of the feasibility study (FS) report to the CPG could be accelerated, resulting in much greater certainty in the programme and earlier completion of the HZMB;
- (b) there will be more time for the three governments to discuss the regulatory arrangements for cross-boundary private cars as such discussion can proceed in parallel with the construction works; and
- (c) the governments will have better control over the toll levels to meet public expectations as far as possible.

Given the terms of the loan financing arrangements by the lead bank (see paragraph 15 below), our latest estimate is that the toll level may well be set at the lower end of the range of toll levels previously assumed (e.g. around RMB ¥100 for private cars and RMB ¥200 for lorries). The exact toll levels will be decided nearer the time of the commissioning of the HZMB having regard to more accurate estimates of operating cost, traffic volume, the economic situation at the time and other relevant factors. It is the consensus of the three governments to set tolls as low as possible to encourage traffic flow.

### **Regulatory Arrangements for Cross-boundary Private Cars**

13. We have been considering means to broaden the availability and flexibility of cross-boundary travel for private cars. Our intention is to introduce ad hoc quotas for cross-boundary private cars in a gradual and controlled manner taking into account the handling capacity of our road networks. We have already had preliminary exchanges of views on this idea with the Guangdong side. The two sides have set up an expert group to examine the feasibility of ad hoc quotas with a view to drawing up an implementation framework. In the course of doing so, we will consider the operational (e.g. application procedures, allocation criteria, insurance etc), environmental, traffic safety and security issues. We aim to roll out a trial scheme for Hong Kong private cars at the Shenzhen Bay Port as soon as possible. The trial, if proven successful, will pave way for future implementation at the HZMB.

### **Job Creation**

14. The implementation of the HKBCF, HKLR, TM-CLKL and TMWB are estimated to create about 18 000 jobs (about 3 000 for professional and technical staff and 15 000 for labourers) during the construction stage.

### **LOAN FACILITIES PROVIDED BY FINANCIAL INSTITUTIONS**

15. In March 2009, the three governments, through an open tender in the Mainland and with the expertise of an independent financial consultant, selected a lead bank for arranging a loan syndicate for financing the remaining 58% of the project cost (estimated to be RMB ¥22 billion). We consider that the loan terms offered by the selected lead banks are very favourable. Their key terms are as follows:

- (a) the lead bank has undertaken to form a syndicate underwriting a loan of RMB ¥22 billion;
- (b) the interest rate can be chosen as fixed interest rate or floating interest rate at the level of the base rate published by the People's Bank of China with 10% discount, i.e. the best lending rate as permitted under Mainland regulations;
- (c) the loan period is 35 years, including the period for constructing the bridge and loan repayment will commence upon commissioning of the bridge; and
- (d) subject to the approval of the relevant central authorities, the lead bank has undertaken that banks of Hong Kong and Macao will have equal opportunities as Mainland banks for extending non-RMB denominated loans and when making RMB loans, banks of Hong



Kong and Macao in the Mainland can compete with Mainland banks on an equal footing on a fair and equitable basis.

16. We are discussing with the lead bank on details such as the future work plan and how the loan syndicate should be organized. We aim to complete the loan agreement in the fourth quarter of 2009.

## FINANCIAL IMPLICATIONS

17. Whereas the contribution by HKSAR will be RMB¥6.75 billion (see paragraph 11 above), taking into account currency adjustment and contingency provisions, we estimate the cost of **3QR** to be \$9,046.5 million in MOD prices, made up as follows –

	RMB¥ million	HK\$ million (at rate RMB 0.88:HKD 1)
(a) Detailed design and construction of -	5,047	5,735
(i) Bridge and tunnel in sea	4,305	
- bridge	2,432	
- tunnel in sea	1,873	
(ii) artificial islands	742	
(b) procurement and installation of associated equipment, plant, etc. for:-	38	43
(i) bridge	18	
(ii) tunnel in sea	17	
(iii) artificial islands	3	
(c) traffic control and surveillance system, signage	70	79
(d) bank loan interests accrued during construction	989	1,124
(e) miscellaneous expenses including preliminary design & investigation, lands provision for works area, further studies and testing, site supervision, etc.	606	689
Sub-total	6,750	7,670

	<b>RMB¥ million</b>	<b>HK\$ million</b> (at rate RMB 0.88:HKD 1)
(f) contingencies		767
	Sub-total	8,437
(g) Provision for Renminbi fluctuation		843
	Sub-total	9280
Less funding in 4QR - Preliminary Design & Investigation		(233.5)
	Total	9,046.5 (in MOD prices)

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

<b>Year</b>	<b>\$ million (MOD)</b>
2009 – 2010	1,244.8
2010 – 2011	1,659.8
2011 – 2012	1,659.8
2012 – 2013	1,659.8
2013 – 2014	1,244.8
2014- 2015	1,203.7
2015 – 2016	373.8
	<hr/> 9,046.5 <hr/>

19. The cash flow in paragraph 18 above is worked out on the basis of the cashflow requirement of the project based on the current available construction cost as estimated in the FS Report. In the estimated cash flow, we

have allowed 10% of the project cost as provision to cater for fluctuation in Renminbi exchange rate and the provision will only be used for such purpose. Regarding price fluctuation, it was estimated according to the Mainland practice and has been included in items (a) to (f) in paragraph 17 above.

20. The recurrent financial implication such as the operation and maintenance cost of the HZMB Main Bridge and the repayment of loans, including interests, will be covered by toll revenue.

## PUBLIC CONSULTATION

21. We briefed Members of the Legislative Council Panel on Transport (the Panel) on the progress of the HZMB project on 29 September and 24 October 2003. On 25 June 2004, we briefed the Panel on the commissioning of the China Highway Planning and Design Institute (HPDI) by the AWCG to conduct the feasibility study for the HZMB. We also informed the Panel of the setting up of a Project Office in Guangzhou to monitor the conduct of the feasibility study for the HZMB. On 27 May 2005, we informed Members of the Panel of the latest developments of the HZMB, and consulted them on the proposed **796TH** “Hong Kong-Zhuhai-Macao Bridge - conceptual design and advance technical studies”.

22. On 13 October 2003, we briefed the Advisory Council on the Environment (ACE) on the HZMB project, and the choice of location for the landing point and alignments of the HZMB. The ACE supported our proposal to conduct further studies on the proposed landing points and alignments. We consulted the ACE again on 18 April 2005 and the representatives of the World Wide Fund, Friends of the Earth, Green Power, the Conservancy Association, Green Lantau Association, the Living Islands Movements and Save our Shorelines in April 2005 on the landing point of the HZMB. We have also actively engaged the local community and conducted consultation with the relevant District Council on the HZMB project.

23. The HZMB project has general support of the community. The community also considers the project as instrumental and important not only for its strategic value in connecting Hong Kong with the Mainland across the west Pearl River Delta region for future economic development but also for its effect to spur economic growth and employment opportunities at a time when the local economy faces threats of being in doldrums because of the global financial tsunami.

24. On 25 April and 16 May 2008, we updated Members of the Panel on the progress of the planning work for the HZMB and they supported our funding application for certain preconstruction works for the HZMB. The Finance Committee approved the funding applications at its meeting on 6 June 2008.

25. On 19 December 2008, we consulted the Panel on the funding support application for the preliminary design and site investigation works of the HZMB Main Bridge and Members supported the application.

26. We consulted the Panel on 24 April 2009 regarding our plan to submit the funding support application for the Project. Members showed their support for the funding application *[subject to further revision, if any]*.

## **ENVIRONMENTAL IMPLICATIONS**

27. The HZMB Main Bridge project site is located within the Mainland waters and hence the project is subject to Mainland laws.

28. Pursuant to Mainland laws, an environmental assessment for the HZMB Project has been carried out. Environmental issues including air quality, water quality, noise, ecological impacts and visual impact along the proposed alignment of the HZMB Main Bridge in the Pearl River Estuary were reviewed and assessed having regard to the requirements under Mainland laws.

29. The environmental assessment report of the HZMB Main Bridge has recommended preventive and mitigation measures to minimize the environmental impacts arising from the detailed design and construction of the HZMB Main Bridge. With the adoption of these measures, the project would be acceptable with regard to the relevant environmental standards.

## **HERITAGE IMPLICATIONS**

30. The proposed detailed design and construction for the HZMB Main Bridge will not affect any heritage site in Hong Kong, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interests and Government historic sites within the HKSAR boundary identified by the Antiquities and Monuments Office.

## **LAND ACQUISITION**

31. The proposed detailed design and construction for the HZMB Main Bridge do not require any land acquisition within the HKSAR boundary.

## **BACKGROUND INFORMATION**

### **Project Aspects**

32. The governments of Guangdong Province, the HKSAR and the Macao SAR have since 2003 formed an HZMB AWCG to commence the preparatory work for the HZMB. In 2004, the AWCG commissioned the HPDI to conduct a feasibility study on the HZMB. The National Development and Reform Commission (NDRC) also formed an HZMB Task Force in 2007 to push forward the project. The Task Force was led by the NDRC, with representatives from the Ministry of Transport, the Hong Kong and Macao Affairs Office, and the governments of the HKSAR, Guangdong Province and the Macao SAR as members. At its meeting on 7 January 2007, the Task Force recommended that the Boundary Crossing Facilities (BCF) of each government should be set up within their respective territories.

33. At the 8<sup>th</sup> AWCG Meeting held on 28 February 2008, a consensus was reached on the financing arrangement and construction option for the HZMB project. Each of the three governments of the HKSAR, Guangdong and the Macao SAR will be responsible for the construction, operation and maintenance of the link roads and BCF within their respective territories.

34. In August 2008, the three governments also agreed to take up the responsibility for the construction of the HZMB Main Bridge, instead of seeking private investment to implement the project under a BOT franchise. The Mainland, HKSAR and Macao SAR governments will contribute RMB ¥7.0 billion, RMB ¥6.75 billion and RMB ¥1.98 billion respectively to the project cost of the Main Bridge. The total contributions from the three sides will be RMB ¥15.73 billion, which is about 42% of the project cost of the Main Bridge. The remaining 58% will be financed by loans.

35. At the 9<sup>th</sup> AWCG Meeting held on 27 November 2008, a consensus was reached on the organizational framework for implementing the HZMB. The AWCG had considered forming a “Joint Works Committee of the Three Governments” to steer the HZMB project. The three governments also endorsed the FS report prepared by the HPDI which was submitted to the CPG on 31 December 2008 for approval.

### **Funding Aspects**

36. In January 2003, D of Hy included an item under **Subhead 6100TX** “Highway works, studies and investigations for items in Category D of the Public Works Programme” to fund HKSAR’s share of the cost for the Institute of Comprehensive Transportation (ICT) to conduct a study entitled “Transport Linkage between Hong Kong and Pearl River West” at a cost of \$800,000 in MOD prices. The ICT completed the study in July 2003.

37. In March 2004, we included an item under **Subhead 6100TX** at an estimated cost of \$11.0 million in MOD prices to fund HKSAR’s share of the cost

for the HPDI to conduct the FS for the HZMB. In April 2005, we increased the Approved Project Estimate (APE) of this item by \$900,000 to \$11.9 million to provide fund for HKSAR's share of the cost for the HPDI to carry out additional topical studies on "Impact on flood protection, ship movements, navigation and use of the territorial waters in the Pearl River Estuary" and "Impact of the HZMB on the Chinese White Dolphin Nature Reserve Area in the Pearl River Estuary". In September 2006, we further increased the APE of this item by \$2.3 million to \$14.2 million to conduct supplementary studies on "Location and arrangements of boundary crossing facilities (BCF) under the 'separate locations of BCF' mode", and "Alternative financing arrangement of the HZMB project" for completing the FS of the HZMB. Upon substantial completion of the supplementary studies, HPDI completed the HZMB FS report, which was endorsed by the AWCG in November 2008 and was submitted to the CPG on 31 December 2008 for consideration.

38. In June 2005, we upgraded **796TH** to Category A at an estimated cost of \$26.8 million in MOD prices to provide fund for HKSAR's share of the cost for the conceptual design and advance technical studies for the HZMB. These include the environmental impact assessment for the Main Bridge, further site investigation works, the collection of design data on wind speed and sea wave, the compilation of design guidelines, construction specifications, maintenance and operation requirements, and acceptance standards as well as the cost estimation for construction works in oceanic condition. The advance technical studies are in good progress and provide useful information for the preliminary design and tender preparation works.

39. In June 2008, with the approval of the Finance Committee, we upgraded **835TH** "Hong Kong-Zhuhai-Macao Bridge - preconstruction works" to Category A at an estimated cost of \$46.6 million in MOD prices to provide fund for HKSAR's share of the cost for some preconstruction works for the HZMB, which includes physical modelling studies and design refinement for the HZMB. The studies and design refinement works are in good progress for the preliminary design.

40. We upgraded **3QR** to Category B in December 2008.

41. In February 2009, with the approval of the Finance Committee, we upgraded part of **3QR** to Category A as **4QR** "Hong Kong-Zhuhai-Macao Bridge – funding support for preliminary design and site investigation for the Main Bridge" at an estimated cost of \$233.5 million in MOD prices for the PD&SI works for the HZMB Main Bridge. The preliminary design and site investigation works commenced in mid-March 2009 and is targeted for completion in late 2009. We plan to invite tenders for the first construction contract, a design and build contract for tunnel section, and commence the construction works of the HZMB Main Bridge – in phases by end-2009 for

completion of the HZMB Main Bridge by 2015/ 2016.

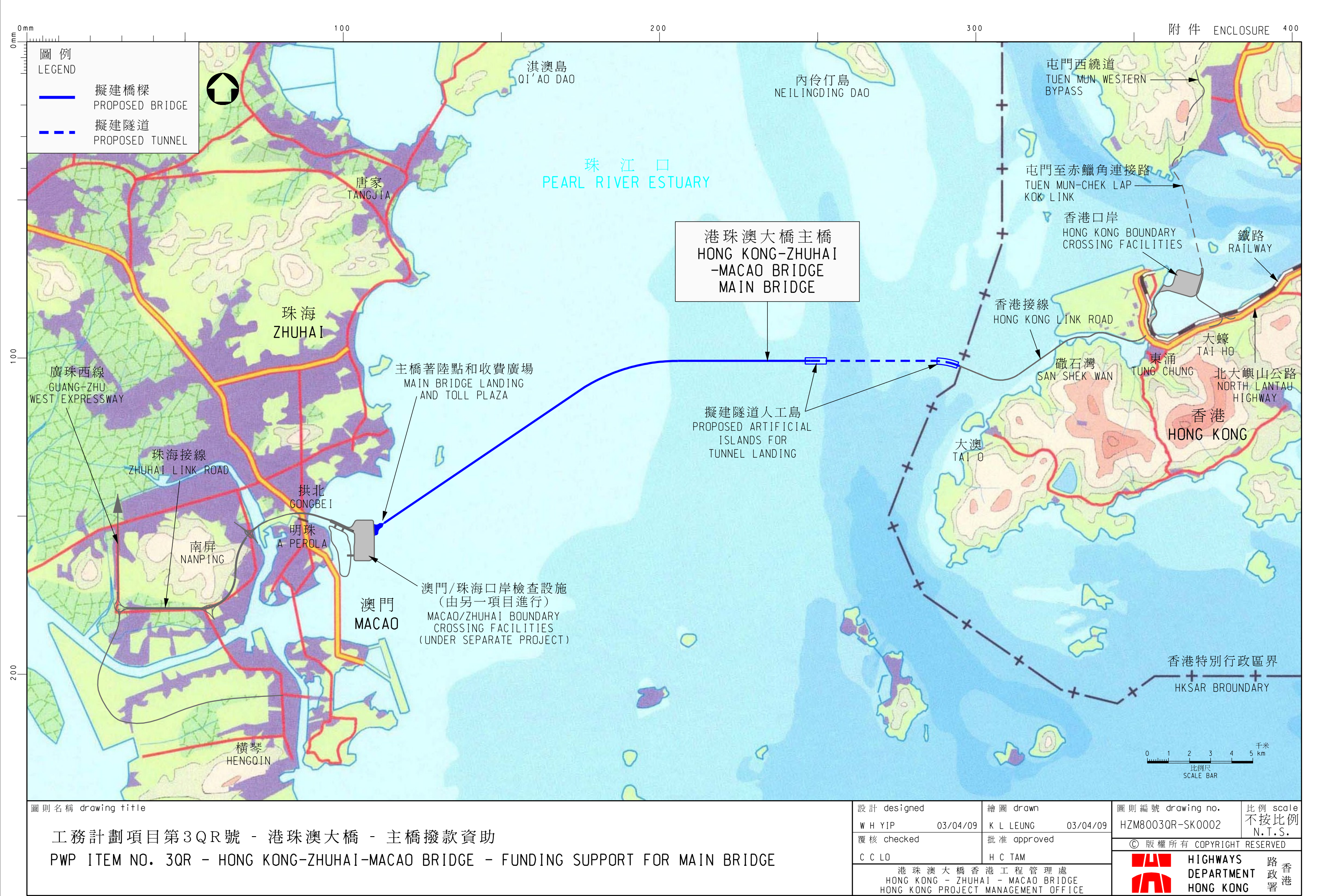
42. The proposed detailed design and construction for the HZMB Main Bridge will not involve any tree removal or planting proposals within the HKSAR boundary.

43. The proposed detailed design and construction for the HZMB Main Bridge will be carried out in the Mainland. Like the winning joint-venture consultant for preliminary design and site investigation works which comprises a Hong Kong consultant as a member, suitable consultants in Hong Kong may submit tenders in the form of joint venture with Mainland consultancy firms for the detailed design.

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Transport and Housing Bureau  
May 2009





圖則名稱 drawing title

工務計劃項目第3QR號 - 港珠澳大橋 - 主橋撥款資助

PWP ITEM NO. 3QR - HONG KONG-ZHUHAI-MACAO BRIDGE - FUNDING SUPPORT FOR MAIN BRIDGE



**For discussion  
on 6 May 2009**

**PWSC(2009-10)xx**

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 706 – HIGHWAYS**

#### **Transport – Roads**

#### **834TH – Hong Kong–Zhuhai–Macao Bridge Hong Kong Boundary Crossing Facilities**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **834TH**, entitled “Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – detailed design and site investigation”, to Category A at an estimated cost of \$621.9 million in money-of-the-day prices; and
- (b) the retention of the remainder of **834TH** in Category B.

### **PROBLEM**

We need to construct the Hong Kong Boundary Crossing Facilities (HKBCF) under the mode of “separate locations of boundary crossing facilities (BCF)”<sup>1</sup> to serve the Hong Kong–Zhuhai–Macao Bridge (HZMB).

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<sup>1</sup> Under the mode of “separate locations of BCF”, the BCFs of the three governments of Guangdong Province, Hong Kong Special Administrative Region and Macao Special Administrative Region will be separately located within their respective territories.

## PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to upgrade part of **834TH** to Category A at an estimated cost of \$621.9 million in money-of-the-day (MOD) prices for engagement of consultants to undertake the detailed design and associated site investigation for the HZMB HKBCF.

## PROJECT SCOPE AND NATURE

3. The scope of **834TH** (the Project) includes –
- (a) reclamation to provide land for the development of the HKBCF;
  - (b) cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray buildings, etc;
  - (c) passenger related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, etc;
  - (d) accommodation for and facilities of the Government departments providing services in connection with the HKBCF;
  - (e) provision of transport and miscellaneous facilities inside the HKBCF including public transport interchange, transport drop-off and pick-up areas, vehicle holding areas, passenger queuing areas, road networks, footbridges, fencing, sewage and drainage systems, water supply system, utilities, electronic system, and traffic control and information system, etc;
  - (f) provision of road access for connection of the HKBCF to the HZMB Hong Kong Link Road, the Tuen Mun-Chek Lap Kok Link (TM-CLKL) and the Airport;
  - (g) reprovisioning of the affected Airport's facilities such as the existing east rescue berth; and

- (h) provision of other facilities for connection with the Airport such as an Automated People Mover system to connect the Airport Terminal with the HKBCF.

———— The proposed location and view (artist's impression) of the HKBCF is at Enclosures 1 and 2 respectively.

4. The part of the project we now propose to upgrade to Category A comprises –

- (a) detailed design of the works described in paragraph 3 above;
- (b) associated site investigation and works supervision; and
- (c) contract procurement including preparation of tender documents and assessment of tenders.

5. We plan to commence the detailed design of the proposed works in September 2009 for completion in June 2012.

## **JUSTIFICATIONS**

### **HKBCF**

6. The governments of Guangdong, the Hong Kong Special Administrative Region and Macao Special Administrative Region (Macao SAR) have since 2003 formed an HZMB Advance Work Coordination Group (AWCG) to commence the preparatory work of the HZMB. In 2004, the AWCG commissioned the China Highway Planning and Design Institute (HPDI) to conduct a feasibility study for the HZMB. The National Development and Reform Commission (NDRC) also formed the HZMB Task Force in 2007 to push forward the project. The Task Force was led by the NDRC, with representatives from the Ministry of Communications, the Hong Kong and Macao Affairs Office, and the governments of Hong Kong, Guangdong and Macao as members. At its meeting on 7 January 2007, the Task Force recommended that the BCF of each government should be set up within their respective territories.

**Previous Legislative Council (LegCo) Approval**

7. On 6 June 2008, the LegCo Finance Committee approved funding of \$86.9 million to engage consultants to undertake the investigation and preliminary design for the HKBCF.

**Proposed Site Location**

8. In the light of the recommendation of the Task Force in January 2007 (paragraph 6 above refers), Highways Department commissioned a site selection study in May 2007 to identify a suitable location for the HKBCF. The study examined various possible sites, including different reclamation options at the eastern and western waters off the Airport Island; reclamation, land formation and hybrid options at San Shek Wan; an Airport Island option; and a reclamation option at Tai Ho.

9. Completed in early 2008, the study finally recommended the preferred location of the HKBCF to be reclaimed at the waters off the north-east of the Airport Island. This was reaffirmed after further reviewing the various options under the investigation and preliminary design study.

**HKBCF as a Transportation Hub**

10. Together with the HZMB Main Bridge and the Hong Kong Link Road (HKLR)<sup>2</sup> as well as the Tuen Mun Western Bypass (TMWB) and TM-CLKL, the proposed HKBCF site enables the formation of a strategic road network linking Hong Kong, Zhuhai, Macao and Shenzhen, thereby further enhancing the transportation and aviation hub status of Hong Kong. The synergy effect will be considerable.

11. With its proximity to the Hong Kong International Airport, the HKBCF will serve as a strategic multi-modal transportation hub. It is our current plan that the HZMB related projects, including the HKBCF and the HKLR, should be completed at the same time as that of TMWB and the TM-CLKL.

**Other Advantages of the Proposed Site Location**

12. The preferred site would comparatively have less impacts on hydraulics and environmental, in particular on marine ecology and water quality.

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<sup>2</sup> The HKLR is about 12 km dual three-lane road connecting the HZMB Main Bridge at the HKSAR boundary with the proposed HKBCF at the north-east of the Airport Island.

For instance, the preferred site location will cause less overall water resistance to the main flow path and less impact on flood discharge capacity of the Pearl River; less disturbance to the movement corridor of Chinese White Dolphins between Sha Chau and west of Lantau Island; less effect on navigation safety; and less damage to the natural hillside or shoreline, etc. As the proposed reclamation can be combined with that for the proposed TM–CLKL landfall, the total area of reclamation and length of seawall can be significantly reduced when compared with other reclamation alternatives. Also, with the proximity of the preferred site to the Airport and after reprovisioning of some affected Airport's facilities, air/land transit of passengers can be facilitated by extending the existing Automated People Mover to connect the Airport Terminal with the HKBCF. It will be very convenient for passengers to switch to different modes of transport at the HKBCF. Furthermore, this site location would also provide better integration with the proposed TM-CLKL, which will land on Lantau Island via the HKBCF site.

### **Impact of the HKBCF**

13. During the public consultation on the site location of the BCF, some Tung Chung residents expressed concerns on the visual impact of the HKBCF (paragraph 25 below refers). We consider that the visual impact is minimal because all the buildings on the HKBCF are very limited in terms of height (the largest building in the HKBCF will be the passenger clearance building, which will be similar to the existing Airport Terminal in terms of height). Furthermore, the distance from the HKBCF to the closest private residential development along Tung Chung shoreline is about 2km (being about the distance between Central and Jordan) and this should be sufficiently far apart. There are also some concerns in the local community on visual impact arising from the part of the original sea viaduct of the HKLR close to Tung Chung and before the HKBCF. We have now addressed these concerns by adopting a hybrid tunnel-cum-at-grade scheme as shown at **Enclosure 2**. A comparison of the effect of the original viaduct scheme and the tunnel-cum-at-grade scheme is at **Enclosure 3**. The Tung Chung residents also showed concern on the noise and air impact on them, which would be dealt with in accordance with the Environmental Impact Assessment Ordinance (EIAO). The substantially completed Environmental Impact Assessment (EIA) results show that the proposed site location will meet the requirements under the EIAO.

### **Alternative Locations Considered**

14. As mentioned in paragraph 8 above, we have considered seven alternative locations. They boil down to two broad categories: (a) constructing the HKBCF along the coastline at San Shek Wan; and (b) constructing the

HKBCF at the western waters off the Airport Island. These two categories of alternatives are not considered suitable primarily on grounds that they pose significant problems in hydraulic, navigation channels and environmental conservation. Neither could they achieve a road network as described in paragraphs 10 to 11 above with synergistic effect as strategic as the proposed site location. Comparison of them and the proposed site location are set out in **Enclosure 4**.

15. After the further review of the HKBCF options under the current investigation and preliminary design (I&PD) study of the HKBCF, the consultant has reaffirmed the recommendation of locating the preferred location of the HKBCF at the waters off the north-east of the Airport Island. We have completed substantially the EIA and other impact assessments on the HKBCF at the preferred location. Current indications are that the project is EIA-compliant. We will complete the preliminary design of the HKBCF by September 2009. We need to commence the detailed design and associated site investigation for the HKBCF as soon as possible such that the HKBCF is completed in time for the commissioning of the HZMB. In view of the multi-disciplinary nature of the project and the lack of in-house resources, we propose to employ consultants to undertake the detailed design and supervise the associated site investigation works.

### **Job Creation**

16. The implementation of the HKBCF, HKLR, TM-CLKL and TMWB projects are estimated to create about 18 000 jobs (about 3 000 for professional / technical staff and 15 000 for labourers) during the construction stage.

17. We estimate that the proposed detailed design and site investigation works will create about 250 jobs (190 for professional/technical staff and 60 for labourers) providing a total employment of about 4 100 man-months.

### **FINANCIAL IMPLICATIONS**

18. We estimate the cost of this part of the Project to be \$621.9 million in MOD prices, made up as follows—

		<b>\$ million</b>
(a)	Consultants' fees	442.5
(i)	review of preliminary design	44.3
(ii)	detailed design	287.7
(iii)	preparation of tender documents and assessment of tenders	110.5
(b)	Supervision of site investigation	6.4
(c)	Site investigation	80.0
(d)	Contingencies	52.9
	Sub-total	581.8 (in September 2008 prices)
(e)	Provision for price adjustment	40.1
	Total	621.9 (in MOD prices)

— A breakdown of the estimated consultants' fees is at **Enclosure 5**.

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

<b>Year</b>	<b>\$ million (Sep 2008)</b>	<b>Price Adjustment Factor</b>	<b>\$ million (MOD)</b>
2009 – 2010	21.7	1.03500	22.5
2010 – 2011	277.4	1.05570	292.9
2011 – 2012	188.5	1.07681	203.0
2012 – 2013	94.2	1.09835	103.5
	581.8		621.9

20. 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 2009 to 2013. We will engage consultants to undertake the detailed design of the reclamation works on a lump-sum basis without provision for price adjustment as the duration of the

consultancy will not exceed 12 months. We will also engage consultants to undertake the detailed design of the remaining works on a lump-sum basis with provision for price adjustment as the duration of the consultancy will exceed 12 months. The consultants will supervise site investigation works under a contract, with provision for price adjustment, to be awarded through competitive tendering.

21. The proposed detailed design and associated site investigation works will not give rise to any annual recurrent expenditure.

## **PUBLIC CONSULTATION**

22. In July 2007, we consulted environmental concern groups and fishermen representatives on their views on the possible HKBCF site locations. Most of the environmental concern groups agreed that a reclamation to the north-east of the Airport would have less environmental impacts than the other options and thus would be worthy of further consideration. Some however expressed objection to reclamation, irrespective of location, as a matter of principle. The fishermen representatives also expressed their objection to any reclamation for fear that it would affect their fisheries production.

23. We consulted the Islands District Council (IDC) on the possible options for the location of the HKBCF on 19 September 2007. Some members supported the option of locating the HKBCF at the waters off the north-east of the Airport due to its potential synergy benefits with the Airport and the overall economic benefits to the whole Hong Kong territory. Some members however indicated their preference to locating the HKBCF near San Shek Wan to help boost the local development and economy. Nevertheless, we do not recommend the San Shek Wan option due to its adverse impact on Chinese White Dolphins and its significant adverse noise, air, visual and landscape impacts, including significant hill cutting, removal of woodland with landscape value and clearance of an archaeological site.

24. On 25 April and 16 May 2008, we updated Members of the Legislative Council Panel on Transport (the Panel) on the progress of the planning work for the HZMB, the HKBCF and the HKLR. On 6 June 2008, the Finance Committee approved funding of \$86.9 million to engage consultants to undertake the investigation and preliminary design for the HKBCF.

25. From September 2008 to October 2008, we conducted a series of public engagement on the HKBCF, including ten focus group meetings with Chairmen of the Islands, Tuen Mun and Yuen Long District Councils, professional institutions, Heung Yee Kuk, Area Committees (Lantau Island), Area Committees (Tuen Mun), trade associations, fisherman groups, marine



industry and green groups; and held two public workshops concerning the Hong Kong-Shenzhen-Zhuhai corridor at Tung Chung and Tuen Mun. To further engage the views from local residents, 13 meetings with Tung Chung residents, Tai O Rural Committee and Tung Chung Rural Committee were held in early 2009. Some Tung Chung residents expressed concerns on the environmental and visual impacts that might be caused by the HKBCF proposed to be located at the waters off the north-east of the Airport Island and expressed their preference of locating the HKBCF at the west side of the Airport Island instead. Furthermore, some residents, particularly the village community, expressed their preference of locating the HKBCF at San Shek Wan to help boost the local development and economy. We have considered the pros and cons of the three schemes thoroughly and a comparison among them is given in paragraph 14 above and Enclosure 4. In particular, to address the residents' concerns on visual impact, we have replaced the original viaduct scheme for the HKLR with a tunnel-cum-at-grade scheme as explained in paragraph 13 above. As regards the concern on the noise and air quality impacts due to the proposed BCF, our initial findings indicate that they satisfy the requirement under EIAO. Furthermore, in response to the concerns expressed by Sha Lo Wan residents on the visual impact caused by the HKLR, we propose to modify the viaduct portion thereat by increasing the span length from 60m to 180m.

26. On 17 April 2009, we consulted the IDC on our proposed HKBCF option at the waters off the north-east of the Airport. Although some DC members representing the interest of residents living in north west Lantau had indicated their preference for a HKBCF west of the Airport Island, most of the DC members supported the implementation of the project with the HKBCF at the above proposed location. Some members suggested that an inter-Bureau group with participation from DC members be formed to discuss proposals to maximize the economic benefits of the HZMB to Lantau. The Administration will follow this up.

27. We consulted the Panel on 24 April 2009 regarding our plan to submit the funding application for the detailed design and associated site investigation. The Panel supported the funding application. *[To be confirmed]*

## ENVIRONMENTAL IMPLICATIONS

28. The reclamation works, dredging operation, extension of Automated People Mover, and road bridges under the project are designated projects under Schedule 2 of the EIAO (Cap. 499) and environment permits are required for their construction and operation. We have carried out an EIA study to address the potential environmental impacts of the Project in detail. We will submit soon the EIA report to the Director of Environmental Protection under the EIAO for approval and will follow the statutory procedures of making the EIA

report available for comment by the public and the Advisory Council on the Environment.

29. The proposed detailed design consultancy and site investigation works will generate very little construction waste. We will require the consultants to fully consider measures to minimise the generation of construction waste and to reuse/recycle construction waste as much as possible in the future implementation of the Project.

## HERITAGE IMPLICATIONS

30. The proposed detailed design and site investigation works 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.

## LAND ACQUISITION

31. The proposed detailed design and associated site investigation works do not require any land acquisition.

## BACKGROUND INFORMATION

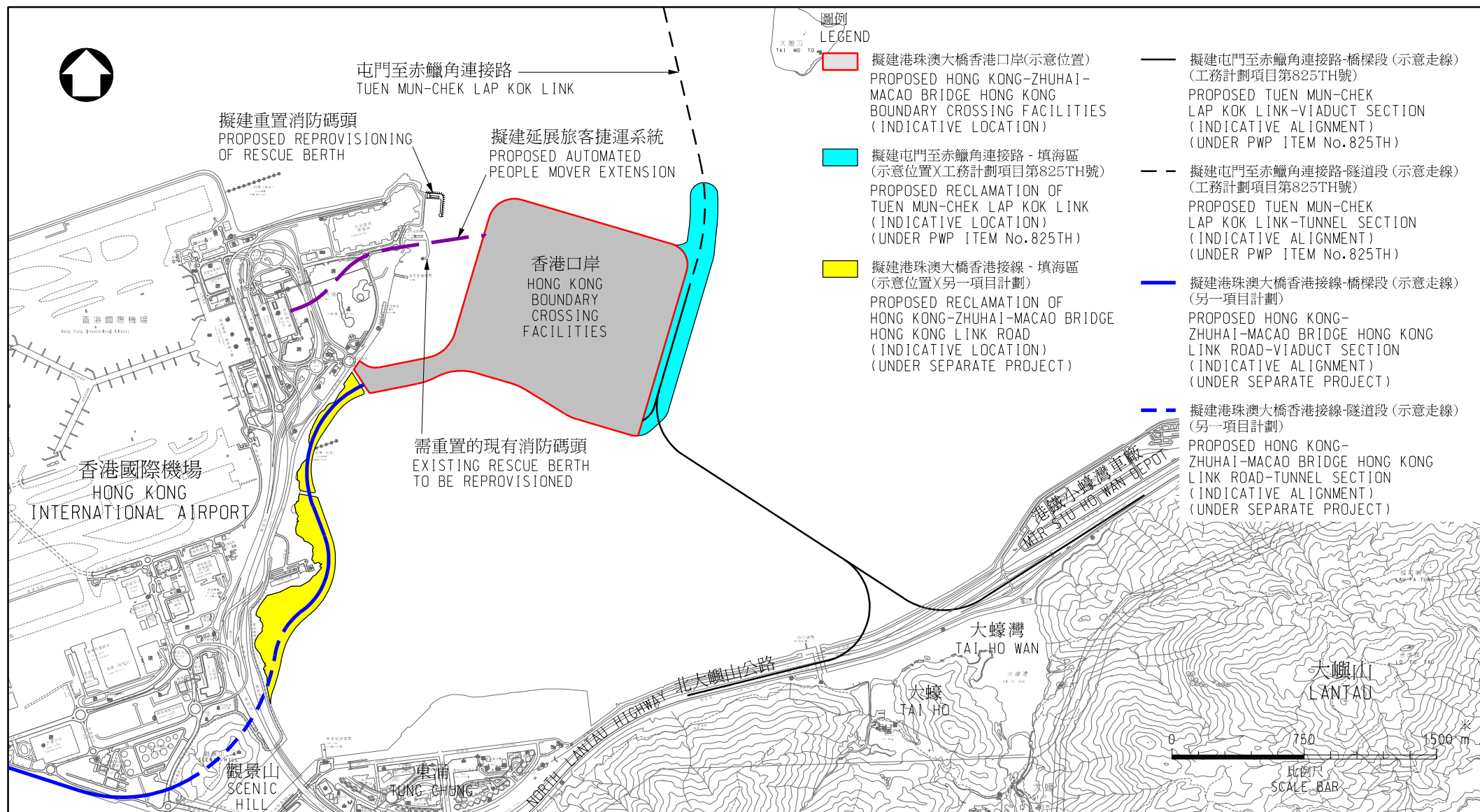
32. In May 2007, we engaged a consultant to undertake the HZMB HKBCF Site Selection Study – Feasibility Study at an estimated cost of \$3.85 million under **Subhead 5101CX** “Civil engineering works, studies and investigations for items in Category D of the Public Works Programme”. The consultant completed the study in March 2008.

33. We included **834TH** in Category B in March 2008.

34. In June 2008, we upgraded part of **834TH** to Category A as **837TH** “Hong Kong–Zhuhai–Macao Bridge Hong Kong Boundary Crossing Facilities – investigation and preliminary design” at an estimated cost of \$86.9 million in MOD prices. We engaged a consultant in July 2008 to undertake the investigation and preliminary design for the project. The consultant has completed substantially the EIA and other impact assessments. The consultant will complete the preliminary design by September 2009.

35. The proposed detailed design and associated site investigation works will not involve any tree removal or planting proposals. We will require the consultants to take into consideration the need for the tree preservation in the detailed design of the project. We will also incorporate tree-planting proposals, where possible, in the construction phase.

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**Transport and Housing Bureau**  
**May 2009**



圖則名稱 plan title

工務計劃項目第834TH號 - 港珠澳大橋香港口岸  
PWP ITEM NO. 834TH - HONG KONG-ZHUHAI-MACAO BRIDGE  
HONG KONG BOUNDARY CROSSING FACILITIES

設計 designed

K Y HO 27/03/09

覆核 checked

K MA

繪圖 drawn

Y L SHIU 31/03/09

批准 approved

K M BOK

圖則編號 plan no.

HZM6834TH-SK0034

比例 scale

1:30000

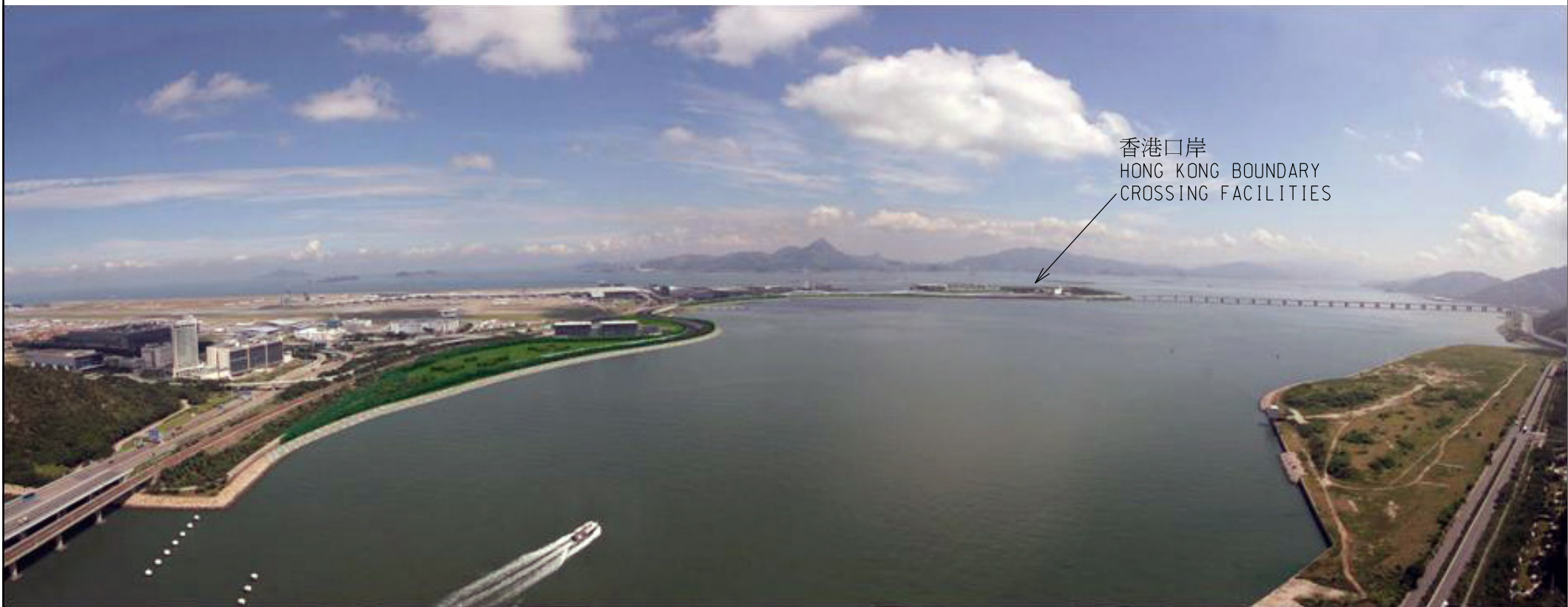
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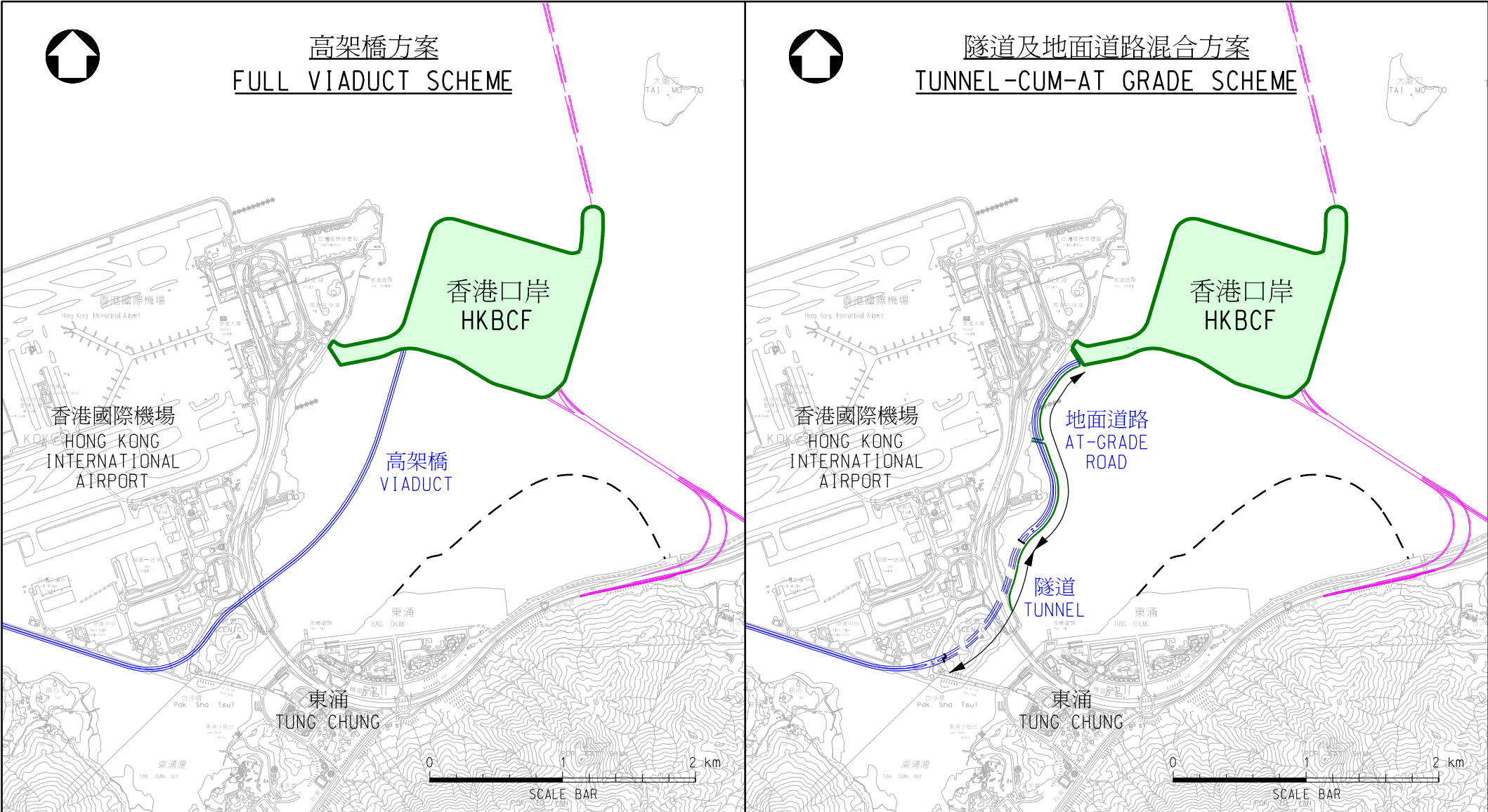
從東涌望向香港口岸的景觀  
VIEW OF HONG KONG BOUNDARY CROSSING FACILITIES FROM TUNG CHUNG

圖則名稱 plan title	設計 designed K Y HO 03/04/09	繪圖 drawn C K WONG 03/04/09	圖則編號 plan no. HXM6834TH-SK0031	比例 scale N.T.S.
工務計劃項目第834TH號 - 港珠澳大橋香港口岸 - 景觀構思圖 PWP ITEM NO. 834TH - HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES - VIEW (ARTIST'S IMPRESSION)	覆核 checked K MA	批准 approved K M BOK	© 版權所有 COPYRIGHT RESERVED	
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**834TH – Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities**

A comparison of the effect of the full viaduct scheme and the tunnel-cum-at grade scheme for the section of HKLR between Scenic Hill and the HKBCF.

	Full Viaduct Scheme	Tunnel-cum-at grade Scheme
Length	2.8km	2.7km
Shortest distance between the road and the Tung Chung North development	700m	920m
Road Level	+17mPD to +35mPD	+6.5mPD
Visual	Standing out structure in Tung Chung Bay	Blend in with the existing Airport Island



圖則名稱 plan title

香港接線 - 機場島東北水域走線方案  
HONG KONG LINK ROAD -  
ALIGNMENT SCHEMES AT NORTH-EAST OF AIRPORT ISLAND

設計 designed

K Y HO 08/04/09

覆核 checked

K MA

繪圖 drawn

Y L SHIU 08/04/09

批准 approved

K M BOK

港珠澳大橋香港工程處  
HONG KONG - ZHUHAI - MACAO BRIDGE  
HONG KONG PROJECT MANAGEMENT OFFICE

圖則編號 plan no.

HZM6834TH-SK0036

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比例 scale

1:40000

**834TH – Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities**  
**Comparison of the proposed HKBCF site location with another two categories of alternatives**

<b>North-east waters off the Airport Island (NECLK) option</b>	<b>San Shek Wan (SSW) option</b>	<b>Western waters off the Airport Island (WCLK) option</b>
<ul style="list-style-type: none"> <li>● The Islands District Council as a whole support the NECLK option.</li> </ul>	<ul style="list-style-type: none"> <li>● Some Sha Lo Wan and Shan Shek Wan villagers support this option in the hope of possible future development of Lantau West in future and some Tung Chung residents support this option.</li> </ul>	<ul style="list-style-type: none"> <li>● Some Tung Chung residents support this option.</li> </ul>
<p><b><u>Transport and Economic functions</u></b></p> <p>1. HKBCF locating at the north east waters of the Airport Island and connecting with TM-CLKL, the transport network for Airport, Northwest New Territories and Lantau Island will be formed. Connectivity between Lantau Island and urban areas and the transport network for Tung Chung town will</p>		<p><b><u>Transport and Economic functions</u></b></p> <p>1. WCLK option would cause 2km detour for the HKLR inducing a greater overall social cost (e.g.time and energy source), and causing more exhausted gases emission (annual NOx emission will be 60 tonnes additional)</p>



North-east waters off the Airport Island (NECLK) option	San Shek Wan (SSW) option	Western waters off the Airport Island (WCLK) option
<p>be improved.</p> <p>2. The HZMB, together with the HKBCF locating at the northeast waters of the Airport Island, the TM-CLKL and TMWB, can form a convenient strategic network linking Hong Kong, Shenzhen, Zhuhai and Macao. Besides, HKBCF will be served by a variety of transport modes in close proximity to each other (including the Airport, the SkyPier, the Airport Express Line and Tung Chung Line), thus forming a multi-modal transportation-hub.</p> <p>3. With the Airport People Mover (APM), HZMB-air transit passengers can get to Airport without the need of custom clearance at HKBCF. Therefore, the</p>		

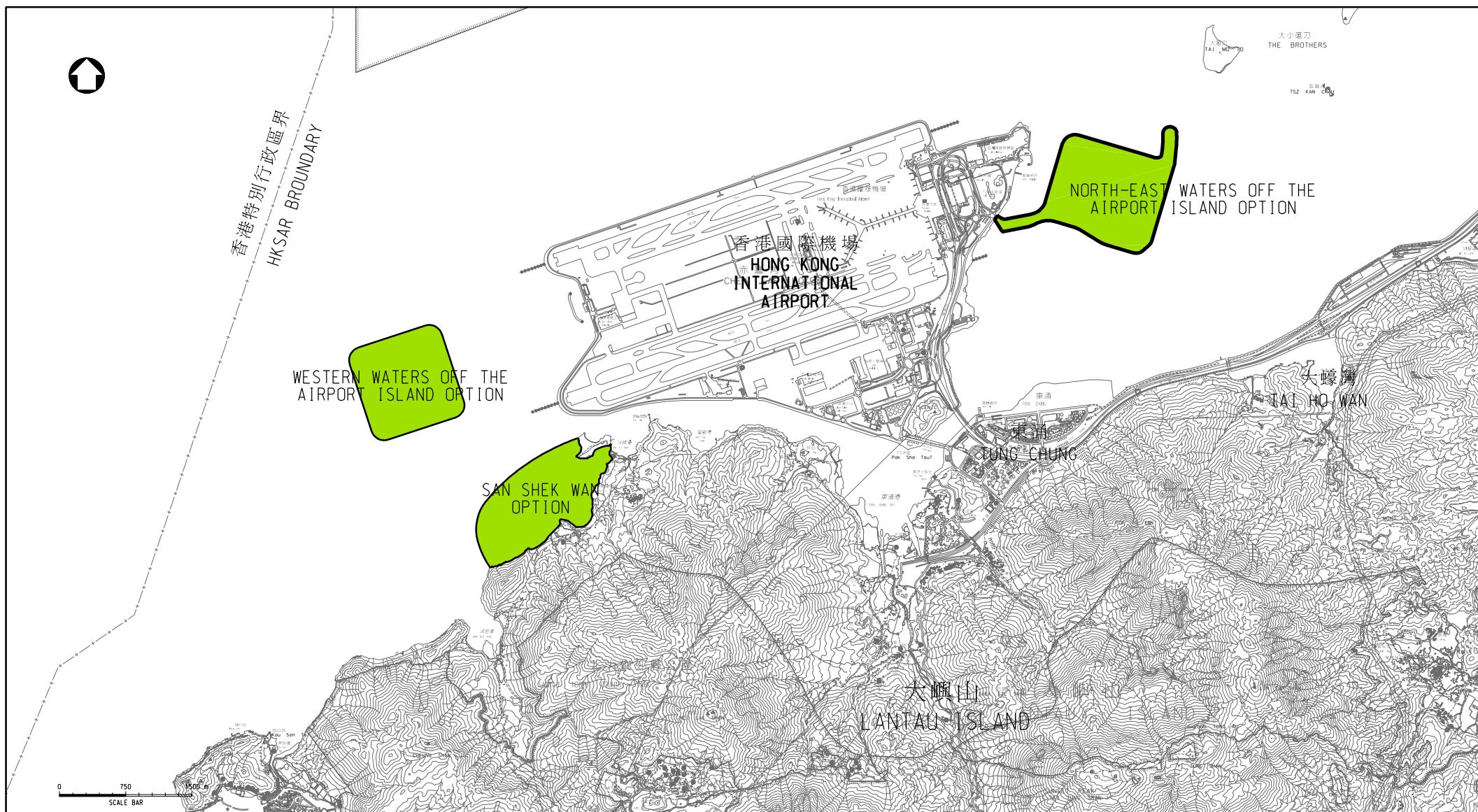
North-east waters off the Airport Island (NECLK) option	San Shek Wan (SSW) option	Western waters off the Airport Island (WCLK) option
<p>clearance time is shortened.</p> <p>4. With AsiaWorld-Expo, hotels, shopping mall and outlets etc in the proximity, there is a greater potential for economic activities and employment opportunities in the local area;</p>		
<p><b><u>Environmental Impact</u></b></p> <p>1. Some Tung Chung residents are concerned about the visual aspect. In response to public views, we have replaced the section of elevated road near Tung Chung by a combination of tunnel and at-grade road. As regards the HKBCF, it is at a distance of 2 kilometres away from Tung Chung (distance being roughly</p>	<p><b><u>Environmental Impact</u></b></p> <p>1. Option SSW is extremely close to nearby villages. The shortest distance is 20m. Such a close distance with HKBCF would result in non-compliance in air-quality and noise criteria stipulated under the EIA Ordinance (EIAO);</p> <p>2. Option SSW involves a large scale of hillside cutting (~15 million m<sup>3</sup>), as well as substantial damage to natural woodland (~35ha/over</p>	<p><b><u>Environmental Impact</u></b></p> <p>1. Chinese White Dolphins – The waters on the western side of the Airport has long been recognised as an active area of Chinese White Dolphins. They are densely populated at Sha Chau/ Lung Kwu Chau and at the west of Lantau Island. Also vital is a dolphin movement corridor between the Sha Chau/ Lung Kwu Chau and West of Lantau Island. An artificial island located in this movement</p>

North-east waters off the Airport Island (NECLK) option	San Shek Wan (SSW) option	Western waters off the Airport Island (WCLK) option
<p>equivalent to that between Central and Jordan) and its buildings are generally low-rise. (The largest building at HKBCF is the passenger clearance building, which is similar in height to the existing airport terminal buildings.) Visual impact on views from Tung Chung should be minimal.</p> <p>2. Some Tung Chung residents are concerned about the environmental aspect, which will be dealt with under the EIA in accordance with the EIAO. The EIA has been substantially completed. The substantially assessed results show that Option NECLK will meet the requirements under the EIAO, including the criteria on air-quality and noise-levels. It should also be</p>	<p>20,000 trees) and natural shoreline (~2km), resulting in irreversible damage to the natural environment in San Shek Wan.</p>	<p>corridor will cause serious impact on the Chinese white dolphins.</p>

<b>North-east waters off the Airport Island (NECLK) option</b>	<b>San Shek Wan (SSW) option</b>	<b>Western waters off the Airport Island (WCLK) option</b>
<p>noted that the assessed results have taken into account not only the HKBCF, the HKLR and the TM-CLKL, but also the cumulative impacts due to other sources. The finalised EIA study report will be submitted to the statutory authority under the EIAO. Subject to the approval by the Director of Environmental Protection, we anticipate that it will be ready for public inspection in August 2009.</p>		
<p><b><u>Reclamation</u></b></p> <p>1. Owing to the merging of the HKBCF with Tuen Mun-Chek Lap Kok Link (TM-CLKL) landfall in terms of reclamation, the seawall will be reduced by approximately</p>	<p><b><u>Reclamation</u></b></p> <p>1. The reclamation cannot be merged with that of the TM-CLKL landfall. This will result in reclamation not only having to be carried out at San Shek Wan for HKBCF, but also east of Airport Island for the TM-CLKL landfall</p>	<p><b><u>Reclamation</u></b></p> <p>1. Under this option, the reclamation cannot be merged with that of TM-CLKL landfall. That means reclamation not only has to be carried out at the west of Airport Island, but at the east as well for TM-CLKL landfall</p>

North-east waters off the Airport Island (NECLK) option	San Shek Wan (SSW) option	Western waters off the Airport Island (WCLK) option
<p>1.8 km and dredging reduced by approximately 5 million m<sup>3</sup>.</p> <p>2. Reclamation will be required on the eastern side of the Airport Island only (unlike the other two options, the Option WCLK and Option SSW, which will involve reclamation not only on western side of the Airport Island but also on eastern side of the Airport Island in order to provide the TMCLKL landfall).</p>	<p>concurrently.</p>	<p>concurrently.</p>
		<p><b><u>Hydraulics &amp; Navigation Safety</u></b></p> <p>1. Main flowpath of Pearl River Delta (PRD) – HZMB feasibility study report assessed that the water resistance ratio should be limited to 10% to minimize the flow and flood discharge impact. Given that an artificial</p>

North-east waters off the Airport Island (NECLK) option	San Shek Wan (SSW) option	Western waters off the Airport Island (WCLK) option
		<p>island will be located at the main flowpath of the PRD under this option, the water resistant ratio will be higher than 10%, thus imposing severe impact on the Pearl River flowpath and flood-discharge capacity.</p> <p>2. Besides, if HKBCF is built near the HKSAR boundary, marine navigation will be affected which may affect navigation safety.</p>



圖則名稱 drawing title

HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF) LOCATIONS

設計 designed

K Y HO 08/04/09

覆核 checked

K MA

繪圖 drawn

Y L SHIU 08/04/09

批准 approved

K M BOK

圖則編號 drawing no.

HZM6834TH-SK0035

比例 scale

1:60000

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DEPARTMENT  
HONG KONG

路政署  
香港

港珠澳大橋香港工程管理處  
HONG KONG - ZHUHAI - MACAO BRIDGE  
HONG KONG PROJECT MANAGEMENT OFFICE

**834TH – Hong Kong–Zhuhai–Macao Bridge  
Hong Kong Boundary Crossing Facilities**

**Breakdown of estimates for consultants' fees**

			Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
Consultants' staff costs						
(a)	Review of preliminary design	Professional	184	38	2.0	22.3
		Technical	554	14	2.0	22.0
(b)	Detailed design	Professional	1 110	38	2.0	134.4
		Technical	3 864	14	2.0	153.3
(c)	Preparation of tender documents and assessment of tenders	Professional	417	38	2.0	50.5
		Technical	1 513	14	2.0	60.0
Total consultants' staff costs						442.5

\* MPS = Master Pay Scale

**Note**

1. A multiplier of 2.0 is applied to the average MPS point to arrive at the full staff costs including the consultants' overheads and profit as the staff will be employed in the consultants' offices. A multiplier of 1.6 is applied to the average MPS point in the case of resident site staff supplied by the consultants. (At 1 April 2008, MPS pt. 38 = \$60,535 per month and MPS pt. 14 = \$19,835 per month).
2. The figures given above are based on estimates prepared by the Director of Highways. We will know the actual man-months and fees only after we have selected the consultants through the usual competitive lump-sum fee bid system.